EXPERIMENTAL STUDY OF THE STATIC AND DYNAMIC CHARACTERISTICS OF A LONG (L/D=0.75) LABYRINTH ANNULAR SEAL OPERATING UNDER TWO-PHASE (LIQUID/GAS) CONDITIONS

A Thesis

by

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Submitted to the Office of Graduate and Professional Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

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May 2018

Major Subject: Mechanical Engineering

ABSTRACT

Wet-gas compression has become an important technology to focus on, requiring a concentrated effort to predict the behavior of compressors when exposed to wet gas conditions. The compressor's stability is highly influenced by the rotordynamic behavior of seals. Labyrinth seals are widely used in compressors to reduce leakage. There have been many studies of labyrinth seals operating under mainly-air conditions. However, there are very few studies on labyrinth seals operating under wet gas conditions. A 2 phase annular-seal stand (2PASS) at Turbomachinery Laboratory of Texas A&M University is utilized to experimentally investigate a labyrinth seal operating under 2- phase flow conditions (a mixture of silicone oil and air).

A long labyrinth seal (L/D = 0.75) is tested at supply pressure of 70 bar-a with gas volume fraction (GVF) ranging from 90% -100%. Tests were conducted at pressure ratios of 0.3, 0.4 and 0.5, three rotating speeds of 5, 10 and 15 krpm, and three preswirl ratios at a radial clearance of 2mm (8 mils). The results show that the direct stiffness and cross coupled stiffness of the labyrinth seal are frequency dependent for all three preswirls. Also, direct stiffness is negative. As inlet GVF decreases (more liquid), direct stiffness becomes more negative for *zero* preswirl, causing the seal's centering force and direct stiffness to decrease. The effect of GVF on direct stiffness for *medium* and *high* preswirl is not as defined as for *zero* preswirl.

Similarly, for *zero* preswirl, as inlet GVF decreases cross-coupled stiffness increases. Hence, decreasing GVF promotes instability by developing a transverse (to the eccentricity vector) reaction force in the direction of rotor precession. On the other hand, for *high* preswirl, cross-coupled stiffness decreases as GVF decreases. Hence, decreasing GVF enhances the stability of the seals.

The increase of liquid in the flow stream increases the direct damping of the system. When the GVF increases, cross-coupled damping increases; however it remains small.

Also, for *zero* preswirl, decreasing GVF from 100% to 90% makes effective damping negative at low frequencies; however effective damping converges to almost the same positive value for frequencies higher than Ω_c (the frequency at which C_{eff} changes from negative to positive), indicating a stable system at higher frequencies. However, for *medium* and *high* preswirl, as GVF decreases, C_{eff} becomes less negative and eventually becomes positive for frequencies higher than Ω_c. This result indicates that the presence of some liquid in air flow can

make the labyrinth seals more stable at higher frequencies. For a compressor running at 15 krpm and PR 0.5 with the first critical speed of 7500 rpm (125 Hz), decrease in GVF increases the stability for *medium* and *high* preswirl.

Similarly, leakage rate $\dot{m}$ increases with decreases in GVF for all three preswirls.

DEDICATION

This thesis work is dedicated to my family

ACKNOWLEDGMENTS

I would like to express my sincere thanks to Dr. Dara Childs for providing me with wonderful opportunity to work at Turbomachinery Laboratory, and for his patience and invaluable guidance throughout my research.

I would like to thank Dr. San Andres and Dr. Yoon for graciously serving on my committee.

I would also like to acknowledge my fellow graduate students, Dung Tran and Jonathan Thiele, for their continuous support while conducting tests.

Finally, I would like to thank my parents and my brother, Bijay Shrestha, for their continuous love and support. Their seamless support and patience has given me the freedom to do what I love the most.

NOMENCLATURE

$\boldsymbol{A_{ij}}$	Fourier transforms of the stator acceleration in *i* direction due to a shake in *j* direction [L/T^2]
c	Cross-coupled damping, defined by Eq.(19), [FT/L]
C	Direct damping, defined by Eq.(18), [FT/L]
C_{eff}	Effective damping defined by Eq. (5), [FT/L]
C_r	Seal radial clearance [L]
D	Seal inner diameter [L]
D_r	Rotor diameter [L]
$\boldsymbol{D_{ij}}$	Fourier transforms of the relative displacement of the stator to the rotor in *i* direction due to a shake in *j* direction [L]
f_{Seal_X}, f_{Seal_Y}	Seal's reaction forces acting on the rotor in *X* and *Y* directions, defined by Eq. (3), [F]
$\boldsymbol{F_{ij}}$	Fourier transforms of the excitation force in *i* direction due to a shake excitation in *j* direction [F]
GVF	Gas volume fraction, defined by Eq. (9), [-]
$\boldsymbol{H_{ij}}$	Complex dynamic stiffness coefficients defined by Eq. (15)
k_Ω	Cross-coupled dynamic stiffness, defined by Eq. (17), [F/L]
K_Ω	Direct dynamic stiffness, defined by Eq. (16), [F/L]
L	Seal length [L]
$\dot{m}$	Mass flow rate [M/T]
M_{ij}	Virtual mass coefficients [M]
$[M_S]$	Stator-mass coefficient matrix, defined by Eq.(20), [M]
P	Pressure [F/L^2]
PR	Pressure ratio, PR= P_e / P_i [-]
$\dot{Q}$	Volume flow rate [L^3/T]
T	Temperature [T]
V_θ	Circumferential bulk-flow velocity, as defined in Eq. (7), [L/T]
x, y	Relative displacements of the stator to the rotor in *X* and *Y* directions [L]

μ	Viscosity [FT/L^2]
ρ	Density [M/L^3]
ω	Rotor speed [T^{-1}]
Ω	Excitation frequency [T^{-1}]

Subscripts

X, Y	X and Y directions of the coordinate system defined in Fig.
e	Seal exit condition
i	Seal inlet condition
l	Liquid component
g	Gas component

Acronyms

GVF	Gas Volume Fraction
LGMR	Liquid/Gas Mass Ratio
LVF	Liquid Volume Fraction, LVF=1-GVF
2PASS	2-Phase Annular-Seal Stand

CONTRIBUTORS AND FUNDING SOURCES

Contributors

This work was supervised by a thesis committee consisting of Professor Dara Childs [advisor] and Luis A. San Andrés of the Department of Mechanical Engineering and Professor Byung-Jun Yoon of the Department of Electrical Engineering.

All work for the thesis was completed by the student, in collaboration with other graduate students: Dung Tran and Jonathan Thiele, and undergraduate students: Kyle Miller and Keaton Hruzek.

Funding Source

This work was funded by Turbomachinery Research Consortium.

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1. INTRODUCTION

Although, most compressors are designed for gaseous fluids, there can be some amount of liquid present in the gas stream. Scrubbers and Separators are used to purge the liquid components. The size of these separation devices becomes a hurdle in natural gas applications. Wet-gas compression significantly reduces the size, weight and cost of a compressor system. Wet-gas compression has become a central technology to access gas reserves and enhance production. A significant amount of liquid carryover can influence the performance and rotordynamic behavior of a compressor [1] .

Labyrinth annular seals are widely used as shaft seals, balance-piston seals, and eye packing seals in compressors to reduce leakage and increase the efficiency of the machine. Figure 1 shows three different placements of labyrinth seals in a typical compressor. The eye packing seals control leakage across the front of the impeller. Shaft seals limit the backflow to the previous stage; whereas, the balance-piston seal counteracts the axial thrust generated within the stages. A compressor's rotordynamic stability can be highly influenced by the rotordynamic behavior of labyrinth seals. A balance-piston seal has a higher rotordynamic impact on a compressor because of its length and pressure difference across the length. Hence, identifying the rotordynamic performance of labyrinth seals under wet-gas conditions is important.

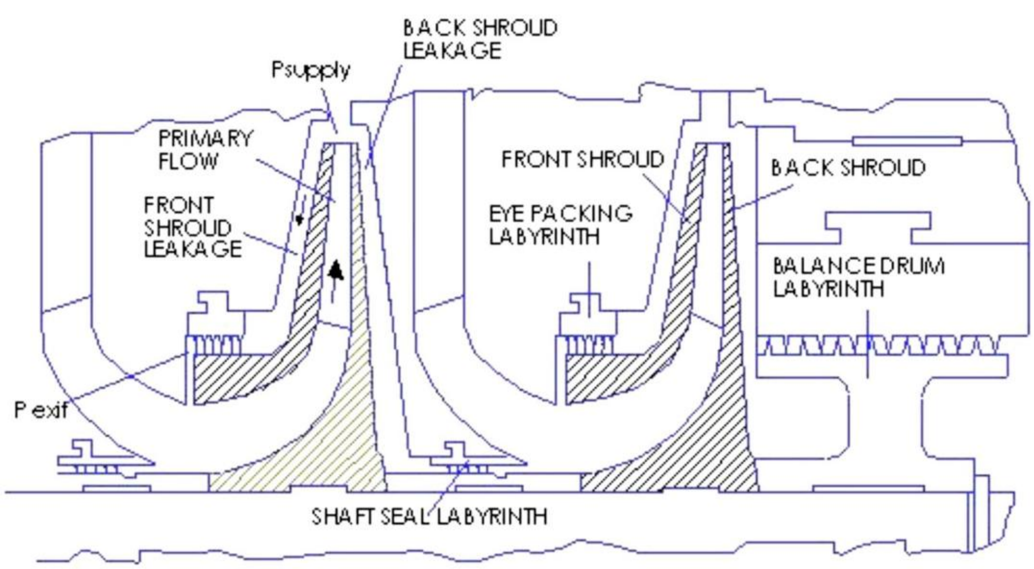


Figure 1. Annular seals in a centrifugal compressor [2]

In this research, labyrinth seals refer to a “tooth-on-stator (TOS)” labyrinth with a smooth rotor. Figure 2 represents a “see-through” TOS design having teeth on the stator, smooth rotor, and a small non contacting gap between the stator and the rotor.

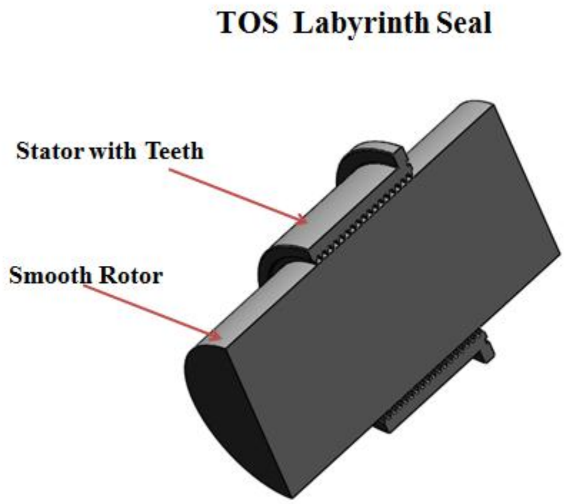


Figure 2. Section view of Teeth on Stator (TOS) labyrinth seal

When a rotor moves radially, there is fluid-film-interaction between the seal and rotor. This interaction causes reaction forces from the seal. According to Childs [3] , for small motion, the seal reaction forces can be modeled by:

$$-\begin{Bmatrix} f_{Seal\_X} \\ f_{Seal\_Y} \end{Bmatrix} = \begin{bmatrix} K(\Omega)_{XX} & K(\Omega)_{XY} \\ K(\Omega)_{YX} & K(\Omega)_{YY} \end{bmatrix} \begin{Bmatrix} x \\ y \end{Bmatrix} + \begin{bmatrix} C(\Omega)_{XX} & C(\Omega)_{XY} \\ C(\Omega)_{YX} & C(\Omega)_{YY} \end{bmatrix} \begin{Bmatrix} \dot{x} \\ \dot{y} \end{Bmatrix} \tag{1}$$

For small motion around the concentric position, Eq. (1) is normally simplified by the following assumptions:

$$\begin{aligned} &K(\Omega)_{XX} = K(\Omega)_{YY} = K(\Omega), K(\Omega)_{XY} = -K(\Omega)_{YX} = k(\Omega) \\ &C(\Omega)_{XX} = C(\Omega)_{YY} = C(\Omega),\ C(\Omega)_{XY} = -C(\Omega)_{YX} = c(\Omega) \end{aligned} \tag{2}$$

Combining Eq. (1), and Eq. (2):

$$-\begin{Bmatrix} f_{Seal\_X} \\ f_{Seal\_Y} \end{Bmatrix} = \begin{bmatrix} K(\Omega) & k(\Omega) \\ -k(\Omega) & K(\Omega) \end{bmatrix} \begin{Bmatrix} x \\ y \end{Bmatrix} + \begin{bmatrix} C(\Omega) & c(\Omega) \\ -c(\Omega) & C(\Omega) \end{bmatrix} \begin{Bmatrix} \dot{x} \\ \dot{y} \end{Bmatrix} \tag{3}$$

where f_{Seal_X} and f_{Seal_Y} are seal reaction component forces, K_{XX} and K_{YY} are direct stiffness, K_{XY} and K_{YX} are cross-coupled stiffness, C_{XX} and C_{YY} are direct damping, and C_{XY} and C_{YX} are cross-coupled damping.

Figure 3 represents a rotor undergoing forward precession around its centered position at the frequency Ω. The rotor is spinning about its own axis with speed ω. The radius of the small circular orbit around the concentric position is e_o. There will be reaction forces generated by a seal on a forward precessing rotor. F_r is the radial component of the reaction force that acts against the radial displacement of the rotor. This component defines effective stiffness K_{eff} as,

$$K_{eff} = \frac{F_r}{e_o} = K(\Omega) + c(\Omega)\Omega \tag{4}$$

The circumferential force component F_θ opposes the whirling motion of the rotor in the direction of the rotation. Effective damping C_{eff} is defined using F_θ.

$$C_{eff} = \frac{F_\theta}{\Omega e_o} = C(\Omega) - \frac{k(\Omega)}{\Omega} \tag{5}$$

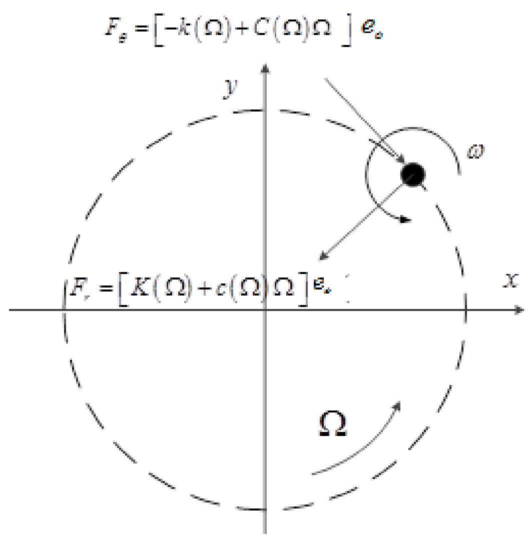


Figure 3. Seal forces on a forward processing rotor

Positive direct stiffness K provides a centering force for the rotor. However, negative direct stiffness pulls the rotor away from the centered position towards the seal wall. Cross-coupled stiffness k arises due to fluid rotation. When positive, cross coupled stiffness promotes instability by developing reaction force in the direction of rotor precession. Positive direct damping C opposes the rotor precession and stabilizes the rotor vibrations. Effective damping C_{eff} relates direct damping to cross-coupled stiffness. High positive value for effective damping indicates low cross-coupled forces compared to direct damping, and hence is desired for stability.

1.1 Test results for a Single-Phase Labyrinth Seal

There has been considerable research on rotordynamic characteristics of labyrinth seals that were tested using air. In 1980, Benckert and Wachter [4] experimentally investigated TOS labyrinth seals. The experiment was carried out on four different labyrinth seals with 3,7,12, and 17 cavities at 1.432 bar (20psi) inlet pressure and different pressure ratios ranging from 0.32 to 0.79. The experiment showed that the labyrinth seals had negative direct stiffness coefficients. The authors also reported that the cross coupled stiffness of the seals was directly proportional to the inlet swirl velocity. Also, preswirl in the direction of shaft rotation made the cross coupled stiffness positive and destabilizing.

In 1996 and 2001, Wagner [5,6] investigated straight-through labyrinth seals, staggered labyrinth seals, and honeycomb seals using a magnetic- bearing test rig at inlet pressures up to 70 bar-a and pressure ratios of 0.4, 0.6 and 0.8. The results showed that the reaction forces in labyrinth seals were considerably smaller than for honeycomb seals. In 2009, Wagner et al. [7] modified the test rig to investigate the rotordynamic coefficients of stepped labyrinth seals using dynamic pressure measurements. The seals had four straight teeth. The tests were carried out with gaseous nitrogen at static inlet pressure of 20 bar-a and rotational speed of 15 krpm. The results showed the presence of gas inertia forces in the radial reaction force.

In 2003, Picardo [8] experimentally investigated a straight tooth TOS labyrinth seal, and in 2012, Mehta and Childs [9] investigated a similar slanted tooth TOS labyrinth seal. The experiments were conducted with air at inlet pressures of 70 bar-a and 52 bar-a for two different radial clearances of 0.2mm (0.008 in) and 0.1 mm (0.004 in) for rotor speeds ranging from 10.2 to 20.2 kRPM. The results showed that k and C increased with increasing preswirl ratio, defined by Eq. (7). They also reported that K was negative. Arthur [10] also reported significant frequency dependence for rotordynamic coefficients of TOR labyrinth seals.

1.2 Wet gas compression

In 1972, Vannini et al. [11] reported that GE performed a field test on back-to-back multistage compressors under wet gas conditions. The results revealed a performance decrease of the compressor due to deterioration of the labyrinth shaft-end seals. The deterioration of the labyrinth shaft-end seals could have been caused by high vibrations. GE further designed the following two experiments: (a) liquid was injected into the gas stream at suction flanges, and (b) the liquid was injected radially through vent lines into the labyrinth shaft-end seals. The radial injection resulted in a subsynchronous lateral vibration at 50% of the rotating speed. The sub-synchronous vibration occurred even after mounting elliptical bearings and tilting pad bearings. Vannini et al. [11] concluded that wet gas conditions on labyrinth shaft-end seals could lead to a sub-synchronous vibration.

In 1993, Vannini et al. [11] performed wet gas compression tests on an 8-stage vertical multistage barrel compressor. The wet gas flow was a mixture of nitrogen and heavy oil. The gas volume fraction (GVF) was maintained from 97.97% to 99.16%. However, this test showed that the wet gas flow did not affect the rotordynamic behavior of the compressor.

In 2005, Brenne et al. [12] investigated the performance of a single-stage centrifugal compressor using a mixture of hydrocarbon gas and hydrocarbon condensate as the test fluid. The liquid-volume fraction (LVF), defined as ratio of volume of liquid to total volume of fluid, was up to 3%. The following approaches were used to inject liquid into pressurized gas stream before entering the compressor: (1) droplet injection, and (2) film injection. The test conditions were varied using different suction pressures (30 and 70 bars) and two rotating speeds (9,651 and 10,732 rpm). Subsynchronous vibration was reported at a suction pressure of 30 bars, a speed of 9,651 rpm, and a GVF of 97%. The subsynchronous vibration disappeared when the GVF was increased above 98%. Brenne et al. [12] suggested that the vibration was induced by liquid trapped in impeller-eye seals or balance-piston seals.

In 2011, Griffin and Maier [13] experimentally investigated an oil-free integrated motor-compressor machine with liquid injected at its inlet. The liquid/gas mass ratio (LGMR), defined as the ratio of the mass of the liquid to the mass of the gas, at the inlet was varied up to 0.5. The test results showed that the liquid injection did not impact the machine's rotordynamic performance. Logarithmic decrement was measured using a magnetic bearing exciter. In some cases, liquid injection improved system stability.

GE Oil & Gas and Southwest Research Institute (SwRI) have been collaborating since 2010 to experimentally investigate the mechanical vibration of centrifugal compressors operating under wet-gas conditions. Ransom et al. [14] , Bertoneri et al [1] , Vannini et al [11] , and Vannini et al. [15] performed different experiments as a part of this collaboration, and the results are discussed below.

In 2011, Ransom et al. [14] investigated the mechanical vibration performance of a two stage centrifugal compressor using a mixture of water and air as a test fluid. The compressor had a labyrinth balance-piston seal. The test matrix included three rotating speeds (8, 9.5, and 11 krpm) and multiple LVF (0.5 to 5%) and a suction pressure of about 20 bars. Test results revealed that the wet gas conditions significantly affected the axial vibration; however, they had negligible effects on lateral vibration.

In 2014, Bertoneri et al. [1] modified the test rig used by Ransom et al. [14] to study the performance of a single-stage centrifugal compressor using a mixture of water and air as test fluid. TOS labyrinth seals were used as shaft end seals, impeller eye seals, and the balance-piston seal. The GVF was varied from 100% to 97%. Spiral injectors were used to inject the atomized water into the dry suction-gas stream. The test matrix included three different suction pressures (10, 15, and 18.5 bars), and three rotating speeds (9, 11.5 and 13.5 krpm). Test data showed that the presence of small amount of water in air did not affect the lateral, axial, and torsional vibrations. In 2014, Vannini et al. [11] experimented using the same test rig and reported that wet gas conditions didn't affect the critical speed.

From 2014 to 2015, Vannini et al. [11] and Vannini et al. [15] experimentally investigated the effects of seal flooding on the compressor's rotordynamic behavior by injecting liquid directly into the seals of a single stage compressor. The seals included shaft end seals, an impeller eye seal, and a balance-piston seal, and all of them were TOS labyrinth seals. When the compressor operated in high flow cases with seals flooded, a subsynchronous vibration occurred at 0.5XREV (0.5 ties the synchronous vibration frequency). This vibration occurred irrespective of dry seals or flooded seals. Another subsynchronous vibration at 0.45XREV (0.45 times the synchronous vibration frequency) appeared when LVF = 3%. When the LVF was decreased, this vibration amplitude also decreased. Vannini et al. [11] thought the flooded TOS labyrinth balance-piston seal induced the 0.45XREV subsynchronous vibration. To confirm this, the authors purged the annular cavities of the TOS labyrinth balance-piston seal with nitrogen and repeated testing. There was a significant reduction in the amplitude of the 0.45XREV subsynchronous vibration. The amplitude of the 0.45XREV subsynchronous vibration dropped further when the original TOS labyrinth balance-piston seal was replaced with a pocket damper seal (PDS).

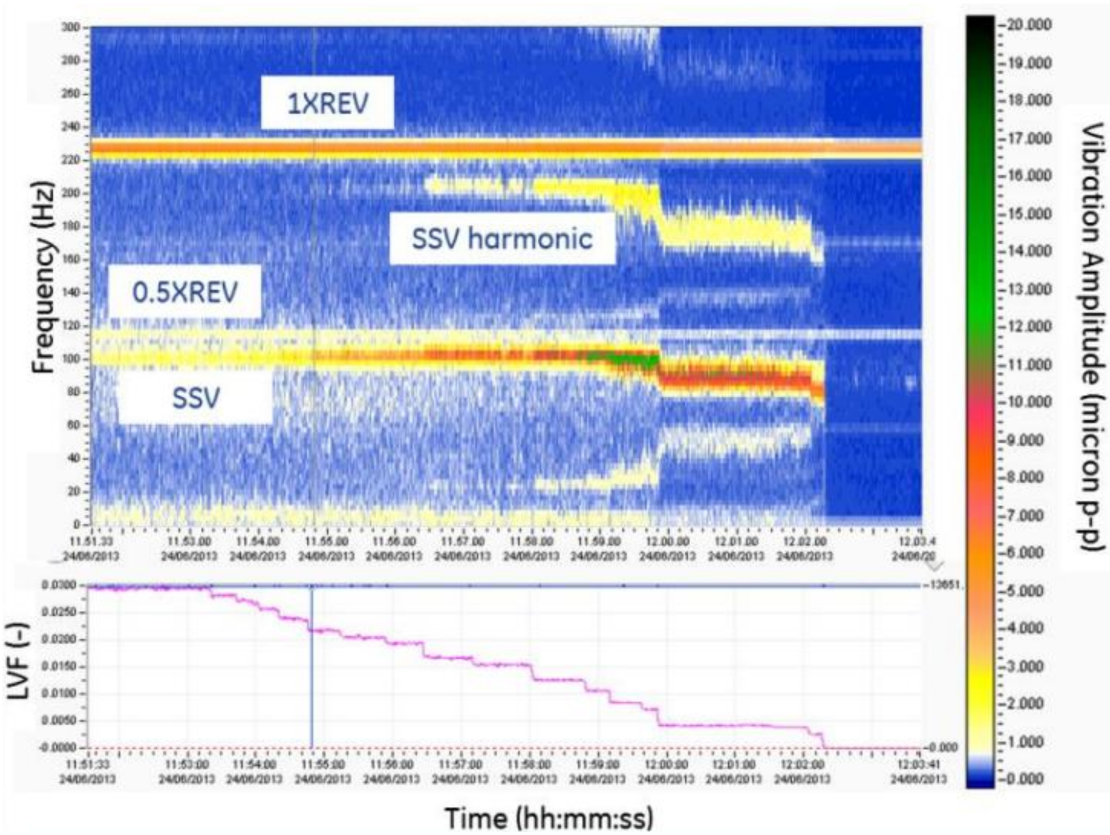


Figure 4: Waterfall plot of lateral vibrations at high flow region with labyrinth seal: 13.5 krpm and 10 bar [11]

In 2015, Vannini et al. [15] investigated the original TOS labyrinth seal and the new PDS using multiphase CFD. The simulation results showed a greater tendency for liquid to be trapped inside the cavities of a labyrinth seal under wet gas conditions. They thought the high circumferential momentum of trapped liquid probably induced a subsynchronous vibration. However, in a PDS cavity, some trapped liquid recirculated steadily in a circumferential direction, and the circumferential velocity V_θ was much smaller in magnitude compared to labyrinth seal cavity. Therefore, it was less likely for the PDS to prompt a subsynchronous vibration.

1.3 Two-Phase Annular Seals

Most of the modeling and experimental study of two phase flow in annular seals have been carried out on smooth seals. Some of the models and experiments can be discussed as below:

In 1994, Iwatsubo and Nishio [16] investigated static and dynamic characteristics of long smooth annular seal (L/D =1, D = 70mm, and C_r = 0.5mm) under two phase flow. The test fluid was a mixture of air and water. The test matrix had low inlet pressures (up to 4 bars), low rotating speeds (500 to 3,500 rpm), and swirl velocity in the range of 0-15m/s. The experiment mainly focused on the effects of inlet pressure, rotating speed, and mean GVF (less than 70%) on the dynamic performance of the test seal. The mean GVF was defined as the average value between the seal inlet and the seal exit. The fluid force increased with increases in inlet pressure, but was unaffected by changes in mean GVF. The fluid forces and the rotordynamic coefficients (stiffness and damping) decreased with increase in the mean GVF. The prediction model was based on the assumption that the mixture was incompressible.

In 2011, San Andres [17] used a bulk-flow model to predict the static and dynamic behavior of smooth annular seals operating under wet gas conditions. The mixture was assumed to be isothermal, homogeneous, and in thermostatic equilibrium. Moody's friction formula was used for the wall stress model, and perturbation analysis was used to analyze the performance of a seal. The model showed that power loss and leakage decrease as GVF increased for a long smooth annular seal (L/D=0.75, D=116.8 mm, and C_r=0.1267 mm) operating with a mixture of nitrogen gas and light oil (ISO VG2) at inlet pressure of 71 bars, ω of 10 krpm, and GVFs from zero to 100% would generally decreased as GVF increased. However, when GVF≈0.1, the flow turned laminar and led to a dip in power loss. Increase in GVF resulted in decrease in k and C except in the region where GVF≈0.1, as shown in Fig. 5. Dramatic increase in K was predicted when GVF increased from 0 to 0.1.For GVF>0.25, increase in GVF resulted in increase in K. The c coefficients were comparatively very small.

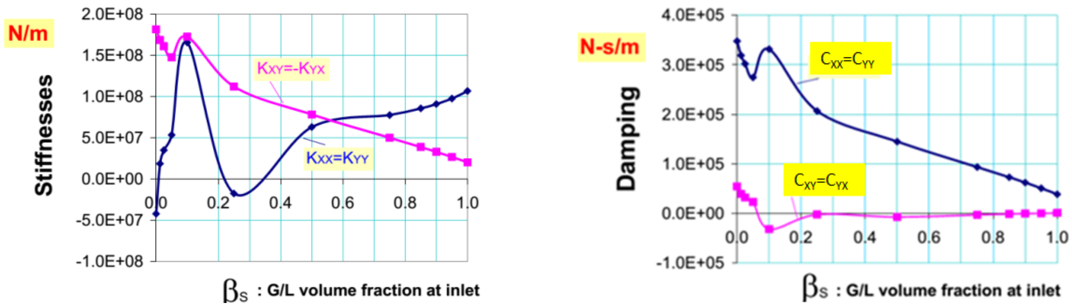


Figure 5. Predicted effects of GVF on stiffness and damping coefficients [17]

In 2011, Arghir et al. [18] studied the rotordynamic characteristics of a centered textured-annular seal (*L*=35 mm, *D*=76.5 mm, and C_r=0.1 mm) operating under bubbly flow conditions with low GVFs, ranging from 0.1% to 10%. The author used Kleynhans and Childs' [19] two-control-volume, bulk-flow model, and took the mass flow exchange between two control volumes and the effects of the cell depth into consideration. The results showed all rotordynamic coefficients to be independent of Ω for pure liquid cases. However, the rotordynamic coefficients were significantly influenced by Ω when dissolved gas was present in the liquid. As GVF increased from 0.1% to 10%, there was a decrease in cross coupled stiffness, direct virtual mass, and cross-coupled virtual mass.

In 2015, San Andres, et al. [20] experimentally investigated a short smooth annular seal (*L/D*=0.36, *D*=127 mm, and C_r=0.127 mm) operating under wet gas conditions. The test fluid was a mixture of ISO-VG10 oil and air. The experiments were conducted without shaft rotation, and at ambient temperature. The test matrix included two inlet pressures (3 and 3.5 bars), and GVFs ranging from 0 to 100%. Two orthogonally-mounted electromagnetic shakers were used to excite the seal cartridge with periodic loads. The test results showed that stiffness, damping, and virtual mass coefficients increased as GVF decreased. Damping values at GVF = 96% were significantly higher than at GVF= 100%. Predictions were based on San Andres'[17] bulk-flow model. Measured leakage data showed that the model's prediction matched well with experiment.

Prior tests, e.g. Iwatsubo and Nishio [16] , and prior analyses, e.g., San Andres et al. [17] , and Arghir et al. [18] analyzed 2-phase flow for smooth and roughened-stator seals, but their contributions are largely irrelevant to the present rest results for a TOS labyrinth seals.

2. OBJECTIVES

This thesis presents a comprehensive experimental investigation of a labyrinth seals operating under two-phase flow conditions. Since labyrinth seals are mostly used in compressors and turbines versus pumps, the research work is focused on mainly-air conditions with some liquid present in the mixture. The research covers the following tasks:

1. Modify the test section to accommodate the experimental investigation of labyrinth seals for different preswirls, GVFs, and rotor speeds.
2. Experimentally investigate the effects of changes in GVF, pressure ratio, and rotor speed on the static (mass flow leakage rate) and dynamic (rotordynamic coefficients) characteristics of a labyrinth annular seal.

3. TEST RIG DESCRIPTION

Zhang et al. [21] modified an existing air annular seal test stand with the assistance of another graduate student, James McLean, and research engineer (Stephen Philips), under the supervision of Dr. Dara Childs, Professor of Mechanical Engineering, Texas A&M University. Childs et al. [22] described the air annular seal test stand. The modified test rig is called 2PASS. Zhang et al. [21] described the modifications on the test rig, and its modifications can be listed below:

(1) The lubricant for hydrostatic bearings was changed from water to the test liquid (Silicone oil PSF 5cSt).
(2) The electric motor was upgraded from 93 kW (125 hp) to 110 kW (150 hp). The external lubrication system was added to the existing gearbox to reduce the minimum test rotor speed from 10 krpm to 5 krpm.
(3) The water-supply/return system was removed, and a new silicone oil-supply/return system was installed.
(4) A sparger-system was installed to make homogenous mainly-liquid mixtures, and a mixer was developed to make homogenous mainly air mixtures.
(5) Separation equipment was installed to separate liquid components from the exhaust mixed flow.

These modifications extended the capabilities of the test rig to test seals with diameters from 88.9 – 114.3 mm (3.5-4.5 inches) for 2-phase flow. For pure or mainly air conditions, the seals can be tested for speed ranging from 3 krpm to 23 krpm at inlet pressure up to 70 bar-a and pressure ratio up to 0.7. GVFs can be maintained from 88% - 100%.

3.1 Experimental Set-up

Figure 6 shows a piping and instrumentation diagram of the 2PASS test rig. Zhang et al. [21] described the 5 different sections of the test rig in detail.

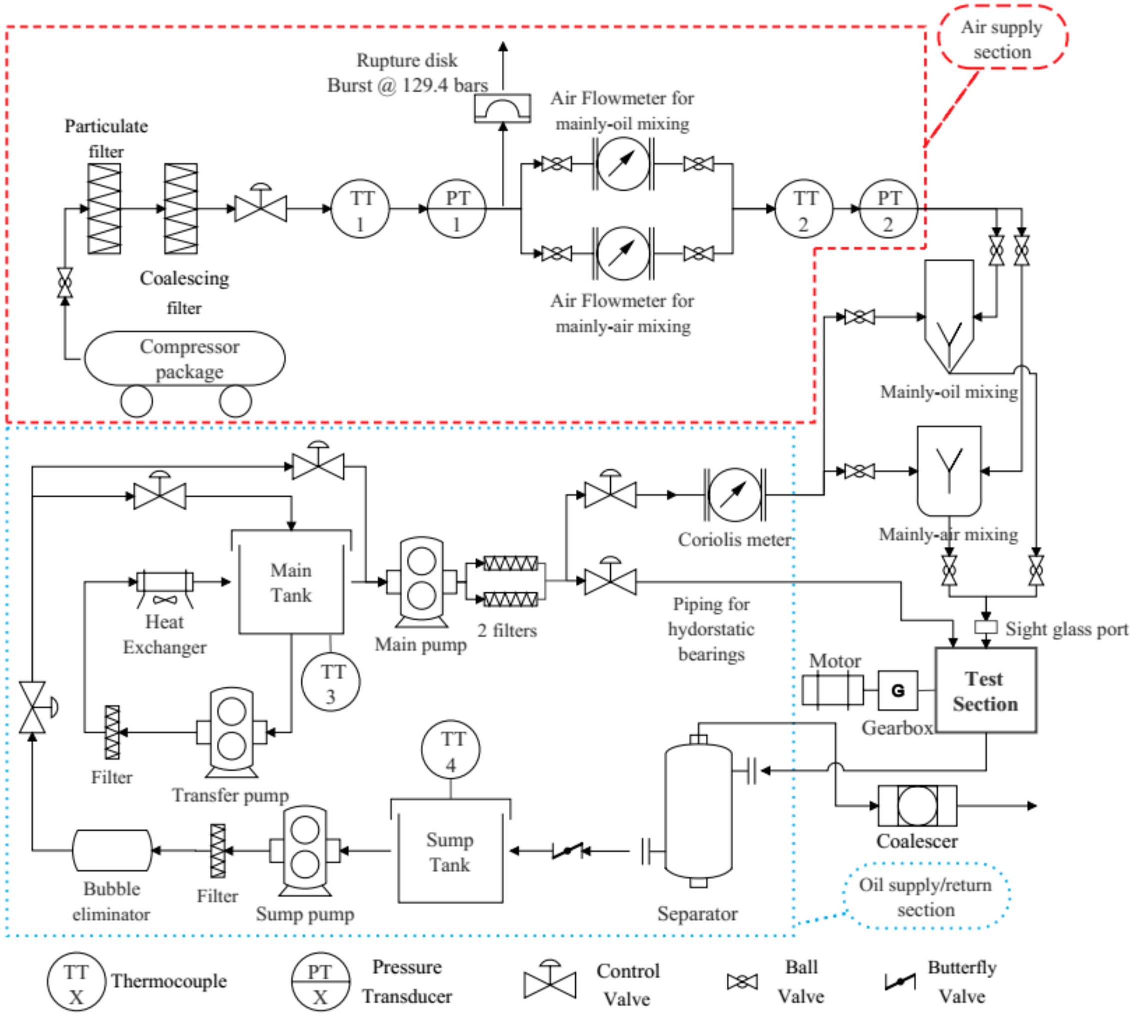


Figure 6. Piping and instrumentation diagram of the 2PASS [21]

3.1.1 Air-Supply Section

The top section, highlighted by dashed lines, in Fig. 6 represents the air-supply section. A compressor package is used to supply compressed air with maximum supply pressure of 172 bars. The compressed air runs through a particulate and coalescing filter to remove solid particles and liquid droplets. A rupture disk with a burst pressure of 129.4 bars acts as a safety valve. Two turbine flowmeters measure the air flow rate, and a control valve is used to control the air flow rate into the test section.

3.1.2 Oil-Supply/Return Section

The bottom section, also highlighted by dashed lines, in Fig. 6 represents the oil-supply/return section. The oil supply from the main pump splits into two pipes; one for hydrostatic bearing and other one for the oil-mixing section. The latter splits further to provide the oil supply for the mainly-oil mixing section and the mainly-air mixing section. A Coriolis flow meter is used to determine the oil's mass flow rate and density.

The air-oil mixture is injected into the test section. The exhaust mixture from the test section then enters an oil/gas separator. Most of the air components are separated in the separator, and the air is discharged into a coalescer. The oil separated by the separator flows into a sump tank via gravity. The coalescer absorbs the remaining oil from the air coming from the separator before releasing the air to the atmosphere. A sump pump is used to pump the oil from the sump tank to the main tank. A heat exchanger is used to cool the oil in main tank.

3.1.3 Mainly-Air Mixing Section

Zhang et al. [21] designed the oil gas mixer, as shown in Fig. 7. There are three chambers in the mixer: oil chamber, air chamber, and mixing chamber. The silicone oil enters the oil chamber through the oil inlet shown at the top of Fig. 7. It then flows into nine injection tubes through which the oil flows to a spray nozzle installed at the end of each injection tube. Table 1 shows the spray nozzle properties. These nozzles inject fine liquid droplets into the mixing chamber. The compressed air from the air-chamber section passes through the clearances between the plate and injection tubes into the mixing chamber where it mixes with the atomized liquid droplets. The liquid-air mixture then flows through a converging cone and is piped into the test section.

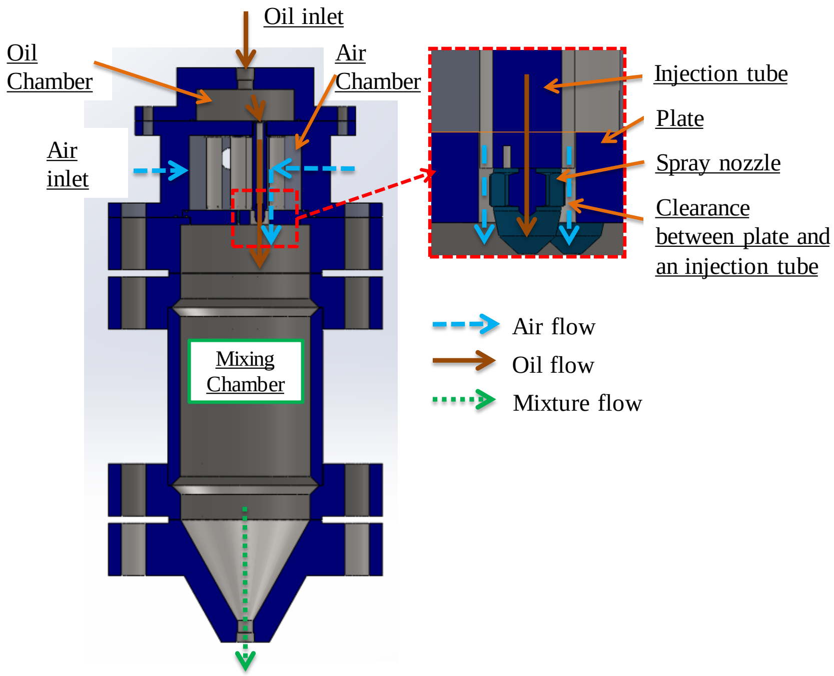


Figure 7. Section view and flow illustration of the oil-gas mixer [21]

Table 1. Properties of the spray nozzle

Type	Hollow cone spray nozzle
Model	1/4KKBP200S303
Standard pressure (bar)	3
Spray angle (°)	55±5
Spray capacity (l/min)	2±0.1

3.2 Test Section

Figure 8 shows the lateral section view of the 2PASS test section. A rotor is supported by two hybrid bearings, each mounted on a bearing pedestal. Silicone oil is supplied to the bearings at 62 bars. The test rotor is connected to a 6.96:1 Lukfin Gearbox via a high speed disc-type coupling. A WEG electric motor of 150 hp drives the gear box which can then drive the test rotor to a maximum speed of 20 kRPM. An Altivar 71 variable speed drive is used to control the motor.

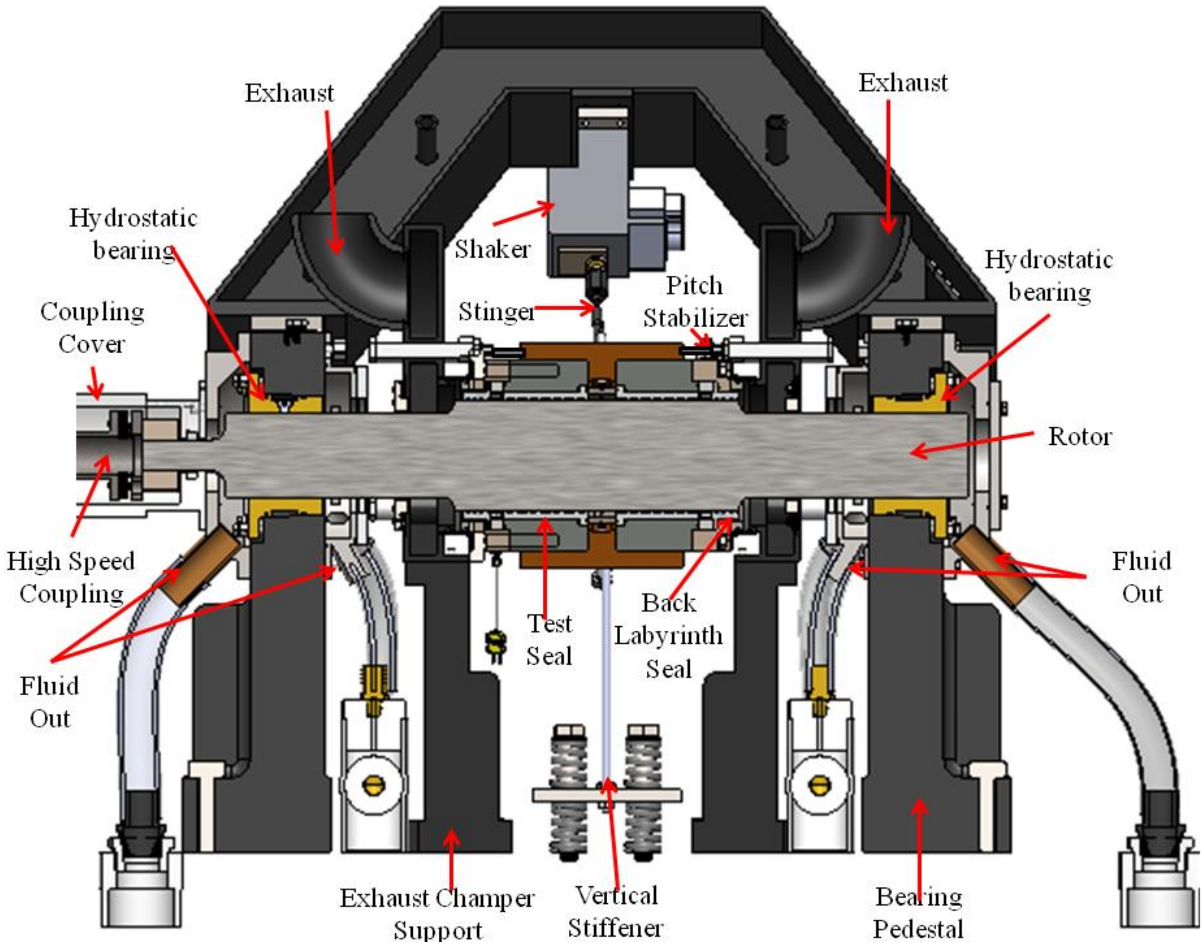


Figure 8. Section view of the test section

3.3 Stator Assembly

Figure 9 shows the stator assembly that is placed around the rotor and between two hybrid bearings. The stator is supported radially by two hydraulic shakers as shown in Fig. 9. These hydraulic shakers are also used to excite the stator with different waveforms. For this thesis, pseudo-random waveforms, as described by Stanway et al. [23] consisting of frequencies ranging from 10Hz – 140Hz are used. The peak-to-peak excitation amplitude is adjusted to be within 10% of the diametral clearance.

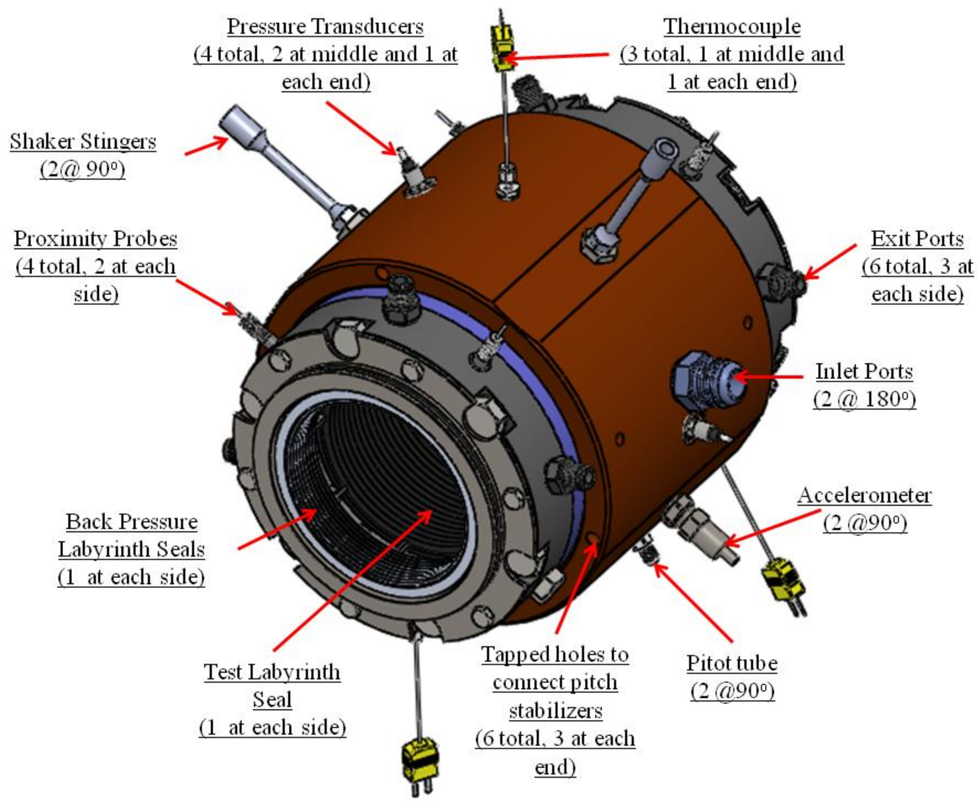


Figure 9. 3-D model of the stator assembly

Three pairs of pitch stabilizers, shown in Fig. 8, are installed to support the stator axially. They are also adjusted to ensure alignment between the rotor and the stator. Two horizontal cables and a vertical stiffener, shown in Fig. 10, are used to improve the dynamic stability of the stator. Picardo [8] first used the horizontal cables to eliminate a stator dynamic instability, and Mehta [9] added the vertical stiffener to overcome the static instability of the stator, induced by negative static direct stiffness of the test seals.

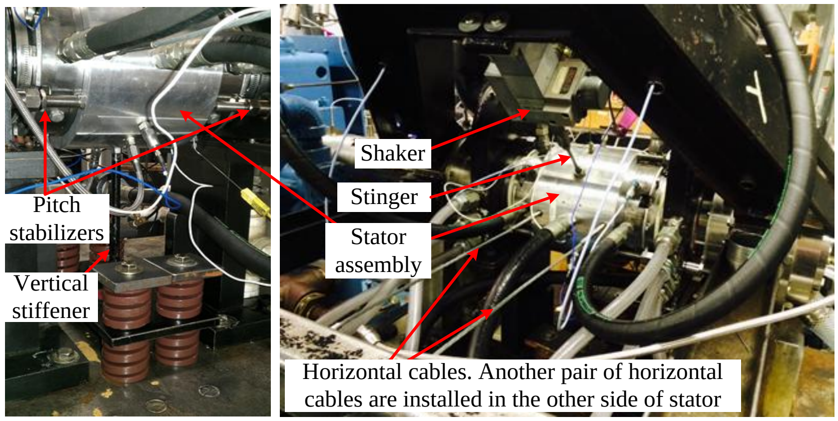


Figure 10. Photograph of the test section [21]

Figure 11 is a section view of the assembled stator with TOS labyrinth seals. The assembly consists of two test seals oriented back-to-back. High pressure fluid enters the assembly through two inlet ports at the center annulus and flows through a pre-swirl guide insert, which is discussed further below. The fluid then flows through the test seals and reaches back-pressure labyrinth seals. The fluid either exits radially through exit ports or axially through the back-pressure labyrinth seals. A bleed valve is mounted to control the back pressure of the test seals. Swirl brakes, upstream of the back pressure labyrinth seal, reduce circumferential air flow, and minimize the cross-coupled stiffness contributions of the back-pressure labyrinth seals.

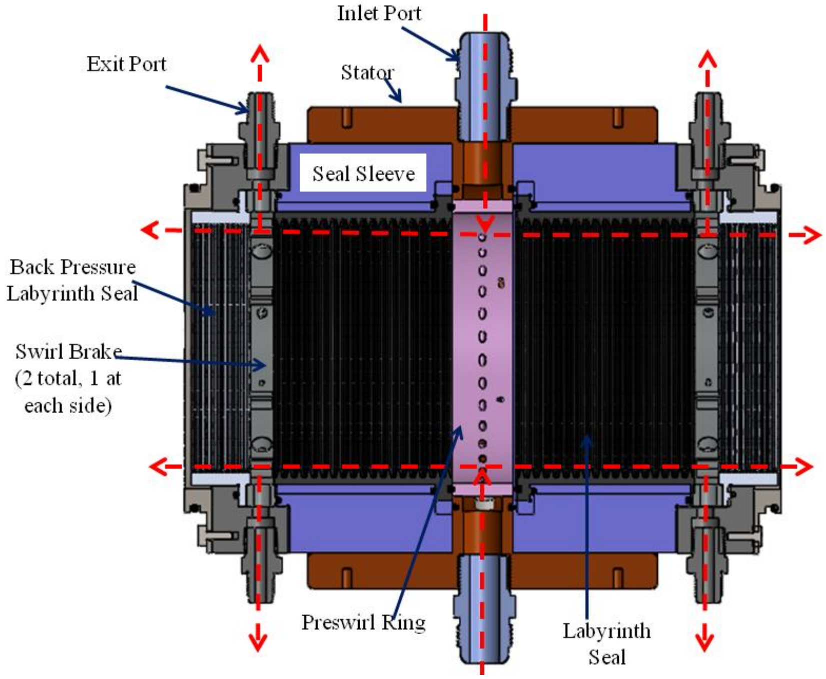


Figure 11. Section view of the stator assembly

3.4 Preswirl

Figure 12 shows the three preswirl rings used for the experiment. Each preswirl ring is inserted into its own stator to introduce specific preswirl to the test fluid. These preswirl rings have nozzles of different diameter. The Z*ero* preswirl ring has 30 radial through holes (diameter 3.57mm) pointed radially towards the center of the hole; whereas the *Medium* preswirl ring has 32 radial through holes (diameter 3.30mm), and the *High* preswirl has 32 radial through holes (diameter 2.38mm) inclined at an angle.

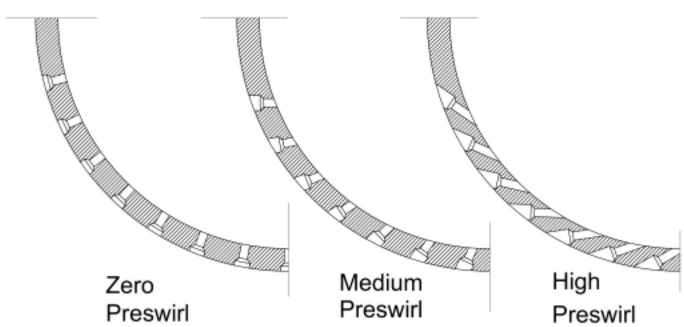


Figure 12. Cross Section of *Zero*, *Medium* and *High* Preswirl ring

A pitot tube and a static pressure probe are installed on the preswirl rings as shown in Fig. 13.

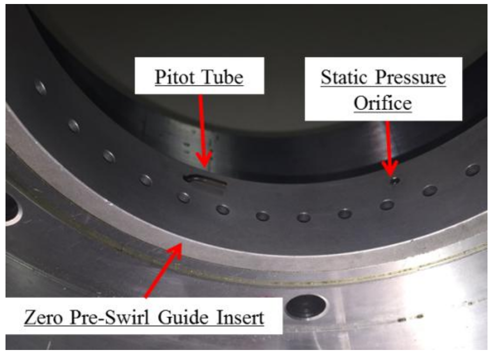


Figure 13. Pitot tube and static pressure orifice [24]

A differential pressure transmitter is connected to the pitot tube and the static pressure probe, and it measures the difference between the stagnation pressure P_t and the static pressure P_s at the seal inlet. This pressure difference can be used to determine the circumferential velocity of the test fluid V_θ via:

$$V_\theta = [2(P_t - P_s)/\rho]^{1/2} \quad (6)$$

where, ρ is the test fluid density. The preswirl ratio is calculated based on the fluid's circumferential velocity w.r.t. the shaft surface's velocity.

$$preswirl = \frac{V_\theta}{D_r \cdot \omega} \quad (7)$$

where, D_r is the rotor's diameter and ω is the rotor speed in radians per second.

3.5 Test Seal

Figure 14 is a schematic of the TOS test seal. The average inner diameter of both seals is measured to be 114.729mm (4.5168") leaving an average radial clearance of 0.213mm (8.4 mils) between the rotor and test seals.

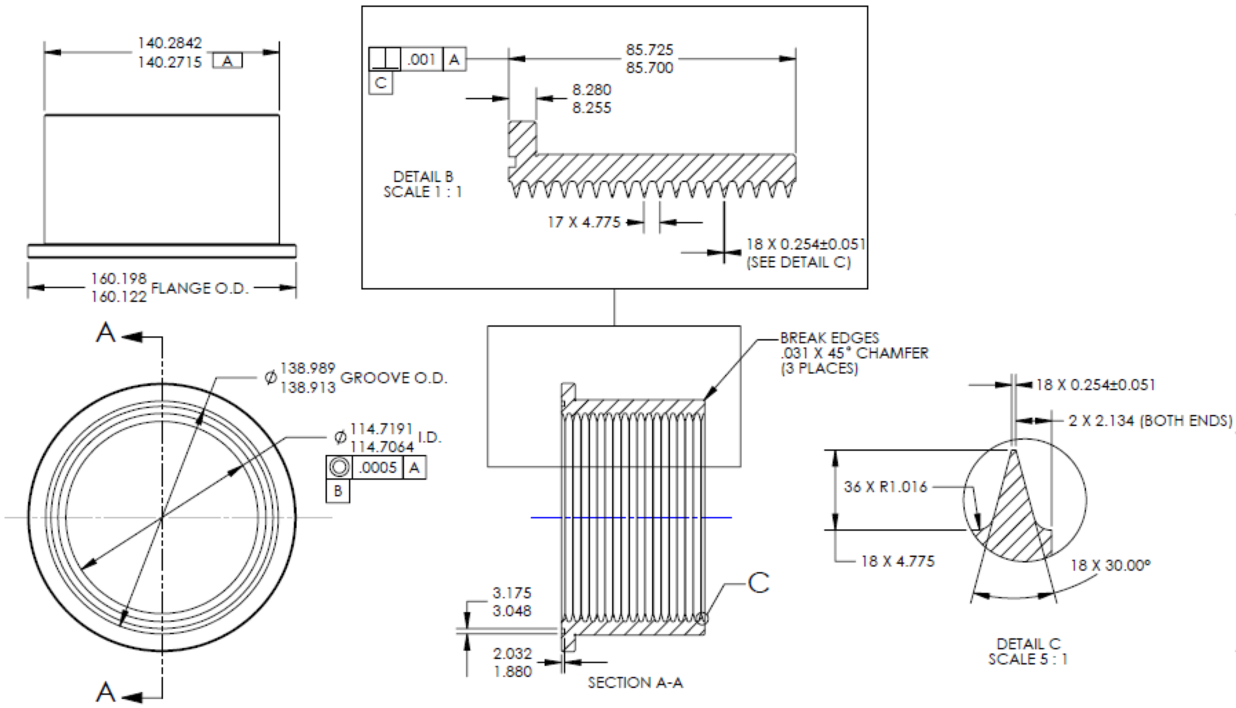


Figure 14. Test labyrinth seal (dimensions are in mm)

Table 2 shows the measured (room temperature) dimensions of the test seals.

Table 2. Labyrinth seals measured dimensions

Angle	Seal 1 inner diameter				Seal 2 inner diameter			
	Top		Bottom		Top		Bottom	
	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)
0^0	4.5165	114.719	4.5165	114.719	4.5172	114.737	4.517	114.732
30^0	4.5165	114.719	4.5167	114.724	4.5171	114.734	4.5169	114.729
60^0	4.5167	114.724	4.5167	114.719	4.5169	114.729	4.5169	114.729
Average	4.5165"(114.7207mm)				4.5170" (114.732mm)			
Combined Average	4.5168" (114.729mm)							

3.6 Test rotor

Figure 15 shows the test rotor's dimensions. The diameter of the rotor is 114.295-114.305 mm (4.4998-4.5002 inches). It is made from 304 SS with surface finish of 0.00254 mm (0.0001 inches) at test seal location.

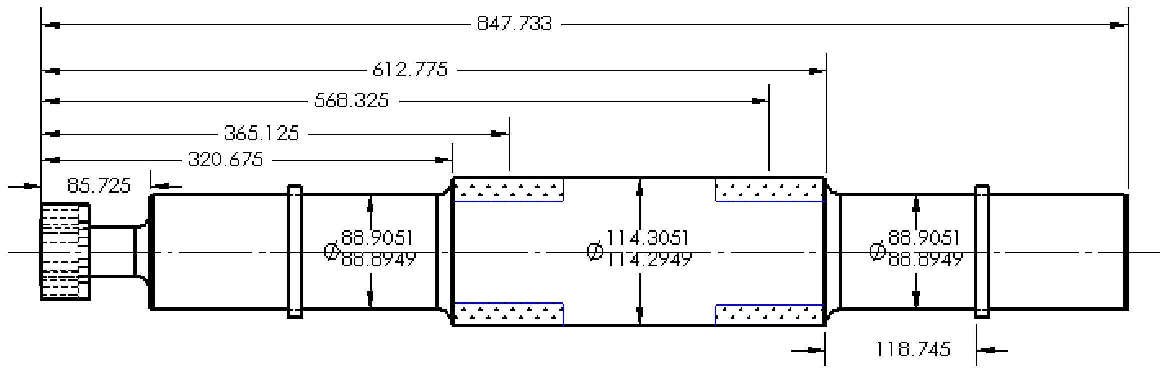


Figure 15. Test rotor's dimension (dimensions are in mm)

3.7 Test fluid

A mixture of Silicone oil (PSF 5cSt) and air is the test fluid. Silicon oil (PSF 5cSt) has low viscosity [25] . The following additional advantages of silicon oil (PSF 5cSt) were taken into consideration before choosing it for testing:

1. Silicon oil (PSF 5cSt) is hydrocarbon-based, non-flammable, hydrophobic, and chemical inert. Also, it has high resistance to oxidation [24] , and mixes well with air.

2. It allows a tolerance in temperature control because of its low oil viscosity temperature coefficient (0.54 at 25^{o}C).

3. The surface tension (0.0197 N/m) is approximately 1/3 that of water [25] . This property leads to the formations of smaller liquid droplets. Smaller liquid droplets are more likely to have a uniform distribution entering the seal.

Properties of the silicone oil are provided in Table 3.

Table 3. Silicone oil specifications and data [26]

Chemical Name	Polydimethylsiloxane
Appearance	Clear, colorless, odorless
Viscosity-Temperature Coefficient	0.54
Viscosity @ 25 ºC (cSt)	5
Specific Gravity	0.918
Flash Point (ºC)	135
Pour Point (ºC)	-90
Vapor Pressure @ 25°C (Pa)	133.3
Thermal Expansion (m^3/ m^3·ºC)	0.00109
Thermal Conductivity @25ºC (W/m·K)	1.172
Surface Tension (N/m)	0.0197
Boiling Point (ºC)	>200

A homogenous assumption is used to determine the mixture properties. The gas phase (air) is assumed to be an ideal gas:

$$\rho_g = \frac{P}{Z\Re_g T} \tag{8}$$

where, Z is the gas compressibility factor, $\Re_g$ is the gas constant, P is the pressure, and T denotes the temperature.

The gas volume fraction GVF is defined as:

$$\mathrm{GVF} = \frac{\dot{Q}_g}{\dot{Q}_g + \dot{Q}_l} \tag{9}$$

where, $\dot{Q}_g$ and $\dot{Q}_l$ are the local volume flow rates of gas and liquid.

Tao et al. [27] [26] defined the equivalent density of a gas-liquid mixture as:

$$\rho = \rho_g \mathrm{GVF} + (1 - \mathrm{GVF})\rho_l \tag{10}$$

where, ρ_l denotes the liquid density.

For a homogenous, quasi-static, and isothermal mixture of a Newtonian incompressible liquid and an ideal gas, Diaz [28] defined the local GVF by:

$$\mathrm{GVF} = \frac{1}{1 + \frac{P - \left(P_V + 2S/C_r\right)}{P_{gi}} \left(\frac{1}{\mathrm{GVF}_i} - 1 \right)} \tag{11}$$

where, P is the local pressure, P_V is the liquid vapor pressure, P_{gi} is the gas pressure at the seal inlet, S is the liquid surface tension per unit length, C_r is the radial clearance, and GVF_i is the GVF at the seal inlet.

According to San Andrés [17] , the magnitude of (P_V+2S/C_r) is negligible (only a few millibars for oil) and hence Eq. (11) can be simplified to

$$\mathrm{GVF} = \frac{1}{1 + \frac{P}{P_{gi}} \left(\frac{1}{\mathrm{GVF}_i} - 1 \right)} \tag{12}$$

According to Eq. (9), GVF_i is determined by the gas volume flow rate at the seal inlet $\dot{Q}_{ig}$, and the liquid volume flow rate at the seal inlet $\dot{Q}_{il}$. Since silicone oil is considered incompressible, $\dot{Q}_{il}$ is defined by the volume flow rate from the Coriolis meter.

$$\dot{Q}_{il} = \frac{\dot{m}_l}{\rho_l} \tag{13}$$

where, $\dot{m}_l$ and ρ_l are the mass flow rate and density of the oil measured by the Coriolis meter.

4. EXPERIMENTAL PROCEDURE

4.1 Parameter Identification

Mehta and Childs [9] discussed in detail parameter identification for the test rig used here. shows two coordinate systems: XY represents hydraulic shakers and X_1Y_1 represents horizontal and vertical. The stator is shaken alternately in the X and Y directions. After applying coordinate transformation from XY to X_1Y_1 and transforming the time domain to the frequency domain via FFT, the stator equation of motion can be stated as:

$$\begin{bmatrix} \boldsymbol{F}_{XX} & \boldsymbol{F}_{XY} \\ \boldsymbol{F}_{YX} & \boldsymbol{F}_{YY} \end{bmatrix} - [M_S] \begin{bmatrix} \boldsymbol{A}_{XX} & \boldsymbol{A}_{XY} \\ \boldsymbol{A}_{YX} & \boldsymbol{A}_{YY} \end{bmatrix} = \begin{bmatrix} \boldsymbol{H}_{XX} & \boldsymbol{H}_{XY} \\ \boldsymbol{H}_{YX} & \boldsymbol{H}_{YY} \end{bmatrix} \begin{bmatrix} \boldsymbol{D}_{XX} & \boldsymbol{D}_{XY} \\ \boldsymbol{D}_{YX} & \boldsymbol{D}_{YY} \end{bmatrix} \tag{14}$$

where, $\boldsymbol{F_{ij}}$ represents excitation forces, $[M_S]$ represents the stator-mass matrix, $\boldsymbol{A_{ij}}$ represents the stator accelerations, $\boldsymbol{D_{ij}}$ represents relative displacements of the stator to the rotor, and $\boldsymbol{H}_{ij}$ represents complex dynamic-stiffness coefficients in the frequency domain. The subscript ij represents the direction of the excitation force and the reaction force respectively. $\boldsymbol{H_{ij}}$ is the complex dynamic stiffness, and is defined by:

$$\boldsymbol{H}_{ij} = \left(K_{ij} - \Omega^2 M_{ij}\right) + \boldsymbol{j}\Omega C_{ij}, \;\; \boldsymbol{j} = \sqrt{-1} \tag{15}$$

where, K_{ij}, C_{ij}, and M_{ij} represents seal stiffness, damping, and virtual mass coefficients, and Ω is the excitation frequency.

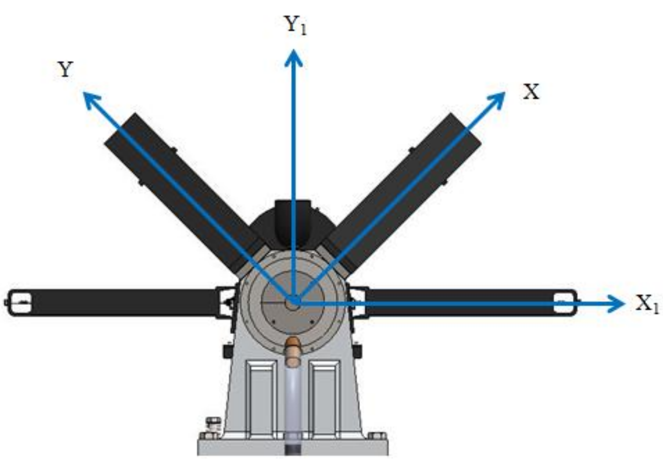


Figure 16. *X-Y* coordinate system

In Eq. (14), all the parameters can be measured except for the complex dynamic stiffness coefficients. Equation (14) can be solved by inverting the displacement matrix to the left-hand side, and the complex dynamic stiffness coefficients are used to calculate rotordynamic coefficients. For small motion about a centered position, these equations can then be simplified to $K_{XX}=K_{YY}=K$, $K_{XY}=-K_{YX}=k$, $C_{XX}=C_{YY}=C$, and $C_{XY}=-C_{YX}= c$. Since the rotordynamic coefficients are almost identical in both directions, the following average values are used:

$$K_{\Omega} = \frac{\mathrm{Re}(H_{XX}) + \mathrm{Re}(H_{YY})}{2} \tag{16}$$

$$k_{\Omega} = \frac{\mathrm{Re}(H_{XY}) - \mathrm{Re}(H_{YX})}{2} \tag{17}$$

$$C = \left(\frac{C_{XX} + C_{YY}}{2} \right) \tag{18}$$

$$c = \left(\frac{C_{XY} - C_{YX}}{2} \right) \tag{19}$$

The stator mass matrix $[M_S]$ is defined by:

$$\left[M_s \right] = \begin{bmatrix} M_{sXX} & M_{sXY} \\ M_{sYX} & M_{sYY} \end{bmatrix} \tag{20}$$

where, M_{sij} are mass coefficients of the stator assembly in the X-Y frame. Tests show that $M_{sXX} \approx M_{sYY}$, and $M_{sXY} \approx M_{sYX} \approx 0$.

4.2 Dynamic Repeatability

Zonic hydraulic shakers, in both X and Y direction, excite the stator sequentially during each test with a pseudo random waveform of frequencies ranging from 10 Hz to 140 Hz in increments of 10 Hz. The stator is excited 1280 times in each direction. The input applied force components, the stator's acceleration components, and the relative displacement between seal and rotor components are measured during each shake. The results are then divided into 10 groups for each direction. The time-domain measurement is then transformed into the frequency domain using Fourier Transforms. The 10 groups obtained for each direction are then combined to create 100 complex force, acceleration, and displacement matrices. These matrices are used in Eq. (14) to obtain 100 complex dynamic-stiffness matrices. The repeatability values of dynamic-stiffness can be calculated from their standard deviations, and are graphically depicted by error bars in each impedance plot.

4.3 Static Uncertainty

Uncertainty on each instrument adds to the uncertainties in static measurements taken during the experiments. Kurtin et al. [29] , calculated uncertainties for instruments of the test section. Table 4 shows the calculated uncertainties.

Table 4. Static uncertainties for instruments in the test section

Parameter	Uncertainty
Pressure	0.838 psi (0.06 bar)
Temperature	5.613 °F
Pitot Tube Differential Pressure	1.276 in-H_2O (0.0032 bar)

Zhang [24] performed an uncertainty analysis for the instruments installed in the air-supply section and oil-supply/return section. Uncertainties are tabulated in Table 5:

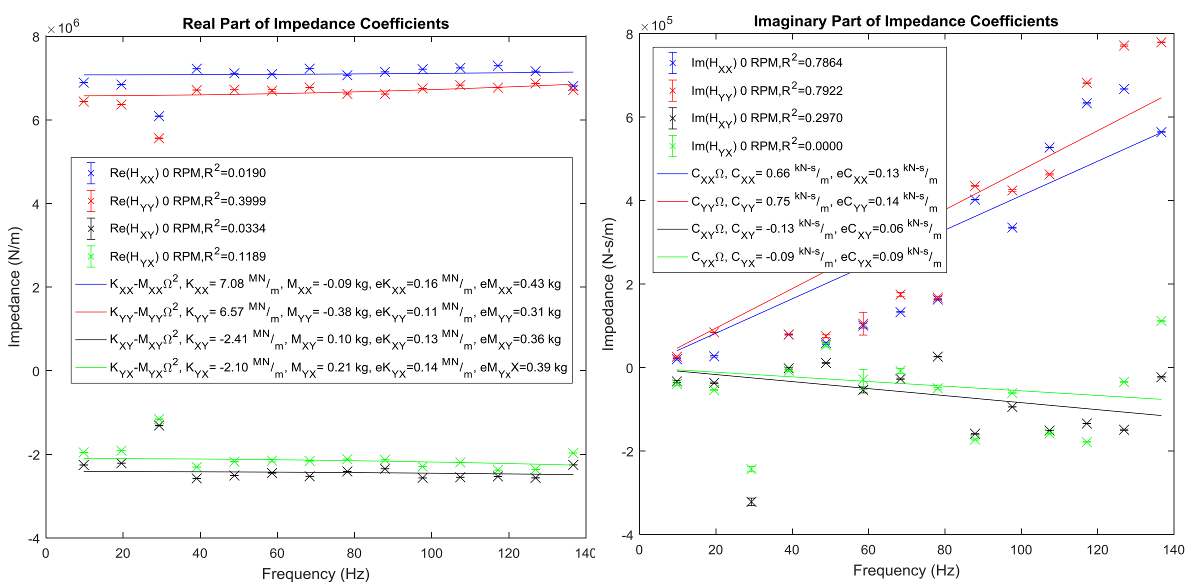
Table 5. Static uncertainties for volume/mass flow rates and oil density [24]

Parameter	Uncertainty
Air Volumetric Flow Rate for Mainly-Air Conditions	0.305 ACFM (0.52 m^3/h)
Air Volumetric Flow Rate for Mainly-Oil Conditions	0.0414 ACFM (0.0703 m^3/h)
Liquid Mass Flow	0.11 kg/min
Liquid Density	0.18g/m^3

5. DISCUSSION OF RESULTS

5.1 Baseline data

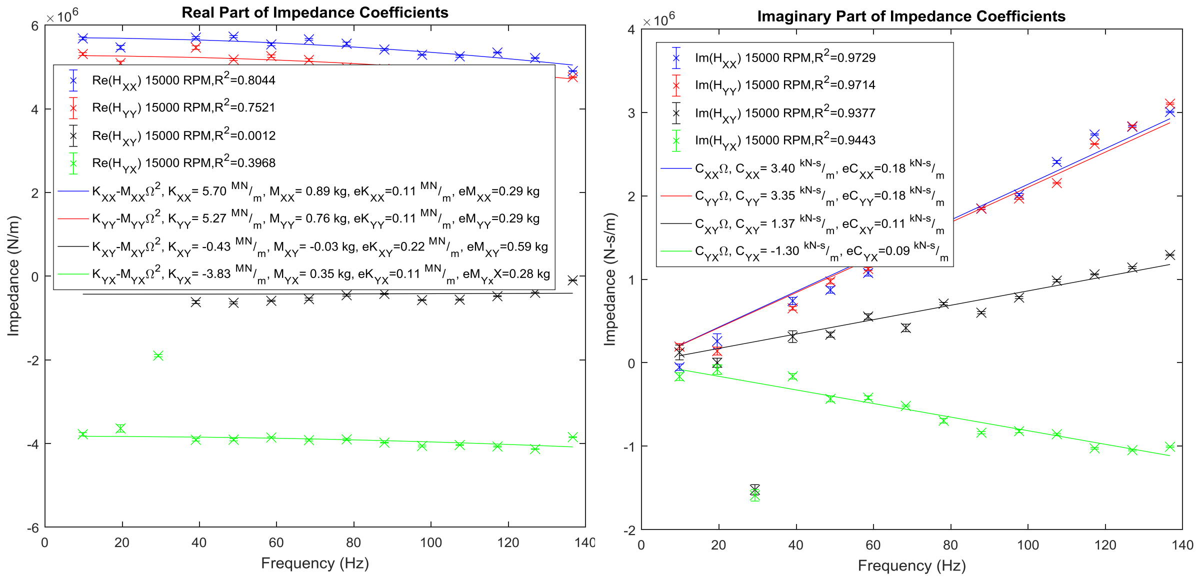
As discussed earlier, the test seals are mounted in a stator. The stator is supported by four horizontal stiffeners, a vertical stiffener, two shakers, and six pitch stabilizers. The rotordynamic coefficients determined after each shake are for the whole system. Exit labyrinth seals also contribute to the stiffness and damping of the system. However, because of their short length (28.58 mm) and large radial clearance (0.254 mm), the stiffness and damping values of exit labyrinth seals are minimal and hence ignored. To determine the rotordynamic coefficients of the test seals alone, baseline data are acquired to correct for the stiffness and damping contributions of the support structure. The rotordynamic coefficients of a dry-shake test, in which the stator is excited without any fluid flowing through seals when speed is zero, are used as baseline data. Figure 17 shows an example of a dry shake test.



(a) Re($\boldsymbol{H}_{ij}$) (b) Im($\boldsymbol{H}_{ij}$)

Figure 17. The (a) real and (b) imaginary parts of $\boldsymbol{H}_{ij}$ for a dry shake baseline

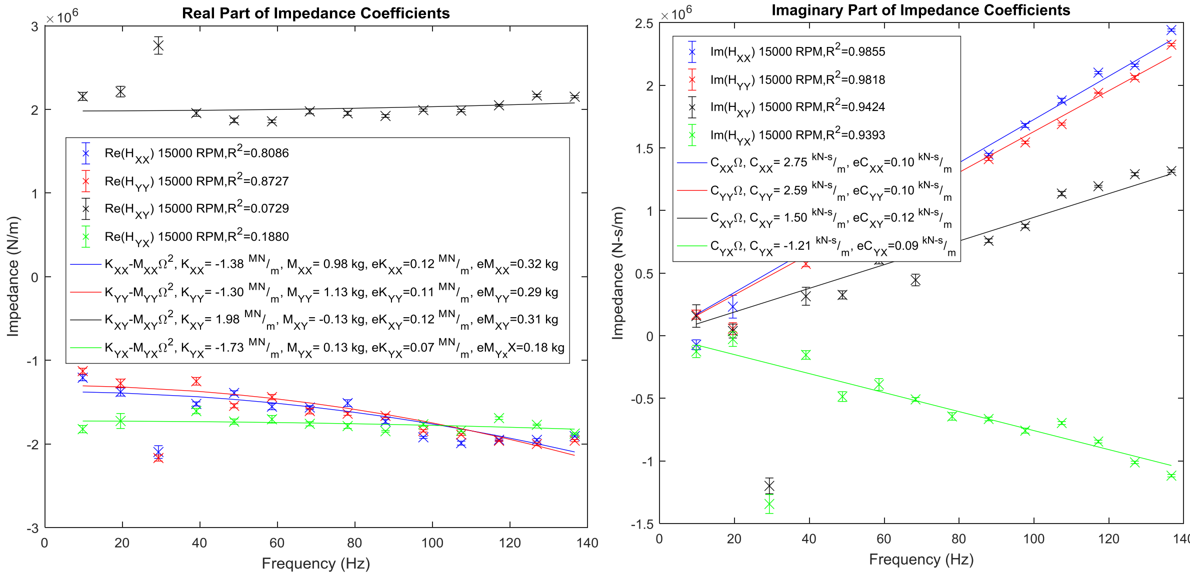
Figure 18 shows typical plots of the the real and imaginary parts of $\boldsymbol{H}_{ij}$ of a two-phase case for GVF=0.981, inlet pressure=62.1 bars (900 psi), PR=0.5, rotating speed = 15 krpm, and *high* preswirl. The real and imaginary parts of $\boldsymbol{H}_{ij}$ shown in Fig. 18 are not corrected for the baseline data.



(a) Re($\boldsymbol{H}_{ij}$) (b) Im($\boldsymbol{H}_{ij}$)

Figure 18. The (a) real and (b) imaginary parts of $\boldsymbol{H}_{ij}$ for a typical test before subtracting baseline data, 0.5 PR, 15 krpm, 98%GVF (*High* Preswirl)

Figure 19 shows the the real and imaginary parts of $\boldsymbol{H}_{ij}$ after subtracting the baseline data.



(a) Re($\boldsymbol{H_{ij}}$) (b) Im($\boldsymbol{H_{ij}}$)

Figure 19. The (a) real and (b) imaginary parts of H_{ij} for a typical test after subtracting baseline data, 0.5 PR, 15 krpm, 98%GVF (*High* Preswirl)

As shown in Fig. 17 through Fig. 19, $\mathrm{Re}(H_{XX}) \approx \mathrm{Re}(H_{YY})$, $\mathrm{Re}(H_{XY}) \approx -\mathrm{Re}(H_{YX})$, $\mathrm{Im}(H_{XX}) \approx \mathrm{Im}(H_{YY})$, and $\mathrm{Im}(H_{XY}) \approx -\mathrm{Im}(H_{YX})$. According to Fig. 17, the real parts of $\boldsymbol{H}_{ij}$ for baseline show some Ω dependency. The baseline's $\mathrm{Im}(H_{XX})$ and $\mathrm{Im}(H_{YY})$ are small compared to those developed by the tested seal, as shown in Fig. 17.

Therefore, the rotordynamic characteristics for cases of pure- or mainly-air conditions can be represented by the real dynamic stiffness and damping coefficient as in Eq. (16)-(19). The average value is chosen to represent the characteristic for each case since the values for Re(H_{ij}) and C_{ij} are close in X and Y directions. From Figure 19, the real part of impedance appears to follow parabolic function. However, as shown in figures later, the real part of the impedance from the actual test data does not follow the parabolic trend. Hence, the virtual mass is not used.

5.2 Test Matrix

The test seal is tested at 3 inlet preswirl ratios, 3 different pressure ratios, 3 rotor speeds, and 6 inlet GVFs. Three different stators were used for three different inlet preswirl ratios. The inlet pressure is maintained at 62 bar for each test, and the pressure ratio is maintained by adjusting back pressure valves. Desired GVF is obtained by controlling the air-control valve and the oil-control valve for each test. Pressure and GVF are monitored throughout the testing to maintain desired pressure ratio and GVF. The drive motor is set to a desired speed using a variable-frequency drive (VFD). Table 6 shows all the test condition for this thesis.

Table 6. Test conditions with pure air or mainly air mixtures

PR (-)	GVF (%)	Inlet Pressure		Outlet Pressure		Zero Preswirl (krpm)			Medium Preswirl (krpm)			High Preswirl (krpm)		
		(psi)	(bar)	(psi)	(bar)	5	10	15	5	10	15	5	10	15
0.5	100	900	62.1	450	31	5	10	15	5	10	15	5	10	15
	98	900	62.1	450	31	5	10	15	5	10	15	5	10	15
	96	900	62.1	450	31	5	10	15	5	10	15	5	10	15
	94	900	62.1	450	31	5	10	15	5	10	15	5	10	15
	92	900	62.1	450	31	5	10	15	5	10	15	5	10	15
	90	900	62.1	450	31	5	10	15	5	10	15	5	10	15
0.4	100	900	62.1	360	24.8	5	10	15	5	10	15	5	10	15
	98	900	62.1	360	24.8	5	10	15	5	10	15	5	10	15
	96	900	62.1	360	24.8	5	10	15	5	10	15	5	10	15
	94	900	62.1	360	24.8	5	10	15	5	10	15	5	10	15
	92	900	62.1	360	24.8	5	10	15	5	10	15	5	10	15
	90	900	62.1	360	24.8	5	10	15	5	10	15	5	10	15
0.3	100	900	62.1	270	18.6	5	10	15	5	10	15	5	10	15
	98	900	62.1	270	18.6	5	10	15	5	10	15	5	10	15
	96	900	62.1	270	18.6	5	10	15	5	10	15	5	10	15
	94	900	62.1	270	18.6	5	10	15	5	10	15	5	10	15
	92	900	62.1	270	18.6	5	10	15	5	10	15	5	10	15
	90	900	62.1	270	18.6	5	10	15	5	10	15	5	10	15

5.3 Seal Leakage

Figure 20 shows $\dot{m}$ versus inlet GVF over a range of PR and ω for *zero* preswirl. It shows $\dot{m}$ decreasing as ω increases. As PR decreases, $\dot{m}$ increases slightly. When GVF increases from 90% to 98%, $\dot{m}$ decreases linearly. However, when GVF increases from 98% to 100%, $\dot{m}$ does not change significantly.

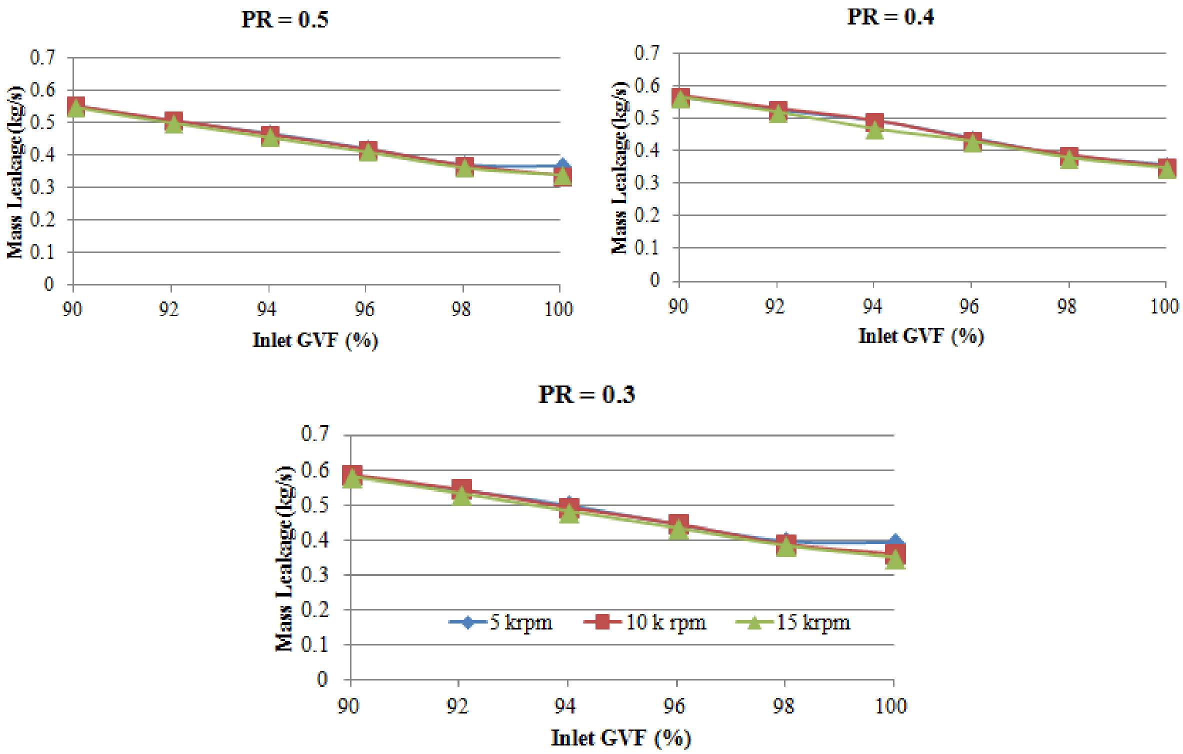


Figure 20. Seal mass flow leakage (*Zero* preswirl)

Figure 21 shows $\dot{m}$ versus inlet GVF over a range of PR and ω for *medium* preswirl. When GVF increases from 90% to 98%, $\dot{m}$ decreases linearly. However, when GVF increases from 98% to 100%, the rate of decrease in $\dot{m}$ is smaller. Change of PR and ω does not have significant effect on $\dot{m}$.

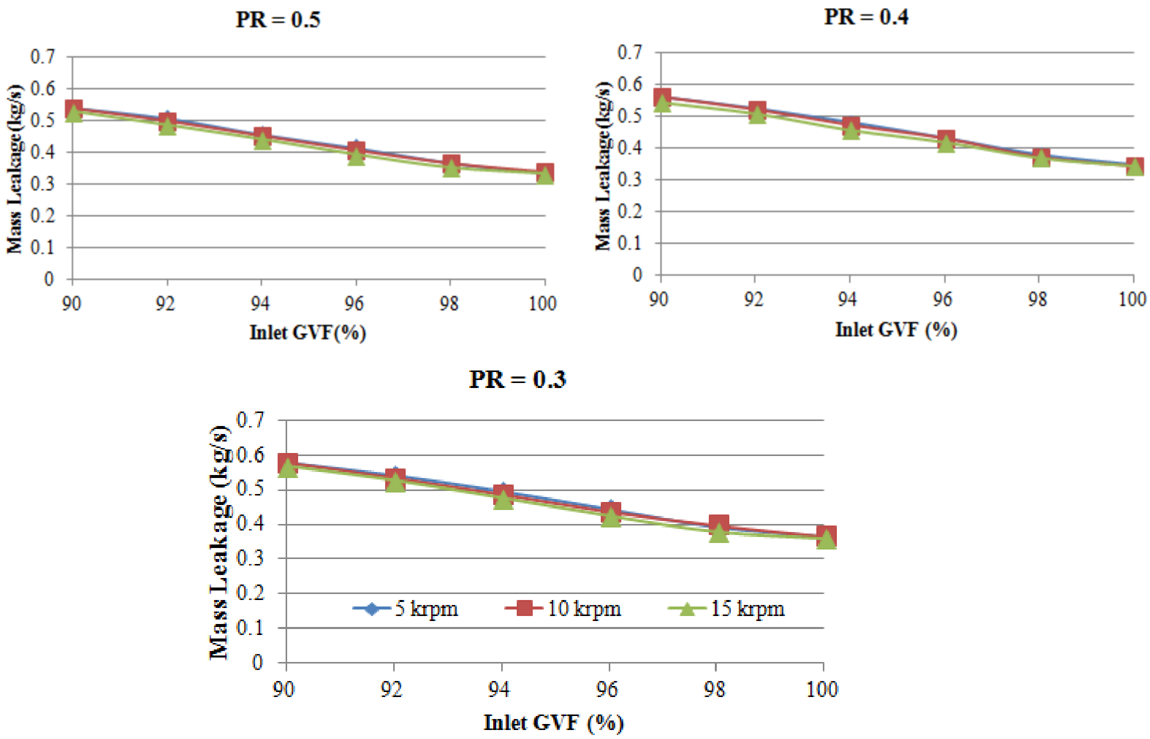


Figure 21. Seal mass flow leakage (*Medium* Preswirl)

Figure 22 shows $\dot{m}$ versus inlet GVF over a range of PR and ω for *high* preswirl. It shows that $\dot{m}$ decreases as ω increases. For PR = 0.3, GVF = 90% and ω = 15 krpm, there is a sudden drop in $\dot{m}$ as ω increases. The author has no explanation for this behavior. However, in most cases, when GVF increases, $\dot{m}$ decreases linearly. Change in PR and ω have no significant effects on $\dot{m}$.

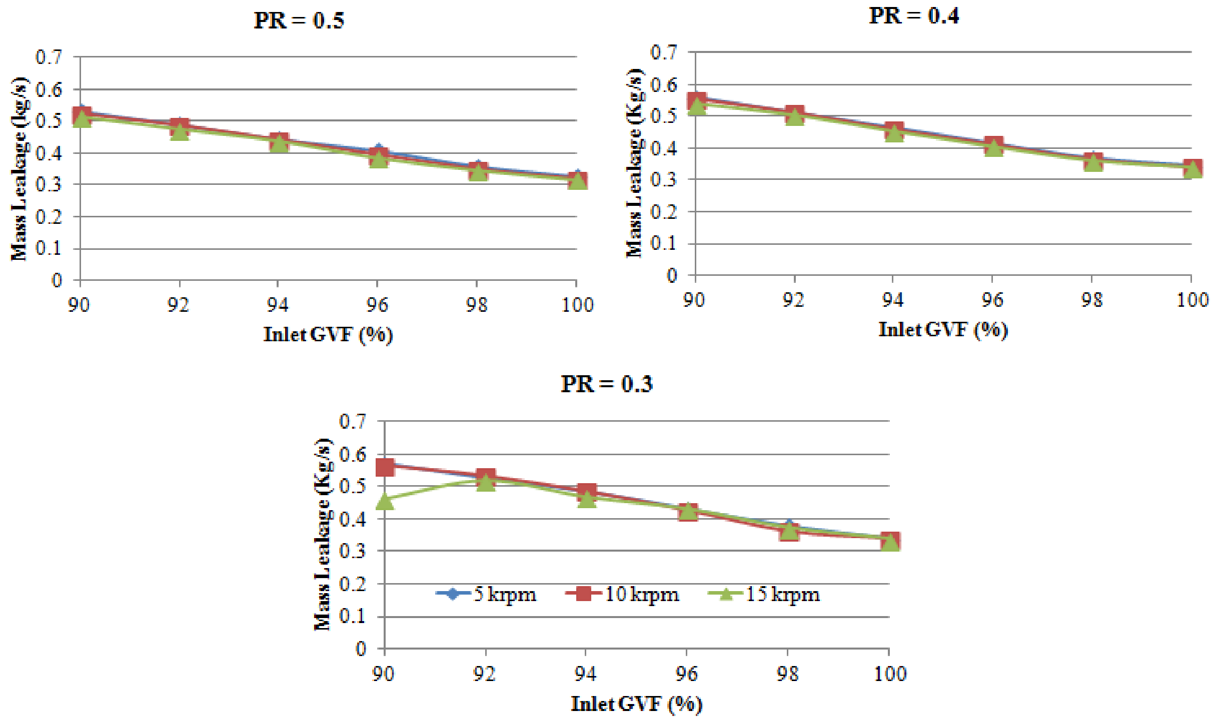


Figure 22. Seal mass flow leakage (*High* Preswirl)

Comparing Fig. 20 – Fig. 22, it is evident that the leakage decreases with increase in preswirl. Picardo [8] , Mehta [9] and Arthur [10] also reported a similar trend. It also appears that for a given GVF, the flow rate does not change with change in PR. The flow might have been choked.

5.4 Direct Stiffness

Direct stiffness K_Ω is calculated using Eq.(16). K_Ω produces most of the seal's effective centering force. Even though cross coupled damping c (discussed below) contributes to the centering force, their contributions are negligible in comparison to K_Ω.

Figure 23 shows K_Ω versus Ω over a range of PR, ω, and inlet GVF for *zero* preswirl. The rows and columns are arranged by PR and ω values, respectively. It shows that K_Ω is frequency dependent and negative. K_Ω decreases (becomes more negative) with increase in Ω for GVF 100%. Picardo [8] and Mehta [9] also reported similar behaviors at GVF 100%. However, for PR = 0.3 and 0.4, when GVF increases from 96-100%, K_Ω suddenly starts increasing after Ω=100 Hz and still remains negative. For PR = 0.5 and GVF 90% – 98%, there is a small increases in K_Ω at 100 Hz and it continues to decreases for higher frequencies after 100 Hz. The author has no explanation for this behavior. Similarly, K_Ω decreases slightly with increasing ω.

As inlet GVF decreases (liquid content increases), K_Ω becomes more negative. Increasing $|K_\Omega|$ increases the decentering force of the seal.

For a given speed and mainly-air condition, increase in PR increases seal's centering force, and hence increases K_Ω. Picardo [8] and Mehta [9] reported similar trend for straight-tooth labyrinth seals and slant-tooth labyrinth seals respectively.

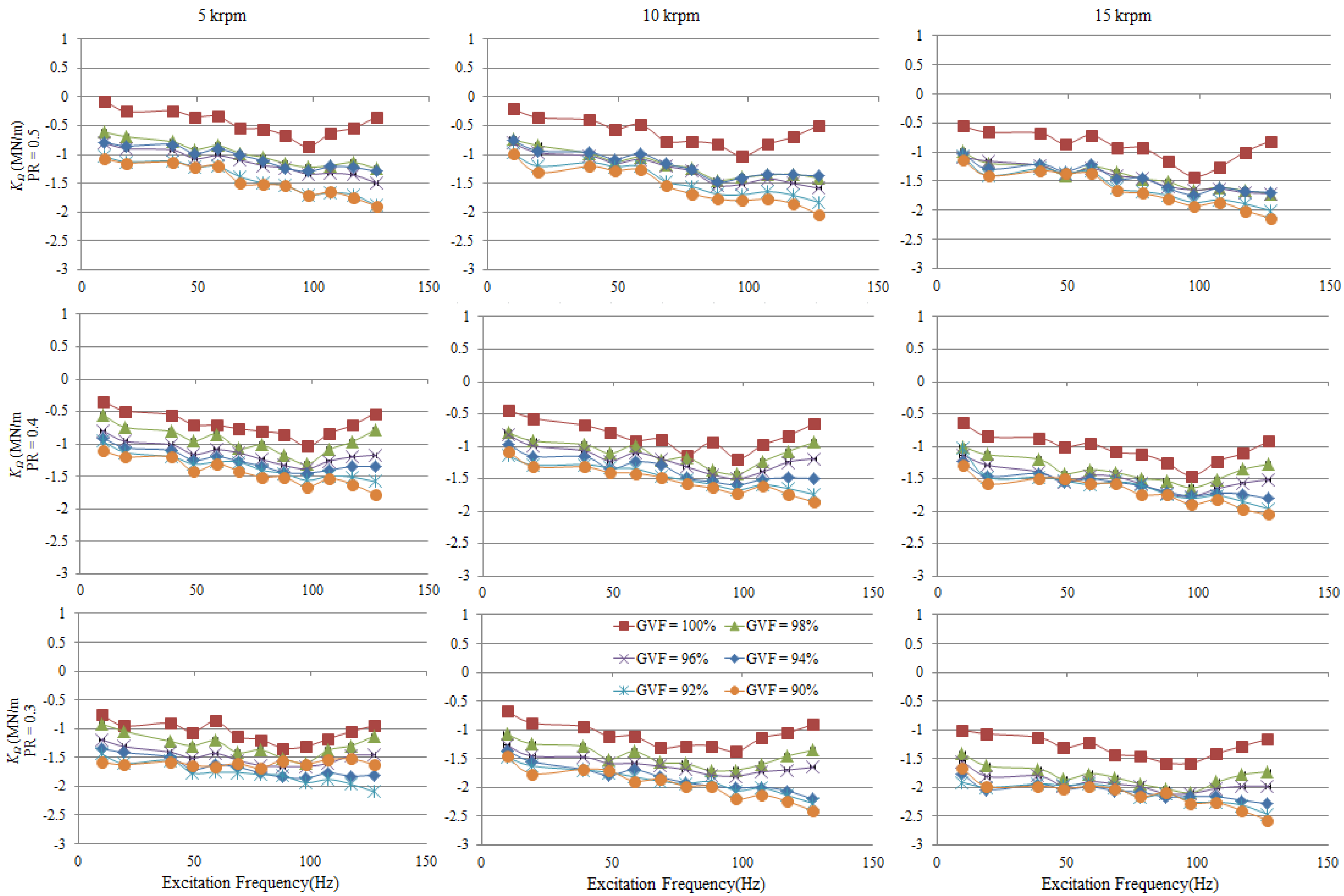


Figure 23. Effects of changing GVF on K_Ω, three speeds and three PRs (*Zero* Preswirl)

Figure 24 shows K_Ω versus Ω over a range of PR, ω, and inlet GVF for *medium* preswirl. Similar to *zero* preswirl, K_Ω is negative and Ω dependent.

As opposed to the *zero* preswirl shown in Fig. 23, there is no clear trend on the effect of changing GVF. For PR = 0.3 and ω = 5 krpm, GVF 90% has the lowest K_Ω and increases with increase in GVF. However, it is hard to establish similar trend for other PR and ω.

Similarly, $|K_\Omega|$ generally increases with increasing Ω. However, it is hard to establish a clear trend on K_Ω after 100 Hz.

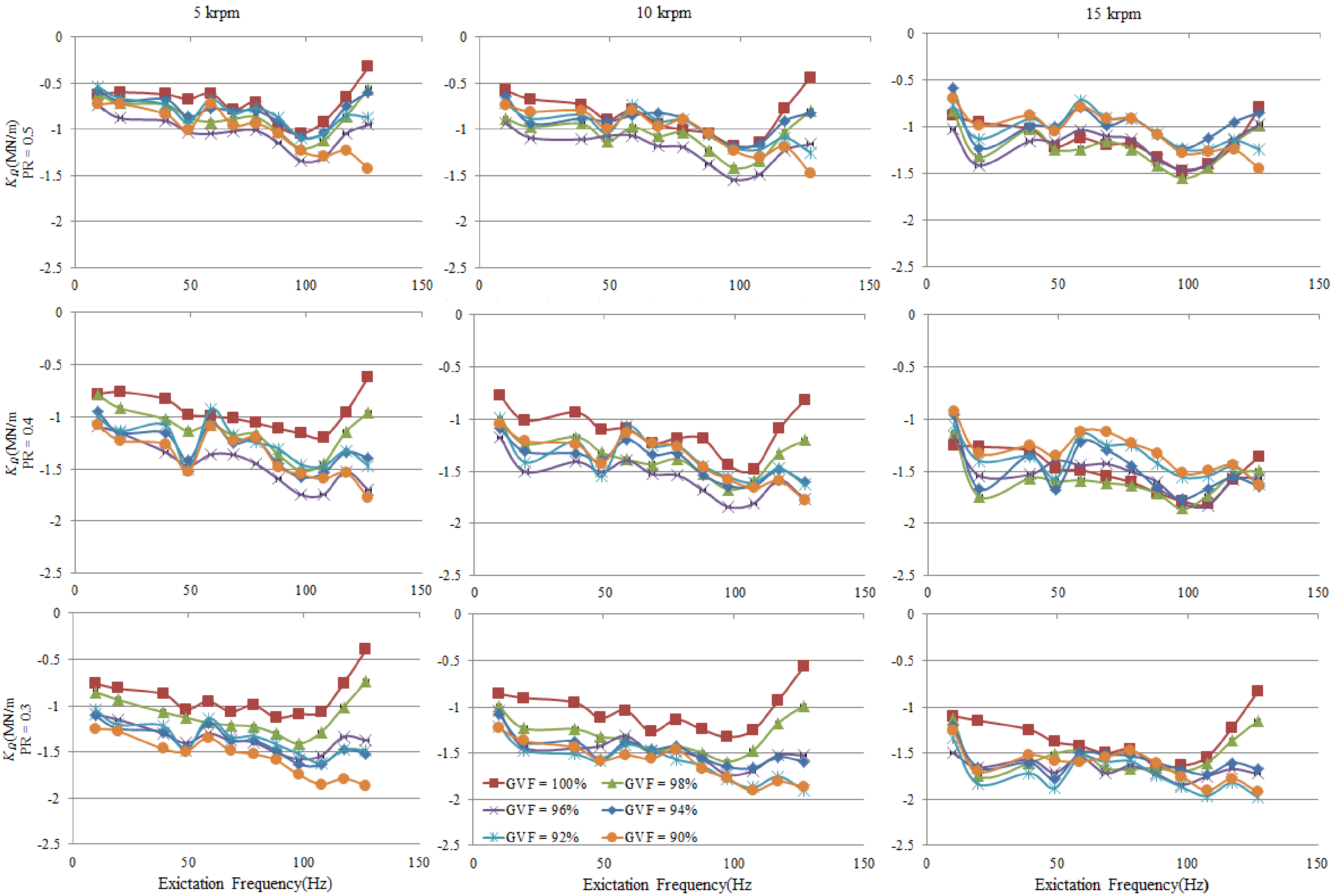


Figure 24. Effects of changing GVF on K_Ω, three speeds and three PRs (*Medium* Preswirl)

Figure 25 shows K_Ω versus Ω over a range of PR, ω, and inlet GVF for *high* preswirl. Similar to *zero* preswirl and *medium* preswirl, K_Ω is Ω dependent. However, contrary to *zero* and *medium* preswirl, K_Ω decreases monotonically as Ω increases, even after 100 Hz.

The effect of changing GVF on K_Ω is less pronounced. Although K_Ω appears to increase with increase in GVF for PR = 0.3 and ω = 5 krpm, a similar trend cannot be established for other PRs and ωs. Instead, K_Ω approaches the same value for all GVFs. Again, the author has no explanation for this behavior.

Similarly, K_Ω values have a weak dependence on ω. Increasing ω slightly decreases K_Ω. However, as PR increases, K_Ω becomes less negative.

Comparing the results for *zero*, *medium*, and *high* preswirl, as inlet GVF decreases, $|K_\Omega|$ increases for *zero* preswirl. When GVF decreases, seal's centering force decreases, which causes decrease in direct stiffness. The effect of GVF on direct stiffness is not prominent for *medium* preswirl and *high* preswirl.

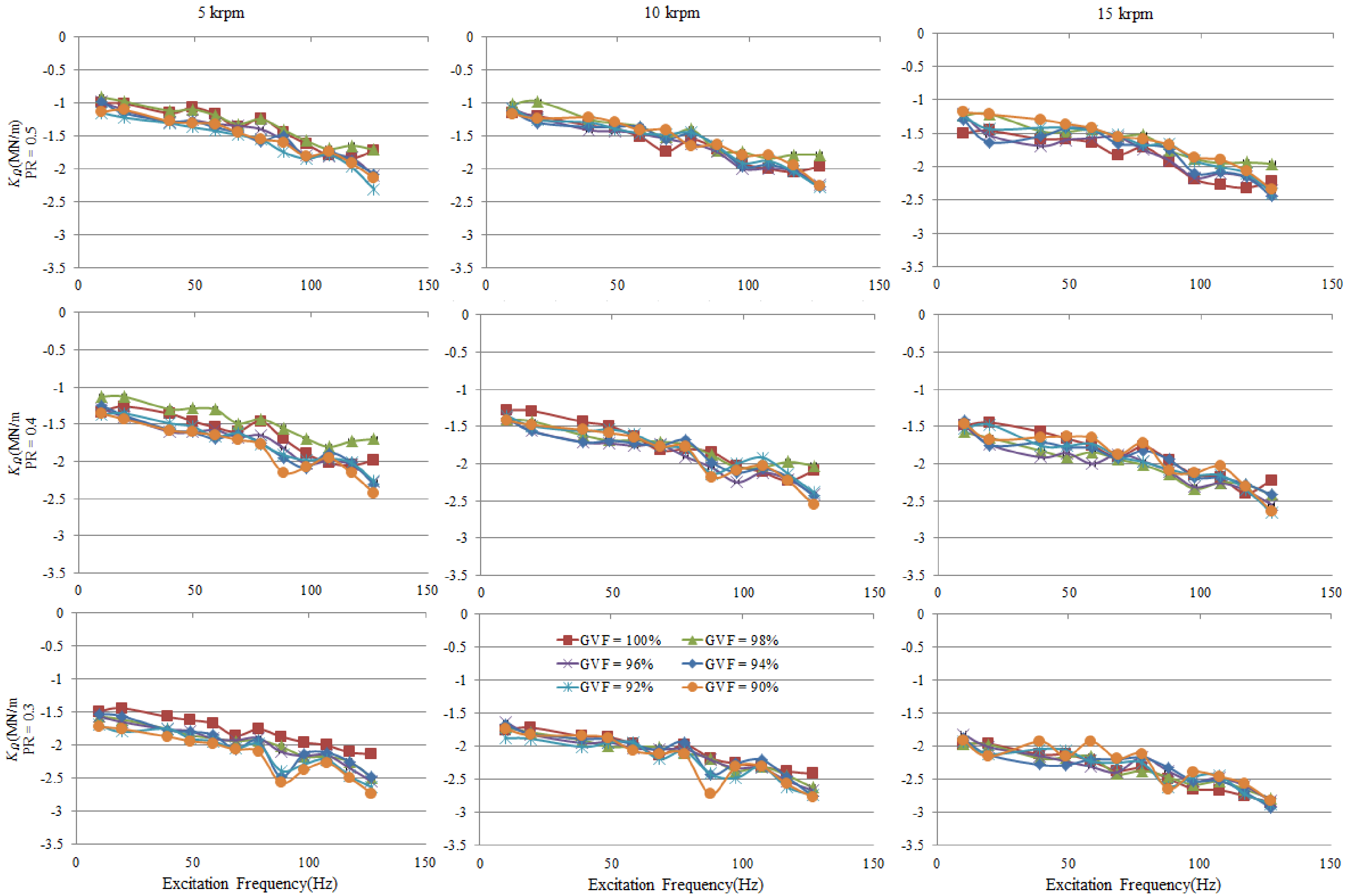


Figure 25. Effects of changing GVF on K_Ω, three speeds and three PRs (*High* Preswirl)

5.5 Cross-Coupled Stiffness

Cross-coupled stiffness k_Ω is calculated using Eq.(17). k_Ω arises due to fluid rotation. When positive, cross coupled stiffness promotes instability by developing a reaction force in the direction of rotor precession.

Figure 26 represents k_Ω versus Ω for *zero* preswirl over a range of PR, ω, and inlet GVF. The rows are arranged in order of increasing ω and the columns are arranged in order of decreasing PR.

For GVF 100%, k_Ω is negative for all conditions. Benckert and Wachter [4] , Picardo [8] and Mehta [9] also reported negative k_Ω for *zero* preswirl. However, for PR = 0.3 and 0.4, as inlet GVF decreases $|k_\Omega|$ increases; i.e., k_Ω becomes less negative and eventually becomes positive. For PR = 0.5, the effect of GVF is not as prominent as for other PRs. For GVF 90% to 98%, k_Ω has almost the same value while k_Ω for GVF 100% is distinct and negative. The measurements show the seal becoming more destabilizing as oil is added to the system. However, direct damping *C* also has impact on stabilizing effect of the seals. The combined effect of k_Ω and *C* is discussed later.

As expected, k_Ω increases with increases in ω. Increasing ω increases the fluid's circumferential velocity within seal annulus, and hence increases cross coupled reaction forces.

Change in PR has no significant effect on k_Ω for ω = 5kprm. However, for ω = 10 and 15 krpm, increasing PR increases k_Ω for all GVFs.

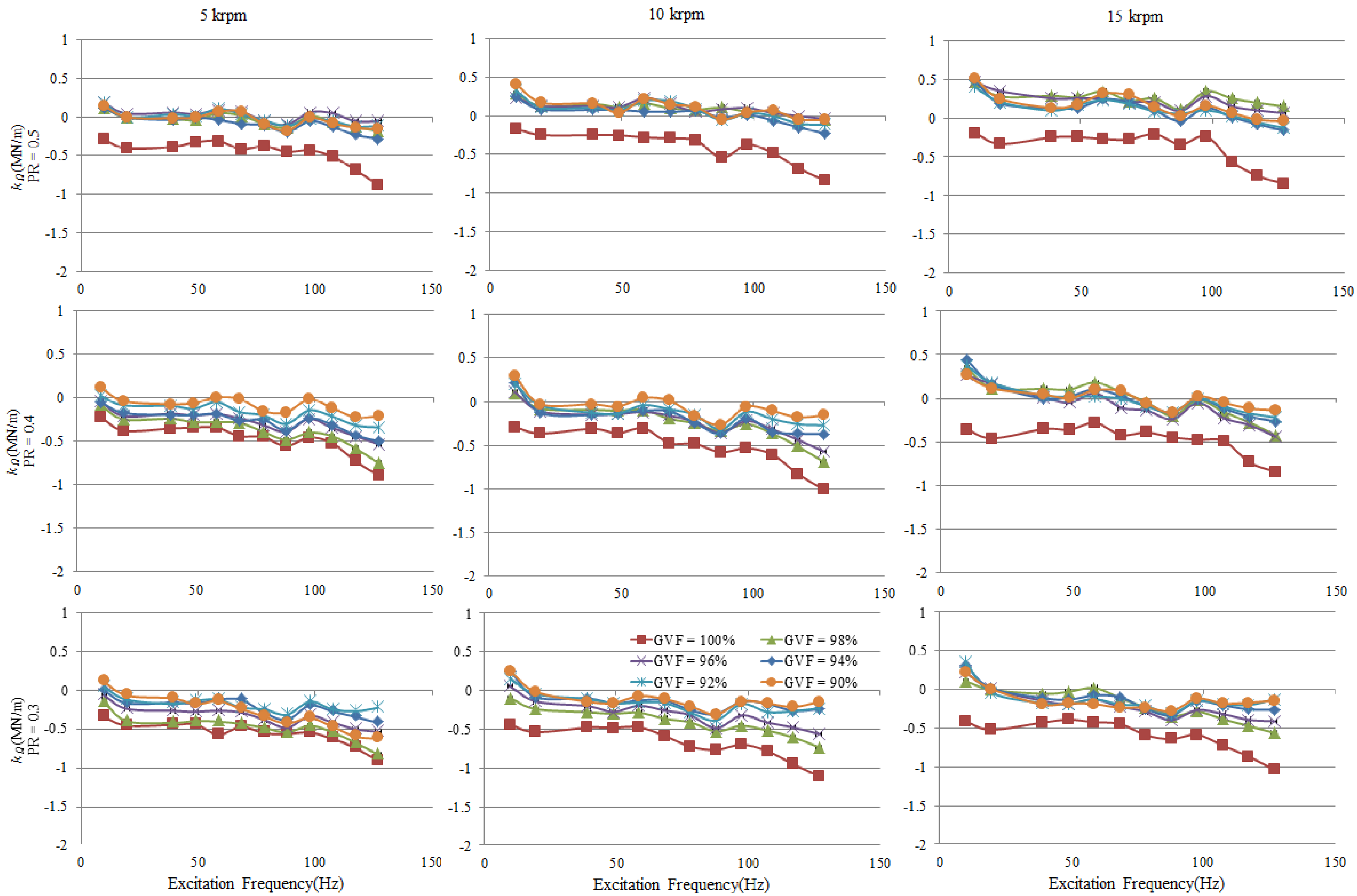


Figure 26. Effects of changing GVF on k_Ω, three speeds and three PRs (*Zero* Preswirl)

Figure 27 shows k_Ω versus Ω over a range of PR, ω, and inlet GVF for *medium* preswirl. k_Ω values are mostly positive except for some high Ω values.

The effect of GVF is not as prominent as in *zero* preswirl. Even though it appears as k_Ω decreases with decrease in GVF in some instances, establishing a clear relationship between k_Ω and GVF is not obvious. The fundamental behavior is different for *zero* and *medium* preswirl.

Changes in ω and PR has negligible effect on k_Ω values.

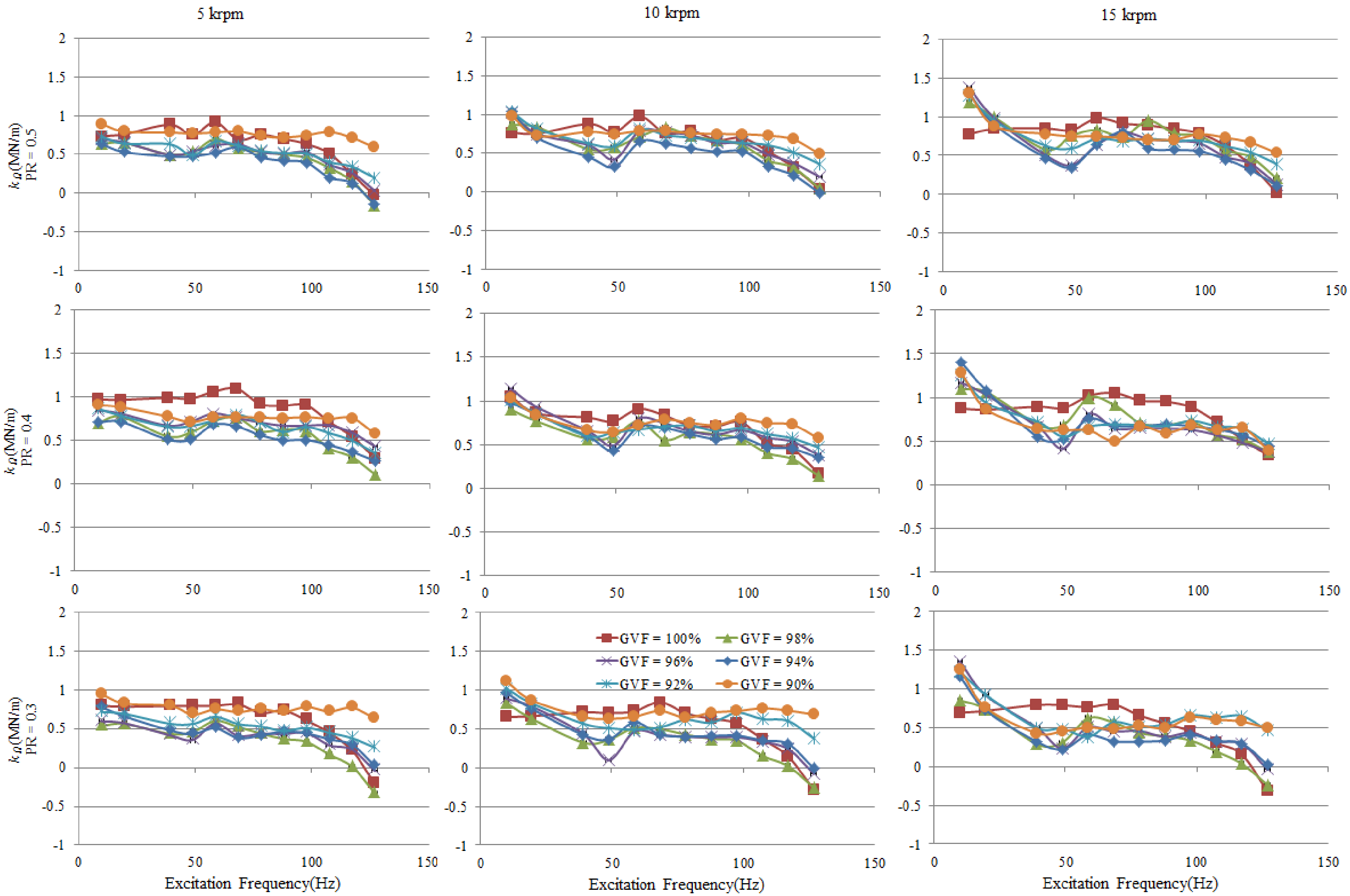


Figure 27. Effects of changing GVF on k_Ω, three speeds and three PRs (*Medium* Preswirl)

Figure 28 shows k_Ω versus Ω over a range of PR, ω, and inlet GVF for *high* preswirl. The results show k_Ω to be mostly positive. For GVFs other than 100%, k_Ω decreases as Ω decreases until 88 Hz and starts to increase after 88 Hz. dependent as GVF decreases. The author has no explanation for this behavior.

The effect of GVF change is more prominent compared to *zero* preswirl and *medium* preswirl. As GVF decreases, k_Ω also decreases. Hence, as oil flow increases, the seal becomes less destabilizing.

Changes in ω and PR have a negligible effect on k_Ω values.

k_Ω values are higher for *high* preswirl than *zero* preswirl and *medium* preswirl and almost appear to increase linearly with preswirl. Picardo [8] , Mehta [9] , and Arthur [10] also reported similar trends. As the preswirl increases, the fluid circumferential velocity increases and hence the forces arising from k_Ω also increases. Hence, as explained by Kwanka [30], it is advisable to use swirl brakes to reduce the effects of increasing circumferential velocity.

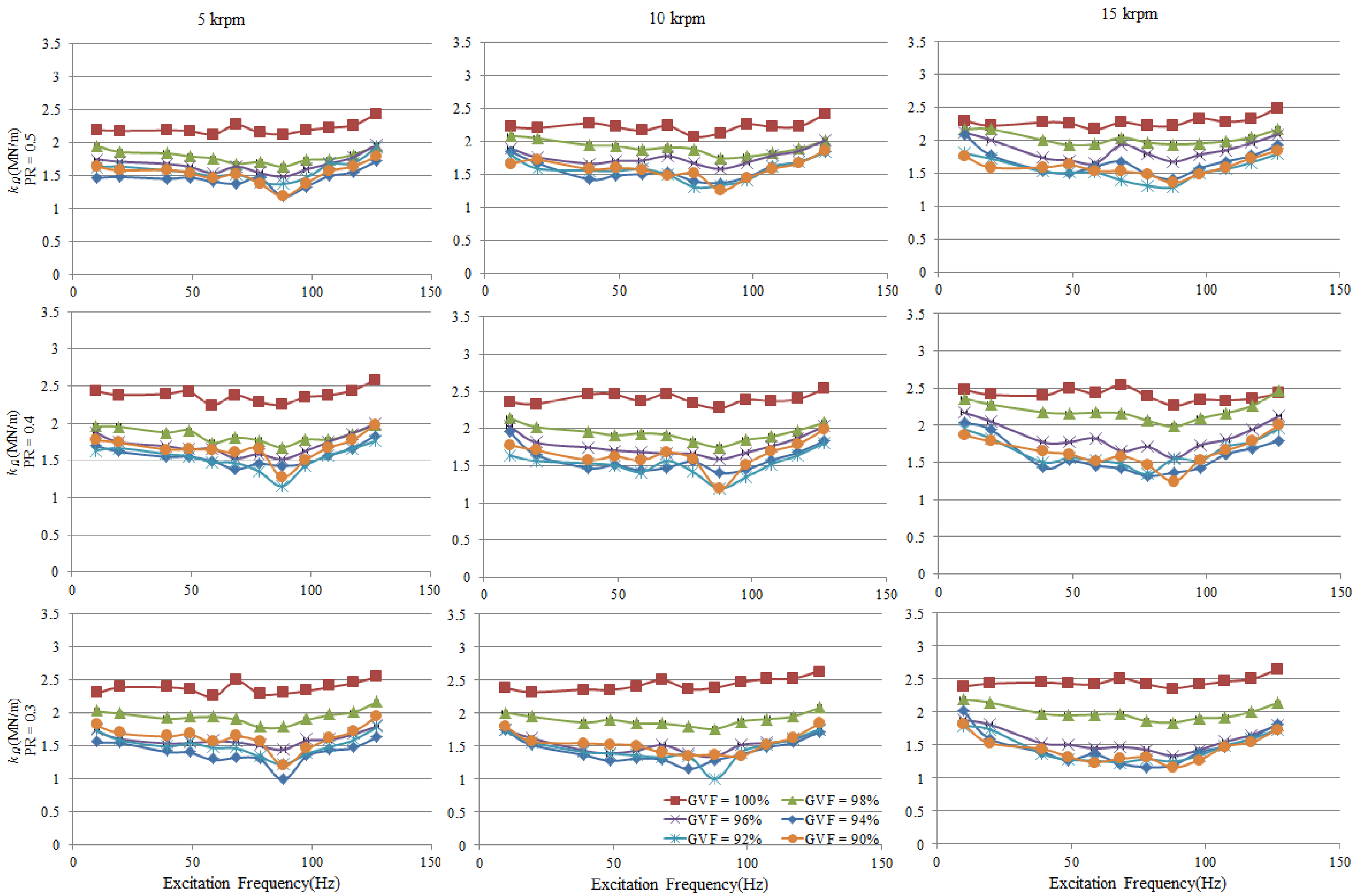


Figure 28. Effects of changing GVF on k_Ω, three speeds and three PRs (*High* Preswirl)

5.6 Direct Damping

Direct damping *C* is calculated using Eq.(18). Positive direct damping *C* opposes the rotor precession to stabilize the rotor vibrations. *C* does not depend on Ω.

Figure 29 shows *C* versus inlet GVF over a range of PR, ω, and preswirl values.

As GVF decreases, *C* increases. Increasing the liquid in the flow stream increases the damping. There is a sharp increase in *C* when GVF drops from 100% to 98%. However, for GVF 98% to 90%, the increase in *C* is almost linear.

C increases with increase in preswirl. Picardo [8] and Mehta [9] also reported similar trend.

Similarly, for a given speed, *C* increases with increase in PR. Picardo [8] also reported increase in *C* with increase in PR. However, Mehta [9] obtained a reduction in *C* with increase in PR.

Increase in ω also increases *C*. However, the effect of change in ω is almost negligible.

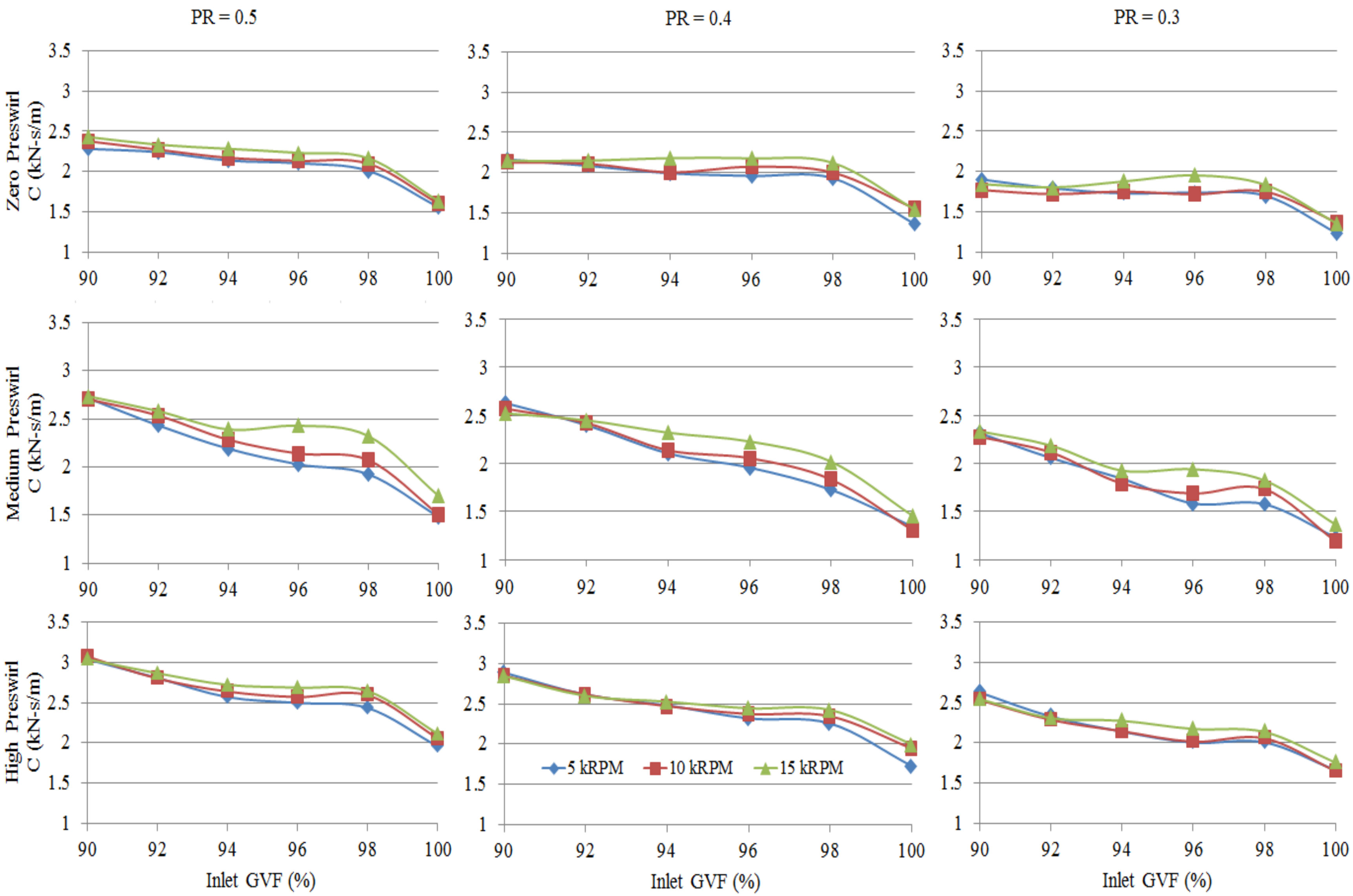


Figure 29. Effects of changing GVF on *C*

5.7 Cross-coupled Damping

Cross-coupled damping *c* is calculated using Eq.(19), and is not frequency dependent. Figure 30 shows *c* versus inlet GVF over a range of PR, ω, and preswirls.

When GVF increases from 90% - 98%, *c* increases very slowly or remains constant in some instances. However, as GVF increases from 98% to 100%, *c* increases sharply (almost by factor of 2 compared to *c* for GVF 90%). *c* still remains small which shows that centering forces due to cross-coupled damping are small. However, cross-coupled damping (*c*) adds to the direct stiffness (K_{Ω}). Hence, positive *c* helps to minimize the negative stiffness of labyrinth seals.

As with Picardo [8] , Mehta [9] , and Arthur [10] , *c* increases with increasing ω.

Changing PR has a negligible effect on *c*. In contrast, Mehta [9] reported increase of *c* with increase in PR. As with Picardo [8] and Mehta [9] , *c* increases with increase in preswirl.

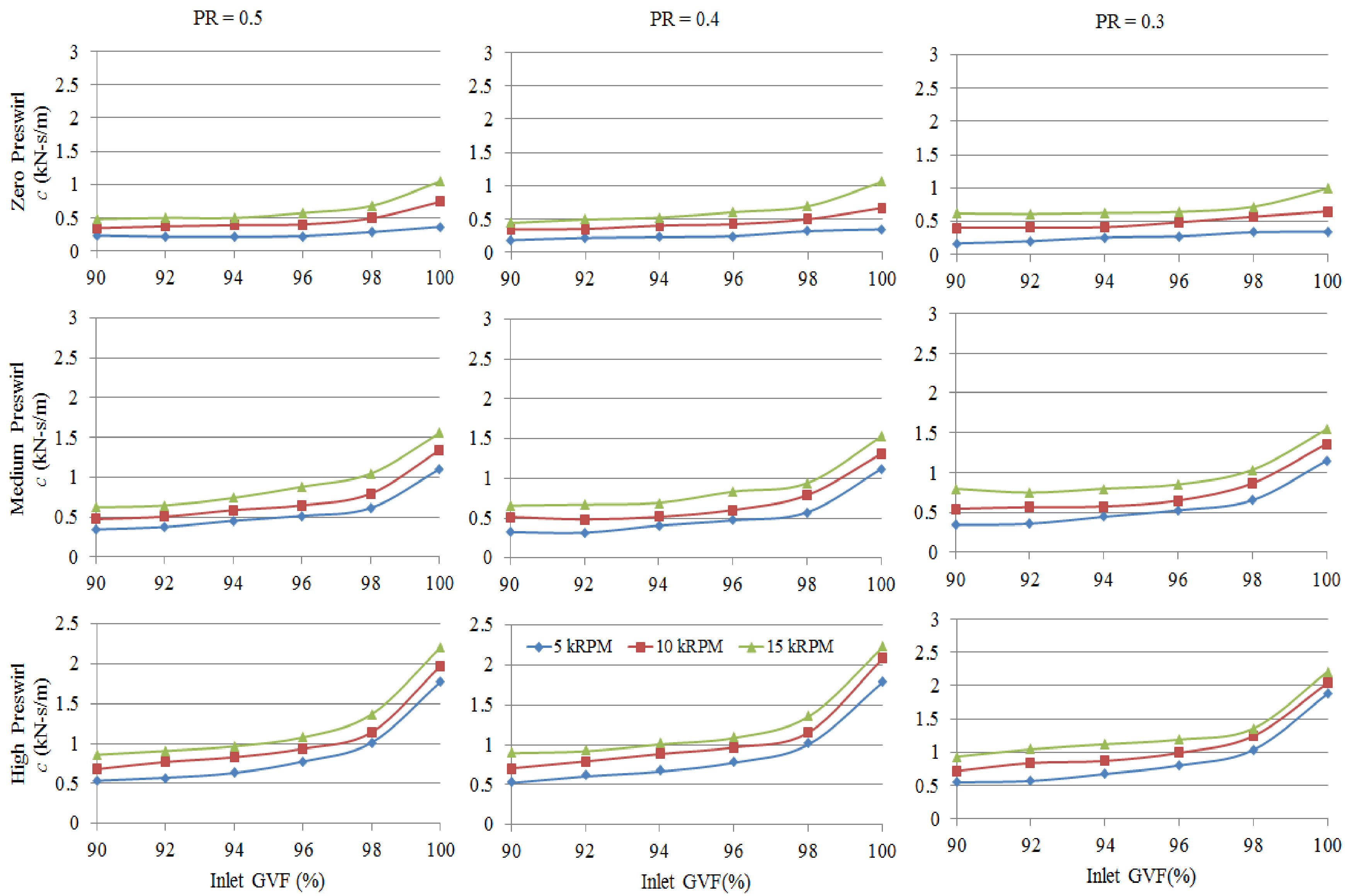


Figure 30. Effects of changing GVF on *c*

5.8 Effective Damping

Effective damping C_{eff} is an indicator of system's stability. It is defined by Eq. (5).

$$C_{eff} = C - k_{\Omega} / \Omega \tag{5}$$

C_{eff} combines the stabilizing impact of C with the destabilizing impact of k_{Ω}. C has a stabilizing impact, and positive k_{Ω} is destabilizing. A high positive C_{eff} value indicates high stabilizing force, and hence is desired. Negative C_{eff} indicates that destabilizing component k_{Ω}/Ω is higher than C which will make the seals destabilizing.

Cross over frequency Ω_c is the frequency at which C_{eff} changes from negative to positive. Figure 31 shows C_{eff} versus Ω over a range of PR, ω, and inlet GVF for *zero* preswirl. C_{eff} is negative for low Ω which means that k_{Ω} (destabilizing) is dominant making the seals unstable. As Ω increases, C_{eff} becomes positive at Ω_c, and C becomes more dominant making the seal's reaction force more stable.

For GVF 100%, C_{eff} is always positive indicating a stable system. Decreasing GVF from 100% to 90% makes C_{eff} negative at low frequencies; however all C_{eff} values converge to almost the same positive value for higher frequencies indicating stabilizing force at higher frequencies. Hence, for a typical compressor running at 15 krpm, PR 0.5 and *zero* preswirl with the first critical speed of 7500 rpm (125Hz), there is no significant effect of change of GVFs. It is further discussed below.

As ω increases, C_{eff} values become more negative for frequencies lower than Ω_c. ω does not affect C_{eff} for higher frequencies. Also, the effect of PR on C_{eff} and Ω_c is not significant.

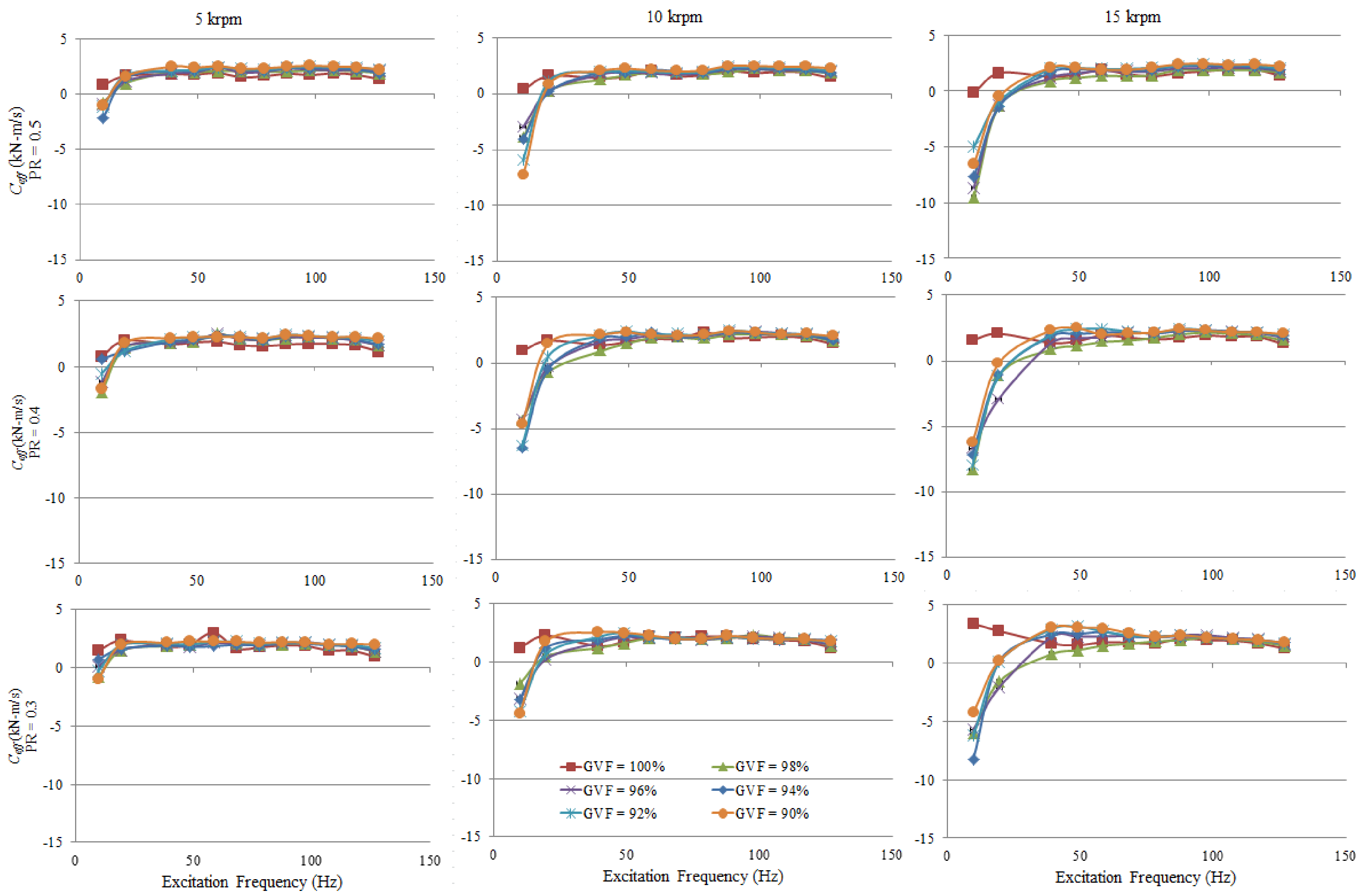


Figure 31. Effects of changing GVF on C_{eff} (*Zero* Preswirl)

Figure 32 shows C_{eff} versus **Ω** over a range of PR, ω, and inlet GVF for *medium* preswirl.

C_{eff} is negative when GVF = 100% for all frequencies indicating instability because the destabilizing k_{Ω} is dominant. For low **Ω**s, there is a steep drop in C_{eff} in comparison to the *zero* preswirl results of Fig. 31, emphasizing the importance of swirl brakes. Although C_{eff} decreases at higher **Ω**s, the rate of decrease is smaller. As GVF decreases, C_{eff} becomes less negative and eventually becomes positive after $\mathbf{\Omega}_c$. This result indicates that the presence of some liquid in air flow can enhance stability for *medium* preswirl at certain lower frequencies.

Changes in PR and ω do not significantly effect $C_{eff.}$

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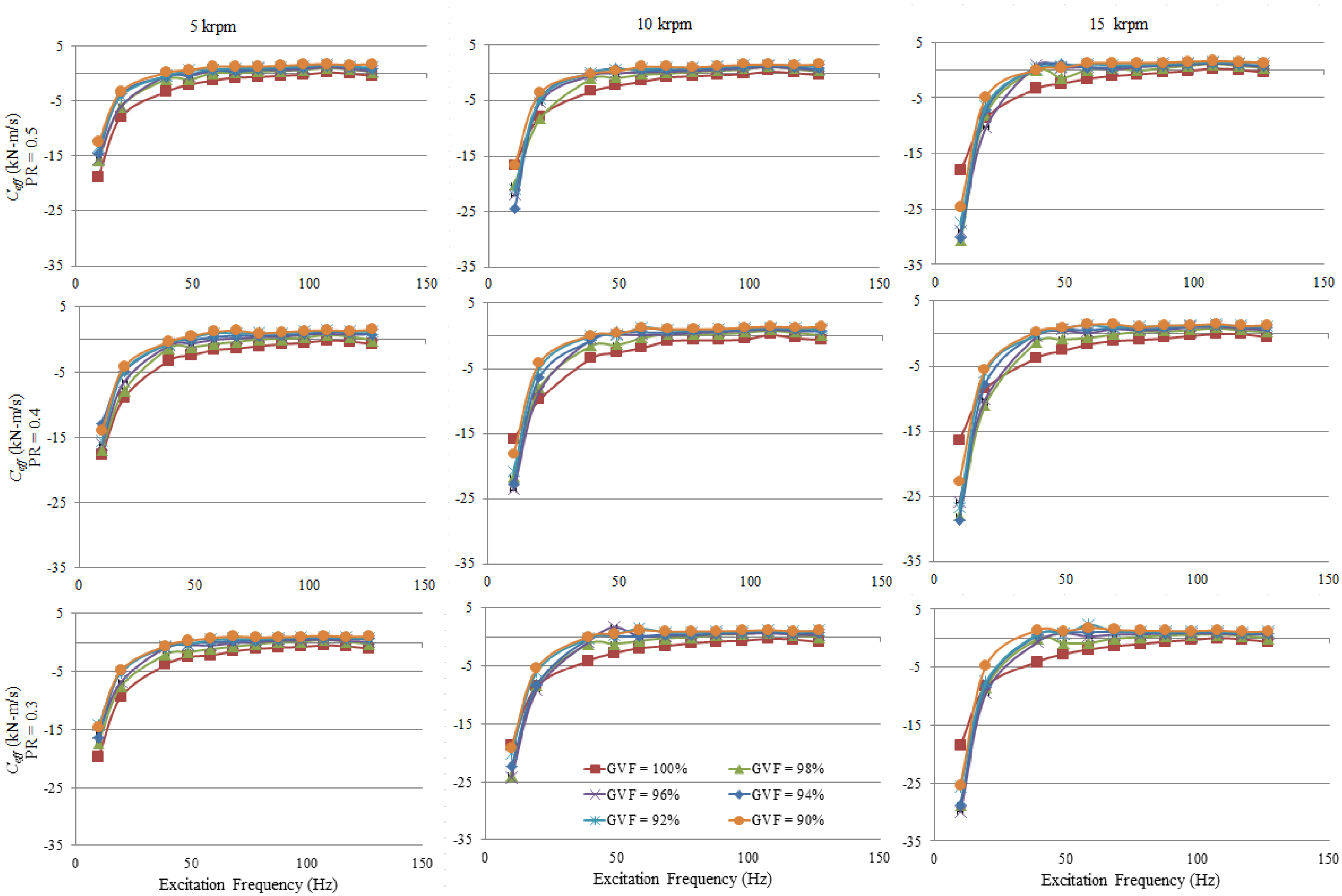

Figure 32. Effects of changing GVF on C_{eff} (*Medium* Preswirl)

Figure 33 shows C_{eff} versus Ω over a range of PR, ω, and inlet GVF for *high* preswirl. Similar to the *medium* preswirl result, C_{eff} is negative when GVF = 100% for all frequencies indicating a destabilizing net damping force because of k_{Ω}'s dominance. For low Ωs, C_{eff} is negative, and smaller than compared to the *zero* preswirl. Even though C_{eff} decreases at higher Ωs, the rate of decrease is smaller. As GVF decreases, C_{eff} becomes less negative and eventually becomes positive. This result indicates that presence of some liquid in gas flow can make the seal forces more stable for certain lower frequencies.

Change in PR and ω do not have significant effect on C_{eff}.

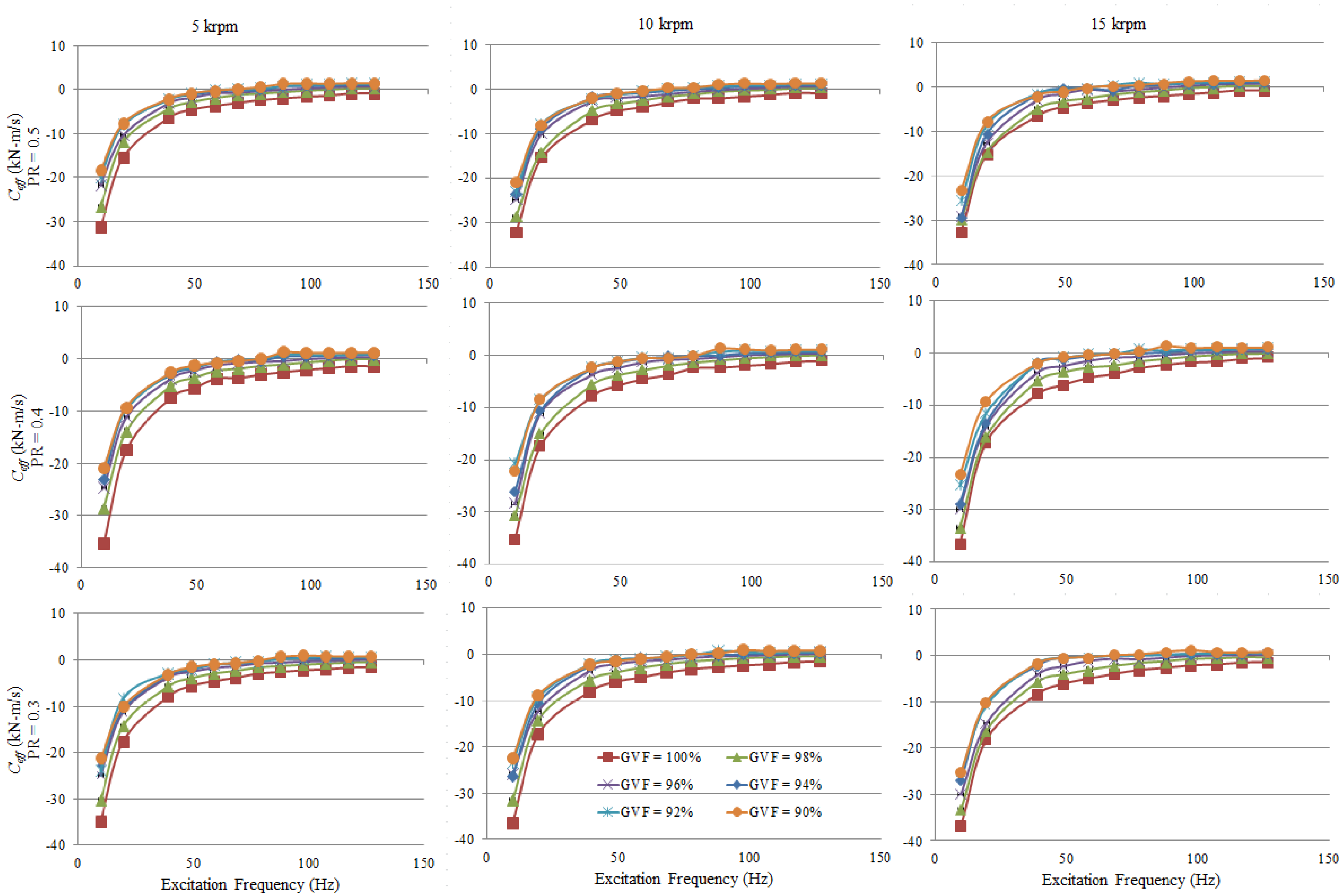

Figure 33. Effects of changing GVF on C_{eff} (*High* Preswirl)

Figure 34 shows the effect of C_{eff} for three different preswirls at PR = 0.5 and ω = 15 krpm for the frequency range 88 Hz – 127 Hz. The frequency range is chosen to represent wet-gas compression on a compressor running at 15 krpm and PR = 0.5 with the first natural frequency around 7500 rpm (125 Hz).

Figure 34 shows that changing GVF does not have much effect on C_{eff} for *zero* preswirl. C_{eff} is positive for all GVFs, which indicates that the labyrinth seal with *zero* preswirl is stable for all GVFs. However, for *medium* preswirl, C_{eff} is negative for GVF = 100% for frequency range 87 – 100 Hz and 117 – 127 Hz. As GVF decreases from 100% to 98%, C_{eff} becomes positive and increases linearly from 87 – 107Hz before decreasing linearly from 107 – 127 Hz, however still remaining positive. C_{eff} shows a similar trend for GVFs 96% - 90%, and is maximum for GVF = 90%. This shows that decreasing GVF (increasing the amount of oil injected) increases the stabilizing capacity of the seals for *medium* preswirl.

Similarly, for *high* preswirl and GVF = 100%, C_{eff} is negative indicating destabilizing forces from the seal. However, as GVF decreases from 100% to 98%, C_{eff} increases and becomes positive after Ω = 107 Hz. As GVF decreases further, C_{eff} becomes more positive, and is maximum for GVF = 90%. This indicates that decrease in GVF increases the stability of the labyrinth seal with *high* preswirl for frequencies 88 – 127 Hz.

Hence, for a compressor running at 15 krpm, PR 0.5 and *medium* preswirl and *high* preswirl with the first critical speed around 7500 rpm (125Hz), the decrease in GVFs increases the stability of the compressor.

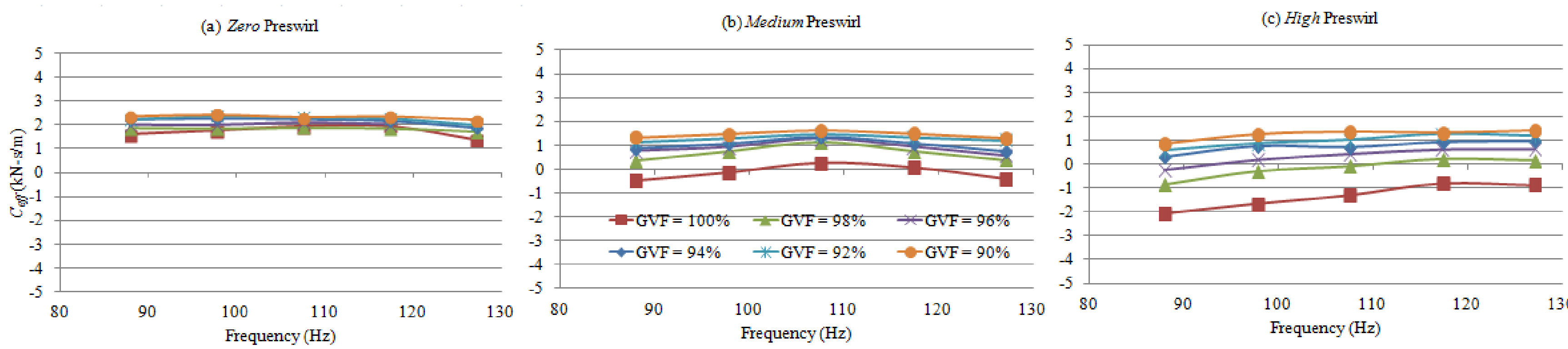

Figure 34. Comparison of C_{eff} at PR = 0.5 and ω = 15 krpm for frequency range 88 Hz – 127 Hz; (a) *Zero* Preswirl, (b) *Medium* Preswirl, (c) *High* Preswirl.

6. SUMMARY AND CONCLUSIONS

This thesis presents a comprehensive experimental investigation of a set of long (length L = 85.725 mm and diameter D = 114.729 mm with L/D = 0.75) labyrinth seals operating under two-phase flow conditions using a mixture of air and silicone oil. The test seal is tested at 3 inlet preswirl ratios, 3 PRs (0.3, 0.4, and 0.5), 3 ωs (5 krpm, 10 krpm, and 15 krpm), and 6 inlet GVFs (90% -100%). Three different stators were used for three different inlet preswirl ratios. The inlet pressure is maintained at 70 bar for each test, and the PR is maintained by adjusting back pressure valves. Desired GVF is obtained by controlling the air-control valve and the oil-control valve for each test. Pressure and GVF are monitored throughout the testing to maintain desired pressure ratio and GVF. The drive motor is set to a desired speed using a variable- frequency drive (VFD).

The experimental results show the existence of negative and frequency dependent direct stiffness for labyrinth seals. As inlet GVF decreases (injected oil flow increases), direct stiffness K_{Ω} becomes more negative for *zero* preswirl. When GVF decreases, the seal's centering force decreases, which causes a decrease in K_{Ω}. The effect of changing GVF on K_{Ω} is not prominent for *medium* preswirl and *high* preswirl. In practical terms, the magnitude of K_{Ω} is too small to have any significant impact on a compressor's rotordynamic characteristics.

When GVF increases, cross-coupled damping c increases. However its significance still remains small compared to K_{Ω}, which shows that the centering forces due to c are small. Positive c acts to reduce the negative stiffness of labyrinth seals.

Effective stiffness K_{eff}, defined by Eq.(4), combines the effect of direct stiffness and cross-coupled damping. It becomes very small due to small values of K_{Ω} and c, and is too small to impact the rotordynamic behavior of a compressor.

For *zero* preswirl, as inlet GVF decreases, cross-coupled stiffness k_{Ω} increases. This shows that for *zero* preswirl, decreasing GVF promotes instability. However, the effect of GVF on k_{Ω} is not as significant for *medium* preswirl as with *zero* preswirl. For *high* preswirl, as GVF decreases, k_{Ω} also decreases. The decrease in k_{Ω} indicates that decreasing GVF for *high* preswirl increases the stability of the seals. However, k_{Ω} alone doesn't dictate the stabilizing capacity of the seals since the direct damping C also affects the stabilizing capacity of the seals.

As GVF decreases, C increases. The increase of liquid in the flow stream increases the damping of the system. Effective damping C_{eff}, defined by Eq. (5), combines k_Ω and C, and is an indicator of system's stability. For *zero* preswirl, as GVF decreases from 100% to 90%, effective damping becomes more negative at low frequencies; however they converge to almost the same positive value for frequencies higher than cross-over frequency Ω_c (the frequency at which C_{eff} changes from negative to positive) , indicating stabilizing force at higher frequencies. However, for *medium* and *high* preswirl, as GVF decreases, C_{eff} becomes less negative and eventually becomes positive after Ω_c. This result indicates that presence of some liquid in air flow can make the system more stable at higher frequencies.

The test conditions that would be most applicable to the balance-piston seal of a compressor are: ω =15 krpm, PR 0.5, and *medium* and *high* preswirl. Assuming a rotor's first critical speed of 7500 rpm (125 Hz), Fig. 34 shows that a decrease in GVF increases C_{eff} and would increases the stability of the compressor. Griffin and Maier [13] also reported that liquid injection at the inlet improved system stability in some cases. In contrast, Brenne et al. [12] suggested that liquid trapped in impeller-eye seals or balance-piston seals could induce vibration in compressors. Brenne et al. [12] used the following approaches to inject liquid into pressurized gas stream before entering the compressor: (1) droplet injection, and (2) film injection. Similarly, Vannini et. al. [15] reported a subsynchronous vibration at LVF = 3% when liquid was injected directly into the seals. Vannini et. al [15] concluded that for wet-gas compression, the TOS labyrinth seal was not as good as a pocket damper seal for a balance-piston seal. However, for the experimental investigation of the labyrinth seals for this thesis, the liquid was injected from an inlet port as shown in Fig. 9. The results suggest that for a compressor running at 15 krpm and PR 0.5 with the first critical speed of 7500 rpm, the presence of liquid increases the stability of the compressor. However, the author encourages more experimental studies in the wet-gas compression to verify this experimental investigation.

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APPENDIX A

RAW DATA

Table A.1 Raw data for test seal at 5,000 rpm, 100% GVF and 0.5 PR (*High* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.01E+06	2.19E+06	-1.94E+06	-1.16E+06	1.33E+05	1.57E+05	-8.08E+04	1.55E+05
19.53	-1.01E+06	2.18E+06	-1.98E+06	-1.06E+06	2.77E+05	2.35E+05	-1.18E+05	1.20E+05
29.30	-1.55E+06	2.64E+06	-1.48E+06	-1.39E+06	8.62E+05	-2.09E+05	-7.54E+05	8.54E+05
39.06	-1.16E+06	2.19E+06	-1.90E+06	-9.94E+05	5.06E+05	4.17E+05	-3.23E+05	4.38E+05
48.83	-1.07E+06	2.18E+06	-1.87E+06	-1.29E+06	6.68E+05	5.59E+05	-4.84E+05	5.91E+05
58.59	-1.17E+06	2.13E+06	-2.00E+06	-1.18E+06	7.37E+05	7.16E+05	-5.40E+05	7.04E+05
68.36	-1.37E+06	2.27E+06	-1.95E+06	-1.28E+06	8.68E+05	8.55E+05	-6.63E+05	7.83E+05
78.13	-1.24E+06	2.15E+06	-1.99E+06	-1.39E+06	9.60E+05	9.12E+05	-7.61E+05	8.90E+05
87.89	-1.44E+06	2.13E+06	-2.08E+06	-1.49E+06	1.06E+06	1.05E+06	-9.09E+05	9.98E+05
97.66	-1.63E+06	2.19E+06	-2.05E+06	-1.66E+06	1.21E+06	1.20E+06	-9.82E+05	1.07E+06
107.42	-1.79E+06	2.23E+06	-2.12E+06	-1.76E+06	1.31E+06	1.36E+06	-1.00E+06	1.21E+06
117.19	-1.84E+06	2.26E+06	-2.06E+06	-1.92E+06	1.64E+06	1.55E+06	-1.08E+06	1.44E+06
126.95	-1.72E+06	2.43E+06	-2.14E+06	-1.93E+06	1.67E+06	1.71E+06	-1.28E+06	1.57E+06
136.72	-1.62E+06	2.42E+06	-2.30E+06	-2.01E+06	1.91E+06	1.68E+06	-1.36E+06	1.80E+06

Table A.2 Raw data for test seal at 10,000 rpm, 100% GVF and 0.5 PR (*High* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.16E+06	2.22E+06	-1.97E+06	-1.24E+06	8.63E+04	1.17E+05	-1.08E+05	1.28E+05
19.53	-1.20E+06	2.21E+06	-1.98E+06	-1.15E+06	1.65E+05	2.86E+05	-1.56E+05	2.13E+05
29.30	-1.78E+06	2.74E+06	-1.48E+06	-1.57E+06	7.97E+05	-2.74E+05	-8.40E+05	1.17E+06
39.06	-1.34E+06	2.28E+06	-1.99E+06	-1.17E+06	4.04E+05	5.18E+05	-4.23E+05	5.07E+05
48.83	-1.38E+06	2.22E+06	-1.98E+06	-1.37E+06	5.84E+05	5.21E+05	-5.63E+05	6.47E+05
58.59	-1.52E+06	2.17E+06	-2.05E+06	-1.32E+06	6.67E+05	7.65E+05	-5.74E+05	6.72E+05
68.36	-1.73E+06	2.23E+06	-2.02E+06	-1.41E+06	8.79E+05	8.46E+05	-7.29E+05	9.11E+05
78.13	-1.56E+06	2.07E+06	-2.02E+06	-1.48E+06	1.07E+06	1.01E+06	-9.15E+05	1.01E+06
87.89	-1.71E+06	2.13E+06	-2.19E+06	-1.54E+06	1.12E+06	1.19E+06	-1.05E+06	1.06E+06
97.66	-1.92E+06	2.26E+06	-2.11E+06	-1.78E+06	1.30E+06	1.36E+06	-1.15E+06	1.16E+06
107.42	-2.00E+06	2.22E+06	-2.17E+06	-1.89E+06	1.42E+06	1.48E+06	-1.17E+06	1.32E+06
117.19	-2.05E+06	2.23E+06	-2.11E+06	-1.95E+06	1.73E+06	1.67E+06	-1.23E+06	1.55E+06
126.95	-1.96E+06	2.42E+06	-2.16E+06	-1.99E+06	1.69E+06	1.84E+06	-1.43E+06	1.58E+06
136.72	-1.88E+06	2.45E+06	-2.30E+06	-2.04E+06	1.93E+06	1.90E+06	-1.59E+06	1.87E+06

Table A.3 Raw data for test seal at 15,000 rpm, 100% GVF and 0.5 PR (*High* Preswirl)

Freq.	*Re(H_XX)*	*Re(H_XY)*	*Re(H_YX)*	*Re(H_YY)*	*Im(H_XX)*	*Im(H_XY)*	*Im(H_YX)*	*Im(H_YY)*
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.50E+06	2.30E+06	-1.91E+06	-1.58E+06	1.07E+05	1.70E+05	-8.48E+04	1.18E+05
19.53	-1.46E+06	2.23E+06	-1.95E+06	-1.45E+06	2.22E+05	2.68E+05	-1.95E+05	2.27E+05
29.30	-2.04E+06	2.85E+06	-1.44E+06	-1.90E+06	8.57E+05	-2.04E+05	-8.90E+05	1.17E+06
39.06	-1.58E+06	2.28E+06	-1.99E+06	-1.36E+06	4.31E+05	5.18E+05	-5.20E+05	5.74E+05
48.83	-1.59E+06	2.26E+06	-1.96E+06	-1.64E+06	7.19E+05	6.17E+05	-7.35E+05	6.90E+05
58.59	-1.64E+06	2.17E+06	-2.06E+06	-1.59E+06	7.83E+05	8.47E+05	-7.99E+05	7.81E+05
68.36	-1.82E+06	2.28E+06	-2.14E+06	-1.57E+06	9.21E+05	1.03E+06	-9.43E+05	8.94E+05
78.13	-1.71E+06	2.22E+06	-2.13E+06	-1.72E+06	1.02E+06	1.13E+06	-1.04E+06	9.69E+05
87.89	-1.94E+06	2.22E+06	-2.31E+06	-1.82E+06	1.15E+06	1.27E+06	-1.23E+06	1.09E+06
97.66	-2.19E+06	2.33E+06	-2.24E+06	-1.99E+06	1.33E+06	1.43E+06	-1.25E+06	1.20E+06
107.42	-2.28E+06	2.28E+06	-2.27E+06	-2.14E+06	1.44E+06	1.62E+06	-1.30E+06	1.36E+06
117.19	-2.32E+06	2.32E+06	-2.19E+06	-2.17E+06	1.78E+06	1.80E+06	-1.38E+06	1.56E+06
126.95	-2.22E+06	2.49E+06	-2.24E+06	-2.29E+06	1.76E+06	2.00E+06	-1.57E+06	1.57E+06
136.72	-2.17E+06	2.42E+06	-2.39E+06	-2.29E+06	2.02E+06	2.06E+06	-1.74E+06	1.90E+06

Table A.4 Raw data for test seal at 5,000 rpm, 98% GVF and 0.5 PR (*High* Preswirl)

Freq.	*Re(H_XX)*	*Re(H_XY)*	*Re(H_YX)*	*Re(H_YY)*	*Im(H_XX)*	*Im(H_XY)*	*Im(H_YX)*	*Im(H_YY)*
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-9.14E+05	1.95E+06	-1.49E+06	-9.47E+05	7.60E+04	1.60E+04	-2.32E+04	1.15E+05
19.53	-9.78E+05	1.86E+06	-1.52E+06	-9.97E+05	2.71E+05	-8.14E+02	-9.58E+04	2.07E+05
29.30	-1.73E+06	2.53E+06	-7.66E+05	-1.62E+06	1.41E+06	-8.77E+05	-1.16E+06	1.45E+06
39.06	-1.12E+06	1.84E+06	-1.41E+06	-9.52E+05	5.35E+05	1.62E+05	-1.28E+05	5.65E+05
48.83	-1.10E+06	1.79E+06	-1.41E+06	-1.21E+06	7.25E+05	2.29E+05	-2.97E+05	7.61E+05
58.59	-1.19E+06	1.76E+06	-1.38E+06	-1.16E+06	9.32E+05	3.37E+05	-2.81E+05	8.48E+05
68.36	-1.32E+06	1.68E+06	-1.50E+06	-1.11E+06	1.12E+06	4.42E+05	-4.18E+05	1.03E+06
78.13	-1.25E+06	1.70E+06	-1.48E+06	-1.34E+06	1.22E+06	4.46E+05	-4.53E+05	1.10E+06
87.89	-1.41E+06	1.64E+06	-1.58E+06	-1.37E+06	1.33E+06	5.76E+05	-5.33E+05	1.26E+06
97.66	-1.58E+06	1.74E+06	-1.46E+06	-1.53E+06	1.55E+06	7.05E+05	-6.05E+05	1.39E+06
107.42	-1.70E+06	1.75E+06	-1.52E+06	-1.64E+06	1.77E+06	8.44E+05	-5.72E+05	1.51E+06
117.19	-1.65E+06	1.82E+06	-1.46E+06	-1.76E+06	1.99E+06	9.17E+05	-6.29E+05	1.74E+06
126.95	-1.71E+06	1.95E+06	-1.49E+06	-1.78E+06	2.04E+06	9.74E+05	-7.73E+05	1.90E+06
136.72	-1.66E+06	1.93E+06	-1.59E+06	-1.83E+06	2.36E+06	9.68E+05	-8.05E+05	2.19E+06

Table A.5 Raw data for test seal at 10,000 rpm, 98% GVF and 0.5 PR (*High* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.02E+06	2.09E+06	-1.64E+06	-1.10E+06	1.04E+05	4.89E+04	-6.55E+04	8.61E+04
19.53	-9.78E+05	2.05E+06	-1.78E+06	-1.12E+06	1.45E+05	4.31E+04	-1.26E+05	2.07E+05
29.3	-1.89E+06	2.74E+06	-8.65E+05	-1.76E+06	1.37E+06	-9.41E+05	-1.09E+06	1.59E+06
39.06	-1.25E+06	1.95E+06	-1.60E+06	-1.07E+06	5.30E+05	1.86E+05	-1.48E+05	6.53E+05
48.83	-1.31E+06	1.93E+06	-1.58E+06	-1.34E+06	7.38E+05	2.69E+05	-2.95E+05	7.90E+05
58.59	-1.36E+06	1.88E+06	-1.60E+06	-1.20E+06	8.72E+05	4.82E+05	-2.44E+05	8.42E+05
68.36	-1.52E+06	1.91E+06	-1.58E+06	-1.42E+06	1.15E+06	4.30E+05	-4.06E+05	1.03E+06
78.13	-1.40E+06	1.88E+06	-1.61E+06	-1.53E+06	1.25E+06	5.10E+05	-5.11E+05	1.21E+06
87.89	-1.72E+06	1.75E+06	-1.65E+06	-1.46E+06	1.44E+06	4.71E+05	-6.77E+05	1.46E+06
97.66	-1.75E+06	1.77E+06	-1.68E+06	-1.62E+06	1.69E+06	7.96E+05	-7.25E+05	1.51E+06
107.42	-1.84E+06	1.82E+06	-1.71E+06	-1.71E+06	1.88E+06	9.75E+05	-6.77E+05	1.62E+06
117.19	-1.79E+06	1.89E+06	-1.61E+06	-1.84E+06	2.14E+06	1.06E+06	-7.04E+05	1.85E+06
126.95	-1.79E+06	2.02E+06	-1.66E+06	-1.87E+06	2.19E+06	1.12E+06	-8.70E+05	2.03E+06
136.72	-1.66E+06	2.02E+06	-1.76E+06	-1.85E+06	2.50E+06	1.16E+06	-9.88E+05	2.36E+06

Table A.6 Raw data for test seal at 15,000 rpm, 98% GVF and 0.5 PR (*High* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.24E+06	2.17E+06	-1.70E+06	-1.19E+06	6.72E+04	1.50E+05	-1.07E+05	1.31E+05
19.53	-1.21E+06	2.17E+06	-1.72E+06	-1.28E+06	1.71E+05	9.34E+04	-1.38E+05	1.15E+05
29.3	-2.15E+06	2.89E+06	-1.03E+06	-1.91E+06	1.28E+06	-8.54E+05	-1.21E+06	1.60E+06
39.06	-1.47E+06	2.00E+06	-1.66E+06	-1.30E+06	6.48E+05	2.56E+05	-1.96E+05	5.50E+05
48.83	-1.48E+06	1.93E+06	-1.74E+06	-1.52E+06	8.09E+05	3.96E+05	-4.06E+05	8.40E+05
58.59	-1.44E+06	1.94E+06	-1.80E+06	-1.47E+06	8.64E+05	5.57E+05	-4.32E+05	9.62E+05
68.36	-1.54E+06	2.04E+06	-1.72E+06	-1.49E+06	1.25E+06	6.58E+05	-5.13E+05	9.85E+05
78.13	-1.53E+06	1.97E+06	-1.79E+06	-1.66E+06	1.29E+06	7.04E+05	-6.16E+05	1.27E+06
87.89	-1.75E+06	1.94E+06	-1.87E+06	-1.64E+06	1.44E+06	7.84E+05	-6.61E+05	1.42E+06
97.66	-1.88E+06	1.95E+06	-1.74E+06	-1.80E+06	1.71E+06	8.82E+05	-7.89E+05	1.59E+06
107.42	-1.95E+06	1.99E+06	-1.83E+06	-1.87E+06	1.93E+06	1.10E+06	-7.64E+05	1.73E+06
117.19	-1.93E+06	2.05E+06	-1.73E+06	-1.95E+06	2.12E+06	1.21E+06	-8.72E+05	1.93E+06
126.95	-1.96E+06	2.17E+06	-1.80E+06	-2.00E+06	2.15E+06	1.28E+06	-1.00E+06	2.04E+06
136.72	-1.87E+06	2.14E+06	-1.90E+06	-1.96E+06	2.46E+06	1.34E+06	-1.14E+06	2.33E+06

Table A.7 Raw data for test seal at 5,000 rpm, 96% GVF and 0.5 PR (*High* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-9.80E+05	1.75E+06	-1.16E+06	-1.17E+06	9.53E+04	-3.26E+04	-2.16E+03	1.64E+05
19.53	-1.11E+06	1.71E+06	-1.27E+06	-1.18E+06	2.22E+05	-3.42E+04	-5.59E+03	2.12E+05
29.3	-1.90E+06	2.30E+06	-3.94E+05	-1.79E+06	2.12E+06	-1.85E+06	-1.79E+06	2.54E+06
39.06	-1.30E+06	1.68E+06	-1.03E+06	-1.13E+06	5.85E+05	9.98E+04	-8.01E+04	6.04E+05
48.83	-1.26E+06	1.63E+06	-1.06E+06	-1.36E+06	7.96E+05	1.05E+05	-2.12E+05	7.71E+05
58.59	-1.32E+06	1.54E+06	-1.06E+06	-1.24E+06	9.90E+05	2.95E+05	-2.21E+05	9.92E+05
68.36	-1.35E+06	1.64E+06	-1.08E+06	-1.25E+06	1.17E+06	3.07E+05	-2.90E+05	9.16E+05
78.13	-1.40E+06	1.54E+06	-1.13E+06	-1.44E+06	1.22E+06	3.69E+05	-3.61E+05	1.13E+06
87.89	-1.56E+06	1.48E+06	-1.17E+06	-1.54E+06	1.32E+06	4.32E+05	-3.53E+05	1.28E+06
97.66	-1.79E+06	1.59E+06	-1.10E+06	-1.75E+06	1.61E+06	5.46E+05	-4.49E+05	1.42E+06
107.42	-1.80E+06	1.68E+06	-1.08E+06	-1.82E+06	1.82E+06	7.03E+05	-4.16E+05	1.59E+06
117.19	-1.83E+06	1.78E+06	-9.65E+05	-1.92E+06	1.97E+06	7.07E+05	-5.35E+05	1.81E+06
126.95	-2.10E+06	1.97E+06	-9.94E+05	-2.06E+06	2.03E+06	6.96E+05	-6.63E+05	2.02E+06
136.72	-2.15E+06	2.12E+06	-9.54E+05	-2.12E+06	2.47E+06	6.52E+05	-7.32E+05	2.24E+06

Table A.8 Raw data for test seal at 10,000 rpm, 96% GVF and 0.5 PR (*High* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.09E+06	1.89E+06	-1.33E+06	-1.31E+06	3.78E+04	9.00E+03	-2.97E+04	1.37E+05
19.53	-1.23E+06	1.76E+06	-1.23E+06	-1.31E+06	2.84E+05	-3.83E+04	2.36E+04	2.27E+05
29.3	-2.11E+06	2.37E+06	-4.14E+05	-1.91E+06	2.30E+06	-2.07E+06	-1.91E+06	2.77E+06
39.06	-1.41E+06	1.66E+06	-1.07E+06	-1.25E+06	6.86E+05	1.07E+05	-1.22E+05	7.49E+05
48.83	-1.43E+06	1.70E+06	-1.12E+06	-1.48E+06	8.21E+05	1.88E+05	-2.85E+05	8.54E+05
58.59	-1.46E+06	1.71E+06	-1.19E+06	-1.27E+06	8.92E+05	5.00E+05	-3.86E+05	9.17E+05
68.36	-1.55E+06	1.78E+06	-1.15E+06	-1.51E+06	1.07E+06	2.45E+05	-3.58E+05	1.01E+06
78.13	-1.62E+06	1.67E+06	-1.19E+06	-1.57E+06	1.20E+06	4.09E+05	-4.09E+05	1.21E+06
87.89	-1.74E+06	1.58E+06	-1.27E+06	-1.63E+06	1.38E+06	5.08E+05	-4.62E+05	1.32E+06
97.66	-2.00E+06	1.68E+06	-1.17E+06	-1.84E+06	1.67E+06	6.54E+05	-5.69E+05	1.48E+06
107.42	-1.99E+06	1.79E+06	-1.18E+06	-1.95E+06	1.88E+06	8.22E+05	-5.12E+05	1.66E+06
117.19	-2.03E+06	1.86E+06	-1.05E+06	-2.01E+06	1.99E+06	8.19E+05	-6.41E+05	1.90E+06
126.95	-2.24E+06	2.02E+06	-1.05E+06	-2.08E+06	2.12E+06	8.10E+05	-7.87E+05	2.04E+06
136.72	-2.33E+06	2.16E+06	-1.03E+06	-2.23E+06	2.56E+06	7.98E+05	-8.87E+05	2.30E+06

Table A.9 Raw data for test seal at 15,000 rpm, 96% GVF and 0.5 PR (*High* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.21E+06	2.12E+06	-1.47E+06	-1.30E+06	1.32E+05	-2.49E+04	-7.07E+04	-1.04E+05
19.53	-1.53E+06	2.01E+06	-1.46E+06	-1.53E+06	2.48E+05	-2.28E+04	2.79E+04	1.20E+05
29.3	-2.40E+06	2.43E+06	-5.87E+05	-2.15E+06	2.47E+06	-2.13E+06	-1.91E+06	2.91E+06
39.06	-1.69E+06	1.74E+06	-1.22E+06	-1.39E+06	7.35E+05	8.13E+04	-2.44E+04	7.35E+05
48.83	-1.60E+06	1.70E+06	-1.22E+06	-1.56E+06	9.47E+05	2.36E+05	-2.94E+05	9.36E+05
58.59	-1.57E+06	1.65E+06	-1.12E+06	-1.51E+06	1.21E+06	3.91E+05	-3.37E+05	1.06E+06
68.36	-1.55E+06	1.93E+06	-1.21E+06	-1.52E+06	1.26E+06	5.45E+05	-5.32E+05	9.91E+05
78.13	-1.75E+06	1.80E+06	-1.31E+06	-1.67E+06	1.26E+06	4.80E+05	-4.39E+05	1.23E+06
87.89	-1.90E+06	1.68E+06	-1.36E+06	-1.74E+06	1.41E+06	6.16E+05	-4.75E+05	1.36E+06
97.66	-2.17E+06	1.78E+06	-1.26E+06	-1.94E+06	1.70E+06	7.72E+05	-6.01E+05	1.58E+06
107.42	-2.10E+06	1.85E+06	-1.24E+06	-2.00E+06	1.98E+06	9.39E+05	-5.82E+05	1.71E+06
117.19	-2.16E+06	1.96E+06	-1.12E+06	-2.08E+06	2.04E+06	9.95E+05	-7.12E+05	1.97E+06
126.95	-2.36E+06	2.09E+06	-1.13E+06	-2.17E+06	2.17E+06	9.84E+05	-8.76E+05	2.08E+06
136.72	-2.46E+06	2.23E+06	-1.18E+06	-2.30E+06	2.58E+06	1.00E+06	-9.64E+05	2.31E+06

Table A.10 Raw data for test seal at 5,000 rpm, 94% GVF and 0.5 PR (*High* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-9.83E+05	1.46E+06	-1.06E+06	-1.09E+06	2.15E+04	-3.47E+04	1.46E+04	1.81E+05
19.53	-1.16E+06	1.48E+06	-9.94E+05	-1.10E+06	2.68E+05	-9.48E+03	1.09E+05	2.43E+05
29.3	-1.92E+06	2.09E+06	-2.13E+05	-1.70E+06	2.40E+06	-2.15E+06	-1.96E+06	2.77E+06
39.06	-1.28E+06	1.45E+06	-8.82E+05	-1.02E+06	6.09E+05	6.12E+04	-6.20E+04	6.70E+05
48.83	-1.27E+06	1.47E+06	-8.99E+05	-1.30E+06	8.40E+05	1.14E+05	-1.61E+05	7.92E+05
58.59	-1.37E+06	1.41E+06	-8.81E+05	-1.17E+06	1.02E+06	2.23E+05	-1.40E+05	9.29E+05
68.36	-1.45E+06	1.38E+06	-8.63E+05	-1.33E+06	1.17E+06	2.06E+05	-1.56E+05	9.50E+05
78.13	-1.58E+06	1.46E+06	-1.03E+06	-1.54E+06	1.17E+06	1.29E+05	-1.35E+05	1.12E+06
87.89	-1.50E+06	1.18E+06	-8.65E+05	-1.42E+06	1.54E+06	4.30E+05	-3.46E+05	1.37E+06
97.66	-1.84E+06	1.33E+06	-8.99E+05	-1.75E+06	1.68E+06	4.56E+05	-3.62E+05	1.52E+06
107.42	-1.74E+06	1.49E+06	-8.83E+05	-1.78E+06	1.88E+06	6.82E+05	-3.66E+05	1.63E+06
117.19	-1.88E+06	1.55E+06	-7.61E+05	-1.87E+06	1.95E+06	6.16E+05	-4.23E+05	1.90E+06
126.95	-2.08E+06	1.72E+06	-7.87E+05	-1.95E+06	2.07E+06	6.12E+05	-5.73E+05	2.02E+06
136.72	-2.21E+06	1.90E+06	-7.55E+05	-2.14E+06	2.54E+06	5.61E+05	-6.04E+05	2.27E+06

Table A.11 Raw data for test seal at 10,000 rpm, 94% GVF and 0.5 PR (*High* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.13E+06	1.85E+06	-1.17E+06	-1.33E+06	8.95E+04	-2.39E+05	9.70E+04	1.92E+04
19.53	-1.30E+06	1.67E+06	-1.02E+06	-1.30E+06	3.15E+05	-7.34E+04	1.13E+05	2.33E+05
29.3	-2.02E+06	2.21E+06	-2.23E+05	-1.93E+06	2.51E+06	-2.24E+06	-2.07E+06	2.94E+06
39.06	-1.37E+06	1.42E+06	-9.20E+05	-1.13E+06	6.39E+05	4.95E+04	-9.10E+04	7.98E+05
48.83	-1.36E+06	1.48E+06	-9.57E+05	-1.38E+06	9.03E+05	1.55E+05	-2.19E+05	9.23E+05
58.59	-1.36E+06	1.51E+06	-9.90E+05	-1.24E+06	1.00E+06	3.74E+05	-2.33E+05	9.72E+05
68.36	-1.55E+06	1.53E+06	-9.27E+05	-1.31E+06	1.18E+06	3.67E+05	-2.70E+05	1.04E+06
78.13	-1.46E+06	1.40E+06	-9.95E+05	-1.41E+06	1.26E+06	4.46E+05	-3.70E+05	1.26E+06
87.89	-1.65E+06	1.37E+06	-1.05E+06	-1.49E+06	1.44E+06	4.89E+05	-3.72E+05	1.36E+06
97.66	-1.96E+06	1.46E+06	-9.24E+05	-1.72E+06	1.76E+06	6.12E+05	-5.08E+05	1.58E+06
107.42	-1.94E+06	1.63E+06	-9.64E+05	-1.82E+06	1.93E+06	7.62E+05	-4.25E+05	1.68E+06
117.19	-2.04E+06	1.68E+06	-8.14E+05	-1.94E+06	1.98E+06	7.23E+05	-5.58E+05	1.92E+06
126.95	-2.28E+06	1.85E+06	-8.39E+05	-2.07E+06	2.14E+06	7.59E+05	-6.89E+05	2.00E+06
136.72	-2.36E+06	2.01E+06	-8.00E+05	-2.25E+06	2.64E+06	6.98E+05	-8.08E+05	2.34E+06

Table A.12 Raw data for test seal at 15,000 rpm, 94% GVF and 0.5 PR (*High* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.30E+06	2.09E+06	-1.36E+06	-1.31E+06	-3.58E+04	-2.59E+04	8.18E+04	-1.25E+05
19.53	-1.63E+06	1.77E+06	-1.25E+06	-1.47E+06	2.20E+05	-1.85E+05	2.99E+05	1.88E+05
29.3	-2.24E+06	1.96E+06	-3.64E+05	-2.01E+06	2.99E+06	-2.69E+06	-2.25E+06	3.43E+06
39.06	-1.54E+06	1.54E+06	-9.13E+05	-1.33E+06	7.59E+05	9.81E+04	-1.09E+05	7.85E+05
48.83	-1.42E+06	1.50E+06	-8.56E+05	-1.52E+06	1.12E+06	1.55E+05	-2.54E+05	1.01E+06
58.59	-1.44E+06	1.60E+06	-8.77E+05	-1.40E+06	1.14E+06	3.99E+05	-3.67E+05	1.03E+06
68.36	-1.65E+06	1.68E+06	-1.02E+06	-1.40E+06	1.08E+06	5.74E+05	-2.75E+05	9.81E+05
78.13	-1.67E+06	1.49E+06	-1.02E+06	-1.59E+06	1.37E+06	3.93E+05	-3.92E+05	1.32E+06
87.89	-1.74E+06	1.41E+06	-1.10E+06	-1.65E+06	1.47E+06	5.42E+05	-4.87E+05	1.40E+06
97.66	-2.10E+06	1.58E+06	-9.37E+05	-1.90E+06	1.85E+06	6.97E+05	-5.26E+05	1.60E+06
107.42	-2.08E+06	1.68E+06	-1.01E+06	-1.97E+06	1.90E+06	9.03E+05	-4.45E+05	1.77E+06
117.19	-2.16E+06	1.77E+06	-8.57E+05	-2.03E+06	2.01E+06	8.85E+05	-6.57E+05	1.99E+06
126.95	-2.45E+06	1.93E+06	-8.10E+05	-2.20E+06	2.21E+06	9.05E+05	-8.40E+05	2.08E+06
136.72	-2.58E+06	2.16E+06	-8.09E+05	-2.49E+06	2.60E+06	8.88E+05	-9.26E+05	2.37E+06

Table A.13 Raw data for test seal at 5,000 rpm, 92% GVF and 0.5 PR (*High* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.15E+06	1.63E+06	-1.03E+06	-1.22E+06	4.49E+04	-1.78E+04	6.74E+04	1.78E+05
19.53	-1.22E+06	1.64E+06	-9.45E+05	-1.12E+06	3.46E+05	2.59E+04	4.99E+04	2.57E+05
29.3	-1.58E+06	1.80E+06	-5.65E+05	-1.31E+06	2.67E+06	-2.30E+06	-2.24E+06	3.04E+06
39.06	-1.31E+06	1.58E+06	-8.53E+05	-1.16E+06	6.36E+05	6.36E+04	-4.37E+04	6.67E+05
48.83	-1.37E+06	1.56E+06	-8.22E+05	-1.43E+06	9.55E+05	1.83E+03	-1.52E+05	8.31E+05
58.59	-1.42E+06	1.49E+06	-8.02E+05	-1.26E+06	1.11E+06	1.16E+05	-1.38E+05	1.09E+06
68.36	-1.48E+06	1.52E+06	-7.62E+05	-1.34E+06	1.28E+06	2.09E+05	-1.70E+05	1.09E+06
78.13	-1.55E+06	1.40E+06	-9.44E+05	-1.53E+06	1.26E+06	1.46E+05	-1.64E+05	1.30E+06
87.89	-1.74E+06	1.37E+06	-7.37E+05	-1.54E+06	1.56E+06	3.62E+05	-1.54E+05	1.41E+06
97.66	-1.85E+06	1.47E+06	-7.51E+05	-1.73E+06	1.88E+06	4.68E+05	-3.48E+05	1.60E+06
107.42	-1.79E+06	1.67E+06	-6.83E+05	-1.90E+06	2.08E+06	5.41E+05	-3.69E+05	1.77E+06
117.19	-1.97E+06	1.69E+06	-6.04E+05	-1.96E+06	2.13E+06	4.97E+05	-4.99E+05	2.08E+06
126.95	-2.31E+06	1.93E+06	-5.50E+05	-2.12E+06	2.30E+06	4.61E+05	-6.59E+05	2.23E+06
136.72	-2.51E+06	2.23E+06	-4.16E+05	-2.46E+06	2.83E+06	3.58E+05	-7.28E+05	2.53E+06

Table A.14 Raw data for test seal at 10,000 rpm, 92% GVF and 0.5 PR (*High* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.09E+06	1.80E+06	-1.10E+06	-1.29E+06	3.07E+04	-6.78E+03	1.16E+04	4.05E+04
19.53	-1.26E+06	1.59E+06	-9.74E+05	-1.23E+06	3.29E+05	-4.14E+04	1.41E+05	3.04E+05
29.3	-1.69E+06	1.84E+06	-4.93E+05	-1.47E+06	2.58E+06	-2.30E+06	-2.11E+06	3.07E+06
39.06	-1.30E+06	1.56E+06	-9.04E+05	-1.18E+06	6.51E+05	8.85E+04	-8.45E+04	7.53E+05
48.83	-1.39E+06	1.55E+06	-9.34E+05	-1.39E+06	8.58E+05	8.51E+04	-1.30E+05	8.79E+05
58.59	-1.46E+06	1.58E+06	-8.51E+05	-1.28E+06	1.11E+06	2.14E+05	-1.75E+05	1.05E+06
68.36	-1.48E+06	1.50E+06	-8.81E+05	-1.35E+06	1.20E+06	3.31E+05	-2.87E+05	1.18E+06
78.13	-1.45E+06	1.31E+06	-9.40E+05	-1.45E+06	1.34E+06	2.89E+05	-3.96E+05	1.40E+06
87.89	-1.65E+06	1.34E+06	-8.92E+05	-1.43E+06	1.53E+06	5.07E+05	-4.13E+05	1.48E+06
97.66	-1.91E+06	1.41E+06	-8.94E+05	-1.66E+06	1.80E+06	5.72E+05	-4.53E+05	1.68E+06
107.42	-1.88E+06	1.62E+06	-8.33E+05	-1.82E+06	1.97E+06	6.96E+05	-3.54E+05	1.80E+06
117.19	-2.04E+06	1.69E+06	-6.83E+05	-1.91E+06	2.14E+06	6.52E+05	-5.90E+05	2.01E+06
126.95	-2.28E+06	1.84E+06	-6.71E+05	-2.12E+06	2.31E+06	6.37E+05	-7.50E+05	2.16E+06
136.72	-2.49E+06	2.05E+06	-6.03E+05	-2.35E+06	2.82E+06	5.91E+05	-8.22E+05	2.47E+06

Table A.15 Raw data for test seal at 15,000 rpm, 92% GVF and 0.5 PR (*High* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.23E+06	1.80E+06	-1.29E+06	-1.26E+06	-9.82E+04	-7.39E+04	1.49E+05	5.51E+04
19.53	-1.43E+06	1.72E+06	-1.01E+06	-1.38E+06	4.03E+05	-1.37E+05	1.84E+05	2.07E+05
29.3	-2.04E+06	1.94E+06	-5.05E+05	-1.50E+06	2.85E+06	-2.27E+06	-2.05E+06	3.19E+06
39.06	-1.42E+06	1.53E+06	-8.49E+05	-1.17E+06	8.49E+05	1.06E+05	-5.61E+04	7.62E+05
48.83	-1.42E+06	1.51E+06	-9.63E+05	-1.40E+06	9.94E+05	1.50E+05	-2.05E+05	9.76E+05
58.59	-1.46E+06	1.51E+06	-9.24E+05	-1.30E+06	1.10E+06	2.22E+05	-2.45E+05	1.13E+06
68.36	-1.53E+06	1.39E+06	-8.19E+05	-1.39E+06	1.30E+06	3.34E+05	-3.58E+05	1.21E+06
78.13	-1.68E+06	1.31E+06	-8.09E+05	-1.40E+06	1.63E+06	4.52E+05	-2.70E+05	1.38E+06
87.89	-1.66E+06	1.29E+06	-1.04E+06	-1.55E+06	1.48E+06	5.41E+05	-4.87E+05	1.48E+06
97.66	-1.91E+06	1.50E+06	-9.20E+05	-1.77E+06	1.84E+06	6.99E+05	-5.45E+05	1.64E+06
107.42	-2.01E+06	1.56E+06	-9.01E+05	-1.89E+06	2.04E+06	8.18E+05	-4.24E+05	1.80E+06
117.19	-2.10E+06	1.66E+06	-7.11E+05	-1.95E+06	2.20E+06	8.01E+05	-6.86E+05	2.06E+06
126.95	-2.40E+06	1.80E+06	-7.45E+05	-2.17E+06	2.26E+06	8.52E+05	-8.52E+05	2.18E+06
136.72	-2.49E+06	2.01E+06	-7.19E+05	-2.40E+06	2.73E+06	8.45E+05	-9.55E+05	2.43E+06

Table A.16 Raw data for test seal at 5,000 rpm, 90% GVF and 0.5 PR (*High* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.14E+06	1.64E+06	-9.89E+05	-1.13E+06	1.89E+05	-5.35E+04	9.69E+04	1.91E+05
19.53	-1.11E+06	1.58E+06	-9.82E+05	-1.06E+06	3.74E+05	4.34E+04	2.31E+04	3.23E+05
29.3	-1.68E+06	2.00E+06	-4.15E+05	-1.41E+06	2.60E+06	-2.15E+06	-2.10E+06	2.92E+06
39.06	-1.28E+06	1.59E+06	-8.91E+05	-1.04E+06	7.32E+05	-4.41E+03	-3.17E+04	7.42E+05
48.83	-1.31E+06	1.54E+06	-8.89E+05	-1.30E+06	9.98E+05	-8.02E+03	-9.43E+04	9.38E+05
58.59	-1.32E+06	1.46E+06	-9.42E+05	-1.18E+06	1.14E+06	5.45E+04	-1.10E+05	1.11E+06
68.36	-1.45E+06	1.52E+06	-8.68E+05	-1.35E+06	1.29E+06	1.28E+05	-1.59E+05	1.23E+06
78.13	-1.55E+06	1.38E+06	-9.87E+05	-1.58E+06	1.42E+06	2.60E+04	-8.07E+04	1.52E+06
87.89	-1.60E+06	1.18E+06	-7.63E+05	-1.46E+06	1.76E+06	3.11E+05	-2.26E+05	1.64E+06
97.66	-1.81E+06	1.39E+06	-7.34E+05	-1.64E+06	2.06E+06	4.70E+05	-3.53E+05	1.85E+06
107.42	-1.75E+06	1.57E+06	-7.38E+05	-1.71E+06	2.18E+06	6.06E+05	-3.01E+05	1.91E+06
117.19	-1.92E+06	1.64E+06	-6.25E+05	-1.83E+06	2.30E+06	5.21E+05	-4.64E+05	2.19E+06
126.95	-2.14E+06	1.79E+06	-6.62E+05	-1.99E+06	2.45E+06	5.06E+05	-5.90E+05	2.29E+06
136.72	-2.32E+06	2.05E+06	-6.08E+05	-2.30E+06	2.92E+06	4.49E+05	-6.42E+05	2.58E+06

Table A.17 Raw data for test seal at 10,000 rpm, 90% GVF and 0.5 PR (*High* Preswirl)

Freq. (Hz)	$Re(H_{XX})$ (N/m)	$Re(H_{XY})$ (N/m)	$Re(H_{YX})$ (N/m)	$Re(H_{YY})$ (N/m)	$Im(H_{XX})$ (N/m)	$Im(H_{XY})$ (N/m)	$Im(H_{YX})$ (N/m)	$Im(H_{YY})$ (N/m)
9.77	-1.17E+06	1.66E+06	-1.20E+06	-1.23E+06	1.65E+04	-7.69E+04	1.03E+05	2.75E+05
19.53	-1.24E+06	1.72E+06	-9.67E+05	-1.22E+06	4.43E+05	-5.59E+04	1.00E+05	2.91E+05
29.3	-1.65E+06	1.94E+06	-4.49E+05	-1.42E+06	2.72E+06	-2.31E+06	-2.17E+06	3.10E+06
39.06	-1.22E+06	1.58E+06	-9.28E+05	-1.04E+06	7.45E+05	1.01E+05	-7.89E+04	8.10E+05
48.83	-1.29E+06	1.60E+06	-9.08E+05	-1.33E+06	9.99E+05	6.69E+04	-1.65E+05	9.91E+05
58.59	-1.41E+06	1.58E+06	-9.40E+05	-1.26E+06	1.14E+06	1.60E+05	-1.56E+05	1.12E+06
68.36	-1.41E+06	1.48E+06	-8.68E+05	-1.39E+06	1.31E+06	1.74E+05	-2.10E+05	1.33E+06
78.13	-1.66E+06	1.52E+06	-9.19E+05	-1.61E+06	1.43E+06	6.25E+04	-7.62E+04	1.44E+06
87.89	-1.63E+06	1.26E+06	-8.92E+05	-1.44E+06	1.71E+06	4.58E+05	-3.40E+05	1.69E+06
97.66	-1.80E+06	1.44E+06	-8.27E+05	-1.62E+06	2.08E+06	5.19E+05	-5.01E+05	1.89E+06
107.42	-1.79E+06	1.59E+06	-8.49E+05	-1.77E+06	2.19E+06	6.04E+05	-4.10E+05	1.98E+06
117.19	-1.96E+06	1.67E+06	-7.17E+05	-1.85E+06	2.30E+06	6.03E+05	-5.32E+05	2.20E+06
126.95	-2.26E+06	1.87E+06	-6.87E+05	-2.05E+06	2.50E+06	6.77E+05	-7.31E+05	2.31E+06
136.72	-2.41E+06	2.13E+06	-6.04E+05	-2.35E+06	3.04E+06	5.94E+05	-7.85E+05	2.66E+06

Table A.18 Raw data for test seal at 15,000 rpm, 90% GVF and 0.5 PR (*High* Preswirl)

Freq. (Hz)	$Re(H_{XX})$ (N/m)	$Re(H_{XY})$ (N/m)	$Re(H_{YX})$ (N/m)	$Re(H_{YY})$ (N/m)	$Im(H_{XX})$ (N/m)	$Im(H_{XY})$ (N/m)	$Im(H_{YX})$ (N/m)	$Im(H_{YY})$ (N/m)
9.77	-1.18E+06	1.76E+06	-1.20E+06	-1.17E+06	6.16E+01	9.98E+04	7.63E+04	1.10E+05
19.53	-1.22E+06	1.59E+06	-1.07E+06	-1.27E+06	3.81E+05	-9.56E+04	7.03E+03	3.55E+05
29.3	-1.74E+06	1.95E+06	-4.13E+05	-1.48E+06	2.91E+06	-2.44E+06	-2.31E+06	3.25E+06
39.06	-1.29E+06	1.59E+06	-9.25E+05	-1.13E+06	7.72E+05	1.33E+05	-9.53E+04	7.84E+05
48.83	-1.36E+06	1.63E+06	-1.04E+06	-1.37E+06	1.00E+06	1.27E+05	-2.12E+05	9.93E+05
58.59	-1.42E+06	1.54E+06	-9.36E+05	-1.26E+06	1.21E+06	2.08E+05	-1.96E+05	1.16E+06
68.36	-1.55E+06	1.53E+06	-8.68E+05	-1.42E+06	1.33E+06	2.51E+05	-1.92E+05	1.19E+06
78.13	-1.58E+06	1.48E+06	-1.04E+06	-1.57E+06	1.46E+06	2.28E+05	-2.06E+05	1.38E+06
87.89	-1.67E+06	1.35E+06	-9.39E+05	-1.45E+06	1.71E+06	5.56E+05	-4.13E+05	1.55E+06
97.66	-1.86E+06	1.49E+06	-8.30E+05	-1.67E+06	2.04E+06	6.43E+05	-5.22E+05	1.83E+06
107.42	-1.90E+06	1.59E+06	-7.65E+05	-1.81E+06	2.25E+06	8.39E+05	-4.86E+05	1.97E+06
117.19	-2.07E+06	1.73E+06	-7.20E+05	-1.92E+06	2.27E+06	8.21E+05	-6.50E+05	2.16E+06
126.95	-2.35E+06	1.84E+06	-6.74E+05	-2.11E+06	2.52E+06	8.20E+05	-8.45E+05	2.28E+06
136.72	-2.49E+06	2.12E+06	-6.38E+05	-2.43E+06	3.01E+06	7.96E+05	-9.66E+05	2.60E+06

Table A.19 Raw data for test seal at 5,000 rpm, 100% GVF and 0.4 PR (*High* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.33E+06	2.43E+06	-2.14E+06	-1.29E+06	1.07E+05	9.49E+04	-1.19E+05	1.16E+05
19.53	-1.26E+06	2.39E+06	-2.19E+06	-1.20E+06	1.68E+05	2.20E+05	-1.92E+05	1.18E+05
29.3	-1.67E+06	2.73E+06	-1.77E+06	-1.51E+06	6.48E+05	-7.00E+04	-6.55E+05	8.00E+05
39.06	-1.36E+06	2.40E+06	-2.11E+06	-1.16E+06	4.08E+05	4.22E+05	-3.58E+05	4.73E+05
48.83	-1.46E+06	2.43E+06	-2.09E+06	-1.44E+06	5.28E+05	4.75E+05	-5.07E+05	5.16E+05
58.59	-1.54E+06	2.25E+06	-2.04E+06	-1.37E+06	7.26E+05	5.63E+05	-5.79E+05	7.91E+05
68.36	-1.60E+06	2.38E+06	-2.24E+06	-1.39E+06	7.86E+05	8.16E+05	-6.87E+05	6.80E+05
78.13	-1.46E+06	2.29E+06	-2.32E+06	-1.53E+06	8.85E+05	8.89E+05	-8.11E+05	7.74E+05
87.89	-1.69E+06	2.25E+06	-2.32E+06	-1.54E+06	9.17E+05	1.00E+06	-9.22E+05	8.47E+05
97.66	-1.90E+06	2.35E+06	-2.28E+06	-1.73E+06	1.11E+06	1.22E+06	-1.06E+06	9.42E+05
107.42	-2.02E+06	2.38E+06	-2.33E+06	-1.88E+06	1.22E+06	1.37E+06	-1.02E+06	1.06E+06
117.19	-2.05E+06	2.44E+06	-2.30E+06	-1.98E+06	1.44E+06	1.52E+06	-1.17E+06	1.26E+06
126.95	-1.98E+06	2.58E+06	-2.42E+06	-2.02E+06	1.45E+06	1.65E+06	-1.32E+06	1.28E+06
136.72	-1.88E+06	2.52E+06	-2.57E+06	-2.03E+06	1.72E+06	1.66E+06	-1.43E+06	1.60E+06

Table A.20 Raw data for test seal at 10,000 rpm, 100% GVF and 0.4 PR (*High* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.28E+06	2.36E+06	-2.19E+06	-1.37E+06	9.60E+04	2.02E+05	-6.39E+04	1.32E+05
19.53	-1.29E+06	2.33E+06	-2.20E+06	-1.28E+06	1.86E+05	3.24E+05	-2.33E+05	8.98E+04
29.3	-1.49E+06	2.45E+06	-1.99E+06	-1.36E+06	4.98E+05	2.55E+05	-5.17E+05	4.51E+05
39.06	-1.44E+06	2.46E+06	-2.19E+06	-1.37E+06	3.76E+05	5.33E+05	-4.23E+05	4.06E+05
48.83	-1.49E+06	2.46E+06	-2.22E+06	-1.59E+06	5.72E+05	5.89E+05	-6.00E+05	5.15E+05
58.59	-1.63E+06	2.37E+06	-2.28E+06	-1.56E+06	6.59E+05	7.68E+05	-7.10E+05	6.44E+05
68.36	-1.82E+06	2.47E+06	-2.24E+06	-1.67E+06	7.32E+05	9.17E+05	-8.21E+05	7.84E+05
78.13	-1.80E+06	2.34E+06	-2.20E+06	-1.78E+06	1.02E+06	8.60E+05	-9.87E+05	1.12E+06
87.89	-1.84E+06	2.27E+06	-2.40E+06	-1.80E+06	1.06E+06	1.25E+06	-1.07E+06	9.96E+05
97.66	-2.03E+06	2.39E+06	-2.40E+06	-1.94E+06	1.23E+06	1.39E+06	-1.20E+06	1.10E+06
107.42	-2.11E+06	2.37E+06	-2.48E+06	-2.00E+06	1.35E+06	1.62E+06	-1.19E+06	1.21E+06
117.19	-2.23E+06	2.40E+06	-2.39E+06	-2.17E+06	1.61E+06	1.75E+06	-1.31E+06	1.39E+06
126.95	-2.10E+06	2.54E+06	-2.56E+06	-2.15E+06	1.74E+06	2.01E+06	-1.50E+06	1.55E+06
136.72	-1.82E+06	2.53E+06	-2.68E+06	-2.12E+06	2.00E+06	2.04E+06	-1.60E+06	1.79E+06

Table A.21 Raw data for test seal at 15,000 rpm, 100% GVF and 0.4 PR (*High* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.49E+06	2.47E+06	-2.23E+06	-1.46E+06	1.25E+05	2.61E+05	-1.24E+05	7.69E+04
19.53	-1.45E+06	2.41E+06	-2.21E+06	-1.40E+06	2.07E+05	2.94E+05	-2.55E+05	1.70E+05
29.3	-1.79E+06	2.56E+06	-1.95E+06	-1.56E+06	5.57E+05	2.03E+05	-6.93E+05	6.14E+05
39.06	-1.57E+06	2.40E+06	-2.24E+06	-1.35E+06	3.55E+05	5.73E+05	-5.05E+05	3.70E+05
48.83	-1.66E+06	2.50E+06	-2.30E+06	-1.70E+06	5.75E+05	6.76E+05	-7.25E+05	4.52E+05
58.59	-1.76E+06	2.43E+06	-2.33E+06	-1.74E+06	6.88E+05	8.28E+05	-7.43E+05	5.92E+05
68.36	-1.91E+06	2.54E+06	-2.35E+06	-1.82E+06	7.94E+05	9.82E+05	-9.07E+05	6.69E+05
78.13	-1.77E+06	2.39E+06	-2.35E+06	-1.93E+06	1.02E+06	1.05E+06	-1.00E+06	9.16E+05
87.89	-1.95E+06	2.26E+06	-2.44E+06	-1.94E+06	1.05E+06	1.24E+06	-1.14E+06	1.15E+06
97.66	-2.15E+06	2.34E+06	-2.45E+06	-2.01E+06	1.31E+06	1.45E+06	-1.28E+06	1.26E+06
107.42	-2.19E+06	2.33E+06	-2.54E+06	-2.05E+06	1.31E+06	1.70E+06	-1.29E+06	1.32E+06
117.19	-2.40E+06	2.36E+06	-2.45E+06	-2.17E+06	1.66E+06	1.87E+06	-1.43E+06	1.47E+06
126.95	-2.22E+06	2.43E+06	-2.57E+06	-2.19E+06	1.79E+06	2.09E+06	-1.57E+06	1.61E+06
136.72	-1.96E+06	2.45E+06	-2.74E+06	-2.17E+06	2.00E+06	2.21E+06	-1.71E+06	1.79E+06

Table A.22 Raw data for test seal at 5,000 rpm, 98% GVF and 0.4 PR (*High* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.13E+06	1.96E+06	-1.78E+06	-1.25E+06	9.59E+04	4.86E+04	-3.51E+04	1.38E+05
19.53	-1.13E+06	1.96E+06	-1.79E+06	-1.19E+06	1.85E+05	8.66E+04	4.12E+03	1.58E+05
29.3	-1.65E+06	2.36E+06	-1.33E+06	-1.66E+06	8.98E+05	-5.71E+05	-6.73E+05	1.16E+06
39.06	-1.30E+06	1.88E+06	-1.64E+06	-1.22E+06	4.82E+05	1.60E+05	-1.22E+05	5.06E+05
48.83	-1.29E+06	1.91E+06	-1.65E+06	-1.39E+06	6.95E+05	1.93E+05	-2.71E+05	6.36E+05
58.59	-1.30E+06	1.74E+06	-1.67E+06	-1.25E+06	8.87E+05	3.86E+05	-3.52E+05	8.40E+05
68.36	-1.49E+06	1.81E+06	-1.76E+06	-1.33E+06	1.02E+06	3.77E+05	-3.69E+05	9.25E+05
78.13	-1.43E+06	1.77E+06	-1.72E+06	-1.49E+06	1.10E+06	4.54E+05	-3.76E+05	1.06E+06
87.89	-1.55E+06	1.68E+06	-1.84E+06	-1.48E+06	1.21E+06	5.94E+05	-4.77E+05	1.12E+06
97.66	-1.69E+06	1.78E+06	-1.77E+06	-1.66E+06	1.44E+06	7.10E+05	-5.88E+05	1.27E+06
107.42	-1.80E+06	1.78E+06	-1.82E+06	-1.76E+06	1.67E+06	8.71E+05	-5.41E+05	1.42E+06
117.19	-1.73E+06	1.86E+06	-1.72E+06	-1.86E+06	1.89E+06	9.50E+05	-5.86E+05	1.60E+06
126.95	-1.70E+06	1.98E+06	-1.83E+06	-1.89E+06	1.87E+06	9.85E+05	-7.93E+05	1.79E+06
136.72	-1.59E+06	1.94E+06	-1.96E+06	-1.84E+06	2.19E+06	9.69E+05	-8.16E+05	2.03E+06

Table A.23 Raw data for test seal at 10,000 rpm, 98% GVF and 0.4 PR (*High* Preswirl)

Freq. (Hz)	$Re(H_{XX})$ (N/m)	$Re(H_{XY})$ (N/m)	$Re(H_{YX})$ (N/m)	$Re(H_{YY})$ (N/m)	$Im(H_{XX})$ (N/m)	$Im(H_{XY})$ (N/m)	$Im(H_{YX})$ (N/m)	$Im(H_{YY})$ (N/m)
9.77	-1.41E+06	2.14E+06	-1.80E+06	-1.42E+06	8.71E+04	-8.70E+04	6.88E+03	8.55E+04
19.53	-1.43E+06	2.03E+06	-1.89E+06	-1.24E+06	1.26E+05	8.77E+04	3.26E+04	9.77E+04
29.3	-2.13E+06	2.57E+06	-1.17E+06	-1.82E+06	1.17E+06	-7.95E+05	-9.05E+05	1.34E+06
39.06	-1.62E+06	1.96E+06	-1.72E+06	-1.40E+06	5.03E+05	2.07E+05	-7.46E+04	3.91E+05
48.83	-1.69E+06	1.91E+06	-1.70E+06	-1.61E+06	6.81E+05	2.50E+05	-2.49E+05	5.69E+05
58.59	-1.69E+06	1.94E+06	-1.66E+06	-1.59E+06	8.02E+05	4.63E+05	-3.42E+05	6.90E+05
68.36	-1.71E+06	1.92E+06	-1.74E+06	-1.74E+06	1.06E+06	3.87E+05	-4.44E+05	8.83E+05
78.13	-1.74E+06	1.83E+06	-1.76E+06	-1.76E+06	1.18E+06	5.73E+05	-4.71E+05	1.05E+06
87.89	-1.88E+06	1.75E+06	-1.85E+06	-1.80E+06	1.33E+06	6.66E+05	-5.92E+05	1.19E+06
97.66	-2.05E+06	1.85E+06	-1.80E+06	-1.97E+06	1.60E+06	8.07E+05	-6.89E+05	1.35E+06
107.42	-2.05E+06	1.89E+06	-1.84E+06	-2.01E+06	1.81E+06	1.01E+06	-6.31E+05	1.50E+06
117.19	-1.98E+06	1.98E+06	-1.74E+06	-2.09E+06	1.93E+06	1.09E+06	-7.04E+05	1.70E+06
126.95	-2.02E+06	2.08E+06	-1.83E+06	-2.10E+06	2.00E+06	1.12E+06	-8.91E+05	1.87E+06
136.72	-1.93E+06	2.09E+06	-1.91E+06	-2.05E+06	2.31E+06	1.12E+06	-9.99E+05	2.06E+06

Table A.24 Raw data for test seal at 15,000 rpm, 98% GVF and 0.4 PR (*High* Preswirl)

Freq. (Hz)	$Re(H_{XX})$ (N/m)	$Re(H_{XY})$ (N/m)	$Re(H_{YX})$ (N/m)	$Re(H_{YY})$ (N/m)	$Im(H_{XX})$ (N/m)	$Im(H_{XY})$ (N/m)	$Im(H_{YX})$ (N/m)	$Im(H_{YY})$ (N/m)
9.77	-1.58E+06	2.36E+06	-1.79E+06	-1.55E+06	4.22E+03	4.71E+04	-9.47E+04	3.48E+04
19.53	-1.65E+06	2.28E+06	-1.92E+06	-1.60E+06	1.17E+05	6.19E+04	-1.55E+05	9.23E+04
29.3	-2.52E+06	3.01E+06	-1.05E+06	-2.53E+06	1.33E+06	-1.07E+06	-1.08E+06	1.51E+06
39.06	-1.82E+06	2.18E+06	-1.58E+06	-1.75E+06	5.82E+05	2.25E+05	-1.51E+05	4.89E+05
48.83	-1.91E+06	2.16E+06	-1.62E+06	-1.91E+06	7.85E+05	2.87E+05	-3.50E+05	7.26E+05
58.59	-1.84E+06	2.17E+06	-1.64E+06	-1.85E+06	9.06E+05	4.89E+05	-4.38E+05	8.65E+05
68.36	-1.94E+06	2.16E+06	-1.74E+06	-1.85E+06	9.35E+05	5.86E+05	-5.61E+05	9.18E+05
78.13	-2.02E+06	2.06E+06	-1.75E+06	-1.96E+06	1.14E+06	5.97E+05	-5.94E+05	1.11E+06
87.89	-2.14E+06	1.98E+06	-1.82E+06	-2.05E+06	1.29E+06	7.40E+05	-6.52E+05	1.25E+06
97.66	-2.34E+06	2.09E+06	-1.68E+06	-2.23E+06	1.59E+06	9.36E+05	-7.57E+05	1.39E+06
107.42	-2.26E+06	2.17E+06	-1.74E+06	-2.24E+06	1.82E+06	1.14E+06	-8.11E+05	1.60E+06
117.19	-2.28E+06	2.26E+06	-1.61E+06	-2.30E+06	1.89E+06	1.20E+06	-9.21E+05	1.82E+06
126.95	-2.42E+06	2.46E+06	-1.66E+06	-2.33E+06	2.03E+06	1.17E+06	-1.11E+06	2.00E+06
136.72	-2.44E+06	2.52E+06	-1.71E+06	-2.39E+06	2.34E+06	1.23E+06	-1.20E+06	2.12E+06

Table A.25 Raw data for test seal at 5,000 rpm, 96% GVF and 0.4 PR (*High* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.29E+06	1.88E+06	-1.30E+06	-1.39E+06	6.17E+04	5.47E+03	-5.60E+03	7.72E+04
19.53	-1.40E+06	1.75E+06	-1.36E+06	-1.42E+06	1.69E+05	-4.04E+03	-1.64E+04	2.04E+05
29.3	-2.34E+06	2.55E+06	-4.36E+05	-2.30E+06	1.81E+06	-1.56E+06	-1.44E+06	2.05E+06
39.06	-1.60E+06	1.70E+06	-1.19E+06	-1.43E+06	5.00E+05	1.01E+05	-7.78E+04	5.37E+05
48.83	-1.60E+06	1.65E+06	-1.19E+06	-1.59E+06	7.50E+05	9.71E+04	-1.71E+05	7.09E+05
58.59	-1.58E+06	1.66E+06	-1.13E+06	-1.64E+06	9.27E+05	1.43E+05	-2.93E+05	9.41E+05
68.36	-1.67E+06	1.53E+06	-1.21E+06	-1.54E+06	1.07E+06	3.28E+05	-3.70E+05	9.68E+05
78.13	-1.64E+06	1.59E+06	-1.25E+06	-1.71E+06	1.21E+06	3.20E+05	-4.46E+05	1.06E+06
87.89	-1.82E+06	1.52E+06	-1.39E+06	-1.72E+06	1.25E+06	4.54E+05	-3.96E+05	1.16E+06
97.66	-2.03E+06	1.63E+06	-1.28E+06	-1.96E+06	1.50E+06	5.74E+05	-4.65E+05	1.32E+06
107.42	-1.99E+06	1.75E+06	-1.28E+06	-2.00E+06	1.72E+06	7.27E+05	-3.59E+05	1.45E+06
117.19	-2.04E+06	1.86E+06	-1.15E+06	-2.08E+06	1.78E+06	7.17E+05	-5.18E+05	1.67E+06
126.95	-2.28E+06	2.00E+06	-1.16E+06	-2.18E+06	1.90E+06	6.45E+05	-6.30E+05	1.83E+06
136.72	-2.29E+06	2.07E+06	-1.19E+06	-2.24E+06	2.25E+06	6.34E+05	-7.14E+05	1.98E+06

Table A.26 Raw data for test seal at 10,000 rpm, 96% GVF and 0.4 PR (*High* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.38E+06	2.03E+06	-1.46E+06	-1.57E+06	3.97E+04	1.60E+04	-4.99E+04	-4.34E+04
19.53	-1.56E+06	1.82E+06	-1.32E+06	-1.53E+06	2.30E+05	-2.92E+04	6.56E+04	1.80E+05
29.3	-2.46E+06	2.64E+06	-3.95E+05	-2.43E+06	1.65E+06	-1.34E+06	-1.30E+06	1.95E+06
39.06	-1.71E+06	1.75E+06	-1.21E+06	-1.53E+06	5.37E+05	1.31E+05	-5.91E+04	6.00E+05
48.83	-1.72E+06	1.71E+06	-1.22E+06	-1.76E+06	6.90E+05	1.86E+05	-2.20E+05	7.20E+05
58.59	-1.76E+06	1.69E+06	-1.17E+06	-1.65E+06	1.00E+06	3.04E+05	-2.32E+05	8.78E+05
68.36	-1.75E+06	1.67E+06	-1.13E+06	-1.76E+06	1.12E+06	3.94E+05	-3.84E+05	9.20E+05
78.13	-1.91E+06	1.66E+06	-1.25E+06	-1.82E+06	1.15E+06	4.73E+05	-3.92E+05	1.07E+06
87.89	-2.05E+06	1.59E+06	-1.31E+06	-1.92E+06	1.30E+06	5.63E+05	-4.79E+05	1.19E+06
97.66	-2.25E+06	1.68E+06	-1.24E+06	-2.11E+06	1.60E+06	6.95E+05	-5.51E+05	1.37E+06
107.42	-2.12E+06	1.77E+06	-1.27E+06	-2.15E+06	1.78E+06	9.17E+05	-5.12E+05	1.51E+06
117.19	-2.21E+06	1.87E+06	-1.13E+06	-2.22E+06	1.81E+06	9.24E+05	-6.23E+05	1.74E+06
126.95	-2.41E+06	2.03E+06	-1.15E+06	-2.32E+06	1.96E+06	9.17E+05	-7.73E+05	1.83E+06
136.72	-2.47E+06	2.16E+06	-1.20E+06	-2.42E+06	2.33E+06	8.74E+05	-8.80E+05	2.07E+06

Table A.27 Raw data for test seal at 15,000 rpm, 96% GVF and 0.4 PR (*High* Preswirl)

Freq. (Hz)	*Re*(H_{XX}) (N/m)	*Re*(H_{XY}) (N/m)	*Re*(H_{YX}) (N/m)	*Re*(H_{YY}) (N/m)	*Im*(H_{XX}) (N/m)	*Im*(H_{XY}) (N/m)	*Im*(H_{YX}) (N/m)	*Im*(H_{YY}) (N/m)
9.77	-1.48E+06	2.17E+06	-1.52E+06	-1.52E+06	9.72E+04	8.45E+04	-1.71E+04	-7.58E+04
19.53	-1.74E+06	2.05E+06	-1.58E+06	-1.68E+06	1.34E+05	-5.75E+04	5.04E+04	1.65E+04
29.3	-2.72E+06	2.83E+06	-5.91E+05	-2.72E+06	1.59E+06	-1.60E+06	-1.32E+06	1.89E+06
39.06	-1.91E+06	1.78E+06	-1.27E+06	-1.77E+06	5.45E+05	1.11E+05	-4.06E+04	6.30E+05
48.83	-1.86E+06	1.78E+06	-1.30E+06	-1.92E+06	7.56E+05	2.25E+05	-2.15E+05	7.80E+05
58.59	-2.00E+06	1.82E+06	-1.22E+06	-1.88E+06	1.08E+06	2.94E+05	-1.95E+05	8.56E+05
68.36	-1.87E+06	1.65E+06	-1.23E+06	-1.89E+06	1.15E+06	4.05E+05	-4.30E+05	1.01E+06
78.13	-1.96E+06	1.71E+06	-1.36E+06	-1.95E+06	1.23E+06	5.16E+05	-5.38E+05	1.15E+06
87.89	-2.10E+06	1.56E+06	-1.43E+06	-2.00E+06	1.31E+06	6.24E+05	-5.73E+05	1.31E+06
97.66	-2.31E+06	1.73E+06	-1.32E+06	-2.18E+06	1.61E+06	8.23E+05	-6.06E+05	1.43E+06
107.42	-2.26E+06	1.81E+06	-1.35E+06	-2.24E+06	1.76E+06	1.02E+06	-5.97E+05	1.61E+06
117.19	-2.36E+06	1.94E+06	-1.20E+06	-2.24E+06	1.85E+06	1.01E+06	-7.12E+05	1.81E+06
126.95	-2.55E+06	2.12E+06	-1.21E+06	-2.41E+06	1.96E+06	9.92E+05	-8.99E+05	1.83E+06
136.72	-2.56E+06	2.22E+06	-1.26E+06	-2.55E+06	2.38E+06	9.99E+05	-9.99E+05	2.09E+06

Table A.28 Raw data for test seal at 5,000 rpm, 94% GVF and 0.4 PR (*High* Preswirl)

Freq. (Hz)	*Re*(H_{XX}) (N/m)	*Re*(H_{XY}) (N/m)	*Re*(H_{YX}) (N/m)	*Re*(H_{YY}) (N/m)	*Im*(H_{XX}) (N/m)	*Im*(H_{XY}) (N/m)	*Im*(H_{YX}) (N/m)	*Im*(H_{YY}) (N/m)
9.77	-1.24E+06	1.70E+06	-1.22E+06	-1.40E+06	5.86E+04	-9.20E+03	-8.49E+02	3.00E+04
19.53	-1.38E+06	1.62E+06	-1.12E+06	-1.40E+06	2.58E+05	-5.77E+04	6.05E+04	1.86E+05
29.3	-2.25E+06	2.32E+06	-2.67E+05	-2.15E+06	1.74E+06	-1.65E+06	-1.38E+06	2.16E+06
39.06	-1.57E+06	1.55E+06	-1.06E+06	-1.40E+06	5.72E+05	2.81E+04	-3.08E+04	5.69E+05
48.83	-1.61E+06	1.55E+06	-9.81E+05	-1.58E+06	7.02E+05	4.73E+04	-1.47E+05	7.21E+05
58.59	-1.70E+06	1.50E+06	-9.61E+05	-1.55E+06	9.92E+05	1.02E+05	-1.80E+05	9.95E+05
68.36	-1.63E+06	1.38E+06	-1.02E+06	-1.50E+06	1.16E+06	2.05E+05	-2.94E+05	1.01E+06
78.13	-1.75E+06	1.46E+06	-1.13E+06	-1.53E+06	1.17E+06	4.24E+05	-2.66E+05	1.06E+06
87.89	-1.95E+06	1.42E+06	-8.52E+05	-1.77E+06	1.66E+06	3.55E+05	-2.48E+05	1.17E+06
97.66	-2.08E+06	1.46E+06	-9.85E+05	-1.90E+06	1.66E+06	5.37E+05	-3.33E+05	1.41E+06
107.42	-1.89E+06	1.57E+06	-1.01E+06	-1.96E+06	1.80E+06	6.69E+05	-3.98E+05	1.56E+06
117.19	-2.02E+06	1.66E+06	-9.02E+05	-2.07E+06	1.86E+06	6.07E+05	-4.91E+05	1.77E+06
126.95	-2.31E+06	1.83E+06	-8.33E+05	-2.21E+06	2.06E+06	5.47E+05	-6.32E+05	1.98E+06
136.72	-2.40E+06	2.00E+06	-8.73E+05	-2.35E+06	2.46E+06	4.75E+05	-6.88E+05	2.14E+06

Table A.29 Raw data for test seal at 10,000 rpm, 94% GVF and 0.4 PR (*High* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.39E+06	1.95E+06	-1.38E+06	-1.58E+06	1.10E+05	-5.06E+04	6.95E+04	1.91E+04
19.53	-1.56E+06	1.65E+06	-1.33E+06	-1.64E+06	2.06E+05	-1.44E+05	1.76E+05	1.55E+05
29.3	-2.33E+06	2.25E+06	-4.02E+05	-2.23E+06	1.80E+06	-1.52E+06	-1.39E+06	2.15E+06
39.06	-1.71E+06	1.47E+06	-1.05E+06	-1.53E+06	5.93E+05	8.65E+04	3.90E+04	6.94E+05
48.83	-1.69E+06	1.51E+06	-1.03E+06	-1.67E+06	8.22E+05	1.36E+05	-1.56E+05	8.28E+05
58.59	-1.72E+06	1.44E+06	-1.00E+06	-1.59E+06	1.04E+06	2.67E+05	-1.88E+05	9.73E+05
68.36	-1.76E+06	1.48E+06	-9.67E+05	-1.65E+06	1.18E+06	3.76E+05	-3.46E+05	1.02E+06
78.13	-1.69E+06	1.56E+06	-1.05E+06	-1.71E+06	1.31E+06	4.80E+05	-4.46E+05	1.17E+06
87.89	-1.98E+06	1.41E+06	-1.15E+06	-1.76E+06	1.33E+06	5.38E+05	-4.02E+05	1.22E+06
97.66	-2.12E+06	1.45E+06	-1.07E+06	-1.96E+06	1.67E+06	7.07E+05	-5.17E+05	1.37E+06
107.42	-2.06E+06	1.58E+06	-1.13E+06	-2.08E+06	1.73E+06	8.27E+05	-4.81E+05	1.58E+06
117.19	-2.18E+06	1.68E+06	-9.79E+05	-2.17E+06	1.86E+06	8.50E+05	-5.79E+05	1.77E+06
126.95	-2.44E+06	1.84E+06	-9.80E+05	-2.28E+06	1.98E+06	7.90E+05	-7.30E+05	1.91E+06
136.72	-2.44E+06	1.94E+06	-9.88E+05	-2.43E+06	2.46E+06	7.47E+05	-7.96E+05	2.13E+06

Table A.30 Raw data for test seal at 15,000 rpm, 94% GVF and 0.4 PR (*High* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.41E+06	2.03E+06	-1.44E+06	-1.53E+06	-1.89E+03	7.48E+02	4.57E+04	-8.47E+04
19.53	-1.75E+06	1.94E+06	-1.44E+06	-1.70E+06	4.90E+04	-2.49E+05	1.86E+05	-3.61E+03
29.3	-2.62E+06	2.22E+06	-3.00E+05	-2.49E+06	1.90E+06	-1.60E+06	-1.19E+06	2.13E+06
39.06	-1.71E+06	1.43E+06	-9.84E+05	-1.67E+06	7.11E+05	-7.52E+03	-7.11E+04	7.87E+05
48.83	-1.78E+06	1.52E+06	-9.92E+05	-1.80E+06	8.79E+05	2.02E+05	-1.56E+05	8.58E+05
58.59	-1.79E+06	1.46E+06	-9.65E+05	-1.80E+06	9.78E+05	1.83E+05	-2.22E+05	1.04E+06
68.36	-1.93E+06	1.42E+06	-9.44E+05	-1.70E+06	1.24E+06	4.94E+05	-3.38E+05	1.03E+06
78.13	-1.82E+06	1.32E+06	-1.15E+06	-1.72E+06	1.12E+06	6.13E+05	-4.29E+05	1.29E+06
87.89	-1.94E+06	1.36E+06	-1.15E+06	-1.90E+06	1.39E+06	5.86E+05	-5.09E+05	1.34E+06
97.66	-2.18E+06	1.43E+06	-1.15E+06	-2.02E+06	1.62E+06	7.99E+05	-5.78E+05	1.57E+06
107.42	-2.18E+06	1.61E+06	-1.11E+06	-2.14E+06	1.81E+06	9.45E+05	-5.07E+05	1.62E+06
117.19	-2.27E+06	1.69E+06	-9.71E+05	-2.17E+06	1.86E+06	9.79E+05	-6.39E+05	1.85E+06
126.95	-2.42E+06	1.79E+06	-9.91E+05	-2.31E+06	2.02E+06	9.31E+05	-8.49E+05	1.88E+06
136.72	-2.48E+06	1.90E+06	-1.08E+06	-2.50E+06	2.41E+06	8.95E+05	-9.40E+05	2.15E+06

Table A.31 Raw data for test seal at 5,000 rpm, 92% GVF and 0.4 PR (*High* Preswirl)

Freq. (Hz)	$Re(H_{XX})$ (N/m)	$Re(H_{XY})$ (N/m)	$Re(H_{YX})$ (N/m)	$Re(H_{YY})$ (N/m)	$Im(H_{XX})$ (N/m)	$Im(H_{XY})$ (N/m)	$Im(H_{YX})$ (N/m)	$Im(H_{YY})$ (N/m)
9.77	-1.37E+06	1.63E+06	-1.21E+06	-1.26E+06	1.30E+05	-4.22E+04	1.45E+05	1.07E+05
19.53	-1.35E+06	1.67E+06	-1.16E+06	-1.35E+06	3.03E+05	-1.99E+04	5.52E+04	1.49E+05
29.3	-2.18E+06	2.35E+06	-2.80E+05	-2.06E+06	1.89E+06	-1.65E+06	-1.42E+06	2.25E+06
39.06	-1.49E+06	1.59E+06	-1.04E+06	-1.30E+06	6.47E+05	8.64E+04	-2.22E+04	6.33E+05
48.83	-1.53E+06	1.56E+06	-9.90E+05	-1.59E+06	7.53E+05	1.65E+04	-8.78E+04	7.65E+05
58.59	-1.66E+06	1.48E+06	-9.72E+05	-1.41E+06	1.04E+06	8.49E+04	-7.15E+04	9.96E+05
68.36	-1.62E+06	1.47E+06	-9.77E+05	-1.52E+06	1.20E+06	2.02E+05	-2.37E+05	1.00E+06
78.13	-1.76E+06	1.36E+06	-1.12E+06	-1.58E+06	1.25E+06	2.68E+05	-1.45E+05	1.26E+06
87.89	-1.91E+06	1.16E+06	-1.01E+06	-1.63E+06	1.52E+06	4.19E+05	-2.18E+05	1.55E+06
97.66	-1.98E+06	1.43E+06	-9.36E+05	-1.86E+06	1.84E+06	5.07E+05	-3.94E+05	1.55E+06
107.42	-1.96E+06	1.56E+06	-1.01E+06	-1.95E+06	1.90E+06	6.52E+05	-2.57E+05	1.64E+06
117.19	-2.02E+06	1.66E+06	-8.75E+05	-1.98E+06	1.91E+06	5.90E+05	-4.67E+05	1.89E+06
126.95	-2.27E+06	1.76E+06	-8.77E+05	-2.17E+06	2.10E+06	6.13E+05	-5.19E+05	1.93E+06
136.72	-2.31E+06	1.89E+06	-9.80E+05	-2.30E+06	2.52E+06	4.96E+05	-5.80E+05	2.22E+06

Table A.32 Raw data for test seal at 10,000 rpm, 92% GVF and 0.4 PR (*High* Preswirl)

Freq. (Hz)	$Re(H_{XX})$ (N/m)	$Re(H_{XY})$ (N/m)	$Re(H_{YX})$ (N/m)	$Re(H_{YY})$ (N/m)	$Im(H_{XX})$ (N/m)	$Im(H_{XY})$ (N/m)	$Im(H_{YX})$ (N/m)	$Im(H_{YY})$ (N/m)
9.77	-1.35E+06	1.64E+06	-1.20E+06	-1.44E+06	9.14E+04	-2.78E+04	5.90E+04	2.02E+05
19.53	-1.49E+06	1.57E+06	-1.14E+06	-1.52E+06	2.82E+05	-9.11E+04	1.96E+05	3.14E+05
29.3	-2.28E+06	2.29E+06	-2.46E+05	-2.11E+06	2.13E+06	-1.93E+06	-1.63E+06	2.65E+06
39.06	-1.56E+06	1.53E+06	-9.76E+05	-1.45E+06	5.98E+05	5.17E+04	-4.57E+04	6.98E+05
48.83	-1.54E+06	1.51E+06	-9.25E+05	-1.59E+06	8.35E+05	1.41E+05	-1.73E+05	8.38E+05
58.59	-1.61E+06	1.41E+06	-9.91E+05	-1.48E+06	1.07E+06	2.10E+05	-2.33E+05	9.84E+05
68.36	-1.76E+06	1.57E+06	-9.57E+05	-1.59E+06	1.08E+06	3.11E+05	-2.03E+05	9.72E+05
78.13	-1.81E+06	1.42E+06	-1.05E+06	-1.70E+06	1.20E+06	2.88E+05	-2.70E+05	1.23E+06
87.89	-2.13E+06	1.20E+06	-9.80E+05	-1.66E+06	1.50E+06	5.02E+05	-1.69E+05	1.47E+06
97.66	-2.00E+06	1.35E+06	-9.33E+05	-1.89E+06	1.84E+06	6.52E+05	-5.26E+05	1.56E+06
107.42	-1.92E+06	1.52E+06	-9.69E+05	-2.06E+06	1.90E+06	7.45E+05	-5.23E+05	1.74E+06
117.19	-2.13E+06	1.64E+06	-8.74E+05	-2.10E+06	1.91E+06	7.27E+05	-5.94E+05	1.89E+06
126.95	-2.39E+06	1.80E+06	-8.40E+05	-2.29E+06	2.11E+06	7.28E+05	-7.41E+05	1.93E+06
136.72	-2.46E+06	2.00E+06	-9.11E+05	-2.48E+06	2.53E+06	6.96E+05	-8.27E+05	2.25E+06

Table A.33 Raw data for test seal at 15,000 rpm, 92% GVF and 0.4 PR (*High* Preswirl)

Freq.	*Re*(H_{XX})	*Re*(H_{XY})	*Re*(H_{YX})	*Re*(H_{YY})	*Im*(H_{XX})	*Im*(H_{XY})	*Im*(H_{YX})	*Im*(H_{YY})
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.53E+06	1.95E+06	-1.23E+06	-1.41E+06	1.10E+04	3.31E+04	1.10E+05	4.95E+04
19.53	-1.47E+06	1.82E+06	-1.29E+06	-1.55E+06	9.57E+04	-1.08E+05	-1.84E+04	1.52E+05
29.3	-2.19E+06	1.96E+06	-3.77E+05	-2.00E+06	3.04E+06	-2.81E+06	-2.39E+06	3.39E+06
39.06	-1.76E+06	1.51E+06	-8.90E+05	-1.56E+06	6.27E+05	2.41E+04	6.59E+02	7.04E+05
48.83	-1.76E+06	1.57E+06	-8.46E+05	-1.70E+06	9.57E+05	1.06E+05	-1.28E+05	8.42E+05
58.59	-1.73E+06	1.53E+06	-8.45E+05	-1.59E+06	1.15E+06	2.91E+05	-2.47E+05	1.00E+06
68.36	-1.90E+06	1.48E+06	-8.54E+05	-1.66E+06	1.14E+06	2.79E+05	-3.28E+05	1.03E+06
78.13	-1.98E+06	1.34E+06	-7.52E+05	-1.74E+06	1.50E+06	4.31E+05	-3.61E+05	1.28E+06
87.89	-2.07E+06	1.55E+06	-7.19E+05	-1.73E+06	1.67E+06	6.81E+05	-3.12E+05	1.14E+06
97.66	-2.15E+06	1.53E+06	-9.04E+05	-2.01E+06	1.75E+06	7.27E+05	-5.82E+05	1.55E+06
107.42	-2.15E+06	1.71E+06	-8.68E+05	-2.10E+06	1.79E+06	8.85E+05	-5.34E+05	1.63E+06
117.19	-2.35E+06	1.78E+06	-7.46E+05	-2.13E+06	1.83E+06	8.03E+05	-6.72E+05	1.81E+06
126.95	-2.66E+06	1.95E+06	-6.77E+05	-2.45E+06	2.16E+06	7.36E+05	-9.04E+05	1.95E+06
136.72	-2.80E+06	2.25E+06	-6.55E+05	-2.73E+06	2.60E+06	7.16E+05	-1.03E+06	2.23E+06

Table A.34 Raw data for test seal at 5,000 rpm, 90% GVF and 0.4 PR (*High* Preswirl)

Freq.	*Re*(H_{XX})	*Re*(H_{XY})	*Re*(H_{YX})	*Re*(H_{YY})	*Im*(H_{XX})	*Im*(H_{XY})	*Im*(H_{YX})	*Im*(H_{YY})
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.35E+06	1.78E+06	-1.16E+06	-1.42E+06	1.40E+05	-1.88E+04	6.19E+04	2.15E+05
19.53	-1.43E+06	1.74E+06	-1.12E+06	-1.31E+06	3.28E+05	-1.21E+04	1.53E+05	2.80E+05
29.3	-1.94E+06	2.09E+06	-5.12E+05	-1.66E+06	2.76E+06	-2.54E+06	-2.34E+06	3.19E+06
39.06	-1.58E+06	1.65E+06	-9.79E+05	-1.36E+06	6.79E+05	1.07E+04	6.50E+04	6.69E+05
48.83	-1.61E+06	1.65E+06	-9.93E+05	-1.56E+06	9.43E+05	-6.06E+03	-3.30E+04	8.82E+05
58.59	-1.64E+06	1.64E+06	-9.47E+05	-1.43E+06	1.12E+06	1.03E+05	-1.34E+05	9.40E+05
68.36	-1.71E+06	1.61E+06	-9.68E+05	-1.59E+06	1.15E+06	1.25E+05	-1.62E+05	1.07E+06
78.13	-1.78E+06	1.66E+06	-9.42E+05	-1.73E+06	1.40E+06	1.59E+05	-1.31E+05	1.25E+06
87.89	-2.15E+06	1.28E+06	-7.69E+05	-1.78E+06	1.79E+06	1.63E+05	-4.77E+04	1.63E+06
97.66	-2.08E+06	1.51E+06	-8.12E+05	-1.88E+06	2.00E+06	4.43E+05	-3.66E+05	1.74E+06
107.42	-1.95E+06	1.67E+06	-8.16E+05	-1.92E+06	2.09E+06	6.26E+05	-3.82E+05	1.90E+06
117.19	-2.16E+06	1.77E+06	-6.99E+05	-1.96E+06	2.17E+06	5.37E+05	-4.24E+05	2.03E+06
126.95	-2.43E+06	1.98E+06	-7.05E+05	-2.21E+06	2.38E+06	4.66E+05	-6.19E+05	2.18E+06
136.72	-2.61E+06	2.32E+06	-6.51E+05	-2.58E+06	2.89E+06	3.27E+05	-7.15E+05	2.47E+06

Table A.35 Raw data for test seal at 10,000 rpm, 90% GVF and 0.4 PR (*High* Preswirl)

Freq. (Hz)	$Re(H_{XX})$ (N/m)	$Re(H_{XY})$ (N/m)	$Re(H_{YX})$ (N/m)	$Re(H_{YY})$ (N/m)	$Im(H_{XX})$ (N/m)	$Im(H_{XY})$ (N/m)	$Im(H_{YX})$ (N/m)	$Im(H_{YY})$ (N/m)
9.77	-1.42E+06	1.78E+06	-1.19E+06	-1.49E+06	1.04E+05	-1.23E+05	8.48E+04	1.49E+05
19.53	-1.48E+06	1.71E+06	-1.07E+06	-1.49E+06	3.51E+05	-1.09E+05	1.23E+05	3.28E+05
29.3	-2.00E+06	2.01E+06	-5.64E+05	-1.73E+06	2.93E+06	-2.65E+06	-2.43E+06	3.28E+06
39.06	-1.54E+06	1.58E+06	-9.98E+05	-1.35E+06	6.67E+05	8.72E+04	-4.44E+04	6.96E+05
48.83	-1.58E+06	1.63E+06	-9.37E+05	-1.58E+06	9.11E+05	1.31E+05	-1.26E+05	8.57E+05
58.59	-1.64E+06	1.57E+06	-9.47E+05	-1.49E+06	1.15E+06	1.88E+05	-2.12E+05	9.61E+05
68.36	-1.77E+06	1.68E+06	-9.73E+05	-1.61E+06	1.20E+06	1.99E+05	-1.61E+05	1.02E+06
78.13	-1.77E+06	1.59E+06	-1.02E+06	-1.70E+06	1.33E+06	2.72E+05	-1.91E+05	1.24E+06
87.89	-2.18E+06	1.19E+06	-7.97E+05	-1.83E+06	1.71E+06	2.46E+05	-1.65E+05	1.72E+06
97.66	-2.09E+06	1.51E+06	-8.35E+05	-1.93E+06	2.01E+06	5.78E+05	-4.71E+05	1.77E+06
107.42	-2.02E+06	1.69E+06	-8.98E+05	-2.02E+06	2.01E+06	7.14E+05	-4.70E+05	1.84E+06
117.19	-2.23E+06	1.79E+06	-7.41E+05	-2.05E+06	2.13E+06	6.46E+05	-5.98E+05	2.00E+06
126.95	-2.56E+06	1.99E+06	-7.35E+05	-2.35E+06	2.37E+06	6.24E+05	-7.72E+05	2.10E+06
136.72	-2.75E+06	2.33E+06	-6.58E+05	-2.68E+06	2.88E+06	4.84E+05	-8.80E+05	2.49E+06

Table A.36 Raw data for test seal at 15,000 rpm, 90% GVF and 0.4 PR (*High* Preswirl)

Freq. (Hz)	$Re(H_{XX})$ (N/m)	$Re(H_{XY})$ (N/m)	$Re(H_{YX})$ (N/m)	$Re(H_{YY})$ (N/m)	$Im(H_{XX})$ (N/m)	$Im(H_{XY})$ (N/m)	$Im(H_{YX})$ (N/m)	$Im(H_{YY})$ (N/m)
9.77	-1.46E+06	1.87E+06	-1.20E+06	-1.51E+06	7.88E+04	-5.50E+04	7.41E+04	1.33E+05
19.53	-1.67E+06	1.78E+06	-1.12E+06	-1.51E+06	3.79E+05	-1.40E+05	2.47E+05	2.08E+05
29.3	-2.02E+06	1.84E+06	-4.86E+05	-1.82E+06	3.11E+06	-2.79E+06	-2.58E+06	3.60E+06
39.06	-1.64E+06	1.65E+06	-8.85E+05	-1.45E+06	7.91E+05	5.64E+04	-6.25E+04	7.21E+05
48.83	-1.63E+06	1.61E+06	-8.87E+05	-1.66E+06	1.03E+06	9.24E+04	-1.93E+05	9.21E+05
58.59	-1.65E+06	1.52E+06	-9.98E+05	-1.62E+06	1.10E+06	1.29E+05	-2.26E+05	1.08E+06
68.36	-1.87E+06	1.58E+06	-9.12E+05	-1.60E+06	1.31E+06	2.79E+05	-3.14E+05	1.08E+06
78.13	-1.72E+06	1.46E+06	-1.01E+06	-1.75E+06	1.35E+06	3.62E+05	-3.36E+05	1.31E+06
87.89	-2.10E+06	1.25E+06	-6.87E+05	-1.80E+06	1.77E+06	4.84E+05	-2.88E+05	1.60E+06
97.66	-2.12E+06	1.54E+06	-8.20E+05	-1.96E+06	1.93E+06	6.81E+05	-5.80E+05	1.65E+06
107.42	-2.03E+06	1.66E+06	-7.96E+05	-2.03E+06	2.04E+06	8.11E+05	-6.56E+05	1.87E+06
117.19	-2.31E+06	1.79E+06	-7.03E+05	-2.06E+06	2.07E+06	7.97E+05	-7.26E+05	1.94E+06
126.95	-2.64E+06	2.00E+06	-7.08E+05	-2.35E+06	2.34E+06	7.95E+05	-9.22E+05	2.07E+06
136.72	-2.84E+06	2.31E+06	-6.98E+05	-2.73E+06	2.78E+06	6.74E+05	-1.02E+06	2.38E+06

Table A.37 Raw data for test seal at 5,000 rpm, 100% GVF and 0.3 PR (*High* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.48E+06	2.30E+06	-2.18E+06	-1.55E+06	1.63E+05	1.52E+05	-1.65E+05	4.20E+04
19.53	-1.44E+06	2.39E+06	-2.30E+06	-1.53E+06	2.12E+05	2.18E+05	-2.08E+05	1.57E+05
29.3	-1.48E+06	2.30E+06	-2.29E+06	-1.54E+06	3.05E+05	3.29E+05	-3.00E+05	2.94E+05
39.06	-1.56E+06	2.39E+06	-2.17E+06	-1.60E+06	3.35E+05	4.43E+05	-3.32E+05	3.25E+05
48.83	-1.62E+06	2.36E+06	-2.14E+06	-1.78E+06	4.97E+05	4.70E+05	-5.54E+05	5.61E+05
58.59	-1.67E+06	2.25E+06	-2.34E+06	-1.50E+06	6.35E+05	7.64E+05	-6.64E+05	5.39E+05
68.36	-1.85E+06	2.49E+06	-2.24E+06	-1.81E+06	7.39E+05	7.96E+05	-7.72E+05	7.20E+05
78.13	-1.75E+06	2.29E+06	-2.30E+06	-1.75E+06	8.67E+05	8.81E+05	-8.88E+05	8.73E+05
87.89	-1.86E+06	2.30E+06	-2.38E+06	-1.85E+06	9.41E+05	1.02E+06	-1.04E+06	9.20E+05
97.66	-1.95E+06	2.34E+06	-2.40E+06	-1.93E+06	1.09E+06	1.26E+06	-1.11E+06	9.63E+05
107.42	-2.00E+06	2.40E+06	-2.46E+06	-1.99E+06	1.12E+06	1.42E+06	-1.14E+06	1.06E+06
117.19	-2.10E+06	2.46E+06	-2.40E+06	-2.17E+06	1.25E+06	1.45E+06	-1.29E+06	1.18E+06
126.95	-2.13E+06	2.54E+06	-2.53E+06	-2.27E+06	1.33E+06	1.60E+06	-1.50E+06	1.32E+06
136.72	-2.00E+06	2.45E+06	-2.79E+06	-2.27E+06	1.65E+06	1.54E+06	-1.58E+06	1.56E+06

Table A.38 Raw data for test seal at 10,000 rpm, 100% GVF and 0.3 PR (*High* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.75E+06	2.38E+06	-2.30E+06	-1.54E+06	1.33E+05	1.75E+05	-7.44E+04	8.62E+04
19.53	-1.71E+06	2.32E+06	-2.31E+06	-1.52E+06	2.35E+05	2.80E+05	-1.98E+05	1.66E+05
29.3	-1.82E+06	2.34E+06	-2.27E+06	-1.52E+06	3.42E+05	3.65E+05	-3.57E+05	3.07E+05
39.06	-1.84E+06	2.36E+06	-2.28E+06	-1.54E+06	3.74E+05	5.40E+05	-4.16E+05	2.96E+05
48.83	-1.86E+06	2.35E+06	-2.28E+06	-1.70E+06	5.53E+05	6.47E+05	-6.29E+05	4.09E+05
58.59	-1.96E+06	2.41E+06	-2.34E+06	-1.76E+06	6.37E+05	8.72E+05	-5.85E+05	4.59E+05
68.36	-2.13E+06	2.51E+06	-2.28E+06	-1.86E+06	8.57E+05	8.93E+05	-7.36E+05	5.85E+05
78.13	-1.97E+06	2.37E+06	-2.34E+06	-1.87E+06	8.97E+05	1.03E+06	-9.55E+05	7.25E+05
87.89	-2.18E+06	2.39E+06	-2.45E+06	-2.02E+06	1.02E+06	1.21E+06	-1.13E+06	7.71E+05
97.66	-2.26E+06	2.48E+06	-2.44E+06	-2.12E+06	1.13E+06	1.38E+06	-1.17E+06	8.33E+05
107.42	-2.30E+06	2.52E+06	-2.52E+06	-2.22E+06	1.21E+06	1.54E+06	-1.20E+06	9.80E+05
117.19	-2.38E+06	2.53E+06	-2.43E+06	-2.34E+06	1.39E+06	1.57E+06	-1.37E+06	1.16E+06
126.95	-2.41E+06	2.64E+06	-2.56E+06	-2.46E+06	1.44E+06	1.71E+06	-1.62E+06	1.28E+06
136.72	-2.31E+06	2.56E+06	-2.77E+06	-2.46E+06	1.78E+06	1.74E+06	-1.74E+06	1.54E+06

Table A.39 Raw data for test seal at 15,000 rpm, 100% GVF and 0.3 PR (*High* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.97E+06	2.39E+06	-2.24E+06	-1.98E+06	7.16E+04	1.71E+05	-1.06E+05	5.21E+04
19.53	-1.96E+06	2.43E+06	-2.27E+06	-1.88E+06	1.57E+05	3.12E+05	-2.26E+05	1.31E+05
29.3	-2.09E+06	2.49E+06	-2.16E+06	-1.96E+06	3.63E+05	3.94E+05	-4.31E+05	3.45E+05
39.06	-2.12E+06	2.45E+06	-2.23E+06	-1.96E+06	3.20E+05	5.42E+05	-4.80E+05	3.05E+05
48.83	-2.12E+06	2.43E+06	-2.28E+06	-2.15E+06	4.76E+05	6.64E+05	-6.99E+05	4.65E+05
58.59	-2.22E+06	2.42E+06	-2.32E+06	-2.12E+06	6.01E+05	8.86E+05	-6.35E+05	5.13E+05
68.36	-2.37E+06	2.51E+06	-2.28E+06	-2.25E+06	7.80E+05	9.20E+05	-8.80E+05	6.45E+05
78.13	-2.33E+06	2.42E+06	-2.32E+06	-2.29E+06	8.85E+05	1.03E+06	-1.02E+06	8.42E+05
87.89	-2.49E+06	2.36E+06	-2.47E+06	-2.38E+06	9.52E+05	1.21E+06	-1.21E+06	9.61E+05
97.66	-2.64E+06	2.42E+06	-2.39E+06	-2.48E+06	1.16E+06	1.45E+06	-1.30E+06	1.06E+06
107.42	-2.66E+06	2.46E+06	-2.54E+06	-2.46E+06	1.24E+06	1.66E+06	-1.36E+06	1.16E+06
117.19	-2.74E+06	2.50E+06	-2.42E+06	-2.58E+06	1.41E+06	1.73E+06	-1.55E+06	1.31E+06
126.95	-2.85E+06	2.64E+06	-2.57E+06	-2.74E+06	1.45E+06	1.89E+06	-1.75E+06	1.43E+06
136.72	-2.72E+06	2.57E+06	-2.76E+06	-2.69E+06	1.82E+06	1.96E+06	-1.86E+06	1.70E+06

Table A.40 Raw data for test seal at 5,000 rpm, 98% GVF and 0.3 PR (*High* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.56E+06	2.03E+06	-1.79E+06	-1.60E+06	2.85E+04	-3.71E+03	2.17E+04	7.62E+04
19.53	-1.61E+06	1.99E+06	-1.82E+06	-1.60E+06	1.80E+05	3.35E+04	-5.22E+04	1.22E+05
29.3	-2.07E+06	2.25E+06	-1.38E+06	-2.01E+06	5.49E+05	-1.35E+05	-3.94E+05	5.52E+05
39.06	-1.75E+06	1.92E+06	-1.68E+06	-1.74E+06	4.06E+05	1.48E+05	-1.77E+05	3.83E+05
48.83	-1.84E+06	1.93E+06	-1.68E+06	-1.85E+06	6.16E+05	2.09E+05	-3.30E+05	5.77E+05
58.59	-1.89E+06	1.94E+06	-1.71E+06	-1.80E+06	8.74E+05	3.52E+05	-3.98E+05	6.51E+05
68.36	-1.94E+06	1.90E+06	-1.76E+06	-1.87E+06	9.02E+05	3.92E+05	-3.72E+05	7.57E+05
78.13	-1.92E+06	1.79E+06	-1.76E+06	-1.93E+06	1.03E+06	4.30E+05	-4.97E+05	9.54E+05
87.89	-2.02E+06	1.79E+06	-1.84E+06	-2.01E+06	1.16E+06	5.08E+05	-5.52E+05	1.03E+06
97.66	-2.16E+06	1.90E+06	-1.80E+06	-2.15E+06	1.36E+06	7.28E+05	-6.06E+05	1.10E+06
107.42	-2.17E+06	1.97E+06	-1.81E+06	-2.19E+06	1.47E+06	8.40E+05	-6.00E+05	1.28E+06
117.19	-2.24E+06	2.01E+06	-1.74E+06	-2.32E+06	1.58E+06	8.70E+05	-7.44E+05	1.40E+06
126.95	-2.49E+06	2.17E+06	-1.75E+06	-2.50E+06	1.66E+06	9.28E+05	-8.71E+05	1.63E+06
136.72	-2.46E+06	2.19E+06	-1.92E+06	-2.47E+06	2.04E+06	8.85E+05	-9.35E+05	1.79E+06

Table A.41 Raw data for test seal at 10,000 rpm, 98% GVF and 0.3 PR (*High* Preswirl)

Freq.	*Re*(H_{XX})	*Re*(H_{XY})	*Re*(H_{YX})	*Re*(H_{YY})	*Im*(H_{XX})	*Im*(H_{XY})	*Im*(H_{YX})	*Im*(H_{YY})
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.71E+06	2.01E+06	-1.89E+06	-1.72E+06	-4.60E+04	-5.96E+03	5.96E+04	8.77E+04
19.53	-1.78E+06	1.95E+06	-1.76E+06	-1.76E+06	1.52E+05	7.26E+04	-1.42E+04	9.58E+04
29.3	-2.19E+06	2.18E+06	-1.48E+06	-2.09E+06	4.89E+05	-1.58E+04	-3.19E+05	4.78E+05
39.06	-1.91E+06	1.86E+06	-1.68E+06	-1.84E+06	4.19E+05	2.29E+05	-1.92E+05	3.98E+05
48.83	-2.00E+06	1.90E+06	-1.63E+06	-2.03E+06	6.21E+05	3.34E+05	-3.21E+05	5.04E+05
58.59	-2.00E+06	1.85E+06	-1.71E+06	-2.01E+06	7.51E+05	4.08E+05	-4.58E+05	7.02E+05
68.36	-2.01E+06	1.85E+06	-1.70E+06	-2.04E+06	9.24E+05	4.65E+05	-5.62E+05	8.28E+05
78.13	-2.10E+06	1.80E+06	-1.74E+06	-2.14E+06	1.05E+06	5.62E+05	-5.45E+05	9.99E+05
87.89	-2.17E+06	1.76E+06	-1.84E+06	-2.16E+06	1.15E+06	6.83E+05	-6.70E+05	1.11E+06
97.66	-2.37E+06	1.88E+06	-1.74E+06	-2.30E+06	1.36E+06	8.44E+05	-7.09E+05	1.25E+06
107.42	-2.30E+06	1.91E+06	-1.82E+06	-2.30E+06	1.45E+06	9.83E+05	-7.07E+05	1.40E+06
117.19	-2.43E+06	1.95E+06	-1.77E+06	-2.38E+06	1.51E+06	1.06E+06	-8.46E+05	1.54E+06
126.95	-2.62E+06	2.09E+06	-1.78E+06	-2.43E+06	1.67E+06	1.15E+06	-1.00E+06	1.67E+06
136.72	-2.52E+06	2.10E+06	-1.96E+06	-2.48E+06	2.06E+06	1.11E+06	-1.13E+06	1.85E+06

Table A.42 Raw data for test seal at 15,000 rpm, 98% GVF and 0.3 PR (*High* Preswirl)

Freq.	*Re*(H_{XX})	*Re*(H_{XY})	*Re*(H_{YX})	*Re*(H_{YY})	*Im*(H_{XX})	*Im*(H_{XY})	*Im*(H_{YX})	*Im*(H_{YY})
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.96E+06	2.20E+06	-1.94E+06	-1.79E+06	3.72E+04	4.26E+04	7.69E+04	8.75E+03
19.53	-1.97E+06	2.14E+06	-1.94E+06	-1.87E+06	8.43E+04	7.25E+04	3.14E+04	2.76E+04
29.3	-2.34E+06	2.34E+06	-1.48E+06	-2.36E+06	4.92E+05	-1.11E+05	-3.03E+05	4.82E+05
39.06	-2.18E+06	1.98E+06	-1.69E+06	-2.07E+06	5.35E+05	1.33E+05	-9.72E+04	3.63E+05
48.83	-2.16E+06	1.95E+06	-1.76E+06	-2.21E+06	6.51E+05	3.14E+05	-3.11E+05	5.45E+05
58.59	-2.15E+06	1.96E+06	-1.74E+06	-2.21E+06	7.72E+05	4.63E+05	-4.24E+05	6.98E+05
68.36	-2.41E+06	1.96E+06	-1.71E+06	-2.26E+06	9.63E+05	5.22E+05	-4.99E+05	8.10E+05
78.13	-2.37E+06	1.86E+06	-1.80E+06	-2.28E+06	1.07E+06	5.84E+05	-5.53E+05	1.06E+06
87.89	-2.46E+06	1.84E+06	-1.89E+06	-2.33E+06	1.20E+06	7.27E+05	-7.05E+05	1.15E+06
97.66	-2.58E+06	1.91E+06	-1.77E+06	-2.44E+06	1.48E+06	8.88E+05	-8.04E+05	1.30E+06
107.42	-2.53E+06	1.92E+06	-1.86E+06	-2.49E+06	1.51E+06	1.09E+06	-8.02E+05	1.41E+06
117.19	-2.65E+06	2.00E+06	-1.77E+06	-2.49E+06	1.65E+06	1.22E+06	-9.68E+05	1.58E+06
126.95	-2.78E+06	2.14E+06	-1.90E+06	-2.61E+06	1.76E+06	1.31E+06	-1.17E+06	1.66E+06
136.72	-2.68E+06	2.13E+06	-2.05E+06	-2.64E+06	2.12E+06	1.33E+06	-1.25E+06	1.86E+06

Table A.43 Raw data for test seal at 5,000 rpm, 96% GVF and 0.3 PR (*High* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.55E+06	1.73E+06	-1.48E+06	-1.76E+06	3.30E+04	-4.17E+04	2.29E+04	1.21E+05
19.53	-1.65E+06	1.61E+06	-1.41E+06	-1.62E+06	1.49E+05	2.55E+04	6.89E+04	1.04E+05
29.3	-2.29E+06	2.18E+06	-7.95E+05	-2.37E+06	7.33E+05	-5.63E+05	-5.11E+05	9.78E+05
39.06	-1.76E+06	1.55E+06	-1.20E+06	-1.72E+06	4.23E+05	1.27E+05	-3.34E+03	4.68E+05
48.83	-1.78E+06	1.55E+06	-1.31E+06	-1.86E+06	5.81E+05	1.79E+05	-1.16E+05	7.06E+05
58.59	-1.90E+06	1.57E+06	-1.24E+06	-1.77E+06	8.07E+05	2.37E+05	-2.26E+05	7.51E+05
68.36	-1.92E+06	1.56E+06	-1.29E+06	-1.84E+06	9.41E+05	3.20E+05	-2.89E+05	7.17E+05
78.13	-1.89E+06	1.50E+06	-1.29E+06	-1.89E+06	1.14E+06	3.42E+05	-3.95E+05	9.56E+05
87.89	-2.10E+06	1.45E+06	-1.39E+06	-1.98E+06	1.15E+06	4.25E+05	-4.39E+05	1.05E+06
97.66	-2.16E+06	1.59E+06	-1.32E+06	-2.14E+06	1.35E+06	5.62E+05	-5.13E+05	1.15E+06
107.42	-2.14E+06	1.60E+06	-1.35E+06	-2.20E+06	1.34E+06	6.87E+05	-4.99E+05	1.28E+06
117.19	-2.34E+06	1.68E+06	-1.34E+06	-2.24E+06	1.47E+06	6.87E+05	-5.58E+05	1.39E+06
126.95	-2.55E+06	1.80E+06	-1.32E+06	-2.53E+06	1.75E+06	6.76E+05	-7.37E+05	1.54E+06
136.72	-2.51E+06	1.87E+06	-1.47E+06	-2.55E+06	2.15E+06	6.82E+05	-7.29E+05	1.74E+06

Table A.44 Raw data for test seal at 10,000 rpm, 96% GVF and 0.3 PR (*High* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.63E+06	1.75E+06	-1.46E+06	-1.73E+06	2.47E+04	-9.46E+04	3.36E+04	7.76E+03
19.53	-1.81E+06	1.62E+06	-1.55E+06	-1.73E+06	5.59E+04	-6.36E+04	1.49E+05	1.20E+05
29.3	-2.26E+06	1.88E+06	-1.08E+06	-2.12E+06	5.58E+05	-2.62E+05	-3.56E+05	6.05E+05
39.06	-1.95E+06	1.43E+06	-1.29E+06	-1.76E+06	4.70E+05	6.03E+04	-2.18E+04	5.10E+05
48.83	-1.93E+06	1.39E+06	-1.27E+06	-1.87E+06	6.97E+05	2.11E+05	-2.29E+05	6.34E+05
58.59	-2.02E+06	1.43E+06	-1.23E+06	-1.87E+06	8.34E+05	2.93E+05	-3.22E+05	7.39E+05
68.36	-2.04E+06	1.52E+06	-1.22E+06	-1.98E+06	9.43E+05	3.56E+05	-4.43E+05	7.33E+05
78.13	-2.04E+06	1.39E+06	-1.35E+06	-2.06E+06	1.02E+06	4.31E+05	-4.77E+05	9.97E+05
87.89	-2.20E+06	1.35E+06	-1.39E+06	-2.04E+06	1.16E+06	5.97E+05	-5.57E+05	1.07E+06
97.66	-2.33E+06	1.52E+06	-1.36E+06	-2.21E+06	1.38E+06	6.97E+05	-5.84E+05	1.14E+06
107.42	-2.33E+06	1.55E+06	-1.38E+06	-2.31E+06	1.43E+06	8.38E+05	-6.12E+05	1.25E+06
117.19	-2.52E+06	1.60E+06	-1.34E+06	-2.40E+06	1.56E+06	8.70E+05	-6.59E+05	1.39E+06
126.95	-2.66E+06	1.75E+06	-1.29E+06	-2.56E+06	1.72E+06	8.97E+05	-8.43E+05	1.52E+06
136.72	-2.62E+06	1.76E+06	-1.44E+06	-2.59E+06	2.12E+06	8.44E+05	-9.58E+05	1.76E+06

Table A.45 Raw data for test seal at 15,000 rpm, 96% GVF and 0.3 PR (*High* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.81E+06	1.88E+06	-1.75E+06	-1.82E+06	2.01E+04	-1.14E+05	8.10E+04	-6.95E+04
19.53	-2.00E+06	1.81E+06	-1.74E+06	-1.89E+06	4.38E+04	1.91E+04	1.47E+05	-6.92E+04
29.3	-2.47E+06	1.95E+06	-1.28E+06	-2.46E+06	4.82E+05	-3.69E+05	-1.45E+05	5.06E+05
39.06	-2.14E+06	1.53E+06	-1.39E+06	-2.09E+06	4.63E+05	4.38E+04	3.54E+04	4.82E+05
48.83	-2.22E+06	1.50E+06	-1.32E+06	-2.20E+06	7.11E+05	1.82E+05	-1.16E+05	6.65E+05
58.59	-2.31E+06	1.45E+06	-1.25E+06	-2.15E+06	9.94E+05	2.90E+05	-2.16E+05	8.44E+05
68.36	-2.39E+06	1.47E+06	-1.19E+06	-2.22E+06	1.12E+06	3.59E+05	-4.29E+05	9.31E+05
78.13	-2.16E+06	1.43E+06	-1.48E+06	-2.15E+06	1.05E+06	6.22E+05	-6.06E+05	1.01E+06
87.89	-2.37E+06	1.34E+06	-1.56E+06	-2.24E+06	1.23E+06	7.38E+05	-6.39E+05	1.14E+06
97.66	-2.53E+06	1.43E+06	-1.43E+06	-2.42E+06	1.44E+06	9.31E+05	-6.74E+05	1.30E+06
107.42	-2.47E+06	1.55E+06	-1.45E+06	-2.42E+06	1.56E+06	1.11E+06	-6.78E+05	1.43E+06
117.19	-2.59E+06	1.65E+06	-1.35E+06	-2.49E+06	1.62E+06	1.14E+06	-7.80E+05	1.50E+06
126.95	-2.82E+06	1.80E+06	-1.41E+06	-2.68E+06	1.82E+06	1.16E+06	-9.57E+05	1.60E+06
136.72	-2.73E+06	1.81E+06	-1.57E+06	-2.75E+06	2.12E+06	1.18E+06	-1.08E+06	1.81E+06

Table A.46 Raw data for test seal at 5,000 rpm, 94% GVF and 0.3 PR (*High* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.52E+06	1.55E+06	-1.36E+06	-1.56E+06	5.75E+04	2.57E+04	7.07E+04	7.42E+04
19.53	-1.55E+06	1.55E+06	-1.31E+06	-1.62E+06	1.12E+05	-7.77E+04	1.00E+05	1.11E+05
29.3	-2.18E+06	2.07E+06	-7.33E+05	-2.21E+06	7.67E+05	-5.48E+05	-4.36E+05	8.39E+05
39.06	-1.76E+06	1.41E+06	-1.11E+06	-1.60E+06	3.85E+05	4.30E+04	-7.51E+04	4.98E+05
48.83	-1.79E+06	1.40E+06	-1.18E+06	-1.75E+06	5.70E+05	1.23E+04	-1.23E+05	6.73E+05
58.59	-1.84E+06	1.29E+06	-1.13E+06	-1.67E+06	8.77E+05	1.84E+05	-1.71E+05	8.05E+05
68.36	-2.06E+06	1.33E+06	-1.09E+06	-1.78E+06	8.44E+05	3.17E+05	-1.90E+05	8.05E+05
78.13	-1.93E+06	1.30E+06	-1.20E+06	-1.84E+06	1.16E+06	3.14E+05	-2.97E+05	9.44E+05
87.89	-2.48E+06	9.93E+05	-1.14E+06	-1.99E+06	1.39E+06	3.05E+05	-2.87E+04	1.26E+06
97.66	-2.13E+06	1.35E+06	-1.12E+06	-2.10E+06	1.62E+06	5.18E+05	-4.93E+05	1.21E+06
107.42	-2.11E+06	1.43E+06	-1.21E+06	-2.09E+06	1.55E+06	6.88E+05	-3.73E+05	1.36E+06
117.19	-2.24E+06	1.47E+06	-1.11E+06	-2.20E+06	1.56E+06	6.18E+05	-5.42E+05	1.48E+06
126.95	-2.48E+06	1.64E+06	-1.12E+06	-2.42E+06	1.75E+06	6.58E+05	-6.51E+05	1.58E+06
136.72	-2.42E+06	1.66E+06	-1.21E+06	-2.49E+06	2.23E+06	5.75E+05	-7.07E+05	1.82E+06

Table A.47 Raw data for test seal at 10,000 rpm, 94% GVF and 0.3 PR (*High* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.67E+06	1.75E+06	-1.47E+06	-1.69E+06	-1.70E+04	-4.67E+04	6.38E+04	1.21E+04
19.53	-1.81E+06	1.52E+06	-1.28E+06	-1.77E+06	1.68E+05	-9.40E+04	1.10E+05	5.13E+04
29.3	-2.49E+06	2.06E+06	-6.13E+05	-2.46E+06	9.35E+05	-6.70E+05	-3.85E+05	9.95E+05
39.06	-1.88E+06	1.37E+06	-1.06E+06	-1.78E+06	6.48E+05	1.06E+04	-1.07E+04	5.44E+05
48.83	-1.89E+06	1.28E+06	-1.01E+06	-1.90E+06	8.11E+05	1.17E+05	-1.76E+05	7.31E+05
58.59	-1.97E+06	1.31E+06	-1.08E+06	-1.82E+06	8.77E+05	2.58E+05	-1.69E+05	8.93E+05
68.36	-2.05E+06	1.30E+06	-1.12E+06	-1.87E+06	9.06E+05	3.75E+05	-2.91E+05	9.05E+05
78.13	-1.94E+06	1.15E+06	-1.05E+06	-1.98E+06	1.22E+06	4.09E+05	-4.50E+05	1.06E+06
87.89	-2.42E+06	1.29E+06	-1.19E+06	-2.12E+06	1.22E+06	4.70E+05	-2.78E+05	1.08E+06
97.66	-2.26E+06	1.37E+06	-1.20E+06	-2.30E+06	1.37E+06	6.43E+05	-5.83E+05	1.24E+06
107.42	-2.20E+06	1.48E+06	-1.12E+06	-2.30E+06	1.49E+06	8.26E+05	-6.00E+05	1.38E+06
117.19	-2.46E+06	1.55E+06	-1.02E+06	-2.40E+06	1.57E+06	7.64E+05	-6.43E+05	1.47E+06
126.95	-2.75E+06	1.72E+06	-1.02E+06	-2.63E+06	1.78E+06	7.68E+05	-7.53E+05	1.61E+06
136.72	-2.66E+06	1.79E+06	-1.14E+06	-2.75E+06	2.20E+06	7.20E+05	-8.52E+05	1.88E+06

Table A.48 Raw data for test seal at 15,000 rpm, 94% GVF and 0.3 PR (*High* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.88E+06	2.02E+06	-1.30E+06	-1.85E+06	2.89E+04	1.08E+05	-9.34E+04	-2.50E+03
19.53	-2.12E+06	1.60E+06	-1.23E+06	-2.17E+06	1.66E+05	-3.35E+05	2.25E+05	1.97E+05
29.3	-3.12E+06	2.32E+06	-1.11E+05	-3.06E+06	2.26E+06	-2.21E+06	-1.57E+06	2.55E+06
39.06	-2.28E+06	1.39E+06	-8.55E+05	-2.11E+06	6.30E+05	-4.83E+04	9.74E+04	5.88E+05
48.83	-2.28E+06	1.27E+06	-7.83E+05	-2.11E+06	9.51E+05	1.36E+05	-1.25E+05	8.93E+05
58.59	-2.20E+06	1.36E+06	-8.44E+05	-2.12E+06	1.01E+06	2.93E+05	-2.82E+05	9.12E+05
68.36	-2.19E+06	1.22E+06	-8.75E+05	-2.23E+06	1.09E+06	2.85E+05	-5.08E+05	9.98E+05
78.13	-2.17E+06	1.17E+06	-1.05E+06	-2.06E+06	1.13E+06	6.81E+05	-5.73E+05	1.14E+06
87.89	-2.31E+06	1.20E+06	-1.12E+06	-2.20E+06	1.28E+06	7.16E+05	-6.19E+05	1.19E+06
97.66	-2.52E+06	1.39E+06	-9.80E+05	-2.44E+06	1.53E+06	8.86E+05	-6.72E+05	1.29E+06
107.42	-2.51E+06	1.47E+06	-1.06E+06	-2.50E+06	1.47E+06	1.03E+06	-5.93E+05	1.49E+06
117.19	-2.69E+06	1.61E+06	-9.59E+05	-2.57E+06	1.63E+06	1.02E+06	-6.95E+05	1.54E+06
126.95	-2.92E+06	1.82E+06	-9.19E+05	-2.85E+06	1.83E+06	1.02E+06	-1.01E+06	1.70E+06
136.72	-3.00E+06	1.92E+06	-1.06E+06	-2.98E+06	2.13E+06	9.78E+05	-1.02E+06	1.89E+06

Table A.49 Raw data for test seal at 5,000 rpm, 92% GVF and 0.3 PR (*High* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.69E+06	1.74E+06	-1.35E+06	-1.76E+06	8.70E+04	-9.99E+04	1.50E+05	7.44E+04
19.53	-1.79E+06	1.59E+06	-9.67E+05	-1.71E+06	2.90E+05	-8.31E+04	1.51E+05	2.40E+05
29.3	-2.62E+06	2.41E+06	-8.53E+04	-2.40E+06	2.18E+06	-1.92E+06	-1.62E+06	2.36E+06
39.06	-1.75E+06	1.50E+06	-1.02E+06	-1.71E+06	4.91E+05	3.69E+04	-6.09E+04	6.12E+05
48.83	-1.90E+06	1.55E+06	-1.01E+06	-1.84E+06	6.68E+05	-5.48E+04	-8.67E+04	6.99E+05
58.59	-1.94E+06	1.48E+06	-9.85E+05	-1.76E+06	9.64E+05	1.18E+05	-9.54E+04	7.85E+05
68.36	-2.05E+06	1.47E+06	-9.98E+05	-1.93E+06	1.03E+06	1.08E+05	-2.53E+05	8.68E+05
78.13	-1.98E+06	1.34E+06	-1.13E+06	-1.94E+06	1.07E+06	2.35E+05	-2.78E+05	1.10E+06
87.89	-2.38E+06	1.22E+06	-1.20E+06	-2.13E+06	1.23E+06	1.38E+05	-7.16E+04	1.34E+06
97.66	-2.29E+06	1.39E+06	-1.02E+06	-2.14E+06	1.58E+06	4.88E+05	-4.05E+05	1.39E+06
107.42	-2.21E+06	1.49E+06	-9.33E+05	-2.21E+06	1.80E+06	6.06E+05	-2.52E+05	1.56E+06
117.19	-2.46E+06	1.59E+06	-9.30E+05	-2.24E+06	1.71E+06	6.25E+05	-3.97E+05	1.66E+06
126.95	-2.64E+06	1.78E+06	-9.61E+05	-2.43E+06	1.92E+06	6.05E+05	-6.44E+05	1.73E+06
136.72	-2.65E+06	1.83E+06	-1.04E+06	-2.67E+06	2.32E+06	4.74E+05	-7.16E+05	2.00E+06

Table A.50 Raw data for test seal at 10,000 rpm, 92% GVF and 0.3 PR (*High* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.87E+06	1.74E+06	-1.37E+06	-1.84E+06	1.28E+05	-6.92E+04	1.69E+05	1.09E+05
19.53	-1.89E+06	1.57E+06	-1.22E+06	-1.78E+06	2.26E+05	-4.75E+04	2.29E+05	2.57E+05
29.3	-2.63E+06	2.31E+06	-2.33E+05	-2.50E+06	2.27E+06	-2.10E+06	-1.73E+06	2.73E+06
39.06	-2.00E+06	1.41E+06	-9.46E+05	-1.71E+06	5.88E+05	-4.29E+04	-3.11E+04	6.92E+05
48.83	-1.94E+06	1.39E+06	-9.23E+05	-1.90E+06	8.37E+05	1.31E+05	-1.68E+05	7.68E+05
58.59	-1.94E+06	1.36E+06	-1.04E+06	-1.79E+06	9.14E+05	2.19E+05	-1.80E+05	7.81E+05
68.36	-2.19E+06	1.33E+06	-1.07E+06	-1.77E+06	9.84E+05	3.18E+05	-1.81E+05	8.64E+05
78.13	-2.07E+06	1.36E+06	-1.01E+06	-2.01E+06	1.22E+06	3.69E+05	-3.05E+05	1.03E+06
87.89	-2.41E+06	1.00E+06	-1.06E+06	-1.88E+06	1.38E+06	5.86E+05	-2.88E+05	1.44E+06
97.66	-2.48E+06	1.41E+06	-8.69E+05	-2.28E+06	1.68E+06	6.31E+05	-4.17E+05	1.28E+06
107.42	-2.30E+06	1.52E+06	-1.01E+06	-2.19E+06	1.46E+06	9.02E+05	-4.69E+05	1.42E+06
117.19	-2.62E+06	1.61E+06	-8.76E+05	-2.32E+06	1.65E+06	8.22E+05	-6.13E+05	1.56E+06
126.95	-2.73E+06	1.76E+06	-9.20E+05	-2.57E+06	1.96E+06	8.28E+05	-7.54E+05	1.63E+06
136.72	-2.79E+06	1.86E+06	-9.40E+05	-2.81E+06	2.29E+06	6.95E+05	-8.67E+05	1.95E+06

Table A.51 Raw data for test seal at 15,000 rpm, 92% GVF and 0.3 PR (*High* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.92E+06	1.79E+06	-1.48E+06	-1.83E+06	-1.05E+04	-1.04E+04	1.08E+05	1.66E+05
19.53	-2.11E+06	1.74E+06	-1.10E+06	-2.07E+06	2.50E+05	-2.26E+05	2.70E+05	-2.29E+04
29.3	-3.05E+06	2.26E+06	-1.82E+05	-2.86E+06	2.36E+06	-2.33E+06	-1.76E+06	2.75E+06
39.06	-2.04E+06	1.37E+06	-8.14E+05	-2.00E+06	7.41E+05	-8.05E+04	-1.14E+05	6.47E+05
48.83	-2.05E+06	1.28E+06	-8.80E+05	-2.04E+06	8.97E+05	1.18E+05	-1.89E+05	8.96E+05
58.59	-2.22E+06	1.27E+06	-8.49E+05	-1.99E+06	1.04E+06	1.87E+05	-1.44E+05	9.00E+05
68.36	-2.24E+06	1.24E+06	-8.47E+05	-2.12E+06	1.10E+06	3.24E+05	-4.17E+05	9.52E+05
78.13	-2.25E+06	1.29E+06	-1.02E+06	-2.19E+06	1.18E+06	4.39E+05	-3.97E+05	1.13E+06
87.89	-2.60E+06	1.25E+06	-1.02E+06	-2.04E+06	1.24E+06	7.65E+05	-3.44E+05	1.18E+06
97.66	-2.45E+06	1.34E+06	-1.02E+06	-2.25E+06	1.57E+06	8.46E+05	-6.22E+05	1.33E+06
107.42	-2.44E+06	1.49E+06	-1.04E+06	-2.37E+06	1.56E+06	1.12E+06	-6.74E+05	1.50E+06
117.19	-2.72E+06	1.60E+06	-7.66E+05	-2.44E+06	1.74E+06	1.02E+06	-6.87E+05	1.54E+06
126.95	-2.86E+06	1.73E+06	-8.67E+05	-2.77E+06	1.90E+06	9.63E+05	-9.35E+05	1.66E+06
136.72	-2.96E+06	1.88E+06	-9.47E+05	-2.98E+06	2.26E+06	9.69E+05	-1.01E+06	1.93E+06

Table A.52 Raw data for test seal at 5,000 rpm, 90% GVF and 0.3 PR (*High* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.72E+06	1.81E+06	-1.22E+06	-1.80E+06	2.45E+05	-1.05E+05	7.67E+04	1.79E+05
19.53	-1.75E+06	1.70E+06	-1.26E+06	-1.72E+06	2.02E+05	-1.00E+05	1.53E+05	2.94E+05
29.3	-2.33E+06	2.23E+06	-6.35E+05	-2.19E+06	2.43E+06	-2.29E+06	-1.95E+06	2.78E+06
39.06	-1.87E+06	1.65E+06	-1.04E+06	-1.73E+06	5.39E+05	-6.39E+04	4.04E+03	6.15E+05
48.83	-1.93E+06	1.68E+06	-9.59E+05	-1.84E+06	8.45E+05	3.18E+03	-6.51E+04	8.14E+05
58.59	-1.97E+06	1.55E+06	-1.05E+06	-1.83E+06	1.01E+06	4.73E+04	-8.95E+04	9.36E+05
68.36	-2.06E+06	1.65E+06	-1.03E+06	-2.00E+06	1.14E+06	1.37E+05	-1.95E+05	9.65E+05
78.13	-2.09E+06	1.56E+06	-1.05E+06	-2.00E+06	1.28E+06	1.90E+05	-1.95E+05	1.17E+06
87.89	-2.57E+06	1.20E+06	-1.07E+06	-2.14E+06	1.45E+06	1.48E+05	1.11E+05	1.59E+06
97.66	-2.38E+06	1.45E+06	-8.82E+05	-2.17E+06	1.90E+06	4.75E+05	-3.72E+05	1.63E+06
107.42	-2.26E+06	1.62E+06	-8.69E+05	-2.17E+06	1.90E+06	6.53E+05	-4.57E+05	1.74E+06
117.19	-2.48E+06	1.72E+06	-9.51E+05	-2.29E+06	1.93E+06	5.48E+05	-4.78E+05	1.80E+06
126.95	-2.73E+06	1.94E+06	-8.77E+05	-2.60E+06	2.17E+06	5.55E+05	-6.44E+05	1.95E+06
136.72	-2.81E+06	2.11E+06	-9.42E+05	-2.79E+06	2.58E+06	4.50E+05	-7.05E+05	2.21E+06

Table A.53 Raw data for test seal at 10,000 rpm, 90% GVF and 0.3 PR (*High* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.73E+06	1.80E+06	-1.30E+06	-1.86E+06	1.87E+05	-1.26E+05	1.00E+05	1.75E+05
19.53	-1.83E+06	1.57E+06	-1.21E+06	-1.75E+06	3.07E+05	-1.22E+05	2.27E+05	3.14E+05
29.3	-2.56E+06	2.18E+06	-3.90E+05	-2.20E+06	2.26E+06	-2.09E+06	-1.76E+06	2.83E+06
39.06	-1.83E+06	1.54E+06	-9.37E+05	-1.71E+06	6.46E+05	-2.69E+03	-1.42E+04	6.69E+05
48.83	-1.87E+06	1.53E+06	-9.94E+05	-1.90E+06	8.43E+05	8.03E+04	-9.38E+04	7.55E+05
58.59	-2.07E+06	1.51E+06	-1.03E+06	-1.87E+06	9.74E+05	1.55E+05	-9.89E+04	8.92E+05
68.36	-2.11E+06	1.40E+06	-1.04E+06	-1.91E+06	9.92E+05	1.94E+05	-2.68E+05	9.79E+05
78.13	-2.12E+06	1.36E+06	-9.94E+05	-2.12E+06	1.25E+06	2.52E+05	-2.15E+05	1.16E+06
87.89	-2.72E+06	1.37E+06	-1.03E+06	-2.45E+06	1.36E+06	5.74E+04	2.63E+04	1.31E+06
97.66	-2.31E+06	1.35E+06	-8.84E+05	-2.26E+06	1.84E+06	6.89E+05	-5.21E+05	1.54E+06
107.42	-2.30E+06	1.53E+06	-9.86E+05	-2.27E+06	1.79E+06	8.38E+05	-5.18E+05	1.69E+06
117.19	-2.57E+06	1.63E+06	-8.07E+05	-2.40E+06	1.91E+06	7.52E+05	-6.27E+05	1.77E+06
126.95	-2.76E+06	1.85E+06	-8.70E+05	-2.69E+06	2.13E+06	7.38E+05	-7.31E+05	1.91E+06
136.72	-2.74E+06	2.05E+06	-9.42E+05	-2.88E+06	2.51E+06	6.38E+05	-8.36E+05	2.15E+06

Table A.54 Raw data for test seal at 15,000 rpm, 90% GVF and 0.3 PR (*High* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.90E+06	1.81E+06	-1.41E+06	-1.79E+06	4.32E+04	-1.18E+05	2.09E+05	8.99E+04
19.53	-2.15E+06	1.53E+06	-1.34E+06	-1.99E+06	1.17E+05	-2.23E+05	3.08E+05	3.27E+05
29.3	-2.75E+06	2.37E+06	-1.96E+05	-2.65E+06	2.36E+06	-1.99E+06	-1.84E+06	2.47E+06
39.06	-1.92E+06	1.44E+06	-8.66E+05	-1.86E+06	7.93E+05	3.59E+04	-5.43E+04	6.75E+05
48.83	-2.15E+06	1.33E+06	-8.64E+05	-1.96E+06	9.76E+05	9.54E+04	-1.35E+05	8.47E+05
58.59	-1.92E+06	1.24E+06	-9.25E+05	-1.96E+06	9.22E+05	2.79E+05	-1.80E+05	9.97E+05
68.36	-2.18E+06	1.29E+06	-8.48E+05	-1.98E+06	1.15E+06	4.39E+05	-3.12E+05	1.08E+06
78.13	-2.12E+06	1.31E+06	-9.53E+05	-2.17E+06	1.35E+06	4.05E+05	-4.14E+05	1.22E+06
87.89	-2.64E+06	1.16E+06	-8.60E+05	-2.41E+06	1.51E+06	3.04E+05	-1.18E+05	1.44E+06
97.66	-2.39E+06	1.27E+06	-7.22E+05	-2.24E+06	1.84E+06	7.92E+05	-6.37E+05	1.55E+06
107.42	-2.45E+06	1.48E+06	-9.64E+05	-2.28E+06	1.75E+06	9.66E+05	-4.76E+05	1.66E+06
117.19	-2.56E+06	1.55E+06	-9.05E+05	-2.40E+06	1.79E+06	9.39E+05	-7.51E+05	1.68E+06
126.95	-2.82E+06	1.73E+06	-8.72E+05	-2.72E+06	2.08E+06	9.60E+05	-8.89E+05	1.75E+06
136.72	-2.82E+06	1.86E+06	-9.85E+05	-2.94E+06	2.50E+06	9.04E+05	-1.04E+06	2.05E+06

Table A.55 Raw data for test seal at 5,000 rpm, 100% GVF and 0.5 PR (*Medium* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-6.28E+05	7.35E+05	-1.51E+06	-5.06E+05	-2.28E+05	7.50E+04	-1.51E+05	1.65E+05
19.53	-6.00E+05	7.59E+05	-1.47E+06	-5.45E+05	7.48E+04	2.27E+05	-1.13E+05	2.27E+05
29.3	-4.91E+05	6.87E+05	-1.21E+06	-6.66E+05	9.01E+05	-4.58E+05	-5.06E+05	5.73E+05
39.06	-6.22E+05	8.85E+05	-1.48E+06	-3.75E+05	3.91E+05	2.16E+05	-2.03E+05	3.32E+05
48.83	-6.75E+05	7.51E+05	-1.31E+06	-6.52E+05	3.19E+05	2.72E+05	-3.02E+05	4.88E+05
58.59	-6.11E+05	9.18E+05	-1.34E+06	-6.39E+05	5.46E+05	4.15E+05	-4.97E+05	7.18E+05
68.36	-7.92E+05	6.91E+05	-1.34E+06	-7.91E+05	7.44E+05	5.21E+05	-3.79E+05	6.01E+05
78.13	-7.10E+05	7.52E+05	-1.55E+06	-6.76E+05	7.49E+05	5.37E+05	-5.09E+05	8.32E+05
87.89	-9.69E+05	7.00E+05	-1.53E+06	-7.47E+05	8.74E+05	5.47E+05	-6.70E+05	8.56E+05
97.66	-1.05E+06	6.36E+05	-1.48E+06	-7.75E+05	8.96E+05	7.07E+05	-6.52E+05	8.83E+05
107.42	-9.21E+05	5.14E+05	-1.73E+06	-7.84E+05	1.17E+06	7.39E+05	-7.97E+05	1.30E+06
117.19	-6.55E+05	2.45E+05	-2.06E+06	-7.15E+05	1.05E+06	1.05E+06	-6.59E+05	1.14E+06
126.95	-3.25E+05	-2.94E+04	-2.61E+06	-6.68E+05	8.41E+05	1.41E+06	-2.91E+05	9.59E+05
136.72	-1.61E+06	7.52E+05	-1.31E+06	-1.79E+06	-4.37E+06	6.56E+06	4.89E+06	-4.16E+06

Table A.56 Raw data for test seal at 10,000 rpm, 100% GVF and 0.5 PR (*Medium* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-5.79E+05	7.65E+05	-1.44E+06	-8.43E+05	-5.33E+04	5.19E+04	-5.08E+04	2.15E+05
19.53	-6.74E+05	7.55E+05	-1.42E+06	-7.80E+05	5.70E+04	2.05E+05	-4.88E+04	1.95E+05
29.3	-8.63E+05	9.43E+05	-1.26E+06	-8.92E+05	8.07E+05	-4.03E+05	-7.62E+05	8.51E+05
39.06	-7.34E+05	8.80E+05	-1.33E+06	-6.97E+05	4.15E+05	6.76E+04	-2.78E+05	1.37E+05
48.83	-8.98E+05	7.75E+05	-1.33E+06	-9.53E+05	3.96E+05	2.73E+05	-3.22E+05	2.89E+05
58.59	-7.89E+05	9.77E+05	-1.37E+06	-9.91E+05	5.75E+05	5.56E+05	-4.54E+05	6.19E+05
68.36	-9.46E+05	7.54E+05	-1.23E+06	-1.36E+06	7.10E+05	8.07E+05	-5.13E+05	5.94E+05
78.13	-1.01E+06	7.90E+05	-1.46E+06	-1.07E+06	7.51E+05	5.56E+05	-5.67E+05	9.03E+05
87.89	-1.05E+06	6.71E+05	-1.48E+06	-1.03E+06	9.76E+05	7.28E+05	-7.78E+05	7.59E+05
97.66	-1.18E+06	6.98E+05	-1.41E+06	-1.18E+06	9.45E+05	9.32E+05	-7.73E+05	8.97E+05
107.42	-1.15E+06	5.24E+05	-1.63E+06	-1.25E+06	1.22E+06	9.50E+05	-9.11E+05	1.31E+06
117.19	-7.82E+05	3.17E+05	-1.91E+06	-1.16E+06	1.16E+06	1.32E+06	-7.97E+05	1.11E+06
126.95	-4.41E+05	3.52E+04	-2.45E+06	-1.06E+06	8.41E+05	1.62E+06	-4.92E+05	1.06E+06
136.72	-1.94E+06	9.90E+05	-1.01E+06	-2.40E+06	-4.31E+06	6.82E+06	4.70E+06	-4.03E+06

Table A.57 Raw data for test seal at 15,000 rpm, 100% GVF and 0.5 PR (*Medium* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-8.84E+05	7.77E+05	-1.55E+06	-9.41E+05	2.20E+04	8.28E+04	-3.95E+04	8.47E+04
19.53	-9.55E+05	8.43E+05	-1.54E+06	-1.01E+06	2.07E+05	1.97E+05	-1.78E+05	6.84E+04
29.3	-1.15E+06	8.25E+05	-1.36E+06	-1.29E+06	6.12E+05	-1.54E+05	-6.26E+05	5.21E+05
39.06	-1.03E+06	8.50E+05	-1.55E+06	-1.09E+06	3.93E+05	4.31E+05	-4.21E+05	3.61E+05
48.83	-1.21E+06	8.29E+05	-1.58E+06	-1.24E+06	4.71E+05	5.43E+05	-4.80E+05	4.26E+05
58.59	-1.12E+06	9.84E+05	-1.54E+06	-1.41E+06	6.47E+05	7.26E+05	-5.25E+05	7.09E+05
68.36	-1.19E+06	9.15E+05	-1.57E+06	-1.40E+06	8.15E+05	6.74E+05	-6.11E+05	7.10E+05
78.13	-1.19E+06	8.91E+05	-1.64E+06	-1.41E+06	8.36E+05	8.43E+05	-6.84E+05	9.32E+05
87.89	-1.33E+06	8.47E+05	-1.67E+06	-1.46E+06	9.99E+05	9.05E+05	-8.42E+05	9.89E+05
97.66	-1.48E+06	7.86E+05	-1.61E+06	-1.49E+06	1.11E+06	9.90E+05	-8.47E+05	1.09E+06
107.42	-1.40E+06	6.28E+05	-1.79E+06	-1.45E+06	1.33E+06	1.11E+06	-9.39E+05	1.42E+06
117.19	-1.20E+06	3.74E+05	-2.12E+06	-1.43E+06	1.24E+06	1.39E+06	-9.82E+05	1.34E+06
126.95	-7.99E+05	2.43E+04	-2.66E+06	-1.15E+06	9.80E+05	1.84E+06	-5.76E+05	1.06E+06
136.72	-2.12E+06	8.35E+05	-1.35E+06	-2.51E+06	-4.15E+06	6.99E+06	4.49E+06	-3.82E+06

Table A.58 Raw data for test seal at 5,000 rpm, 98% GVF and 0.5 PR (*Medium* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-6.19E+05	6.36E+05	-1.33E+06	-5.97E+05	-3.91E+04	-6.98E+04	1.24E+05	6.53E+04
19.53	-7.18E+05	6.50E+05	-1.20E+06	-6.78E+05	2.26E+05	-4.19E+04	1.05E+05	1.40E+05
29.3	-9.95E+05	6.63E+05	-8.49E+05	-1.10E+06	1.16E+06	-9.84E+05	-7.68E+05	1.15E+06
39.06	-7.33E+05	4.98E+05	-1.06E+06	-7.68E+05	4.97E+05	1.49E+05	-1.31E+05	5.26E+05
48.83	-8.76E+05	5.31E+05	-1.12E+06	-8.47E+05	4.53E+05	2.40E+05	-9.44E+04	4.81E+05
58.59	-9.20E+05	6.99E+05	-9.63E+05	-1.03E+06	7.76E+05	3.16E+05	-2.09E+05	8.93E+05
68.36	-8.90E+05	5.78E+05	-1.09E+06	-8.38E+05	9.07E+05	2.62E+05	-2.15E+05	8.53E+05
78.13	-8.66E+05	5.35E+05	-1.20E+06	-9.27E+05	9.76E+05	3.26E+05	-2.30E+05	1.05E+06
87.89	-1.02E+06	4.98E+05	-1.20E+06	-1.00E+06	1.12E+06	3.39E+05	-3.42E+05	1.12E+06
97.66	-1.21E+06	4.56E+05	-1.15E+06	-1.02E+06	1.18E+06	4.65E+05	-3.53E+05	1.20E+06
107.42	-1.12E+06	3.27E+05	-1.37E+06	-1.06E+06	1.48E+06	4.70E+05	-4.31E+05	1.53E+06
117.19	-8.61E+05	1.59E+05	-1.67E+06	-1.02E+06	1.44E+06	6.69E+05	-3.11E+05	1.47E+06
126.95	-5.61E+05	-1.54E+05	-2.15E+06	-9.85E+05	1.11E+06	9.83E+05	7.70E+04	1.31E+06
136.72	-2.12E+06	1.03E+06	-5.34E+05	-2.53E+06	-3.46E+06	6.07E+06	5.28E+06	-3.59E+06

Table A.59 Raw data for test seal at 10,000 rpm, 98% GVF and 0.5 PR (*Medium* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-8.86E+05	8.71E+05	-1.56E+06	-6.83E+05	-1.36E+05	2.04E+04	2.44E+05	8.22E+04
19.53	-9.73E+05	8.36E+05	-1.36E+06	-9.08E+05	1.31E+05	-1.73E+05	2.27E+05	3.56E+04
29.3	-1.17E+06	6.21E+05	-1.02E+06	-1.32E+06	1.52E+06	-1.45E+06	-1.12E+06	1.67E+06
39.06	-9.41E+05	5.52E+05	-1.17E+06	-9.92E+05	5.69E+05	1.38E+05	-1.09E+05	6.14E+05
48.83	-1.13E+06	5.77E+05	-1.12E+06	-9.12E+05	6.34E+05	3.12E+05	-1.31E+05	4.98E+05
58.59	-9.79E+05	7.16E+05	-1.12E+06	-1.14E+06	8.39E+05	5.09E+05	-7.75E+04	7.76E+05
68.36	-1.07E+06	8.26E+05	-1.04E+06	-1.20E+06	9.30E+05	4.08E+05	-2.62E+05	8.61E+05
78.13	-1.03E+06	7.24E+05	-1.16E+06	-1.17E+06	1.02E+06	4.86E+05	-3.36E+05	1.09E+06
87.89	-1.23E+06	6.70E+05	-1.21E+06	-1.21E+06	1.20E+06	4.18E+05	-4.87E+05	1.19E+06
97.66	-1.42E+06	6.06E+05	-1.16E+06	-1.26E+06	1.36E+06	5.17E+05	-4.92E+05	1.25E+06
107.42	-1.34E+06	4.05E+05	-1.37E+06	-1.27E+06	1.73E+06	5.84E+05	-5.87E+05	1.61E+06
117.19	-1.03E+06	3.14E+05	-1.68E+06	-1.30E+06	1.55E+06	8.02E+05	-4.68E+05	1.53E+06
126.95	-8.04E+05	4.39E+04	-2.12E+06	-1.26E+06	1.23E+06	1.11E+06	-8.24E+04	1.46E+06
136.72	-2.35E+06	1.35E+06	-1.79E+05	-2.93E+06	-3.49E+06	6.13E+06	4.90E+06	-3.39E+06

Table A.60 Raw data for test seal at 15,000 rpm, 98% GVF and 0.5 PR (*Medium* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-8.36E+05	1.18E+06	-1.91E+06	-7.44E+05	-4.69E+05	3.52E+04	2.71E+05	-1.84E+05
19.53	-1.32E+06	9.93E+05	-1.31E+06	-1.18E+06	2.81E+05	-2.79E+05	3.06E+05	6.06E+04
29.3	-1.38E+06	8.12E+05	-1.16E+06	-1.42E+06	1.59E+06	-1.46E+06	-1.08E+06	1.56E+06
39.06	-1.03E+06	5.78E+05	-1.04E+06	-1.11E+06	7.75E+05	1.79E+05	-3.05E+05	8.05E+05
48.83	-1.24E+06	7.55E+05	-1.28E+06	-1.04E+06	5.94E+05	4.22E+05	-2.75E+05	5.61E+05
58.59	-1.24E+06	8.33E+05	-1.18E+06	-1.30E+06	1.08E+06	5.21E+05	-3.31E+05	9.83E+05
68.36	-1.16E+06	7.45E+05	-1.13E+06	-1.36E+06	1.16E+06	5.28E+05	-4.87E+05	1.06E+06
78.13	-1.24E+06	9.51E+05	-1.35E+06	-1.39E+06	1.12E+06	5.18E+05	-5.07E+05	1.11E+06
87.89	-1.42E+06	7.88E+05	-1.36E+06	-1.45E+06	1.29E+06	5.37E+05	-5.66E+05	1.26E+06
97.66	-1.55E+06	7.53E+05	-1.29E+06	-1.48E+06	1.48E+06	6.93E+05	-6.54E+05	1.48E+06
107.42	-1.44E+06	5.73E+05	-1.56E+06	-1.43E+06	1.79E+06	7.41E+05	-7.09E+05	1.87E+06
117.19	-1.17E+06	4.80E+05	-1.79E+06	-1.41E+06	1.63E+06	9.84E+05	-6.66E+05	1.76E+06
126.95	-9.93E+05	2.06E+05	-2.22E+06	-1.36E+06	1.36E+06	1.27E+06	-2.98E+05	1.68E+06
136.72	-2.53E+06	1.46E+06	-2.67E+05	-3.03E+06	-3.38E+06	6.31E+06	4.71E+06	-3.16E+06

Table A.61 Raw data for test seal at 5,000 rpm, 96% GVF and 0.5 PR (*Medium* Preswirl)

Freq.	*Re*(H_{XX})	*Re*(H_{XY})	*Re*(H_{YX})	*Re*(H_{YY})	*Im*(H_{XX})	*Im*(H_{XY})	*Im*(H_{YX})	*Im*(H_{YY})
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-7.38E+05	6.94E+05	-1.27E+06	-7.18E+05	-8.23E+04	-5.71E+04	1.25E+05	1.44E+05
19.53	-8.80E+05	6.57E+05	-1.11E+06	-7.55E+05	1.82E+05	-9.63E+04	1.28E+05	1.15E+05
29.3	-9.50E+05	5.35E+05	-9.44E+05	-9.02E+05	1.37E+06	-1.27E+06	-1.10E+06	1.42E+06
39.06	-9.09E+05	4.96E+05	-8.37E+05	-8.51E+05	5.82E+05	2.67E+02	-5.06E+04	5.17E+05
48.83	-1.03E+06	5.41E+05	-9.15E+05	-9.46E+05	5.69E+05	1.60E+05	-8.82E+04	5.73E+05
58.59	-1.05E+06	6.17E+05	-8.85E+05	-1.13E+06	9.29E+05	2.14E+05	-1.24E+05	9.55E+05
68.36	-1.02E+06	6.34E+05	-8.58E+05	-1.09E+06	9.26E+05	2.89E+05	-2.01E+05	9.63E+05
78.13	-1.01E+06	5.30E+05	-1.04E+06	-1.01E+06	1.04E+06	2.72E+05	-2.46E+05	1.22E+06
87.89	-1.15E+06	5.10E+05	-1.07E+06	-1.08E+06	1.14E+06	3.14E+05	-3.30E+05	1.09E+06
97.66	-1.34E+06	5.32E+05	-9.71E+05	-1.14E+06	1.21E+06	4.27E+05	-3.23E+05	1.24E+06
107.42	-1.31E+06	3.69E+05	-1.25E+06	-1.08E+06	1.48E+06	4.33E+05	-3.84E+05	1.65E+06
117.19	-1.05E+06	2.65E+05	-1.48E+06	-1.26E+06	1.37E+06	5.84E+05	-2.65E+05	1.51E+06
126.95	-9.50E+05	3.22E+04	-1.90E+06	-1.23E+06	1.16E+06	7.60E+05	1.28E+05	1.50E+06
136.72	-2.65E+06	1.61E+06	1.73E+05	-3.22E+06	-3.57E+06	5.67E+06	5.06E+06	-3.04E+06

Table A.62 Raw data for test seal at 10,000 rpm, 96% GVF and 0.5 PR (*Medium* Preswirl)

Freq.	*Re*(H_{XX})	*Re*(H_{XY})	*Re*(H_{YX})	*Re*(H_{YY})	*Im*(H_{XX})	*Im*(H_{XY})	*Im*(H_{YX})	*Im*(H_{YY})
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-9.34E+05	1.02E+06	-1.43E+06	-9.36E+05	-2.01E+05	-1.85E+05	3.43E+05	-5.47E+04
19.53	-1.09E+06	7.48E+05	-1.02E+06	-1.13E+06	2.50E+05	-3.39E+05	2.63E+05	2.08E+05
29.3	-1.07E+06	4.50E+05	-1.00E+06	-1.01E+06	1.65E+06	-1.47E+06	-1.20E+06	1.71E+06
39.06	-1.11E+06	6.06E+05	-9.10E+05	-1.07E+06	6.19E+05	1.01E+05	-7.51E+04	6.51E+05
48.83	-1.07E+06	4.22E+05	-9.82E+05	-1.09E+06	6.31E+05	2.27E+05	-3.01E+05	7.60E+05
58.59	-1.07E+06	7.93E+05	-8.74E+05	-1.23E+06	8.98E+05	4.26E+05	-1.55E+05	9.29E+05
68.36	-1.18E+06	7.71E+05	-8.63E+05	-1.35E+06	9.33E+05	2.74E+05	-2.35E+05	9.03E+05
78.13	-1.20E+06	7.32E+05	-1.06E+06	-1.26E+06	1.09E+06	3.51E+05	-3.54E+05	1.16E+06
87.89	-1.37E+06	6.33E+05	-1.11E+06	-1.31E+06	1.19E+06	4.12E+05	-3.77E+05	1.23E+06
97.66	-1.55E+06	6.35E+05	-1.01E+06	-1.39E+06	1.36E+06	4.66E+05	-4.20E+05	1.33E+06
107.42	-1.49E+06	4.85E+05	-1.25E+06	-1.34E+06	1.60E+06	4.85E+05	-4.07E+05	1.66E+06
117.19	-1.23E+06	3.73E+05	-1.44E+06	-1.49E+06	1.47E+06	6.66E+05	-3.83E+05	1.60E+06
126.95	-1.16E+06	1.98E+05	-1.81E+06	-1.54E+06	1.27E+06	9.06E+05	1.29E+04	1.58E+06
136.72	-2.97E+06	1.78E+06	3.47E+05	-3.50E+06	-3.44E+06	5.75E+06	4.78E+06	-3.03E+06

Table A.63 Raw data for test seal at 15,000 rpm, 96% GVF and 0.5 PR (*Medium* Preswirl)

Freq.	*Re(H_{XX})*	*Re(H_{XY})*	*Re(H_{YX})*	*Re(H_{YY})*	*Im(H_{XX})*	*Im(H_{XY})*	*Im(H_{YX})*	*Im(H_{YY})*
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.03E+06	1.38E+06	-1.77E+06	-8.34E+05	-5.83E+04	-1.75E+05	4.30E+05	-3.44E+05
19.53	-1.41E+06	9.82E+05	-1.60E+06	-1.29E+06	-2.83E+03	-4.72E+05	5.45E+05	5.77E+04
29.3	-1.18E+06	5.59E+05	-7.30E+05	-1.50E+06	1.79E+06	-1.61E+06	-9.65E+05	1.65E+06
39.06	-1.15E+06	5.03E+05	-8.55E+05	-1.32E+06	9.09E+05	-2.01E+05	-8.31E+04	8.37E+05
48.83	-1.16E+06	3.77E+05	-1.04E+06	-1.01E+06	7.30E+05	3.32E+05	-3.14E+05	9.37E+05
58.59	-1.04E+06	6.39E+05	-1.13E+06	-1.25E+06	1.09E+06	4.86E+05	-3.10E+05	1.07E+06
68.36	-1.10E+06	7.98E+05	-1.21E+06	-1.19E+06	1.01E+06	4.93E+05	-3.85E+05	1.12E+06
78.13	-1.13E+06	7.15E+05	-1.25E+06	-1.28E+06	1.19E+06	4.71E+05	-4.29E+05	1.31E+06
87.89	-1.35E+06	6.90E+05	-1.26E+06	-1.42E+06	1.36E+06	4.45E+05	-5.42E+05	1.45E+06
97.66	-1.46E+06	6.60E+05	-1.22E+06	-1.40E+06	1.44E+06	6.08E+05	-6.00E+05	1.59E+06
107.42	-1.40E+06	4.85E+05	-1.45E+06	-1.36E+06	1.74E+06	6.95E+05	-5.74E+05	1.91E+06
117.19	-1.14E+06	3.94E+05	-1.65E+06	-1.44E+06	1.64E+06	8.14E+05	-5.97E+05	1.81E+06
126.95	-9.71E+05	1.30E+05	-2.14E+06	-1.39E+06	1.39E+06	1.12E+06	-2.28E+05	1.82E+06
136.72	-2.48E+06	1.37E+06	-2.64E+05	-3.05E+06	-3.31E+06	6.15E+06	4.78E+06	-3.10E+06

Table A.64 Raw data for test seal at 5,000 rpm, 94% GVF and 0.5 PR (*Medium* Preswirl)

Freq.	*Re(H_{XX})*	*Re(H_{XY})*	*Re(H_{YX})*	*Re(H_{YY})*	*Im(H_{XX})*	*Im(H_{XY})*	*Im(H_{YX})*	*Im(H_{YY})*
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-5.73E+05	6.34E+05	-1.23E+06	-6.57E+05	-2.93E+04	-1.46E+05	1.72E+05	1.16E+05
19.53	-6.96E+05	5.32E+05	-1.01E+06	-5.98E+05	2.96E+05	-8.66E+04	1.73E+05	2.98E+05
29.3	-6.48E+05	4.58E+05	-9.49E+05	-8.07E+05	1.34E+06	-1.06E+06	-9.04E+05	1.45E+06
39.06	-6.77E+05	4.74E+05	-1.00E+06	-6.53E+05	5.41E+05	1.23E+05	-5.65E+04	6.48E+05
48.83	-8.64E+05	4.75E+05	-9.30E+05	-6.64E+05	6.35E+05	1.76E+05	4.16E+03	6.60E+05
58.59	-7.75E+05	5.22E+05	-9.20E+05	-7.94E+05	9.32E+05	2.26E+05	-7.83E+04	9.77E+05
68.36	-8.01E+05	5.97E+05	-9.68E+05	-7.64E+05	9.36E+05	3.19E+05	-1.34E+05	9.06E+05
78.13	-8.00E+05	4.63E+05	-1.09E+06	-8.69E+05	1.12E+06	2.67E+05	-1.32E+05	1.14E+06
87.89	-9.16E+05	4.18E+05	-1.11E+06	-9.59E+05	1.27E+06	2.73E+05	-2.36E+05	1.20E+06
97.66	-1.09E+06	3.96E+05	-1.03E+06	-1.02E+06	1.36E+06	3.91E+05	-2.54E+05	1.37E+06
107.42	-1.04E+06	2.01E+05	-1.19E+06	-1.03E+06	1.63E+06	3.68E+05	-2.83E+05	1.73E+06
117.19	-7.57E+05	1.30E+05	-1.43E+06	-1.08E+06	1.54E+06	5.57E+05	-2.07E+05	1.69E+06
126.95	-6.02E+05	-1.39E+05	-1.86E+06	-1.07E+06	1.28E+06	8.46E+05	1.87E+05	1.62E+06
136.72	-2.08E+06	1.21E+06	3.85E+04	-2.67E+06	-3.46E+06	5.87E+06	5.24E+06	-3.26E+06

Table A.65 Raw data for test seal at 10,000 rpm, 94% GVF and 0.5 PR (*Medium* Preswirl)

Freq.	*Re(H_{XX})*	*Re(H_{XY})*	*Re(H_{YX})*	*Re(H_{YY})*	*Im(H_{XX})*	*Im(H_{XY})*	*Im(H_{YX})*	*Im(H_{YY})*
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-6.40E+05	1.04E+06	-1.54E+06	-8.25E+05	-3.16E+05	-2.56E+05	3.71E+05	-1.21E+05
19.53	-9.37E+05	6.96E+05	-1.07E+06	-9.15E+05	2.90E+05	-3.89E+05	3.18E+05	2.84E+05
29.3	-7.95E+05	3.89E+05	-1.04E+06	-9.77E+05	1.50E+06	-1.44E+06	-9.94E+05	1.88E+06
39.06	-8.82E+05	4.50E+05	-9.21E+05	-8.13E+05	5.94E+05	4.71E+04	-3.99E+03	7.88E+05
48.83	-9.17E+05	3.24E+05	-8.18E+05	-8.49E+05	7.78E+05	9.03E+04	-1.10E+05	8.34E+05
58.59	-8.52E+05	6.52E+05	-9.07E+05	-9.47E+05	9.63E+05	3.65E+05	-1.65E+05	9.42E+05
68.36	-8.23E+05	6.23E+05	-9.59E+05	-1.11E+06	1.04E+06	2.82E+05	-2.94E+05	1.04E+06
78.13	-8.85E+05	5.70E+05	-1.07E+06	-1.00E+06	1.14E+06	3.34E+05	-2.25E+05	1.19E+06
87.89	-1.06E+06	5.20E+05	-1.08E+06	-1.09E+06	1.27E+06	3.60E+05	-2.94E+05	1.32E+06
97.66	-1.19E+06	5.29E+05	-1.04E+06	-1.12E+06	1.37E+06	4.42E+05	-3.90E+05	1.48E+06
107.42	-1.16E+06	3.35E+05	-1.21E+06	-1.12E+06	1.72E+06	4.52E+05	-4.18E+05	1.77E+06
117.19	-9.10E+05	2.17E+05	-1.45E+06	-1.19E+06	1.55E+06	6.33E+05	-3.58E+05	1.70E+06
126.95	-8.24E+05	-1.02E+04	-1.85E+06	-1.21E+06	1.30E+06	9.45E+05	3.99E+04	1.69E+06
136.72	-2.45E+06	1.42E+06	1.90E+05	-2.97E+06	-3.44E+06	5.94E+06	4.96E+06	-3.16E+06

Table A.66 Raw data for test seal at 15,000 rpm, 94% GVF and 0.5 PR (*Medium* Preswirl)

Freq.	*Re(H_{XX})*	*Re(H_{XY})*	*Re(H_{YX})*	*Re(H_{YY})*	*Im(H_{XX})*	*Im(H_{XY})*	*Im(H_{YX})*	*Im(H_{YY})*
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-5.88E+05	1.31E+06	-1.76E+06	-8.56E+05	-4.62E+05	-1.46E+05	2.38E+05	-1.68E+05
19.53	-1.23E+06	8.96E+05	-1.23E+06	-1.18E+06	1.25E+05	-8.66E+04	5.02E+05	2.18E+05
29.3	-9.26E+05	3.83E+05	-1.08E+06	-9.93E+05	1.83E+06	-1.06E+06	-1.16E+06	2.05E+06
39.06	-9.96E+05	4.69E+05	-9.67E+05	-9.10E+05	7.69E+05	1.23E+05	3.58E+04	9.10E+05
48.83	-9.97E+05	3.51E+05	-8.44E+05	-7.54E+05	8.37E+05	1.76E+05	-7.56E+04	1.04E+06
58.59	-7.96E+05	6.43E+05	-1.01E+06	-9.89E+05	9.85E+05	2.26E+05	-2.50E+05	1.02E+06
68.36	-9.86E+05	7.99E+05	-9.64E+05	-1.04E+06	1.06E+06	3.19E+05	-3.18E+05	1.13E+06
78.13	-9.17E+05	5.94E+05	-1.16E+06	-1.04E+06	1.20E+06	2.67E+05	-2.92E+05	1.27E+06
87.89	-1.09E+06	5.74E+05	-1.17E+06	-1.11E+06	1.33E+06	2.73E+05	-3.63E+05	1.37E+06
97.66	-1.23E+06	5.58E+05	-1.09E+06	-1.16E+06	1.44E+06	3.91E+05	-4.47E+05	1.51E+06
107.42	-1.12E+06	4.54E+05	-1.29E+06	-1.18E+06	1.70E+06	3.68E+05	-5.48E+05	1.85E+06
117.19	-9.50E+05	3.14E+05	-1.49E+06	-1.28E+06	1.56E+06	5.57E+05	-5.53E+05	1.83E+06
126.95	-8.50E+05	1.12E+05	-1.87E+06	-1.21E+06	1.33E+06	8.46E+05	-9.63E+04	1.83E+06
136.72	-2.60E+06	1.65E+06	2.24E+05	-3.18E+06	-3.44E+06	5.87E+06	4.73E+06	-3.01E+06

Table A.67 Raw data for test seal at 5,000 rpm, 92% GVF and 0.5 PR (*Medium* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-5.38E+05	7.31E+05	-1.17E+06	-7.24E+05	-3.00E+04	-2.10E+05	1.32E+05	2.82E+05
19.53	-6.66E+05	6.40E+05	-9.70E+05	-5.14E+05	3.17E+05	-1.30E+05	1.75E+05	2.90E+05
29.3	-5.66E+05	3.82E+05	-1.03E+06	-5.38E+05	1.63E+06	-1.46E+06	-1.19E+06	1.86E+06
39.06	-7.32E+05	6.33E+05	-9.38E+05	-6.33E+05	6.40E+05	8.11E+04	-4.34E+04	7.01E+05
48.83	-9.23E+05	4.90E+05	-7.85E+05	-7.72E+05	8.38E+05	-1.81E+04	6.01E+04	7.59E+05
58.59	-6.77E+05	6.68E+05	-8.37E+05	-8.16E+05	1.06E+06	1.84E+05	-1.09E+05	9.46E+05
68.36	-8.29E+05	6.14E+05	-8.36E+05	-8.33E+05	1.12E+06	2.47E+05	-1.66E+05	1.10E+06
78.13	-7.67E+05	5.45E+05	-1.02E+06	-8.11E+05	1.25E+06	2.23E+05	-1.40E+05	1.29E+06
87.89	-8.72E+05	5.18E+05	-1.02E+06	-9.77E+05	1.36E+06	2.81E+05	-2.29E+05	1.32E+06
97.66	-1.09E+06	5.12E+05	-9.29E+05	-1.05E+06	1.49E+06	3.09E+05	-2.44E+05	1.51E+06
107.42	-1.05E+06	4.01E+05	-1.08E+06	-1.07E+06	1.78E+06	3.21E+05	-2.68E+05	1.80E+06
117.19	-8.55E+05	3.44E+05	-1.29E+06	-1.20E+06	1.66E+06	4.87E+05	-1.74E+05	1.80E+06
126.95	-8.75E+05	1.97E+05	-1.60E+06	-1.27E+06	1.49E+06	6.62E+05	2.00E+05	1.92E+06
136.72	-3.10E+06	2.27E+06	1.01E+06	-3.73E+06	-2.94E+06	5.13E+06	4.76E+06	-2.40E+06

Table A.68 Raw data for test seal at 10,000 rpm, 92% GVF and 0.5 PR (*Medium* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-7.19E+05	1.04E+06	-1.39E+06	-8.06E+05	-2.19E+05	-2.46E+05	3.08E+05	5.86E+04
19.53	-8.86E+05	8.13E+05	-9.73E+05	-7.70E+05	3.05E+05	-2.81E+05	3.16E+05	3.17E+05
29.3	-4.91E+05	2.63E+05	-1.15E+06	-5.09E+05	1.78E+06	-1.48E+06	-1.29E+06	2.01E+06
39.06	-8.47E+05	6.28E+05	-8.67E+05	-7.92E+05	6.82E+05	6.38E+04	9.66E+02	7.85E+05
48.83	-1.04E+06	5.94E+05	-7.17E+05	-8.66E+05	8.56E+05	5.21E+04	8.57E+04	8.59E+05
58.59	-7.43E+05	8.13E+05	-7.30E+05	-8.26E+05	1.07E+06	3.17E+05	-1.91E+05	9.84E+05
68.36	-9.13E+05	7.34E+05	-7.80E+05	-9.21E+05	1.14E+06	2.88E+05	-2.09E+05	1.23E+06
78.13	-8.96E+05	7.02E+05	-9.01E+05	-9.24E+05	1.26E+06	2.96E+05	-1.95E+05	1.25E+06
87.89	-1.06E+06	6.61E+05	-8.89E+05	-1.07E+06	1.39E+06	3.30E+05	-3.14E+05	1.40E+06
97.66	-1.20E+06	6.34E+05	-8.29E+05	-1.13E+06	1.58E+06	4.09E+05	-3.51E+05	1.55E+06
107.42	-1.22E+06	6.07E+05	-9.74E+05	-1.23E+06	1.79E+06	3.98E+05	-3.63E+05	1.81E+06
117.19	-1.09E+06	5.13E+05	-1.14E+06	-1.35E+06	1.70E+06	5.59E+05	-3.70E+05	1.92E+06
126.95	-1.25E+06	3.62E+05	-1.36E+06	-1.34E+06	1.68E+06	5.85E+05	-5.98E+04	2.03E+06
136.72	-4.13E+06	2.72E+06	1.76E+06	-4.23E+06	-1.55E+06	4.17E+06	3.04E+06	-1.09E+06

Table A.69 Raw data for test seal at 15,000 rpm, 92% GVF and 0.5 PR (*Medium* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-7.71E+05	1.28E+06	-1.65E+06	-7.96E+05	-3.58E+05	-2.05E+05	3.41E+05	-8.91E+04
19.53	-1.13E+06	9.46E+05	-1.11E+06	-9.12E+05	2.58E+05	-3.41E+05	5.26E+05	2.14E+05
29.3	-4.66E+05	2.25E+05	-1.40E+06	-6.17E+05	1.94E+06	-1.81E+06	-1.32E+06	2.21E+06
39.06	-9.17E+05	6.27E+05	-9.00E+05	-8.91E+05	7.39E+05	3.15E+04	4.60E+04	8.65E+05
48.83	-1.03E+06	5.93E+05	-7.86E+05	-9.51E+05	8.82E+05	-2.35E+04	3.02E+04	9.10E+05
58.59	-7.17E+05	7.20E+05	-7.41E+05	-9.10E+05	1.15E+06	2.63E+05	-2.43E+05	1.08E+06
68.36	-9.09E+05	6.90E+05	-8.89E+05	-1.04E+06	1.17E+06	3.42E+05	-2.68E+05	1.18E+06
78.13	-9.11E+05	7.18E+05	-9.59E+05	-9.99E+05	1.28E+06	4.13E+05	-2.82E+05	1.29E+06
87.89	-1.08E+06	6.87E+05	-9.26E+05	-1.14E+06	1.46E+06	4.58E+05	-3.78E+05	1.41E+06
97.66	-1.24E+06	6.94E+05	-9.24E+05	-1.20E+06	1.57E+06	5.62E+05	-4.10E+05	1.63E+06
107.42	-1.24E+06	6.23E+05	-1.06E+06	-1.30E+06	1.74E+06	5.22E+05	-4.29E+05	1.91E+06
117.19	-1.14E+06	5.44E+05	-1.19E+06	-1.45E+06	1.68E+06	6.84E+05	-4.69E+05	2.02E+06
126.95	-1.25E+06	3.91E+05	-1.40E+06	-1.43E+06	1.58E+06	7.33E+05	-2.17E+05	2.14E+06
136.72	-3.95E+06	2.58E+06	1.52E+06	-4.16E+06	-2.16E+06	4.66E+06	3.57E+06	-1.48E+06

Table A.70 Raw data for test seal at 5,000 rpm, 90% GVF and 0.5 PR (*Medium* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-7.32E+05	8.93E+05	-9.38E+05	-8.71E+05	8.71E+04	-2.52E+05	1.85E+05	2.04E+05
19.53	-7.26E+05	7.96E+05	-7.78E+05	-7.20E+05	3.81E+05	-1.13E+05	1.17E+05	3.82E+05
29.3	-2.95E+05	1.73E+05	-1.33E+06	-2.69E+05	1.76E+06	-1.46E+06	-1.28E+06	2.10E+06
39.06	-8.36E+05	7.82E+05	-7.05E+05	-8.44E+05	7.08E+05	6.74E+04	-5.71E+04	8.24E+05
48.83	-1.00E+06	7.69E+05	-6.50E+05	-8.89E+05	8.73E+05	-5.90E+02	-2.37E+03	9.01E+05
58.59	-7.32E+05	7.84E+05	-5.96E+05	-9.54E+05	1.14E+06	1.74E+05	-1.09E+05	1.12E+06
68.36	-9.56E+05	7.97E+05	-6.14E+05	-9.27E+05	1.20E+06	1.30E+05	-1.57E+05	1.27E+06
78.13	-9.31E+05	7.38E+05	-7.33E+05	-9.97E+05	1.35E+06	1.97E+05	-1.46E+05	1.33E+06
87.89	-1.05E+06	7.18E+05	-7.41E+05	-1.11E+06	1.48E+06	2.25E+05	-2.14E+05	1.45E+06
97.66	-1.24E+06	7.46E+05	-6.56E+05	-1.20E+06	1.68E+06	3.09E+05	-2.17E+05	1.63E+06
107.42	-1.29E+06	7.89E+05	-6.76E+05	-1.34E+06	1.83E+06	2.82E+05	-2.63E+05	1.87E+06
117.19	-1.24E+06	7.16E+05	-8.79E+05	-1.52E+06	1.79E+06	3.94E+05	-2.20E+05	2.04E+06
126.95	-1.42E+06	5.90E+05	-9.54E+05	-1.61E+06	2.06E+06	4.35E+05	3.58E+03	2.16E+06
136.72	-3.92E+06	2.79E+06	1.66E+06	-4.01E+06	7.05E+05	2.25E+06	1.05E+06	8.37E+05

Table A.71 Raw data for test seal at 10,000 rpm, 90% GVF and 0.5 PR (*Medium* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-7.34E+05	9.82E+05	-1.16E+06	-8.88E+05	-6.18E+04	-3.05E+05	2.83E+05	1.55E+05
19.53	-8.09E+05	7.24E+05	-9.26E+05	-7.89E+05	3.79E+05	-2.59E+05	2.61E+05	3.88E+05
29.3	-4.16E+05	1.87E+05	-1.30E+06	-2.70E+05	1.87E+06	-1.51E+06	-1.37E+06	2.17E+06
39.06	-8.02E+05	7.76E+05	-8.42E+05	-7.70E+05	6.80E+05	1.38E+05	-3.72E+04	8.62E+05
48.83	-9.93E+05	7.48E+05	-7.54E+05	-8.13E+05	8.58E+05	7.63E+04	-5.84E+03	8.55E+05
58.59	-8.03E+05	7.91E+05	-6.66E+05	-9.10E+05	1.16E+06	2.69E+05	-9.48E+04	1.11E+06
68.36	-9.68E+05	7.85E+05	-6.87E+05	-9.65E+05	1.17E+06	2.35E+05	-1.24E+05	1.27E+06
78.13	-8.94E+05	7.56E+05	-8.50E+05	-9.89E+05	1.29E+06	2.52E+05	-1.96E+05	1.31E+06
87.89	-1.05E+06	7.50E+05	-8.39E+05	-1.13E+06	1.51E+06	2.95E+05	-2.73E+05	1.49E+06
97.66	-1.23E+06	7.44E+05	-7.73E+05	-1.15E+06	1.67E+06	4.18E+05	-3.20E+05	1.69E+06
107.42	-1.31E+06	7.27E+05	-8.72E+05	-1.29E+06	1.87E+06	4.04E+05	-3.92E+05	1.86E+06
117.19	-1.19E+06	6.78E+05	-1.05E+06	-1.45E+06	1.80E+06	4.89E+05	-3.07E+05	2.07E+06
126.95	-1.47E+06	4.92E+05	-1.13E+06	-1.50E+06	2.02E+06	5.79E+05	-6.61E+04	2.06E+06
136.72	-4.35E+06	3.01E+06	1.89E+06	-4.35E+06	-1.46E+05	3.13E+06	1.80E+06	2.62E+05

Table A.72 Raw data for test seal at 15,000 rpm, 90% GVF and 0.5 PR (*Medium* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-6.91E+05	1.30E+06	-1.50E+06	-7.94E+05	-1.80E+05	-1.60E+05	1.77E+05	-4.58E+04
19.53	-9.88E+05	8.76E+05	-1.01E+06	-9.53E+05	3.48E+05	-3.31E+05	4.06E+05	3.32E+05
29.3	-4.42E+05	1.94E+05	-1.37E+06	-6.14E+05	1.99E+06	-1.90E+06	-1.34E+06	2.35E+06
39.06	-8.80E+05	7.80E+05	-7.94E+05	-8.15E+05	6.86E+05	1.13E+05	7.63E+04	9.00E+05
48.83	-1.05E+06	7.47E+05	-7.62E+05	-9.30E+05	8.69E+05	2.38E+04	5.62E+04	8.75E+05
58.59	-7.89E+05	7.50E+05	-7.01E+05	-9.34E+05	1.20E+06	2.90E+05	-2.00E+05	1.13E+06
68.36	-9.19E+05	7.26E+05	-7.41E+05	-1.05E+06	1.26E+06	2.47E+05	-3.04E+05	1.30E+06
78.13	-9.16E+05	7.05E+05	-8.94E+05	-1.05E+06	1.36E+06	3.34E+05	-2.32E+05	1.44E+06
87.89	-1.08E+06	7.06E+05	-8.60E+05	-1.18E+06	1.53E+06	4.22E+05	-3.57E+05	1.50E+06
97.66	-1.28E+06	7.75E+05	-8.00E+05	-1.24E+06	1.67E+06	5.37E+05	-3.75E+05	1.70E+06
107.42	-1.27E+06	7.31E+05	-9.60E+05	-1.36E+06	1.86E+06	5.34E+05	-4.64E+05	2.02E+06
117.19	-1.24E+06	6.67E+05	-1.06E+06	-1.49E+06	1.78E+06	6.63E+05	-4.16E+05	2.13E+06
126.95	-1.45E+06	5.34E+05	-1.31E+06	-1.55E+06	1.80E+06	7.86E+05	-1.67E+05	2.12E+06
136.72	-4.37E+06	2.96E+06	1.91E+06	-4.62E+06	-1.31E+06	4.07E+06	2.81E+06	-6.87E+05

Table A.73 Raw data for test seal at 5,000 rpm, 100% GVF and 0.4 PR (*Medium* Preswirl)

Freq.	*Re*(H_{XX})	*Re*(H_{XY})	*Re*(H_{YX})	*Re*(H_{YY})	*Im*(H_{XX})	*Im*(H_{XY})	*Im*(H_{YX})	*Im*(H_{YY})
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-7.79E+05	9.70E+05	-1.38E+06	-7.87E+05	2.64E+04	-1.01E+04	-6.81E+03	1.55E+05
19.53	-7.61E+05	9.66E+05	-1.40E+06	-8.29E+05	1.17E+05	1.05E+05	-6.03E+04	5.80E+04
29.3	-7.34E+05	7.71E+05	-1.44E+06	-7.46E+05	3.53E+05	-9.19E+04	-2.73E+05	3.38E+05
39.06	-8.30E+05	9.88E+05	-1.34E+06	-9.01E+05	3.63E+05	3.43E+05	-3.30E+05	3.75E+05
48.83	-9.75E+05	9.79E+05	-1.35E+06	-9.83E+05	3.86E+05	2.54E+05	-3.29E+05	4.25E+05
58.59	-9.95E+05	1.06E+06	-1.30E+06	-1.12E+06	5.35E+05	4.35E+05	-3.46E+05	5.98E+05
68.36	-1.02E+06	1.09E+06	-1.39E+06	-1.12E+06	6.18E+05	5.16E+05	-4.69E+05	6.43E+05
78.13	-1.06E+06	9.18E+05	-1.50E+06	-1.01E+06	7.34E+05	5.65E+05	-5.24E+05	6.92E+05
87.89	-1.11E+06	8.97E+05	-1.48E+06	-1.20E+06	8.13E+05	5.99E+05	-6.47E+05	7.48E+05
97.66	-1.16E+06	9.06E+05	-1.47E+06	-1.22E+06	8.72E+05	7.46E+05	-6.84E+05	8.33E+05
107.42	-1.20E+06	7.15E+05	-1.62E+06	-1.24E+06	1.01E+06	7.77E+05	-7.88E+05	1.09E+06
117.19	-9.53E+05	5.44E+05	-1.95E+06	-1.17E+06	1.00E+06	1.00E+06	-7.32E+05	1.02E+06
126.95	-6.16E+05	2.94E+05	-2.45E+06	-1.01E+06	6.95E+05	1.37E+06	-3.07E+05	8.82E+05
136.72	-1.78E+06	1.35E+06	-8.99E+05	-2.52E+06	-4.05E+06	6.38E+06	4.76E+06	-4.01E+06

Table A.74 Raw data for test seal at 10,000 rpm, 100% GVF and 0.4 PR (*Medium* Preswirl)

Freq.	*Re*(H_{XX})	*Re*(H_{XY})	*Re*(H_{YX})	*Re*(H_{YY})	*Im*(H_{XX})	*Im*(H_{XY})	*Im*(H_{YX})	*Im*(H_{YY})
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-7.76E+05	1.05E+06	-1.33E+06	-6.99E+05	2.17E+05	7.86E+04	2.79E+05	2.17E+05
19.53	-1.01E+06	8.57E+05	-1.63E+06	-8.21E+05	-8.35E+04	2.11E+05	-1.33E+05	1.50E+05
29.3	-1.02E+06	9.45E+05	-1.33E+06	-9.35E+05	5.80E+05	-2.22E+05	-5.40E+05	4.11E+05
39.06	-9.34E+05	8.09E+05	-1.27E+06	-9.52E+05	3.99E+05	-2.88E+04	-2.50E+05	-5.01E+04
48.83	-1.10E+06	7.66E+05	-1.28E+06	-1.19E+06	2.87E+05	1.94E+05	-4.49E+05	1.39E+05
58.59	-1.09E+06	9.08E+05	-1.41E+06	-1.12E+06	5.24E+05	5.52E+05	-4.54E+05	4.28E+05
68.36	-1.23E+06	8.31E+05	-1.23E+06	-1.78E+06	5.92E+05	7.48E+05	-4.05E+05	7.38E+05
78.13	-1.18E+06	7.19E+05	-1.48E+06	-1.19E+06	6.04E+05	6.36E+05	-6.01E+05	9.31E+05
87.89	-1.19E+06	7.09E+05	-1.61E+06	-1.21E+06	9.37E+05	7.72E+05	-7.73E+05	6.45E+05
97.66	-1.44E+06	7.58E+05	-1.50E+06	-1.33E+06	8.37E+05	9.14E+05	-7.27E+05	7.30E+05
107.42	-1.48E+06	5.12E+05	-1.66E+06	-1.31E+06	1.03E+06	1.04E+06	-9.36E+05	1.25E+06
117.19	-1.09E+06	4.47E+05	-1.99E+06	-1.29E+06	9.15E+05	1.31E+06	-7.60E+05	9.58E+05
126.95	-8.15E+05	1.74E+05	-2.43E+06	-1.14E+06	6.95E+05	1.53E+06	-3.96E+05	9.20E+05
136.72	-2.23E+06	1.36E+06	-6.83E+05	-2.76E+06	-4.04E+06	6.70E+06	4.58E+06	-4.04E+06

Table A.75 Raw data for test seal at 15,000 rpm, 100% GVF and 0.4 PR (*Medium* Preswirl)

Freq.	*Re*(H_{XX})	*Re*(H_{XY})	*Re*(H_{YX})	*Re*(H_{YY})	*Im*(H_{XX})	*Im*(H_{XY})	*Im*(H_{YX})	*Im*(H_{YY})
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-7.76E+05	1.05E+06	-1.33E+06	-6.99E+05	2.17E+05	7.86E+04	2.79E+05	2.17E+05
19.53	-1.01E+06	8.57E+05	-1.63E+06	-8.21E+05	-8.35E+04	2.11E+05	-1.33E+05	1.50E+05
29.3	-1.02E+06	9.45E+05	-1.33E+06	-9.35E+05	5.80E+05	-2.22E+05	-5.40E+05	4.11E+05
39.06	-9.34E+05	8.09E+05	-1.27E+06	-9.52E+05	3.99E+05	-2.88E+04	-2.50E+05	-5.01E+04
48.83	-1.10E+06	7.66E+05	-1.28E+06	-1.19E+06	2.87E+05	1.94E+05	-4.49E+05	1.39E+05
58.59	-1.09E+06	9.08E+05	-1.41E+06	-1.12E+06	5.24E+05	5.52E+05	-4.54E+05	4.28E+05
68.36	-1.23E+06	8.31E+05	-1.23E+06	-1.78E+06	5.92E+05	7.48E+05	-4.05E+05	7.38E+05
78.13	-1.18E+06	7.19E+05	-1.48E+06	-1.19E+06	6.04E+05	6.36E+05	-6.01E+05	9.31E+05
87.89	-1.19E+06	7.09E+05	-1.61E+06	-1.21E+06	9.37E+05	7.72E+05	-7.73E+05	6.45E+05
97.66	-1.44E+06	7.58E+05	-1.50E+06	-1.33E+06	8.37E+05	9.14E+05	-7.27E+05	7.30E+05
107.42	-1.48E+06	5.12E+05	-1.66E+06	-1.31E+06	1.03E+06	1.04E+06	-9.36E+05	1.25E+06
117.19	-1.09E+06	4.47E+05	-1.99E+06	-1.29E+06	9.15E+05	1.31E+06	-7.60E+05	9.58E+05
126.95	-8.15E+05	1.74E+05	-2.43E+06	-1.14E+06	6.95E+05	1.53E+06	-3.96E+05	9.20E+05
136.72	-2.23E+06	1.36E+06	-6.83E+05	-2.76E+06	-4.04E+06	6.70E+06	4.58E+06	-4.04E+06

Table A.76 Raw data for test seal at 5,000 rpm, 98% GVF and 0.4 PR (*Medium* Preswirl)

Freq.	*Re*(H_{XX})	*Re*(H_{XY})	*Re*(H_{YX})	*Re*(H_{YY})	*Im*(H_{XX})	*Im*(H_{XY})	*Im*(H_{YX})	*Im*(H_{YY})
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-7.87E+05	6.98E+05	-1.43E+06	-9.05E+05	-5.67E+04	-2.63E+04	7.71E+04	1.05E+05
19.53	-9.16E+05	7.70E+05	-1.27E+06	-9.11E+05	1.07E+05	-2.82E+04	1.18E+05	2.10E+04
29.3	-1.21E+06	7.20E+05	-1.01E+06	-1.17E+06	1.12E+06	-9.64E+05	-6.89E+05	1.10E+06
39.06	-1.02E+06	5.47E+05	-1.04E+06	-1.03E+06	4.98E+05	1.03E+05	-5.61E+04	4.38E+05
48.83	-1.14E+06	5.89E+05	-1.17E+06	-1.13E+06	4.86E+05	1.46E+05	-1.13E+05	5.42E+05
58.59	-1.07E+06	7.20E+05	-1.22E+06	-1.21E+06	7.83E+05	4.29E+05	-1.20E+05	6.43E+05
68.36	-1.17E+06	7.64E+05	-1.12E+06	-1.41E+06	7.65E+05	2.57E+05	-1.24E+05	7.78E+05
78.13	-1.16E+06	6.05E+05	-1.22E+06	-1.17E+06	8.50E+05	3.13E+05	-2.56E+05	9.96E+05
87.89	-1.36E+06	6.23E+05	-1.29E+06	-1.26E+06	1.01E+06	3.34E+05	-3.62E+05	9.75E+05
97.66	-1.52E+06	6.12E+05	-1.27E+06	-1.28E+06	1.12E+06	4.38E+05	-3.81E+05	1.08E+06
107.42	-1.45E+06	4.10E+05	-1.52E+06	-1.23E+06	1.36E+06	4.86E+05	-3.84E+05	1.42E+06
117.19	-1.14E+06	3.08E+05	-1.65E+06	-1.34E+06	1.24E+06	6.58E+05	-2.93E+05	1.31E+06
126.95	-9.60E+05	1.10E+05	-2.18E+06	-1.24E+06	9.76E+05	8.77E+05	1.42E+05	1.13E+06
136.72	-2.46E+06	1.48E+06	-2.08E+05	-3.12E+06	-3.88E+06	5.85E+06	5.10E+06	-3.39E+06

Table A.77 Raw data for test seal at 10,000 rpm, 98% GVF and 0.4 PR (*Medium* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-9.99E+05	8.98E+05	-1.51E+06	-1.02E+06	-2.17E+05	-9.78E+04	1.74E+05	-4.21E+04
19.53	-1.24E+06	7.69E+05	-1.31E+06	-1.18E+06	6.53E+04	-1.68E+05	3.08E+05	2.55E+04
29.3	-1.33E+06	6.70E+05	-1.04E+06	-1.43E+06	1.34E+06	-1.42E+06	-1.04E+06	1.33E+06
39.06	-1.17E+06	5.66E+05	-1.12E+06	-1.20E+06	4.34E+05	1.51E+05	-1.98E+05	4.76E+05
48.83	-1.32E+06	5.94E+05	-1.20E+06	-1.19E+06	4.47E+05	2.98E+05	-2.28E+05	4.70E+05
58.59	-1.39E+06	7.70E+05	-1.02E+06	-1.43E+06	7.90E+05	3.74E+05	-1.82E+05	7.39E+05
68.36	-1.43E+06	5.54E+05	-9.88E+05	-1.52E+06	8.63E+05	2.93E+05	-2.39E+05	9.00E+05
78.13	-1.38E+06	6.36E+05	-1.16E+06	-1.40E+06	9.84E+05	4.20E+05	-3.97E+05	1.03E+06
87.89	-1.53E+06	6.17E+05	-1.24E+06	-1.43E+06	1.08E+06	4.18E+05	-4.64E+05	1.04E+06
97.66	-1.67E+06	5.65E+05	-1.17E+06	-1.48E+06	1.22E+06	5.68E+05	-5.33E+05	1.12E+06
107.42	-1.60E+06	4.02E+05	-1.44E+06	-1.50E+06	1.47E+06	5.54E+05	-6.05E+05	1.45E+06
117.19	-1.33E+06	3.33E+05	-1.64E+06	-1.54E+06	1.31E+06	7.95E+05	-5.19E+05	1.32E+06
126.95	-1.20E+06	1.44E+05	-2.07E+06	-1.49E+06	1.08E+06	1.04E+06	-9.12E+04	1.26E+06
136.72	-2.94E+06	1.64E+06	7.87E+04	-3.41E+06	-3.69E+06	5.83E+06	4.74E+06	-3.27E+06

Table A.78 Raw data for test seal at 15,000 rpm, 98% GVF and 0.4 PR (*Medium* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.14E+06	1.10E+06	-1.80E+06	-1.16E+06	-5.45E+05	-1.44E+05	1.30E+05	1.31E+04
19.53	-1.75E+06	1.06E+06	-1.53E+06	-1.20E+06	-5.14E+04	-9.28E+04	4.68E+05	-7.96E+04
29.3	-1.58E+06	6.42E+05	-1.33E+06	-1.37E+06	1.53E+06	-1.48E+06	-1.21E+06	1.60E+06
39.06	-1.57E+06	6.90E+05	-1.07E+06	-1.46E+06	5.80E+05	1.81E+05	-4.44E+04	5.06E+05
48.83	-1.60E+06	6.86E+05	-1.04E+06	-1.45E+06	7.00E+05	4.08E+05	-2.44E+05	4.65E+05
58.59	-1.59E+06	1.00E+06	-1.08E+06	-1.69E+06	8.76E+05	4.58E+05	-1.43E+05	6.93E+05
68.36	-1.61E+06	9.10E+05	-1.07E+06	-1.81E+06	9.96E+05	3.27E+05	-3.42E+05	8.40E+05
78.13	-1.64E+06	7.05E+05	-1.18E+06	-1.76E+06	1.11E+06	4.60E+05	-4.02E+05	1.07E+06
87.89	-1.71E+06	6.82E+05	-1.28E+06	-1.79E+06	1.20E+06	5.03E+05	-5.81E+05	1.09E+06
97.66	-1.86E+06	7.21E+05	-1.19E+06	-1.84E+06	1.40E+06	6.70E+05	-6.52E+05	1.22E+06
107.42	-1.73E+06	5.76E+05	-1.49E+06	-1.82E+06	1.60E+06	7.02E+05	-6.71E+05	1.60E+06
117.19	-1.53E+06	5.19E+05	-1.62E+06	-1.87E+06	1.39E+06	9.71E+05	-6.31E+05	1.50E+06
126.95	-1.49E+06	3.76E+05	-1.98E+06	-1.81E+06	1.19E+06	1.13E+06	-2.73E+05	1.50E+06
136.72	-3.48E+06	2.10E+06	3.64E+05	-4.02E+06	-3.40E+06	5.69E+06	4.33E+06	-2.86E+06

Table A.79 Raw data for test seal at 5,000 rpm, 96% GVF and 0.4 PR (*Medium* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.09E+06	8.45E+05	-1.29E+06	-1.02E+06	-3.98E+04	-4.25E+04	-4.20E+04	1.94E+05
19.53	-1.16E+06	8.05E+05	-1.08E+06	-1.12E+06	1.53E+05	-5.15E+03	2.03E+05	1.37E+05
29.3	-1.13E+06	5.19E+05	-1.02E+06	-1.15E+06	1.63E+06	-1.53E+06	-1.29E+06	1.81E+06
39.06	-1.34E+06	6.70E+05	-8.57E+05	-1.31E+06	5.08E+05	1.36E+05	2.56E+04	5.59E+05
48.83	-1.47E+06	7.13E+05	-8.12E+05	-1.41E+06	4.83E+05	8.73E+04	-1.27E+05	6.47E+05
58.59	-1.36E+06	8.07E+05	-8.04E+05	-1.33E+06	8.20E+05	3.22E+05	-1.74E+05	7.49E+05
68.36	-1.36E+06	7.58E+05	-8.10E+05	-1.32E+06	8.24E+05	1.66E+05	-1.78E+05	8.59E+05
78.13	-1.45E+06	7.07E+05	-8.88E+05	-1.39E+06	9.81E+05	2.61E+05	-2.58E+05	9.81E+05
87.89	-1.60E+06	6.69E+05	-9.49E+05	-1.47E+06	9.36E+05	3.05E+05	-3.33E+05	1.08E+06
97.66	-1.75E+06	6.69E+05	-8.59E+05	-1.53E+06	1.19E+06	3.97E+05	-3.36E+05	1.23E+06
107.42	-1.75E+06	6.73E+05	-1.05E+06	-1.51E+06	1.42E+06	3.55E+05	-3.46E+05	1.42E+06
117.19	-1.53E+06	5.89E+05	-1.20E+06	-1.72E+06	1.33E+06	4.90E+05	-3.25E+05	1.52E+06
126.95	-1.70E+06	4.29E+05	-1.39E+06	-1.72E+06	1.37E+06	3.67E+05	-6.88E+04	1.66E+06
136.72	-4.22E+06	2.32E+06	1.40E+06	-3.94E+06	-1.74E+06	3.42E+06	2.78E+06	-8.55E+05

Table A.80 Raw data for test seal at 10,000 rpm, 96% GVF and 0.4 PR (*Medium* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.17E+06	1.14E+06	-1.43E+06	-1.24E+06	-2.90E+05	-1.54E+05	3.22E+05	-5.05E+04
19.53	-1.50E+06	9.31E+05	-1.19E+06	-1.41E+06	5.51E+03	-2.89E+05	4.27E+05	1.00E+04
29.3	-1.37E+06	5.59E+05	-9.27E+05	-1.42E+06	1.73E+06	-1.70E+06	-1.21E+06	1.84E+06
39.06	-1.41E+06	6.58E+05	-8.17E+05	-1.51E+06	5.63E+05	-2.56E+04	-1.44E+04	6.22E+05
48.83	-1.51E+06	4.89E+05	-7.59E+05	-1.48E+06	6.19E+05	1.99E+05	-1.69E+05	7.61E+05
58.59	-1.40E+06	7.98E+05	-8.60E+05	-1.49E+06	8.50E+05	3.02E+05	-1.79E+05	8.81E+05
68.36	-1.53E+06	7.44E+05	-8.73E+05	-1.54E+06	9.51E+05	1.91E+05	-1.42E+05	8.20E+05
78.13	-1.54E+06	6.53E+05	-9.57E+05	-1.53E+06	1.03E+06	3.38E+05	-2.87E+05	1.01E+06
87.89	-1.68E+06	6.14E+05	-9.88E+05	-1.62E+06	1.07E+06	3.56E+05	-4.79E+05	1.17E+06
97.66	-1.84E+06	6.65E+05	-9.10E+05	-1.67E+06	1.24E+06	4.75E+05	-4.91E+05	1.31E+06
107.42	-1.81E+06	5.79E+05	-1.08E+06	-1.62E+06	1.44E+06	4.70E+05	-4.86E+05	1.57E+06
117.19	-1.59E+06	5.33E+05	-1.31E+06	-1.78E+06	1.35E+06	6.27E+05	-4.34E+05	1.59E+06
126.95	-1.77E+06	3.79E+05	-1.48E+06	-1.72E+06	1.36E+06	5.27E+05	-2.01E+05	1.72E+06
136.72	-4.30E+06	2.27E+06	1.35E+06	-4.07E+06	-1.85E+06	3.62E+06	2.84E+06	-8.93E+05

Table A.81 Raw data for test seal at 15,000 rpm, 96% GVF and 0.4 PR (*Medium* Preswirl)

Freq.	*Re(H_{XX})*	*Re(H_{XY})*	*Re(H_{YX})*	*Re(H_{YY})*	*Im(H_{XX})*	*Im(H_{XY})*	*Im(H_{YX})*	*Im(H_{YY})*
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.16E+06	1.17E+06	-1.71E+06	-1.13E+06	-2.09E+05	-3.37E+05	2.36E+05	-8.25E+04
19.53	-1.54E+06	1.03E+06	-1.41E+06	-1.55E+06	-2.28E+04	-4.64E+05	4.96E+05	-3.65E+04
29.3	-1.68E+06	7.91E+05	-7.92E+05	-1.84E+06	1.68E+06	-1.62E+06	-8.04E+05	1.41E+06
39.06	-1.53E+06	6.63E+05	-8.77E+05	-1.77E+06	6.95E+05	-1.45E+05	-5.12E+04	5.98E+05
48.83	-1.40E+06	4.15E+05	-9.05E+05	-1.54E+06	7.13E+05	1.95E+05	-2.85E+05	8.84E+05
58.59	-1.44E+06	8.10E+05	-9.17E+05	-1.77E+06	8.95E+05	2.97E+05	-2.00E+05	8.95E+05
68.36	-1.43E+06	6.45E+05	-9.31E+05	-1.75E+06	1.02E+06	2.77E+05	-4.12E+05	1.15E+06
78.13	-1.51E+06	6.51E+05	-1.08E+06	-1.73E+06	1.04E+06	4.16E+05	-4.28E+05	1.24E+06
87.89	-1.61E+06	6.44E+05	-1.15E+06	-1.83E+06	1.19E+06	5.05E+05	-5.49E+05	1.29E+06
97.66	-1.81E+06	6.30E+05	-1.04E+06	-1.82E+06	1.39E+06	6.00E+05	-6.08E+05	1.50E+06
107.42	-1.83E+06	5.67E+05	-1.30E+06	-1.84E+06	1.58E+06	6.74E+05	-6.41E+05	1.73E+06
117.19	-1.58E+06	4.78E+05	-1.47E+06	-1.93E+06	1.43E+06	8.26E+05	-5.95E+05	1.73E+06
126.95	-1.57E+06	3.81E+05	-1.74E+06	-1.85E+06	1.26E+06	9.62E+05	-2.49E+05	1.75E+06
136.72	-3.64E+06	2.06E+06	6.26E+05	-4.12E+06	-3.17E+06	5.41E+06	4.16E+06	-2.51E+06

Table A.82 Raw data for test seal at 5,000 rpm, 94% GVF and 0.4 PR (*Medium* Preswirl)

Freq.	*Re(H_{XX})*	*Re(H_{XY})*	*Re(H_{YX})*	*Re(H_{YY})*	*Im(H_{XX})*	*Im(H_{XY})*	*Im(H_{YX})*	*Im(H_{YY})*
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-9.49E+05	7.08E+05	-1.11E+06	-1.09E+06	-4.10E+04	-9.65E+04	1.45E+05	2.73E+05
19.53	-1.15E+06	7.12E+05	-1.00E+06	-9.95E+05	2.91E+05	-1.84E+05	2.16E+05	2.11E+05
29.3	-1.13E+06	5.48E+05	-9.45E+05	-9.94E+05	1.67E+06	-1.46E+06	-1.30E+06	1.71E+06
39.06	-1.15E+06	5.11E+05	-8.68E+05	-1.13E+06	4.65E+05	9.32E+04	-7.67E+04	6.30E+05
48.83	-1.41E+06	5.07E+05	-8.29E+05	-1.20E+06	6.12E+05	1.33E+05	-4.85E+04	6.48E+05
58.59	-1.06E+06	6.79E+05	-8.40E+05	-1.16E+06	1.01E+06	2.98E+05	-1.84E+05	7.64E+05
68.36	-1.26E+06	6.62E+05	-8.33E+05	-1.42E+06	9.51E+05	2.14E+05	-1.08E+05	1.04E+06
78.13	-1.22E+06	5.61E+05	-1.07E+06	-1.23E+06	1.04E+06	1.80E+05	-2.56E+05	1.15E+06
87.89	-1.45E+06	5.02E+05	-1.08E+06	-1.32E+06	1.13E+06	2.81E+05	-2.47E+05	1.14E+06
97.66	-1.58E+06	5.05E+05	-9.98E+05	-1.46E+06	1.28E+06	3.41E+05	-2.40E+05	1.26E+06
107.42	-1.54E+06	4.48E+05	-1.12E+06	-1.47E+06	1.49E+06	4.16E+05	-2.86E+05	1.62E+06
117.19	-1.34E+06	3.68E+05	-1.25E+06	-1.66E+06	1.43E+06	5.02E+05	-2.11E+05	1.62E+06
126.95	-1.39E+06	2.63E+05	-1.54E+06	-1.68E+06	1.31E+06	5.20E+05	1.78E+05	1.67E+06
136.72	-3.84E+06	2.25E+06	1.18E+06	-4.13E+06	-2.78E+06	4.53E+06	4.22E+06	-2.01E+06

Table A.83 Raw data for test seal at 10,000 rpm, 94% GVF and 0.4 PR (*Medium* Preswirl)

Freq. (Hz)	$Re(H_{XX})$ (N/m)	$Re(H_{XY})$ (N/m)	$Re(H_{YX})$ (N/m)	$Re(H_{YY})$ (N/m)	$Im(H_{XX})$ (N/m)	$Im(H_{XY})$ (N/m)	$Im(H_{YX})$ (N/m)	$Im(H_{YY})$ (N/m)
9.77	-1.09E+06	9.79E+05	-1.52E+06	-1.18E+06	-2.75E+05	-1.98E+05	3.53E+05	-6.22E+03
19.53	-1.31E+06	8.49E+05	-1.02E+06	-1.29E+06	2.11E+05	-3.22E+05	4.17E+05	8.93E+04
29.3	-1.20E+06	3.93E+05	-9.58E+05	-1.27E+06	1.63E+06	-1.62E+06	-1.22E+06	1.92E+06
39.06	-1.33E+06	5.97E+05	-8.93E+05	-1.30E+06	5.10E+05	2.54E+04	-1.18E+04	6.07E+05
48.83	-1.40E+06	4.32E+05	-7.53E+05	-1.46E+06	7.31E+05	1.06E+04	-7.02E+04	7.74E+05
58.59	-1.20E+06	7.05E+05	-7.55E+05	-1.44E+06	9.69E+05	3.09E+05	-1.44E+05	8.94E+05
68.36	-1.34E+06	6.91E+05	-8.50E+05	-1.59E+06	9.49E+05	2.42E+05	-1.70E+05	1.01E+06
78.13	-1.33E+06	6.21E+05	-9.64E+05	-1.40E+06	1.09E+06	2.72E+05	-2.32E+05	1.18E+06
87.89	-1.54E+06	5.63E+05	-1.01E+06	-1.45E+06	1.17E+06	3.59E+05	-2.82E+05	1.18E+06
97.66	-1.64E+06	5.83E+05	-9.02E+05	-1.53E+06	1.33E+06	4.51E+05	-3.57E+05	1.34E+06
107.42	-1.64E+06	4.71E+05	-1.11E+06	-1.55E+06	1.56E+06	4.73E+05	-3.96E+05	1.59E+06
117.19	-1.49E+06	4.51E+05	-1.24E+06	-1.73E+06	1.40E+06	6.18E+05	-3.64E+05	1.63E+06
126.95	-1.61E+06	3.50E+05	-1.48E+06	-1.70E+06	1.32E+06	6.01E+05	-7.34E+03	1.63E+06
136.72	-4.07E+06	2.36E+06	1.30E+06	-4.30E+06	-2.46E+06	4.39E+06	3.66E+06	-1.70E+06

Table A.84 Raw data for test seal at 15,000 rpm, 94% GVF and 0.4 PR (*Medium* Preswirl)

Freq. (Hz)	$Re(H_{XX})$ (N/m)	$Re(H_{XY})$ (N/m)	$Re(H_{YX})$ (N/m)	$Re(H_{YY})$ (N/m)	$Im(H_{XX})$ (N/m)	$Im(H_{XY})$ (N/m)	$Im(H_{YX})$ (N/m)	$Im(H_{YY})$ (N/m)
9.77	-9.62E+05	1.41E+06	-1.48E+06	-1.21E+06	-2.86E+05	-1.78E+05	1.07E+05	-3.57E+05
19.53	-1.67E+06	1.08E+06	-1.13E+06	-1.67E+06	2.87E+05	-5.04E+05	4.95E+05	-1.82E+04
29.3	-1.20E+06	3.02E+05	-1.10E+06	-1.39E+06	1.80E+06	-1.89E+06	-1.13E+06	1.91E+06
39.06	-1.35E+06	5.45E+05	-7.47E+05	-1.63E+06	5.10E+05	-8.58E+04	-2.19E+04	7.76E+05
48.83	-1.68E+06	5.20E+05	-7.07E+05	-1.63E+06	6.96E+05	2.82E+04	6.43E+04	9.40E+05
58.59	-1.22E+06	7.57E+05	-7.74E+05	-1.58E+06	1.02E+06	3.49E+05	-2.07E+05	9.04E+05
68.36	-1.29E+06	6.76E+05	-8.21E+05	-1.61E+06	1.06E+06	2.61E+05	-3.45E+05	1.21E+06
78.13	-1.45E+06	6.72E+05	-9.01E+05	-1.67E+06	1.12E+06	4.11E+05	-3.61E+05	1.21E+06
87.89	-1.66E+06	6.94E+05	-9.64E+05	-1.76E+06	1.16E+06	4.45E+05	-4.62E+05	1.37E+06
97.66	-1.77E+06	6.72E+05	-8.89E+05	-1.78E+06	1.38E+06	5.51E+05	-5.17E+05	1.54E+06
107.42	-1.66E+06	6.36E+05	-1.04E+06	-1.88E+06	1.54E+06	6.37E+05	-5.44E+05	1.75E+06
117.19	-1.56E+06	5.66E+05	-1.19E+06	-1.89E+06	1.46E+06	6.98E+05	-5.29E+05	1.85E+06
126.95	-1.64E+06	4.41E+05	-1.45E+06	-1.86E+06	1.37E+06	6.37E+05	-2.29E+05	1.97E+06
136.72	-4.24E+06	2.29E+06	1.33E+06	-4.28E+06	-2.63E+06	4.53E+06	3.65E+06	-1.56E+06

Table A.85 Raw data for test seal at 5,000 rpm, 92% GVF and 0.4 PR (*Medium* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.00E+06	8.63E+05	-1.12E+06	-1.08E+06	-1.08E+05	-1.39E+05	1.77E+05	1.77E+05
19.53	-1.14E+06	7.82E+05	-9.63E+05	-1.10E+06	3.03E+05	-1.65E+05	1.86E+05	2.38E+05
29.3	-8.73E+05	4.35E+05	-1.07E+06	-9.49E+05	1.64E+06	-1.44E+06	-1.24E+06	1.78E+06
39.06	-1.08E+06	6.55E+05	-8.22E+05	-1.13E+06	5.43E+05	3.68E+03	-1.41E+04	6.16E+05
48.83	-1.50E+06	6.64E+05	-6.72E+05	-1.42E+06	7.24E+05	-9.47E+04	1.28E+05	7.42E+05
58.59	-9.26E+05	7.27E+05	-6.63E+05	-1.33E+06	1.13E+06	2.21E+05	-1.77E+05	9.69E+05
68.36	-1.18E+06	7.96E+05	-7.01E+05	-1.28E+06	1.16E+06	2.02E+05	-1.09E+05	1.11E+06
78.13	-1.24E+06	7.07E+05	-8.57E+05	-1.31E+06	1.24E+06	1.18E+05	-1.80E+05	1.27E+06
87.89	-1.30E+06	5.97E+05	-9.13E+05	-1.41E+06	1.26E+06	2.01E+05	-2.59E+05	1.27E+06
97.66	-1.46E+06	6.55E+05	-8.83E+05	-1.49E+06	1.52E+06	3.29E+05	-2.60E+05	1.48E+06
107.42	-1.48E+06	5.85E+05	-1.01E+06	-1.60E+06	1.67E+06	3.73E+05	-2.25E+05	1.71E+06
117.19	-1.33E+06	4.97E+05	-1.13E+06	-1.75E+06	1.58E+06	4.31E+05	-1.89E+05	1.82E+06
126.95	-1.47E+06	3.53E+05	-1.33E+06	-1.74E+06	1.58E+06	3.30E+05	1.23E+05	1.97E+06
136.72	-4.17E+06	2.42E+06	1.62E+06	-4.21E+06	-2.01E+06	3.83E+06	3.67E+06	-1.07E+06

Table A.86 Raw data for test seal at 10,000 rpm, 92% GVF and 0.4 PR (*Medium* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-9.95E+05	1.01E+06	-1.36E+06	-1.26E+06	-2.32E+05	-2.07E+05	2.59E+05	4.71E+04
19.53	-1.41E+06	8.51E+05	-9.70E+05	-1.29E+06	3.19E+05	-2.92E+05	4.04E+05	2.70E+05
29.3	-1.06E+06	3.07E+05	-1.08E+06	-9.90E+05	1.80E+06	-1.58E+06	-1.22E+06	1.98E+06
39.06	-1.21E+06	5.95E+05	-7.65E+05	-1.21E+06	5.89E+05	3.49E+04	3.80E+04	7.52E+05
48.83	-1.55E+06	6.38E+05	-7.60E+05	-1.47E+06	6.48E+05	1.87E+03	1.41E+05	7.68E+05
58.59	-1.07E+06	6.73E+05	-5.94E+05	-1.30E+06	1.19E+06	2.45E+05	-2.08E+05	1.03E+06
68.36	-1.26E+06	7.08E+05	-7.20E+05	-1.35E+06	1.10E+06	2.81E+05	-1.65E+05	1.09E+06
78.13	-1.26E+06	7.18E+05	-8.85E+05	-1.40E+06	1.23E+06	2.72E+05	-2.47E+05	1.26E+06
87.89	-1.45E+06	6.56E+05	-8.76E+05	-1.48E+06	1.29E+06	3.24E+05	-3.25E+05	1.34E+06
97.66	-1.56E+06	6.90E+05	-8.32E+05	-1.57E+06	1.49E+06	4.73E+05	-3.70E+05	1.50E+06
107.42	-1.61E+06	6.21E+05	-1.01E+06	-1.67E+06	1.66E+06	4.38E+05	-3.51E+05	1.72E+06
117.19	-1.48E+06	5.70E+05	-1.13E+06	-1.71E+06	1.61E+06	5.71E+05	-3.12E+05	1.82E+06
126.95	-1.63E+06	4.66E+05	-1.32E+06	-1.76E+06	1.60E+06	4.45E+05	-1.06E+05	1.97E+06
136.72	-4.37E+06	2.54E+06	1.63E+06	-4.30E+06	-1.82E+06	4.05E+06	3.25E+06	-1.12E+06

Table A.87 Raw data for test seal at 15,000 rpm, 92% GVF and 0.4 PR (*Medium* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.06E+06	1.26E+06	-1.54E+06	-1.26E+06	-3.48E+05	-2.50E+05	2.42E+05	-1.49E+05
19.53	-1.40E+06	9.36E+05	-1.02E+06	-1.50E+06	2.72E+05	-4.66E+05	5.27E+05	1.72E+05
29.3	-8.01E+05	1.28E+05	-1.18E+06	-8.69E+05	1.94E+06	-1.86E+06	-1.31E+06	2.12E+06
39.06	-1.36E+06	7.22E+05	-8.09E+05	-1.34E+06	6.29E+05	-2.19E+03	5.82E+04	7.83E+05
48.83	-1.57E+06	5.50E+05	-6.93E+05	-1.44E+06	8.22E+05	2.43E+04	1.77E+05	8.95E+05
58.59	-1.15E+06	6.68E+05	-5.39E+05	-1.28E+06	1.19E+06	4.27E+05	-2.49E+05	9.73E+05
68.36	-1.25E+06	6.92E+05	-7.67E+05	-1.47E+06	1.09E+06	2.83E+05	-3.18E+05	1.18E+06
78.13	-1.25E+06	6.85E+05	-7.74E+05	-1.44E+06	1.26E+06	3.87E+05	-3.18E+05	1.28E+06
87.89	-1.43E+06	6.72E+05	-8.92E+05	-1.53E+06	1.34E+06	4.93E+05	-4.14E+05	1.39E+06
97.66	-1.56E+06	7.34E+05	-7.33E+05	-1.61E+06	1.55E+06	5.76E+05	-4.26E+05	1.50E+06
107.42	-1.55E+06	6.71E+05	-9.79E+05	-1.72E+06	1.67E+06	5.71E+05	-4.85E+05	1.76E+06
117.19	-1.46E+06	6.44E+05	-1.12E+06	-1.73E+06	1.57E+06	7.38E+05	-4.64E+05	1.88E+06
126.95	-1.62E+06	4.69E+05	-1.31E+06	-1.84E+06	1.53E+06	6.66E+05	-2.59E+05	1.96E+06
136.72	-4.29E+06	2.60E+06	1.64E+06	-4.37E+06	-2.09E+06	4.11E+06	3.34E+06	-1.03E+06

Table A.88 Raw data for test seal at 5,000 rpm, 90% GVF and 0.4 PR (*Medium* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.08E+06	9.05E+05	-1.13E+06	-1.23E+06	9.66E+04	-1.72E+05	1.96E+05	2.05E+05
19.53	-1.23E+06	8.80E+05	-8.67E+05	-1.25E+06	4.29E+05	-1.70E+05	2.06E+05	2.84E+05
29.3	-9.00E+05	3.00E+05	-1.15E+06	-7.88E+05	1.75E+06	-1.48E+06	-1.20E+06	1.86E+06
39.06	-1.26E+06	7.74E+05	-7.73E+05	-1.28E+06	5.75E+05	-1.27E+04	-3.81E+04	7.81E+05
48.83	-1.52E+06	7.10E+05	-7.42E+05	-1.35E+06	8.39E+05	-6.47E+03	-2.92E+04	8.81E+05
58.59	-1.09E+06	7.62E+05	-7.25E+05	-1.30E+06	1.27E+06	1.70E+05	-1.31E+05	1.09E+06
68.36	-1.24E+06	7.68E+05	-6.90E+05	-1.38E+06	1.35E+06	8.74E+04	-1.29E+05	1.25E+06
78.13	-1.20E+06	7.60E+05	-8.39E+05	-1.42E+06	1.28E+06	1.67E+05	-1.95E+05	1.24E+06
87.89	-1.48E+06	7.54E+05	-8.21E+05	-1.60E+06	1.38E+06	2.06E+05	-2.63E+05	1.42E+06
97.66	-1.55E+06	7.66E+05	-8.24E+05	-1.65E+06	1.60E+06	2.78E+05	-2.45E+05	1.59E+06
107.42	-1.60E+06	7.47E+05	-8.93E+05	-1.81E+06	1.74E+06	3.15E+05	-2.65E+05	1.82E+06
117.19	-1.54E+06	7.56E+05	-1.01E+06	-1.92E+06	1.73E+06	3.88E+05	-1.91E+05	1.95E+06
126.95	-1.78E+06	5.74E+05	-1.11E+06	-1.92E+06	1.93E+06	3.83E+05	4.57E+04	2.13E+06
136.72	-4.63E+06	2.22E+06	1.72E+06	-3.78E+06	3.21E+05	2.28E+06	1.43E+06	5.81E+05

Table A.89 Raw data for test seal at 10,000 rpm, 90% GVF and 0.4 PR (*Medium* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.05E+06	1.03E+06	-1.28E+06	-1.26E+06	-6.01E+04	-2.91E+05	1.67E+05	1.40E+05
19.53	-1.21E+06	8.40E+05	-9.50E+05	-1.27E+06	3.99E+05	-2.60E+05	2.59E+05	3.56E+05
29.3	-8.41E+05	2.55E+05	-1.33E+06	-7.52E+05	1.91E+06	-1.56E+06	-1.24E+06	2.05E+06
39.06	-1.24E+06	6.64E+05	-7.48E+05	-1.26E+06	6.21E+05	3.76E+04	3.46E+04	8.09E+05
48.83	-1.43E+06	6.44E+05	-7.60E+05	-1.33E+06	7.37E+05	1.35E+05	2.73E+04	8.43E+05
58.59	-1.13E+06	7.23E+05	-6.39E+05	-1.36E+06	1.16E+06	3.28E+05	-1.40E+05	1.05E+06
68.36	-1.23E+06	7.87E+05	-7.36E+05	-1.46E+06	1.24E+06	3.17E+05	-2.07E+05	1.14E+06
78.13	-1.26E+06	7.51E+05	-7.92E+05	-1.47E+06	1.28E+06	2.47E+05	-2.23E+05	1.26E+06
87.89	-1.47E+06	7.24E+05	-8.20E+05	-1.55E+06	1.37E+06	3.02E+05	-3.58E+05	1.35E+06
97.66	-1.58E+06	7.96E+05	-7.97E+05	-1.65E+06	1.57E+06	4.42E+05	-3.29E+05	1.55E+06
107.42	-1.66E+06	7.46E+05	-9.58E+05	-1.79E+06	1.72E+06	4.51E+05	-3.53E+05	1.89E+06
117.19	-1.59E+06	7.28E+05	-1.02E+06	-1.92E+06	1.69E+06	5.84E+05	-2.80E+05	1.93E+06
126.95	-1.78E+06	5.70E+05	-1.17E+06	-2.01E+06	1.90E+06	5.96E+05	-9.93E+04	2.06E+06
136.72	-4.37E+06	2.31E+06	1.36E+06	-3.99E+06	1.96E+05	2.53E+06	1.32E+06	6.58E+05

Table A.90 Raw data for test seal at 15,000 rpm, 90% GVF and 0.4 PR (*Medium* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-9.25E+05	1.29E+06	-1.35E+06	-1.28E+06	-1.04E+05	-3.97E+05	1.86E+05	-5.03E+04
19.53	-1.33E+06	8.63E+05	-1.07E+06	-1.32E+06	2.61E+05	-4.79E+05	4.85E+05	2.98E+05
29.3	-6.58E+05	3.32E+04	-1.35E+06	-7.49E+05	2.11E+06	-2.01E+06	-1.42E+06	2.40E+06
39.06	-1.26E+06	6.35E+05	-7.81E+05	-1.21E+06	6.97E+05	4.81E+04	1.17E+05	8.37E+05
48.83	-1.35E+06	6.24E+05	-6.59E+05	-1.21E+06	8.96E+05	1.57E+04	1.79E+04	8.74E+05
58.59	-1.12E+06	6.21E+05	-5.83E+05	-1.31E+06	1.11E+06	1.53E+05	-1.94E+05	1.11E+06
68.36	-1.12E+06	5.00E+05	-7.21E+05	-1.29E+06	1.13E+06	2.46E+05	-3.41E+05	1.31E+06
78.13	-1.23E+06	6.69E+05	-8.74E+05	-1.33E+06	1.25E+06	3.88E+05	-2.83E+05	1.26E+06
87.89	-1.33E+06	5.92E+05	-8.58E+05	-1.43E+06	1.41E+06	4.44E+05	-3.93E+05	1.41E+06
97.66	-1.52E+06	6.73E+05	-8.20E+05	-1.51E+06	1.47E+06	5.98E+05	-4.32E+05	1.55E+06
107.42	-1.50E+06	6.21E+05	-9.36E+05	-1.59E+06	1.67E+06	5.61E+05	-3.96E+05	1.86E+06
117.19	-1.44E+06	6.49E+05	-1.13E+06	-1.73E+06	1.56E+06	7.29E+05	-4.06E+05	1.91E+06
126.95	-1.64E+06	3.96E+05	-1.28E+06	-1.82E+06	1.82E+06	8.72E+05	-2.63E+05	1.89E+06
136.72	-4.23E+06	2.70E+06	1.50E+06	-4.47E+06	-2.20E+05	2.84E+06	1.29E+06	4.19E+05

Table A.91 Raw data for test seal at 5,000 rpm, 100% GVF and 0.3 PR (*Medium* Preswirl)

Freq. (Hz)	$Re(H_{XX})$ (N/m)	$Re(H_{XY})$ (N/m)	$Re(H_{YX})$ (N/m)	$Re(H_{YY})$ (N/m)	$Im(H_{XX})$ (N/m)	$Im(H_{XY})$ (N/m)	$Im(H_{YX})$ (N/m)	$Im(H_{YY})$ (N/m)
9.77	-7.60E+05	7.96E+05	-1.76E+06	-8.16E+05	4.08E+04	4.04E+04	2.74E+03	8.81E+04
19.53	-8.14E+05	7.86E+05	-1.73E+06	-8.17E+05	1.35E+05	9.34E+04	-9.20E+04	7.61E+04
29.3	-6.13E+05	5.12E+05	-1.93E+06	-6.99E+05	8.36E+04	2.13E+05	5.21E+04	-1.05E+05
39.06	-8.73E+05	7.94E+05	-1.68E+06	-9.28E+05	2.62E+05	3.07E+05	-2.25E+05	3.51E+05
48.83	-1.04E+06	7.99E+05	-1.57E+06	-1.10E+06	3.60E+05	2.82E+05	-2.97E+05	4.87E+05
58.59	-9.52E+05	7.98E+05	-1.74E+06	-1.08E+06	4.49E+05	5.02E+05	-4.25E+05	4.65E+05
68.36	-1.07E+06	8.17E+05	-1.71E+06	-9.84E+05	5.76E+05	5.97E+05	-4.50E+05	6.51E+05
78.13	-9.93E+05	7.04E+05	-1.82E+06	-1.11E+06	7.09E+05	5.62E+05	-5.30E+05	7.45E+05
87.89	-1.13E+06	7.37E+05	-1.86E+06	-1.22E+06	7.84E+05	6.01E+05	-6.79E+05	8.66E+05
97.66	-1.09E+06	6.11E+05	-1.93E+06	-1.09E+06	8.44E+05	7.46E+05	-6.74E+05	8.03E+05
107.42	-1.07E+06	4.50E+05	-2.11E+06	-1.07E+06	1.01E+06	7.90E+05	-7.90E+05	9.70E+05
117.19	-7.56E+05	2.25E+05	-2.40E+06	-1.01E+06	8.41E+05	1.08E+06	-6.98E+05	8.85E+05
126.95	-3.92E+05	-2.08E+05	-3.00E+06	-6.17E+05	5.17E+05	1.47E+06	-2.67E+05	6.95E+05
136.72	-1.53E+06	5.35E+05	-1.86E+06	-1.70E+06	-4.64E+06	6.62E+06	4.85E+06	-4.40E+06

Table A.92 Raw data for test seal at 10,000 rpm, 100% GVF and 0.3 PR (*Medium* Preswirl)

Freq. (Hz)	$Re(H_{XX})$ (N/m)	$Re(H_{XY})$ (N/m)	$Re(H_{YX})$ (N/m)	$Re(H_{YY})$ (N/m)	$Im(H_{XX})$ (N/m)	$Im(H_{XY})$ (N/m)	$Im(H_{YX})$ (N/m)	$Im(H_{YY})$ (N/m)
9.77	-8.60E+05	6.56E+05	-1.70E+06	-9.04E+05	4.03E+04	5.33E+04	2.06E+04	1.57E+04
19.53	-9.02E+05	6.65E+05	-1.68E+06	-9.49E+05	1.34E+05	1.51E+05	-1.23E+05	1.29E+05
29.3	-7.98E+05	5.03E+05	-1.83E+06	-8.95E+05	1.17E+05	2.70E+05	-5.07E+04	-2.90E+04
39.06	-9.52E+05	7.15E+05	-1.70E+06	-9.09E+05	2.30E+05	4.23E+05	-2.61E+05	1.54E+05
48.83	-1.12E+06	7.05E+05	-1.58E+06	-1.11E+06	2.90E+05	4.35E+05	-3.36E+05	2.60E+05
58.59	-1.04E+06	7.28E+05	-1.58E+06	-1.31E+06	4.10E+05	6.35E+05	-4.34E+05	4.78E+05
68.36	-1.27E+06	8.46E+05	-1.61E+06	-1.29E+06	5.66E+05	6.35E+05	-4.97E+05	5.53E+05
78.13	-1.14E+06	7.01E+05	-1.72E+06	-1.27E+06	6.03E+05	7.40E+05	-5.90E+05	7.69E+05
87.89	-1.24E+06	6.34E+05	-1.75E+06	-1.38E+06	7.50E+05	7.77E+05	-7.78E+05	7.88E+05
97.66	-1.33E+06	5.76E+05	-1.86E+06	-1.30E+06	8.05E+05	8.79E+05	-7.86E+05	8.17E+05
107.42	-1.25E+06	3.70E+05	-2.06E+06	-1.28E+06	9.70E+05	9.60E+05	-9.00E+05	1.05E+06
117.19	-9.33E+05	1.46E+05	-2.29E+06	-1.15E+06	8.23E+05	1.27E+06	-8.30E+05	9.72E+05
126.95	-5.67E+05	-2.81E+05	-2.94E+06	-7.48E+05	4.91E+05	1.63E+06	-4.44E+05	7.09E+05
136.72	-1.81E+06	4.50E+05	-1.69E+06	-1.92E+06	-4.63E+06	6.80E+06	4.73E+06	-4.37E+06

Table A.93 Raw data for test seal at 15,000 rpm, 100% GVF and 0.3 PR (*Medium* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.10E+06	6.94E+05	-1.66E+06	-1.21E+06	3.64E+04	5.47E+04	-3.93E+02	4.44E+04
19.53	-1.15E+06	7.19E+05	-1.66E+06	-1.11E+06	1.21E+05	2.02E+05	-1.45E+05	2.16E+05
29.3	-1.07E+06	6.07E+05	-1.67E+06	-1.12E+06	1.17E+05	3.60E+05	-1.03E+05	9.23E+04
39.06	-1.25E+06	7.92E+05	-1.69E+06	-1.10E+06	2.25E+05	4.80E+05	-3.11E+05	2.42E+05
48.83	-1.38E+06	7.91E+05	-1.53E+06	-1.28E+06	3.00E+05	4.23E+05	-4.52E+05	3.01E+05
58.59	-1.42E+06	7.65E+05	-1.63E+06	-1.44E+06	4.43E+05	6.82E+05	-5.03E+05	5.01E+05
68.36	-1.50E+06	8.00E+05	-1.60E+06	-1.49E+06	5.91E+05	5.58E+05	-6.63E+05	6.30E+05
78.13	-1.46E+06	6.59E+05	-1.79E+06	-1.46E+06	6.61E+05	6.87E+05	-7.27E+05	7.91E+05
87.89	-1.64E+06	5.60E+05	-1.80E+06	-1.55E+06	8.73E+05	7.40E+05	-8.41E+05	8.31E+05
97.66	-1.64E+06	4.55E+05	-1.79E+06	-1.50E+06	9.32E+05	1.02E+06	-8.96E+05	8.99E+05
107.42	-1.55E+06	3.06E+05	-2.05E+06	-1.48E+06	1.16E+06	1.13E+06	-1.01E+06	1.22E+06
117.19	-1.22E+06	1.55E+05	-2.22E+06	-1.30E+06	9.63E+05	1.41E+06	-1.02E+06	1.10E+06
126.95	-8.36E+05	-3.15E+05	-2.89E+06	-9.16E+05	6.43E+05	1.77E+06	-6.75E+05	8.69E+05
136.72	-2.19E+06	4.85E+05	-1.58E+06	-2.11E+06	-4.42E+06	6.96E+06	4.57E+06	-4.15E+06

Table A.94 Raw data for test seal at 5,000 rpm, 98% GVF and 0.3 PR (*Medium* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-8.52E+05	5.40E+05	-1.58E+06	-8.23E+05	-1.33E+04	-1.45E+04	9.93E+04	2.21E+03
19.53	-9.34E+05	5.65E+05	-1.44E+06	-8.85E+05	9.11E+04	-8.92E+02	9.29E+04	6.01E+04
29.3	-1.27E+06	6.81E+05	-1.17E+06	-1.38E+06	3.68E+05	-2.63E+05	1.21E+04	2.90E+05
39.06	-1.07E+06	4.37E+05	-1.30E+06	-1.03E+06	3.72E+05	1.54E+05	-2.17E+04	3.66E+05
48.83	-1.13E+06	4.61E+05	-1.32E+06	-1.08E+06	3.39E+05	2.23E+05	-2.22E+05	4.32E+05
58.59	-1.18E+06	6.07E+05	-1.37E+06	-1.20E+06	5.55E+05	3.23E+05	-1.90E+05	5.94E+05
68.36	-1.21E+06	5.25E+05	-1.39E+06	-1.17E+06	6.51E+05	3.10E+05	-1.92E+05	6.98E+05
78.13	-1.22E+06	4.41E+05	-1.48E+06	-1.26E+06	8.20E+05	3.37E+05	-2.50E+05	8.44E+05
87.89	-1.30E+06	3.71E+05	-1.52E+06	-1.33E+06	9.98E+05	2.83E+05	-4.35E+05	1.03E+06
97.66	-1.41E+06	3.35E+05	-1.52E+06	-1.24E+06	1.02E+06	5.02E+05	-3.84E+05	1.05E+06
107.42	-1.29E+06	1.68E+05	-1.73E+06	-1.19E+06	1.25E+06	5.16E+05	-4.18E+05	1.33E+06
117.19	-1.01E+06	1.53E+04	-1.98E+06	-1.11E+06	1.09E+06	7.11E+05	-3.80E+05	1.22E+06
126.95	-7.36E+05	-3.25E+05	-2.56E+06	-8.82E+05	8.33E+05	9.32E+05	5.51E+03	1.09E+06
136.72	-2.05E+06	8.52E+05	-8.65E+05	-2.38E+06	-3.97E+06	5.91E+06	5.03E+06	-3.70E+06

Table A.95 Raw data for test seal at 10,000 rpm, 98% GVF and 0.3 PR (*Medium* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-9.95E+05	8.33E+05	-1.71E+06	-1.00E+06	-2.26E+05	-9.29E+04	2.28E+05	-1.59E+05
19.53	-1.23E+06	6.33E+05	-1.38E+06	-1.40E+06	5.70E+04	-2.53E+05	2.31E+05	-1.04E+05
29.3	-1.45E+06	5.25E+05	-1.03E+06	-1.70E+06	5.00E+05	-3.33E+05	-4.13E+04	4.53E+05
39.06	-1.24E+06	3.25E+05	-1.26E+06	-1.41E+06	3.90E+05	1.03E+05	-1.30E+05	5.87E+05
48.83	-1.32E+06	3.61E+05	-1.31E+06	-1.40E+06	3.61E+05	1.82E+05	-2.83E+05	5.81E+05
58.59	-1.35E+06	5.13E+05	-1.27E+06	-1.51E+06	6.11E+05	3.45E+05	-2.30E+05	6.71E+05
68.36	-1.49E+06	4.98E+05	-1.24E+06	-1.42E+06	7.49E+05	3.47E+05	-3.41E+05	8.41E+05
78.13	-1.43E+06	4.27E+05	-1.41E+06	-1.51E+06	8.23E+05	4.75E+05	-3.46E+05	9.32E+05
87.89	-1.50E+06	3.73E+05	-1.44E+06	-1.60E+06	1.05E+06	4.18E+05	-6.01E+05	1.18E+06
97.66	-1.59E+06	3.48E+05	-1.43E+06	-1.49E+06	1.15E+06	6.07E+05	-5.42E+05	1.21E+06
107.42	-1.48E+06	1.52E+05	-1.64E+06	-1.36E+06	1.35E+06	6.36E+05	-6.99E+05	1.42E+06
117.19	-1.17E+06	2.09E+04	-1.93E+06	-1.35E+06	1.14E+06	8.51E+05	-6.07E+05	1.32E+06
126.95	-9.88E+05	-2.56E+05	-2.46E+06	-1.10E+06	8.86E+05	1.06E+06	-1.89E+05	1.26E+06
136.72	-2.50E+06	9.67E+05	-5.53E+05	-2.74E+06	-3.89E+06	5.91E+06	4.68E+06	-3.52E+06

Table A.96 Raw data for test seal at 15,000 rpm, 98% GVF and 0.3 PR (*Medium* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.12E+06	8.53E+05	-1.99E+06	-1.10E+06	-4.72E+05	-4.88E+04	3.53E+05	-2.15E+05
19.53	-1.75E+06	7.42E+05	-1.42E+06	-1.58E+06	1.32E+05	-3.59E+05	5.68E+05	-8.07E+04
29.3	-1.74E+06	7.90E+05	-9.28E+05	-1.94E+06	6.03E+05	-4.17E+05	1.45E+05	1.12E+05
39.06	-1.61E+06	2.90E+05	-1.02E+06	-1.64E+06	5.95E+05	3.32E+04	1.05E+05	6.49E+05
48.83	-1.51E+06	3.12E+05	-1.29E+06	-1.39E+06	4.15E+05	4.27E+05	-2.77E+05	6.69E+05
58.59	-1.48E+06	6.24E+05	-1.24E+06	-1.69E+06	6.59E+05	3.10E+05	-3.27E+05	6.01E+05
68.36	-1.66E+06	5.69E+05	-1.18E+06	-1.66E+06	8.40E+05	4.14E+05	-3.27E+05	8.49E+05
78.13	-1.67E+06	4.34E+05	-1.34E+06	-1.64E+06	9.67E+05	4.99E+05	-4.78E+05	9.68E+05
87.89	-1.66E+06	3.91E+05	-1.44E+06	-1.65E+06	1.19E+06	5.56E+05	-7.24E+05	1.12E+06
97.66	-1.70E+06	3.37E+05	-1.44E+06	-1.59E+06	1.27E+06	7.10E+05	-7.62E+05	1.21E+06
107.42	-1.61E+06	1.96E+05	-1.75E+06	-1.57E+06	1.43E+06	7.15E+05	-8.41E+05	1.36E+06
117.19	-1.37E+06	3.49E+04	-1.95E+06	-1.51E+06	1.22E+06	1.00E+06	-7.06E+05	1.35E+06
126.95	-1.15E+06	-2.36E+05	-2.49E+06	-1.24E+06	9.83E+05	1.25E+06	-3.68E+05	1.28E+06
136.72	-2.68E+06	9.93E+05	-5.91E+05	-2.85E+06	-3.85E+06	6.16E+06	4.53E+06	-3.54E+06

Table A.97 Raw data for test seal at 5,000 rpm, 96% GVF and 0.3 PR (*Medium* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.10E+06	6.00E+05	-1.29E+06	-1.18E+06	-4.32E+04	-8.19E+04	1.78E+05	2.59E+04
19.53	-1.15E+06	5.76E+05	-1.19E+06	-1.22E+06	6.33E+04	-4.83E+04	1.58E+05	3.66E+04
29.3	-1.59E+06	8.43E+05	-6.81E+05	-1.81E+06	6.82E+05	-5.70E+05	-3.71E+05	8.11E+05
39.06	-1.30E+06	4.19E+05	-9.38E+05	-1.33E+06	4.36E+05	8.67E+04	-4.77E+03	5.16E+05
48.83	-1.40E+06	3.59E+05	-9.71E+05	-1.32E+06	5.49E+05	1.18E+05	-3.82E+04	5.31E+05
58.59	-1.30E+06	5.70E+05	-9.61E+05	-1.46E+06	5.88E+05	2.57E+05	-9.47E+04	6.10E+05
68.36	-1.38E+06	4.10E+05	-1.01E+06	-1.34E+06	6.73E+05	3.29E+05	-1.53E+05	7.20E+05
78.13	-1.39E+06	4.38E+05	-1.10E+06	-1.44E+06	7.88E+05	3.35E+05	-2.09E+05	8.21E+05
87.89	-1.51E+06	4.34E+05	-1.14E+06	-1.58E+06	9.71E+05	2.88E+05	-3.68E+05	9.83E+05
97.66	-1.58E+06	4.48E+05	-1.11E+06	-1.53E+06	1.00E+06	4.32E+05	-3.79E+05	1.07E+06
107.42	-1.54E+06	2.91E+05	-1.31E+06	-1.50E+06	1.17E+06	4.34E+05	-4.20E+05	1.20E+06
117.19	-1.33E+06	2.36E+05	-1.55E+06	-1.58E+06	9.58E+05	5.72E+05	-3.10E+05	1.25E+06
126.95	-1.37E+06	-3.91E+04	-1.91E+06	-1.38E+06	8.92E+05	6.06E+05	-5.47E+02	1.23E+06
136.72	-3.69E+06	1.68E+06	7.27E+05	-3.42E+06	-2.92E+06	4.26E+06	3.76E+06	-2.16E+06

Table A.98 Raw data for test seal at 10,000 rpm, 96% GVF and 0.3 PR (*Medium* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.04E+06	8.92E+05	-1.58E+06	-1.24E+06	-3.12E+05	-1.65E+05	2.19E+05	-1.85E+05
19.53	-1.44E+06	7.90E+05	-1.28E+06	-1.56E+06	-3.52E+04	-3.52E+05	4.37E+05	-1.34E+05
29.3	-1.81E+06	9.15E+05	-4.74E+05	-2.21E+06	8.74E+05	-9.49E+05	-3.98E+05	1.01E+06
39.06	-1.45E+06	4.37E+05	-9.01E+05	-1.59E+06	4.20E+05	-7.32E+04	3.40E+04	5.16E+05
48.83	-1.42E+06	9.65E+04	-5.43E+05	-1.57E+06	8.33E+05	9.31E+02	-1.14E+05	8.61E+05
58.59	-1.31E+06	4.65E+05	-8.45E+05	-1.57E+06	6.55E+05	2.96E+05	-2.45E+05	7.22E+05
68.36	-1.49E+06	4.22E+05	-9.06E+05	-1.45E+06	7.27E+05	2.84E+05	-3.01E+05	8.16E+05
78.13	-1.48E+06	3.98E+05	-1.08E+06	-1.52E+06	8.08E+05	3.84E+05	-3.75E+05	8.81E+05
87.89	-1.56E+06	3.90E+05	-1.10E+06	-1.63E+06	1.02E+06	3.75E+05	-4.49E+05	1.03E+06
97.66	-1.73E+06	3.93E+05	-1.09E+06	-1.59E+06	1.03E+06	4.94E+05	-4.38E+05	1.10E+06
107.42	-1.69E+06	3.37E+05	-1.27E+06	-1.65E+06	1.20E+06	5.24E+05	-5.12E+05	1.27E+06
117.19	-1.52E+06	2.42E+05	-1.46E+06	-1.60E+06	1.02E+06	6.59E+05	-4.25E+05	1.29E+06
126.95	-1.52E+06	-7.67E+04	-1.82E+06	-1.47E+06	9.83E+05	7.49E+05	-1.47E+05	1.27E+06
136.72	-3.94E+06	1.67E+06	9.22E+05	-3.47E+06	-2.35E+06	3.99E+06	3.04E+06	-1.67E+06

Table A.99 Raw data for test seal at 15,000 rpm, 96% GVF and 0.3 PR (*Medium* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.49E+06	1.35E+06	-1.77E+06	-1.12E+06	-2.53E+05	-3.01E+05	4.73E+05	-3.06E+05
19.53	-1.65E+06	9.23E+05	-1.35E+06	-1.63E+06	6.65E+04	-5.03E+05	4.97E+05	-1.20E+05
29.3	-1.96E+06	8.54E+05	-7.32E+05	-2.15E+06	8.51E+05	-8.76E+05	3.10E+04	7.03E+05
39.06	-1.57E+06	5.02E+05	-8.92E+05	-1.82E+06	5.56E+05	-1.16E+05	6.76E+04	5.05E+05
48.83	-1.71E+06	2.35E+05	-7.80E+05	-1.82E+06	6.55E+05	3.65E+04	-2.56E+04	8.34E+05
58.59	-1.54E+06	5.06E+05	-8.12E+05	-1.77E+06	7.05E+05	2.51E+05	-2.94E+05	8.16E+05
68.36	-1.72E+06	4.51E+05	-9.19E+05	-1.74E+06	8.75E+05	2.67E+05	-3.71E+05	1.01E+06
78.13	-1.64E+06	4.59E+05	-9.41E+05	-1.75E+06	1.00E+06	3.91E+05	-4.61E+05	1.02E+06
87.89	-1.72E+06	3.84E+05	-1.06E+06	-1.81E+06	1.12E+06	4.55E+05	-6.80E+05	1.20E+06
97.66	-1.84E+06	4.36E+05	-1.08E+06	-1.73E+06	1.24E+06	6.17E+05	-6.54E+05	1.26E+06
107.42	-1.75E+06	3.24E+05	-1.36E+06	-1.79E+06	1.29E+06	6.60E+05	-6.99E+05	1.44E+06
117.19	-1.67E+06	2.93E+05	-1.45E+06	-1.76E+06	1.19E+06	8.16E+05	-6.40E+05	1.46E+06
126.95	-1.72E+06	-3.54E+04	-1.75E+06	-1.70E+06	1.29E+06	9.18E+05	-4.52E+05	1.46E+06
136.72	-3.61E+06	1.24E+06	3.18E+05	-3.14E+06	-1.14E+06	3.37E+06	1.51E+06	-6.16E+05

Table A.100 Raw data for test seal at 5,000 rpm, 94% GVF and 0.3 PR (*Medium* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.11E+06	7.80E+05	-1.24E+06	-1.20E+06	-3.51E+04	-1.63E+05	2.41E+05	5.00E+04
19.53	-1.25E+06	6.64E+05	-9.65E+05	-1.34E+06	2.42E+05	-1.86E+05	2.79E+05	1.57E+05
29.3	-1.59E+06	9.17E+05	-4.55E+05	-1.81E+06	9.90E+05	-8.36E+05	-6.17E+05	1.14E+06
39.06	-1.28E+06	4.82E+05	-8.75E+05	-1.30E+06	4.49E+05	8.06E+04	-2.73E+04	4.95E+05
48.83	-1.46E+06	4.33E+05	-8.26E+05	-1.39E+06	5.79E+05	1.41E+04	-6.43E+03	5.97E+05
58.59	-1.18E+06	5.09E+05	-8.53E+05	-1.38E+06	7.34E+05	2.77E+05	-2.22E+05	7.09E+05
68.36	-1.37E+06	3.82E+05	-9.48E+05	-1.31E+06	7.60E+05	2.10E+05	-2.11E+05	8.18E+05
78.13	-1.37E+06	4.17E+05	-1.05E+06	-1.50E+06	9.74E+05	2.16E+05	-2.11E+05	8.61E+05
87.89	-1.48E+06	4.65E+05	-1.06E+06	-1.56E+06	1.09E+06	2.73E+05	-3.13E+05	1.03E+06
97.66	-1.63E+06	4.42E+05	-1.05E+06	-1.56E+06	1.17E+06	3.78E+05	-3.06E+05	1.16E+06
107.42	-1.64E+06	3.67E+05	-1.23E+06	-1.61E+06	1.30E+06	3.27E+05	-2.45E+05	1.34E+06
117.19	-1.47E+06	2.97E+05	-1.36E+06	-1.64E+06	1.19E+06	4.90E+05	-2.35E+05	1.43E+06
126.95	-1.52E+06	2.43E+04	-1.57E+06	-1.54E+06	1.33E+06	6.60E+05	1.50E+04	1.40E+06
136.72	-3.61E+06	1.53E+06	5.42E+05	-3.20E+06	-6.90E+05	2.73E+06	1.71E+06	-4.00E+05

Table A.101 Raw data for test seal at 10,000 rpm, 94% GVF and 0.3 PR (*Medium* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.08E+06	9.66E+05	-1.40E+06	-1.26E+06	-2.03E+05	-2.76E+05	4.77E+05	-1.78E+05
19.53	-1.38E+06	7.59E+05	-1.15E+06	-1.33E+06	2.26E+04	-3.40E+05	3.34E+05	-1.32E+05
29.3	-1.76E+06	9.24E+05	-4.36E+05	-1.97E+06	1.06E+06	-1.04E+06	-4.97E+05	1.02E+06
39.06	-1.37E+06	4.24E+05	-8.25E+05	-1.54E+06	4.87E+05	-1.32E+04	1.65E+03	5.96E+05
48.83	-1.57E+06	3.64E+05	-7.46E+05	-1.47E+06	5.85E+05	-1.59E+04	4.48E+04	5.93E+05
58.59	-1.38E+06	5.85E+05	-7.96E+05	-1.49E+06	6.72E+05	2.48E+05	-1.77E+05	7.60E+05
68.36	-1.46E+06	4.28E+05	-8.31E+05	-1.55E+06	7.73E+05	2.82E+05	-2.69E+05	8.39E+05
78.13	-1.43E+06	4.01E+05	-1.00E+06	-1.53E+06	8.81E+05	3.68E+05	-2.50E+05	8.98E+05
87.89	-1.55E+06	4.11E+05	-9.97E+05	-1.66E+06	1.04E+06	3.89E+05	-3.45E+05	1.00E+06
97.66	-1.65E+06	4.14E+05	-9.21E+05	-1.65E+06	1.14E+06	5.14E+05	-4.01E+05	1.15E+06
107.42	-1.66E+06	3.53E+05	-1.15E+06	-1.72E+06	1.24E+06	4.87E+05	-3.83E+05	1.38E+06
117.19	-1.54E+06	3.08E+05	-1.28E+06	-1.69E+06	1.12E+06	6.26E+05	-3.57E+05	1.38E+06
126.95	-1.59E+06	-8.17E+03	-1.50E+06	-1.64E+06	1.29E+06	7.34E+05	-1.12E+05	1.36E+06
136.72	-3.65E+06	1.69E+06	5.98E+05	-3.50E+06	-8.73E+05	2.96E+06	1.59E+06	-4.73E+05

Table A.102 Raw data for test seal at 15,000 rpm, 94% GVF and 0.3 PR (*Medium* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.21E+06	1.16E+06	-1.72E+06	-1.34E+06	-3.88E+05	-2.78E+05	3.83E+05	-2.58E+05
19.53	-1.66E+06	7.29E+05	-1.20E+06	-1.70E+06	1.20E+03	-4.51E+05	5.90E+05	-5.04E+04
29.3	-1.90E+06	7.92E+05	-5.12E+05	-2.28E+06	8.57E+05	-1.08E+06	-2.52E+05	1.15E+06
39.06	-1.60E+06	3.21E+05	-6.88E+05	-1.77E+06	5.92E+05	-1.24E+05	1.13E+05	6.62E+05
48.83	-1.78E+06	2.22E+05	-6.05E+05	-1.74E+06	6.95E+05	5.14E+04	1.86E+05	7.36E+05
58.59	-1.50E+06	4.05E+05	-5.22E+05	-1.63E+06	8.37E+05	4.37E+05	-2.26E+05	8.35E+05
68.36	-1.51E+06	3.28E+05	-7.01E+05	-1.61E+06	8.44E+05	4.87E+05	-3.19E+05	1.12E+06
78.13	-1.53E+06	3.23E+05	-8.35E+05	-1.66E+06	1.00E+06	4.78E+05	-3.43E+05	1.08E+06
87.89	-1.60E+06	3.38E+05	-9.58E+05	-1.66E+06	1.09E+06	5.28E+05	-5.49E+05	1.09E+06
97.66	-1.68E+06	4.11E+05	-8.71E+05	-1.75E+06	1.18E+06	6.55E+05	-5.42E+05	1.18E+06
107.42	-1.73E+06	3.30E+05	-1.11E+06	-1.77E+06	1.29E+06	6.93E+05	-4.19E+05	1.48E+06
117.19	-1.60E+06	2.97E+05	-1.20E+06	-1.75E+06	1.15E+06	8.01E+05	-4.93E+05	1.41E+06
126.95	-1.67E+06	2.38E+04	-1.47E+06	-1.83E+06	1.26E+06	1.06E+06	-3.21E+05	1.45E+06
136.72	-3.87E+06	1.68E+06	8.01E+05	-3.49E+06	-8.92E+05	2.94E+06	1.45E+06	-2.30E+05

Table A.103 Raw data for test seal at 5,000 rpm, 92% GVF and 0.3 PR (*Medium* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.04E+06	7.18E+05	-1.29E+06	-1.25E+06	4.21E+03	-2.18E+05	1.97E+05	2.44E+05
19.53	-1.20E+06	6.95E+05	-1.04E+06	-1.22E+06	2.51E+05	-1.87E+05	2.33E+05	2.22E+05
29.3	-1.55E+06	9.10E+05	-5.38E+05	-1.74E+06	1.28E+06	-1.17E+06	-8.30E+05	1.46E+06
39.06	-1.22E+06	5.69E+05	-8.55E+05	-1.29E+06	5.49E+05	5.11E+03	5.82E+04	5.93E+05
48.83	-1.48E+06	5.65E+05	-8.26E+05	-1.33E+06	6.11E+05	-5.97E+04	1.09E+05	6.27E+05
58.59	-1.13E+06	6.57E+05	-7.45E+05	-1.31E+06	9.34E+05	1.87E+05	-1.35E+05	8.07E+05
68.36	-1.33E+06	5.64E+05	-7.87E+05	-1.39E+06	9.11E+05	1.89E+05	-1.97E+05	1.00E+06
78.13	-1.33E+06	5.33E+05	-9.56E+05	-1.42E+06	1.09E+06	2.11E+05	-1.38E+05	9.96E+05
87.89	-1.42E+06	4.74E+05	-1.02E+06	-1.48E+06	1.23E+06	1.91E+05	-2.70E+05	1.15E+06
97.66	-1.52E+06	5.13E+05	-9.69E+05	-1.51E+06	1.36E+06	2.95E+05	-2.56E+05	1.30E+06
107.42	-1.62E+06	4.51E+05	-1.15E+06	-1.58E+06	1.45E+06	2.84E+05	-1.76E+05	1.49E+06
117.19	-1.48E+06	3.82E+05	-1.23E+06	-1.64E+06	1.34E+06	4.53E+05	-1.64E+05	1.53E+06
126.95	-1.48E+06	2.61E+05	-1.40E+06	-1.70E+06	1.45E+06	7.43E+05	1.20E+05	1.43E+06
136.72	-3.76E+06	1.76E+06	6.84E+05	-3.28E+06	5.73E+05	1.71E+06	6.42E+05	8.21E+05

Table A.104 Raw data for test seal at 10,000 rpm, 92% GVF and 0.3 PR (*Medium* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.21E+06	1.02E+06	-1.23E+06	-1.41E+06	-2.37E+05	-2.46E+05	2.05E+05	1.58E+04
19.53	-1.47E+06	8.29E+05	-9.22E+05	-1.64E+06	1.17E+05	-3.58E+05	3.78E+05	1.73E+05
29.3	-9.07E+05	-5.58E+04	-1.35E+06	-9.49E+05	2.01E+06	-1.92E+06	-1.63E+06	2.23E+06
39.06	-1.51E+06	5.70E+05	-7.59E+05	-1.60E+06	5.47E+05	-4.80E+04	6.73E+04	6.69E+05
48.83	-1.59E+06	5.11E+05	-6.19E+05	-1.63E+06	6.84E+05	-5.17E+04	3.98E+04	6.97E+05
58.59	-1.41E+06	4.89E+05	-4.43E+05	-1.53E+06	1.08E+06	2.79E+05	-2.21E+05	9.25E+05
68.36	-1.47E+06	5.20E+05	-7.00E+05	-1.59E+06	9.24E+05	3.25E+05	-3.30E+05	1.00E+06
78.13	-1.57E+06	6.18E+05	-7.37E+05	-1.69E+06	1.04E+06	3.97E+05	-2.63E+05	1.04E+06
87.89	-1.64E+06	5.82E+05	-8.04E+05	-1.83E+06	1.18E+06	4.18E+05	-3.90E+05	1.16E+06
97.66	-1.79E+06	7.09E+05	-7.16E+05	-1.92E+06	1.31E+06	4.62E+05	-3.91E+05	1.25E+06
107.42	-1.87E+06	6.28E+05	-8.63E+05	-2.02E+06	1.41E+06	4.58E+05	-3.48E+05	1.56E+06
117.19	-1.75E+06	6.04E+05	-1.01E+06	-2.10E+06	1.32E+06	5.54E+05	-3.80E+05	1.58E+06
126.95	-1.90E+06	3.76E+05	-1.16E+06	-2.15E+06	1.48E+06	5.70E+05	-2.23E+05	1.75E+06
136.72	-4.45E+06	2.37E+06	1.51E+06	-4.37E+06	-1.50E+06	3.55E+06	2.52E+06	-7.95E+05

Table A.105 Raw data for test seal at 15,000 rpm, 92% GVF and 0.3 PR (*Medium* Preswirl)

Freq.	*Re*(H_{XX})	*Re*(H_{XY})	*Re*(H_{YX})	*Re*(H_{YY})	*Im*(H_{XX})	*Im*(H_{XY})	*Im*(H_{YX})	*Im*(H_{YY})
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.34E+06	1.23E+06	-1.43E+06	-1.47E+06	-3.32E+05	-2.66E+05	3.25E+05	-1.68E+05
19.53	-1.84E+06	9.30E+05	-9.99E+05	-1.98E+06	1.46E+05	-5.87E+05	6.95E+05	-7.58E+04
29.3	-1.08E+06	-2.63E+05	-1.53E+06	-9.96E+05	1.98E+06	-2.05E+06	-1.38E+06	2.30E+06
39.06	-1.72E+06	4.96E+05	-5.22E+05	-1.84E+06	6.71E+05	-6.16E+04	1.25E+05	6.82E+05
48.83	-1.88E+06	4.89E+05	-5.42E+05	-1.89E+06	6.79E+05	1.19E+04	1.74E+05	7.91E+05
58.59	-1.54E+06	3.85E+05	-2.34E+05	-1.73E+06	1.18E+06	3.60E+05	-2.47E+05	1.13E+06
68.36	-1.60E+06	5.72E+05	-5.05E+05	-1.78E+06	1.03E+06	4.07E+05	-3.67E+05	1.05E+06
78.13	-1.59E+06	5.14E+05	-6.38E+05	-1.85E+06	1.14E+06	4.64E+05	-3.77E+05	1.14E+06
87.89	-1.74E+06	5.43E+05	-6.85E+05	-1.93E+06	1.23E+06	5.42E+05	-4.54E+05	1.20E+06
97.66	-1.86E+06	6.60E+05	-6.30E+05	-2.07E+06	1.32E+06	6.64E+05	-5.57E+05	1.35E+06
107.42	-1.96E+06	6.36E+05	-8.26E+05	-2.13E+06	1.40E+06	6.51E+05	-4.02E+05	1.62E+06
117.19	-1.82E+06	6.53E+05	-9.28E+05	-2.22E+06	1.28E+06	8.05E+05	-5.58E+05	1.62E+06
126.95	-1.98E+06	4.68E+05	-1.07E+06	-2.41E+06	1.46E+06	7.60E+05	-3.25E+05	1.76E+06
136.72	-4.75E+06	2.50E+06	1.71E+06	-4.65E+06	-1.45E+06	3.69E+06	2.23E+06	-6.47E+05

Table A.106 Raw data for test seal at 5,000 rpm, 90% GVF and 0.3 PR (*Medium* Preswirl)

Freq.	*Re*(H_{XX})	*Re*(H_{XY})	*Re*(H_{YX})	*Re*(H_{YY})	*Im*(H_{XX})	*Im*(H_{XY})	*Im*(H_{YX})	*Im*(H_{YY})
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.25E+06	9.48E+05	-1.11E+06	-1.40E+06	9.60E+04	-2.65E+05	2.07E+05	1.72E+05
19.53	-1.28E+06	8.31E+05	-9.57E+05	-1.39E+06	2.79E+05	-1.61E+05	2.02E+05	3.27E+05
29.3	-8.95E+05	1.76E+05	-1.31E+06	-8.71E+05	1.95E+06	-1.78E+06	-1.52E+06	2.23E+06
39.06	-1.47E+06	7.99E+05	-7.46E+05	-1.44E+06	5.91E+05	3.65E+04	6.02E+04	6.85E+05
48.83	-1.49E+06	6.85E+05	-7.07E+05	-1.46E+06	8.20E+05	-4.05E+04	-2.30E+03	7.58E+05
58.59	-1.35E+06	7.53E+05	-5.94E+05	-1.55E+06	1.00E+06	1.53E+05	-1.13E+05	9.10E+05
68.36	-1.49E+06	7.17E+05	-6.30E+05	-1.49E+06	1.08E+06	2.29E+05	-1.98E+05	1.17E+06
78.13	-1.52E+06	7.56E+05	-8.13E+05	-1.64E+06	1.21E+06	1.32E+05	-2.13E+05	1.22E+06
87.89	-1.59E+06	7.16E+05	-8.26E+05	-1.69E+06	1.34E+06	2.35E+05	-2.88E+05	1.25E+06
97.66	-1.74E+06	7.83E+05	-7.72E+05	-1.82E+06	1.42E+06	3.13E+05	-2.93E+05	1.40E+06
107.42	-1.85E+06	7.25E+05	-9.13E+05	-1.86E+06	1.56E+06	2.68E+05	-1.51E+05	1.66E+06
117.19	-1.79E+06	7.73E+05	-9.75E+05	-2.03E+06	1.48E+06	3.98E+05	-1.82E+05	1.71E+06
126.95	-1.86E+06	6.37E+05	-1.06E+06	-2.18E+06	1.61E+06	5.01E+05	5.57E+04	1.77E+06
136.72	-4.95E+06	2.71E+06	1.94E+06	-4.49E+06	-1.87E+05	2.53E+06	1.60E+06	2.25E+05

Table A.107 Raw data for test seal at 10,000 rpm, 90% GVF and 0.3 PR (*Medium* Preswirl)

Freq.	*Re*(H_{XX})	*Re*(H_{XY})	*Re*(H_{YX})	*Re*(H_{YY})	*Im*(H_{XX})	*Im*(H_{XY})	*Im*(H_{YX})	*Im*(H_{YY})
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.23E+06	1.11E+06	-1.19E+06	-1.53E+06	-9.80E+04	-3.17E+05	2.29E+05	5.10E+04
19.53	-1.37E+06	8.69E+05	-9.49E+05	-1.58E+06	1.99E+05	-3.19E+05	3.32E+05	3.06E+05
29.3	-8.36E+05	-4.62E+04	-1.44E+06	-7.89E+05	1.90E+06	-1.93E+06	-1.41E+06	2.24E+06
39.06	-1.44E+06	6.57E+05	-6.78E+05	-1.50E+06	5.98E+05	-5.89E+03	3.59E+04	7.61E+05
48.83	-1.58E+06	6.32E+05	-6.08E+05	-1.51E+06	7.21E+05	-6.55E+03	7.54E+03	8.15E+05
58.59	-1.52E+06	6.58E+05	-4.83E+05	-1.49E+06	1.05E+06	2.38E+05	-1.23E+05	9.37E+05
68.36	-1.56E+06	7.32E+05	-5.87E+05	-1.61E+06	1.05E+06	2.09E+05	-2.42E+05	1.07E+06
78.13	-1.46E+06	6.46E+05	-7.27E+05	-1.66E+06	1.15E+06	2.96E+05	-3.11E+05	1.12E+06
87.89	-1.67E+06	7.10E+05	-7.40E+05	-1.82E+06	1.34E+06	3.12E+05	-3.63E+05	1.23E+06
97.66	-1.77E+06	7.30E+05	-7.14E+05	-1.88E+06	1.41E+06	4.49E+05	-4.12E+05	1.32E+06
107.42	-1.91E+06	7.65E+05	-8.11E+05	-2.07E+06	1.58E+06	4.17E+05	-4.46E+05	1.63E+06
117.19	-1.81E+06	7.37E+05	-9.40E+05	-2.12E+06	1.45E+06	5.34E+05	-3.86E+05	1.69E+06
126.95	-1.86E+06	6.87E+05	-1.03E+06	-2.31E+06	1.58E+06	6.22E+05	-2.05E+05	1.81E+06
136.72	-3.77E+06	1.52E+06	6.35E+05	-3.33E+06	5.60E+05	2.22E+06	4.12E+05	7.49E+05

Table A.108 Raw data for test seal at 15,000 rpm, 90% GVF and 0.3 PR (*Medium* Preswirl)

Freq.	*Re*(H_{XX})	*Re*(H_{XY})	*Re*(H_{YX})	*Re*(H_{YY})	*Im*(H_{XX})	*Im*(H_{XY})	*Im*(H_{YX})	*Im*(H_{YY})
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.25E+06	1.26E+06	-1.42E+06	-1.59E+06	-2.24E+05	-3.74E+05	2.33E+05	-2.17E+05
19.53	-1.70E+06	7.65E+05	-9.08E+05	-1.74E+06	2.88E+05	-4.16E+05	6.47E+05	2.19E+05
29.3	-1.05E+06	-8.28E+04	-1.19E+06	-1.30E+06	2.03E+06	-2.02E+06	-1.40E+06	2.36E+06
39.06	-1.52E+06	4.31E+05	-5.18E+05	-1.75E+06	7.39E+05	-3.00E+04	4.64E+04	8.84E+05
48.83	-1.58E+06	4.54E+05	-5.24E+05	-1.71E+06	8.45E+05	6.37E+04	4.50E+04	8.64E+05
58.59	-1.59E+06	5.01E+05	-2.84E+05	-1.64E+06	1.14E+06	3.16E+05	-1.71E+05	9.69E+05
68.36	-1.54E+06	4.81E+05	-6.04E+05	-1.69E+06	1.11E+06	4.78E+05	-4.06E+05	1.21E+06
78.13	-1.48E+06	5.29E+05	-7.06E+05	-1.75E+06	1.25E+06	4.54E+05	-3.99E+05	1.24E+06
87.89	-1.60E+06	4.92E+05	-7.10E+05	-1.83E+06	1.28E+06	5.79E+05	-4.36E+05	1.30E+06
97.66	-1.75E+06	6.36E+05	-6.56E+05	-1.93E+06	1.37E+06	6.47E+05	-5.74E+05	1.37E+06
107.42	-1.90E+06	6.06E+05	-8.12E+05	-2.03E+06	1.51E+06	6.68E+05	-5.16E+05	1.71E+06
117.19	-1.78E+06	5.82E+05	-9.18E+05	-2.10E+06	1.36E+06	8.19E+05	-5.43E+05	1.71E+06
126.95	-1.92E+06	4.96E+05	-1.14E+06	-2.24E+06	1.64E+06	8.42E+05	-3.44E+05	1.80E+06
136.72	-4.62E+06	2.36E+06	1.71E+06	-4.49E+06	-8.12E+05	3.32E+06	1.61E+06	-1.24E+05

Table A.109 Raw data for test seal at 5,000 rpm, 100% GVF and 0.5 PR (*Zero* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-6.98E+04	-2.93E+05	-3.13E+05	-2.91E+05	-1.96E+04	-2.84E+04	2.45E+04	1.37E+05
19.53	-2.53E+05	-4.06E+05	-2.79E+05	-1.70E+05	9.29E+04	6.44E+04	6.85E+04	1.81E+05
29.3	-1.86E+04	-7.11E+05	-4.58E+05	1.24E+05	2.73E+05	3.99E+04	-5.80E+04	3.42E+05
39.06	-2.42E+05	-3.84E+05	-2.07E+05	-2.24E+05	3.39E+05	8.08E+04	-4.51E+04	3.63E+05
48.83	-3.46E+05	-3.24E+05	-1.56E+05	-3.38E+05	4.40E+05	1.20E+05	-1.28E+05	4.78E+05
58.59	-3.37E+05	-3.09E+05	-9.66E+04	-4.82E+05	6.22E+05	1.02E+05	-7.41E+04	5.64E+05
68.36	-5.37E+05	-4.14E+05	-1.79E+05	-4.74E+05	5.11E+05	1.30E+05	-1.81E+05	5.60E+05
78.13	-5.54E+05	-3.75E+05	-2.40E+05	-5.17E+05	7.21E+05	1.97E+05	-1.50E+05	7.24E+05
87.89	-6.73E+05	-4.50E+05	-3.45E+05	-5.31E+05	9.57E+05	3.73E+04	-3.32E+05	9.65E+05
97.66	-8.70E+05	-4.30E+05	-2.82E+05	-6.83E+05	1.07E+06	2.96E+05	-1.96E+05	9.02E+05
107.42	-6.28E+05	-5.13E+05	-3.98E+05	-6.50E+05	1.32E+06	1.50E+05	-3.76E+05	1.10E+06
117.19	-5.39E+05	-6.82E+05	-5.45E+05	-6.04E+05	1.25E+06	2.90E+05	-3.05E+05	1.17E+06
126.95	-3.55E+05	-8.79E+05	-8.90E+05	-3.95E+05	1.11E+06	5.93E+05	1.87E+04	1.02E+06
136.72	-4.38E+05	-7.18E+05	-1.11E+06	-7.61E+05	-1.43E+06	3.57E+06	3.02E+06	-2.56E+06

Table A.110 Raw data for test seal at 10,000 rpm, 100% GVF and 0.5 PR (*Zero* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-2.06E+05	-1.64E+05	-2.29E+05	-4.82E+05	6.99E+03	2.65E+04	-2.11E+04	1.03E+05
19.53	-3.60E+05	-2.48E+05	-9.50E+04	-3.94E+05	7.56E+04	8.81E+04	-2.14E+04	1.68E+05
29.3	-1.80E+05	-5.22E+05	-3.25E+05	-1.28E+05	1.90E+05	1.00E+05	-1.16E+05	3.05E+05
39.06	-4.02E+05	-2.48E+05	-1.26E+05	-4.06E+05	2.75E+05	1.52E+05	-1.73E+05	3.11E+05
48.83	-5.58E+05	-2.49E+05	-6.10E+04	-5.73E+05	3.56E+05	1.75E+05	-1.47E+05	4.17E+05
58.59	-4.75E+05	-2.79E+05	1.07E+05	-7.58E+05	5.21E+05	2.05E+05	-1.62E+05	6.16E+05
68.36	-7.69E+05	-2.92E+05	-8.77E+04	-7.45E+05	6.03E+05	2.63E+05	-3.45E+05	5.86E+05
78.13	-7.74E+05	-3.16E+05	-1.25E+05	-8.01E+05	6.61E+05	2.74E+05	-3.18E+05	8.13E+05
87.89	-8.27E+05	-5.40E+05	-2.88E+05	-6.15E+05	1.07E+06	2.37E+05	-6.62E+05	9.50E+05
97.66	-1.03E+06	-3.72E+05	-1.33E+05	-9.07E+05	1.12E+06	5.02E+05	-3.99E+05	9.54E+05
107.42	-8.25E+05	-4.82E+05	-3.17E+05	-8.42E+05	1.35E+06	3.76E+05	-6.66E+05	1.18E+06
117.19	-6.93E+05	-6.78E+05	-4.12E+05	-7.68E+05	1.33E+06	5.73E+05	-5.93E+05	1.23E+06
126.95	-4.90E+05	-8.31E+05	-7.09E+05	-5.77E+05	1.10E+06	9.52E+05	-3.46E+05	1.03E+06
136.72	-7.10E+05	-4.03E+05	-8.09E+05	-1.22E+06	-1.31E+06	3.93E+06	2.68E+06	-2.50E+06

Table A.111 Raw data for test seal at 15,000 rpm, 100% GVF and 0.5 PR (*Zero* Preswirl)

Freq.	*Re(H_{XX})*	*Re(H_{XY})*	*Re(H_{YX})*	*Re(H_{YY})*	*Im(H_{XX})*	*Im(H_{XY})*	*Im(H_{YX})*	*Im(H_{YY})*
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-5.50E+05	-1.91E+05	-2.98E+05	-6.40E+05	4.91E+04	6.29E+04	-3.81E+04	3.86E+04
19.53	-6.58E+05	-3.32E+05	-2.35E+05	-4.99E+05	1.22E+05	1.59E+05	-3.82E+04	1.76E+05
29.3	-5.32E+05	-4.98E+05	-3.57E+05	-3.62E+05	2.89E+05	1.65E+05	-2.20E+05	3.60E+05
39.06	-6.70E+05	-2.48E+05	-2.64E+05	-6.20E+05	2.78E+05	2.64E+05	-2.67E+05	3.70E+05
48.83	-8.60E+05	-2.43E+05	-1.88E+05	-7.14E+05	3.84E+05	3.09E+05	-3.30E+05	4.67E+05
58.59	-7.03E+05	-2.70E+05	-6.38E+04	-8.81E+05	5.06E+05	4.17E+05	-2.88E+05	6.78E+05
68.36	-9.13E+05	-2.75E+05	-2.52E+05	-8.39E+05	6.21E+05	4.81E+05	-4.59E+05	6.66E+05
78.13	-9.25E+05	-2.06E+05	-3.01E+05	-8.79E+05	6.46E+05	5.38E+05	-5.44E+05	7.60E+05
87.89	-1.16E+06	-3.39E+05	-4.98E+05	-8.72E+05	8.58E+05	3.79E+05	-7.42E+05	1.07E+06
97.66	-1.42E+06	-2.35E+05	-2.32E+05	-1.13E+06	1.04E+06	5.43E+05	-6.00E+05	1.10E+06
107.42	-1.26E+06	-5.60E+05	-5.02E+05	-9.68E+05	1.31E+06	4.84E+05	-8.33E+05	1.24E+06
117.19	-9.96E+05	-7.44E+05	-5.58E+05	-8.76E+05	1.42E+06	8.41E+05	-8.14E+05	1.25E+06
126.95	-8.09E+05	-8.41E+05	-8.31E+05	-7.40E+05	1.13E+06	1.20E+06	-5.82E+05	1.05E+06
136.72	-1.04E+06	-5.62E+05	-9.10E+05	-1.29E+06	-1.27E+06	4.24E+06	2.41E+06	-2.41E+06

Table A.112 Raw data for test seal at 5,000 rpm, 98% GVF and 0.5 PR (*Zero* Preswirl)

Freq.	*Re(H_{XX})*	*Re(H_{XY})*	*Re(H_{YX})*	*Re(H_{YY})*	*Im(H_{XX})*	*Im(H_{XY})*	*Im(H_{YX})*	*Im(H_{YY})*
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-6.16E+05	1.18E+05	-1.41E+05	-8.24E+05	7.37E+04	-1.02E+05	-8.18E+03	8.62E+04
19.53	-6.93E+05	-8.56E+03	-1.18E+05	-7.40E+05	1.57E+05	6.42E+03	7.52E+04	1.87E+05
29.3	-7.02E+05	1.61E+03	-9.66E+03	-9.16E+05	6.07E+05	-5.66E+05	-4.31E+05	1.03E+06
39.06	-7.81E+05	-2.60E+04	2.40E+04	-8.40E+05	4.88E+05	8.33E+03	-5.16E+04	4.57E+05
48.83	-9.16E+05	-3.98E+04	2.65E+04	-9.70E+05	5.40E+05	1.21E+03	-4.19E+04	5.90E+05
58.59	-8.47E+05	4.82E+04	1.49E+05	-1.13E+06	5.97E+05	8.50E+04	-5.18E+04	8.50E+05
68.36	-9.81E+05	1.69E+04	1.36E+05	-1.12E+06	8.48E+05	-1.12E+04	-1.99E+05	7.93E+05
78.13	-1.05E+06	-9.03E+04	-2.27E+04	-1.10E+06	9.50E+05	1.06E+05	-1.65E+05	9.45E+05
87.89	-1.16E+06	-1.36E+05	-1.43E+05	-1.15E+06	1.16E+06	1.60E+05	-1.75E+05	1.08E+06
97.66	-1.22E+06	1.20E+04	3.00E+04	-1.34E+06	1.37E+06	1.70E+05	-2.23E+05	1.23E+06
107.42	-1.19E+06	-6.45E+04	-5.27E+04	-1.36E+06	1.50E+06	1.42E+05	-3.26E+05	1.38E+06
117.19	-1.14E+06	-1.25E+05	-1.11E+05	-1.37E+06	1.54E+06	2.03E+05	-3.10E+05	1.46E+06
126.95	-1.25E+06	-1.86E+05	-2.48E+05	-1.50E+06	1.48E+06	3.06E+05	-1.27E+05	1.61E+06
136.72	-2.09E+06	1.01E+06	6.37E+05	-2.94E+06	1.41E+05	1.74E+06	1.49E+06	-1.40E+05

Table A.113 Raw data for test seal at 10,000 rpm, 98% GVF and 0.5 PR (*Zero* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-7.41E+05	2.90E+05	-2.57E+05	-9.60E+05	5.76E+04	-5.86E+04	1.74E+04	9.02E+03
19.53	-8.49E+05	1.24E+05	-1.73E+05	-8.93E+05	1.98E+05	-1.29E+04	7.12E+04	1.60E+05
29.3	-9.56E+05	1.21E+05	-5.69E+04	-1.01E+06	6.59E+05	-3.83E+05	-3.89E+05	8.80E+05
39.06	-9.85E+05	1.52E+05	-1.20E+05	-9.95E+05	4.47E+05	6.07E+04	-2.51E+04	4.50E+05
48.83	-1.13E+06	1.13E+05	-5.31E+04	-1.12E+06	5.67E+05	1.08E+05	-5.12E+04	6.27E+05
58.59	-1.04E+06	1.61E+05	8.00E+04	-1.16E+06	6.59E+05	1.77E+05	-1.36E+05	8.36E+05
68.36	-1.17E+06	9.90E+04	4.20E+04	-1.31E+06	8.54E+05	1.85E+05	-2.34E+05	8.78E+05
78.13	-1.24E+06	8.14E+04	-6.95E+04	-1.32E+06	9.20E+05	3.09E+05	-1.82E+05	9.94E+05
87.89	-1.45E+06	1.08E+05	-1.27E+05	-1.32E+06	1.12E+06	2.73E+05	-2.28E+05	1.25E+06
97.66	-1.40E+06	5.43E+04	1.01E+04	-1.45E+06	1.45E+06	3.29E+05	-3.45E+05	1.33E+06
107.42	-1.36E+06	6.14E+04	-1.53E+05	-1.43E+06	1.54E+06	3.41E+05	-4.36E+05	1.49E+06
117.19	-1.35E+06	-4.63E+04	-1.59E+05	-1.49E+06	1.58E+06	4.19E+05	-3.73E+05	1.56E+06
126.95	-1.41E+06	-4.78E+04	-2.25E+05	-1.61E+06	1.53E+06	5.93E+05	-1.83E+05	1.68E+06
136.72	-2.40E+06	1.35E+06	8.31E+05	-3.24E+06	1.00E+03	2.43E+06	1.51E+06	-4.84E+05

Table A.114 Raw data for test seal at 15,000 rpm, 98% GVF and 0.5 PR (*Zero* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-9.92E+05	4.70E+05	-5.90E+05	-1.14E+06	-4.16E+04	1.02E+05	5.91E+04	-7.05E+04
19.53	-1.19E+06	2.79E+05	-3.99E+05	-1.16E+06	1.47E+05	7.41E+04	1.12E+05	2.04E+05
29.3	-1.24E+06	3.41E+05	-2.82E+05	-1.41E+06	7.36E+05	-5.04E+05	-4.87E+05	1.17E+06
39.06	-1.23E+06	2.87E+05	-3.05E+05	-1.28E+06	5.07E+05	9.31E+04	-2.46E+04	5.23E+05
48.83	-1.40E+06	2.69E+05	-2.88E+05	-1.42E+06	6.17E+05	1.82E+05	-8.59E+04	6.56E+05
58.59	-1.25E+06	3.50E+05	-2.32E+05	-1.46E+06	6.78E+05	2.40E+05	-2.54E+05	9.08E+05
68.36	-1.34E+06	2.22E+05	-2.59E+05	-1.55E+06	7.88E+05	3.31E+05	-3.19E+05	8.38E+05
78.13	-1.46E+06	2.56E+05	-3.55E+05	-1.54E+06	9.39E+05	3.88E+05	-3.29E+05	1.07E+06
87.89	-1.51E+06	1.17E+05	-4.12E+05	-1.55E+06	1.26E+06	4.21E+05	-2.60E+05	1.34E+06
97.66	-1.65E+06	3.49E+05	-2.00E+05	-1.71E+06	1.34E+06	4.59E+05	-4.23E+05	1.47E+06
107.42	-1.60E+06	2.54E+05	-3.35E+05	-1.68E+06	1.54E+06	4.54E+05	-4.88E+05	1.59E+06
117.19	-1.66E+06	1.99E+05	-3.30E+05	-1.72E+06	1.57E+06	5.57E+05	-5.09E+05	1.68E+06
126.95	-1.71E+06	1.52E+05	-3.89E+05	-1.83E+06	1.54E+06	7.84E+05	-3.32E+05	1.71E+06
136.72	-3.24E+06	2.21E+06	1.29E+06	-4.32E+06	-1.56E+05	2.24E+06	1.58E+06	2.49E+04

Table A.115 Raw data for test seal at 5,000 rpm, 96% GVF and 0.5 PR (*Zero* Preswirl)

Freq.	*Re(H_{XX})*	*Re(H_{XY})*	*Re(H_{YX})*	*Re(H_{YY})*	*Im(H_{XX})*	*Im(H_{XY})*	*Im(H_{YX})*	*Im(H_{YY})*
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-8.02E+05	1.81E+05	-1.02E+05	-9.52E+05	8.72E+04	-5.21E+04	3.99E+03	8.29E+04
19.53	-9.01E+05	4.23E+04	-6.95E+04	-8.59E+05	2.11E+05	2.35E+04	4.07E+04	1.89E+05
29.3	-7.28E+05	-2.70E+05	-2.01E+05	-7.37E+05	9.65E+05	-8.21E+05	-7.26E+05	1.30E+06
39.06	-9.24E+05	5.52E+04	1.11E+04	-9.95E+05	5.38E+05	2.20E+04	-5.75E+04	4.14E+05
48.83	-1.08E+06	3.67E+04	3.57E+03	-1.11E+06	6.25E+05	-1.58E+03	4.49E+03	6.01E+05
58.59	-1.02E+06	8.87E+04	2.22E+05	-1.18E+06	6.93E+05	4.47E+04	-7.62E+04	9.27E+05
68.36	-1.10E+06	6.51E+04	1.12E+05	-1.30E+06	8.56E+05	7.39E+04	-1.80E+05	7.65E+05
78.13	-1.19E+06	-5.43E+04	-2.85E+03	-1.27E+06	9.89E+05	9.56E+04	-8.63E+04	9.32E+05
87.89	-1.23E+06	-9.99E+04	-5.67E+04	-1.35E+06	1.31E+06	1.65E+05	-7.15E+04	1.16E+06
97.66	-1.34E+06	6.01E+04	9.86E+04	-1.51E+06	1.40E+06	1.52E+05	-1.64E+05	1.27E+06
107.42	-1.32E+06	4.70E+04	2.44E+04	-1.53E+06	1.49E+06	1.25E+05	-2.46E+05	1.41E+06
117.19	-1.36E+06	-5.53E+04	3.13E+04	-1.61E+06	1.59E+06	1.41E+05	-2.86E+05	1.53E+06
126.95	-1.49E+06	-5.57E+04	-2.57E+04	-1.72E+06	1.61E+06	2.03E+05	-8.77E+04	1.74E+06
136.72	-2.81E+06	1.62E+06	1.35E+06	-3.75E+06	5.14E+05	9.84E+05	1.10E+06	7.49E+05

Table A.116 Raw data for test seal at 10,000 rpm, 96% GVF and 0.5 PR (*Zero* Preswirl)

Freq.	*Re(H_{XX})*	*Re(H_{XY})*	*Re(H_{YX})*	*Re(H_{YY})*	*Im(H_{XX})*	*Im(H_{XY})*	*Im(H_{YX})*	*Im(H_{YY})*
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-8.07E+05	2.38E+05	-2.92E+05	-1.11E+06	1.00E+05	-1.44E+05	2.68E+04	6.49E+04
19.53	-9.71E+05	1.25E+05	-1.99E+05	-1.01E+06	1.82E+05	1.05E+04	1.61E+05	2.03E+05
29.3	-9.63E+05	4.91E+04	-7.54E+04	-1.06E+06	8.59E+05	-6.95E+05	-5.69E+05	1.29E+06
39.06	-1.02E+06	1.26E+05	-3.57E+04	-1.05E+06	5.27E+05	8.30E+04	4.44E+04	4.94E+05
48.83	-1.16E+06	1.12E+05	-3.23E+03	-1.19E+06	6.50E+05	5.25E+04	-4.09E+04	6.52E+05
58.59	-1.08E+06	2.29E+05	8.34E+04	-1.30E+06	6.73E+05	1.66E+05	-8.67E+04	8.34E+05
68.36	-1.20E+06	1.52E+05	2.73E+04	-1.41E+06	7.94E+05	1.80E+05	-1.98E+05	8.29E+05
78.13	-1.29E+06	5.39E+04	-4.95E+04	-1.39E+06	9.19E+05	2.60E+05	-1.03E+05	1.02E+06
87.89	-1.54E+06	8.53E+04	-2.14E+04	-1.39E+06	1.25E+06	1.56E+05	-1.59E+05	1.32E+06
97.66	-1.52E+06	1.05E+05	8.26E+04	-1.58E+06	1.44E+06	3.13E+05	-2.74E+05	1.33E+06
107.42	-1.42E+06	3.39E+04	-1.20E+05	-1.57E+06	1.55E+06	2.96E+05	-3.41E+05	1.47E+06
117.19	-1.50E+06	-1.87E+03	-4.93E+04	-1.67E+06	1.63E+06	3.68E+05	-3.35E+05	1.59E+06
126.95	-1.59E+06	-3.90E+04	-9.76E+04	-1.80E+06	1.59E+06	5.34E+05	-1.22E+05	1.64E+06
136.72	-2.91E+06	1.83E+06	1.36E+06	-4.05E+06	8.14E+04	2.34E+06	1.56E+06	-4.52E+05

Table A.117 Raw data for test seal at 15,000 rpm, 96% GVF and 0.5 PR (*Zero* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.08E+06	4.62E+05	-5.77E+05	-1.16E+06	3.02E+03	9.59E+04	2.15E+05	-2.63E+04
19.53	-1.16E+06	3.51E+05	-3.76E+05	-1.27E+06	2.75E+05	-3.77E+04	1.74E+05	1.42E+05
29.3	-1.25E+06	1.90E+05	-1.70E+05	-1.37E+06	8.17E+05	-6.42E+05	-4.11E+05	1.32E+06
39.06	-1.23E+06	2.55E+05	-2.45E+05	-1.25E+06	4.99E+05	1.35E+05	7.32E+04	5.79E+05
48.83	-1.38E+06	2.56E+05	-2.10E+05	-1.38E+06	6.73E+05	1.23E+05	-2.92E+04	7.52E+05
58.59	-1.28E+06	2.53E+05	-7.83E+04	-1.37E+06	7.15E+05	1.96E+05	-1.72E+05	9.49E+05
68.36	-1.40E+06	2.08E+05	-9.99E+04	-1.52E+06	8.68E+05	2.27E+05	-2.41E+05	9.31E+05
78.13	-1.45E+06	2.06E+05	-1.78E+05	-1.61E+06	9.81E+05	3.16E+05	-2.28E+05	1.12E+06
87.89	-1.59E+06	9.31E+04	-3.10E+05	-1.58E+06	1.32E+06	3.52E+05	-2.22E+05	1.31E+06
97.66	-1.65E+06	2.82E+05	-1.15E+05	-1.77E+06	1.37E+06	4.04E+05	-3.51E+05	1.50E+06
107.42	-1.63E+06	1.54E+05	-2.41E+05	-1.72E+06	1.59E+06	3.72E+05	-4.76E+05	1.65E+06
117.19	-1.70E+06	1.00E+05	-2.16E+05	-1.80E+06	1.60E+06	4.93E+05	-4.62E+05	1.73E+06
126.95	-1.71E+06	6.45E+04	-3.12E+05	-1.91E+06	1.55E+06	7.48E+05	-2.57E+05	1.71E+06
136.72	-3.03E+06	1.86E+06	1.06E+06	-4.15E+06	-3.41E+05	2.66E+06	1.94E+06	-5.38E+05

Table A.118 Raw data for test seal at 5,000 rpm, 94% GVF and 0.5 PR (*Zero* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-7.93E+05	1.17E+05	-2.51E+05	-8.88E+05	5.27E+04	-8.77E+04	2.62E+03	4.74E+04
19.53	-8.53E+05	-5.68E+03	-1.27E+05	-8.60E+05	2.57E+05	-6.58E+04	8.37E+04	2.19E+05
29.3	-6.61E+05	-1.99E+05	-2.21E+05	-8.68E+05	7.88E+05	-5.43E+05	-4.43E+05	1.01E+06
39.06	-8.29E+05	-3.69E+04	-7.49E+04	-9.14E+05	5.61E+05	-9.07E+03	-7.70E+03	4.80E+05
48.83	-9.88E+05	-6.23E+03	-6.18E+04	-1.05E+06	6.84E+05	-3.32E+04	5.75E+02	6.33E+05
58.59	-9.02E+05	-3.78E+04	8.99E+04	-1.12E+06	7.33E+05	1.15E+04	-2.90E+04	9.33E+05
68.36	-1.01E+06	-8.76E+04	2.21E+04	-1.17E+06	9.53E+05	4.93E+03	-1.72E+05	8.44E+05
78.13	-1.11E+06	-1.05E+05	-8.62E+04	-1.20E+06	1.06E+06	6.20E+04	-1.18E+05	9.95E+05
87.89	-1.24E+06	-1.94E+05	-1.82E+05	-1.23E+06	1.37E+06	1.32E+05	-1.09E+05	1.19E+06
97.66	-1.29E+06	-5.27E+04	2.83E+04	-1.35E+06	1.50E+06	1.30E+05	-1.49E+05	1.27E+06
107.42	-1.21E+06	-1.26E+05	-1.12E+05	-1.36E+06	1.65E+06	9.71E+04	-2.48E+05	1.45E+06
117.19	-1.22E+06	-2.32E+05	-1.38E+05	-1.41E+06	1.65E+06	1.81E+05	-2.13E+05	1.51E+06
126.95	-1.29E+06	-2.79E+05	-3.12E+05	-1.45E+06	1.53E+06	4.55E+05	4.65E+04	1.47E+06
136.72	-2.10E+06	1.07E+06	5.46E+05	-3.11E+06	-6.54E+05	2.92E+06	2.69E+06	-1.49E+06

Table A.119 Raw data for test seal at 10,000 rpm, 94% GVF and 0.5 PR (*Zero* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-7.58E+05	2.41E+05	-4.04E+05	-1.02E+06	1.17E+05	-6.79E+04	2.58E+04	2.39E+04
19.53	-9.37E+05	8.29E+04	-2.76E+05	-9.93E+05	1.74E+05	-2.58E+04	2.15E+05	2.28E+05
29.3	-8.69E+05	-1.93E+04	-1.68E+05	-9.90E+05	7.93E+05	-5.17E+05	-4.00E+05	1.10E+06
39.06	-9.65E+05	7.81E+04	-1.05E+05	-9.88E+05	5.81E+05	3.53E+04	-1.59E+04	5.56E+05
48.83	-1.08E+06	7.56E+04	-1.17E+05	-1.14E+06	6.65E+05	9.45E+04	-3.55E+04	6.63E+05
58.59	-9.84E+05	5.52E+04	2.38E+04	-1.27E+06	7.21E+05	1.13E+05	-8.24E+04	9.09E+05
68.36	-1.16E+06	4.97E+04	3.42E+04	-1.31E+06	8.52E+05	1.36E+05	-1.74E+05	9.18E+05
78.13	-1.26E+06	6.16E+04	-1.22E+05	-1.37E+06	9.57E+05	2.20E+05	-1.43E+05	1.08E+06
87.89	-1.48E+06	-2.08E+04	-1.60E+05	-1.36E+06	1.31E+06	1.46E+05	-1.43E+05	1.32E+06
97.66	-1.41E+06	1.63E+04	-3.12E+04	-1.50E+06	1.52E+06	3.35E+05	-2.21E+05	1.33E+06
107.42	-1.34E+06	-5.94E+04	-1.73E+05	-1.51E+06	1.61E+06	2.88E+05	-3.27E+05	1.52E+06
117.19	-1.35E+06	-1.46E+05	-1.87E+05	-1.58E+06	1.61E+06	3.84E+05	-2.72E+05	1.60E+06
126.95	-1.38E+06	-2.29E+05	-3.35E+05	-1.59E+06	1.51E+06	6.84E+05	-3.66E+04	1.57E+06
136.72	-2.21E+06	1.11E+06	5.37E+05	-3.27E+06	-6.96E+05	3.22E+06	2.61E+06	-1.44E+06

Table A.120 Raw data for test seal at 15,000 rpm, 94% GVF and 0.5 PR (*Zero* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.02E+06	4.85E+05	-5.23E+05	-1.37E+06	1.17E+05	1.51E+04	1.35E+05	-5.46E+04
19.53	-1.29E+06	1.91E+05	-5.45E+05	-1.50E+06	1.09E+05	-1.48E+05	2.98E+05	2.95E+05
29.3	-1.18E+06	8.25E+04	-2.85E+05	-1.40E+06	9.07E+05	-7.04E+05	-3.52E+05	1.19E+06
39.06	-1.21E+06	1.32E+05	-2.58E+05	-1.39E+06	5.48E+05	5.54E+04	5.79E+04	6.70E+05
48.83	-1.33E+06	1.31E+05	-2.24E+05	-1.47E+06	7.46E+05	1.04E+05	2.45E+04	7.86E+05
58.59	-1.22E+06	2.39E+05	-8.63E+04	-1.53E+06	7.54E+05	1.47E+05	-1.32E+05	9.77E+05
68.36	-1.46E+06	2.10E+05	-9.55E+04	-1.61E+06	8.72E+05	1.26E+05	-2.56E+05	9.95E+05
78.13	-1.44E+06	9.44E+04	-2.43E+05	-1.64E+06	1.02E+06	1.98E+05	-1.61E+05	1.16E+06
87.89	-1.62E+06	-3.74E+04	-3.29E+05	-1.67E+06	1.35E+06	2.65E+05	-2.05E+05	1.39E+06
97.66	-1.74E+06	1.35E+05	-1.02E+05	-1.85E+06	1.49E+06	3.47E+05	-3.17E+05	1.52E+06
107.42	-1.62E+06	1.12E+04	-2.47E+05	-1.81E+06	1.61E+06	3.33E+05	-4.23E+05	1.66E+06
117.19	-1.67E+06	-7.67E+04	-2.73E+05	-1.89E+06	1.62E+06	4.83E+05	-4.28E+05	1.75E+06
126.95	-1.69E+06	-1.59E+05	-3.70E+05	-1.96E+06	1.54E+06	7.83E+05	-2.08E+05	1.67E+06
136.72	-2.64E+06	1.31E+06	5.86E+05	-3.81E+06	-6.39E+05	3.13E+06	2.39E+06	-1.07E+06

Table A.121 Raw data for test seal at 5,000 rpm, 92% GVF and 0.5 PR (*Zero* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.03E+06	1.86E+05	-1.18E+05	-1.11E+06	5.57E+04	-1.24E+05	-2.56E+04	1.04E+05
19.53	-1.13E+06	-2.51E+03	-2.09E+04	-1.13E+06	2.46E+05	-4.29E+04	7.91E+04	1.91E+05
29.3	-8.38E+05	-3.13E+05	-2.91E+05	-8.14E+05	1.05E+06	-8.63E+05	-7.35E+05	1.40E+06
39.06	-1.12E+06	3.31E+04	1.00E+02	-1.21E+06	5.68E+05	1.66E+04	-1.30E+03	4.90E+05
48.83	-1.22E+06	1.13E+04	3.62E+04	-1.29E+06	6.70E+05	-4.81E+04	-1.41E+04	6.38E+05
58.59	-1.20E+06	1.08E+05	2.16E+05	-1.37E+06	7.21E+05	2.29E+04	-6.16E+04	9.37E+05
68.36	-1.39E+06	3.68E+04	8.78E+04	-1.45E+06	9.40E+05	-3.59E+04	-2.41E+05	9.47E+05
78.13	-1.49E+06	-4.69E+04	-1.84E+03	-1.51E+06	1.06E+06	7.12E+04	-1.31E+05	1.05E+06
87.89	-1.54E+06	-1.12E+05	-8.96E+04	-1.51E+06	1.36E+06	9.33E+04	-7.96E+04	1.23E+06
97.66	-1.70E+06	-2.13E+04	1.08E+05	-1.70E+06	1.52E+06	9.23E+04	-1.83E+05	1.37E+06
107.42	-1.67E+06	-5.26E+04	6.50E+03	-1.71E+06	1.66E+06	6.79E+04	-2.34E+05	1.51E+06
117.19	-1.70E+06	-1.25E+05	3.99E+04	-1.82E+06	1.72E+06	1.62E+05	-2.39E+05	1.65E+06
126.95	-1.89E+06	-1.14E+05	7.56E+03	-1.95E+06	1.70E+06	3.90E+05	-7.36E+04	1.65E+06
136.72	-3.32E+06	1.65E+06	1.63E+06	-4.13E+06	5.98E+05	1.57E+06	1.15E+06	2.14E+05

Table A.122 Raw data for test seal at 10,000 rpm, 92% GVF and 0.5 PR (*Zero* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-9.77E+05	3.29E+05	-4.18E+05	-1.29E+06	6.30E+04	-9.78E+04	6.40E+04	-4.55E+04
19.53	-1.20E+06	1.07E+05	-1.42E+05	-1.25E+06	3.24E+05	-7.57E+04	2.41E+05	2.10E+05
29.3	-1.04E+06	-1.27E+05	-1.64E+05	-1.05E+06	1.03E+06	-7.73E+05	-5.98E+05	1.35E+06
39.06	-1.14E+06	1.06E+05	-6.16E+04	-1.26E+06	5.91E+05	4.90E+04	5.69E+03	5.26E+05
48.83	-1.21E+06	7.14E+04	-2.12E+04	-1.39E+06	6.80E+05	1.17E+05	3.84E+04	6.92E+05
58.59	-1.21E+06	1.94E+05	5.87E+04	-1.47E+06	6.76E+05	1.40E+05	-3.25E+04	9.28E+05
68.36	-1.48E+06	1.89E+05	2.70E+04	-1.58E+06	8.63E+05	1.25E+05	-2.06E+05	9.28E+05
78.13	-1.56E+06	9.00E+04	-3.87E+04	-1.59E+06	9.65E+05	1.97E+05	-1.02E+05	1.11E+06
87.89	-1.69E+06	-5.45E+04	-1.50E+05	-1.56E+06	1.42E+06	1.16E+05	-1.69E+05	1.38E+06
97.66	-1.70E+06	3.47E+04	3.45E+04	-1.78E+06	1.54E+06	2.82E+05	-2.39E+05	1.44E+06
107.42	-1.65E+06	-2.61E+03	-1.18E+05	-1.78E+06	1.66E+06	2.61E+05	-2.98E+05	1.60E+06
117.19	-1.71E+06	-1.01E+05	-8.84E+04	-1.88E+06	1.69E+06	3.60E+05	-2.79E+05	1.71E+06
126.95	-1.83E+06	-1.14E+05	-1.26E+05	-1.99E+06	1.65E+06	6.43E+05	-1.14E+05	1.67E+06
136.72	-3.13E+06	1.52E+06	1.29E+06	-4.00E+06	2.11E+04	2.29E+06	1.78E+06	-2.61E+05

Table A.123 Raw data for test seal at 15,000 rpm, 92% GVF and 0.5 PR (*Zero* Preswirl)

Freq.	*Re*(H_{XX})	*Re*(H_{XY})	*Re*(H_{YX})	*Re*(H_{YY})	*Im*(H_{XX})	*Im*(H_{XY})	*Im*(H_{YX})	*Im*(H_{YY})
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.07E+06	4.06E+05	-3.53E+05	-1.25E+06	1.67E+05	1.03E+05	1.10E+04	-2.14E+04
19.53	-1.40E+06	2.08E+05	-4.11E+05	-1.51E+06	1.29E+05	-1.27E+05	2.62E+05	2.67E+05
29.3	-1.36E+06	7.70E+04	-1.80E+05	-1.44E+06	9.49E+05	-7.17E+05	-4.76E+05	1.46E+06
39.06	-1.28E+06	9.74E+04	-1.83E+05	-1.41E+06	5.97E+05	6.11E+04	4.72E+04	6.55E+05
48.83	-1.36E+06	1.70E+05	-1.42E+05	-1.51E+06	7.33E+05	1.01E+05	5.46E+03	8.28E+05
58.59	-1.33E+06	2.36E+05	-6.22E+04	-1.53E+06	7.01E+05	1.82E+05	-1.33E+05	1.05E+06
68.36	-1.62E+06	1.83E+05	-9.35E+04	-1.64E+06	9.17E+05	1.14E+05	-2.13E+05	1.05E+06
78.13	-1.68E+06	8.67E+04	-1.59E+05	-1.71E+06	1.09E+06	1.89E+05	-1.82E+05	1.20E+06
87.89	-1.74E+06	5.91E+04	-2.33E+05	-1.70E+06	1.35E+06	2.83E+05	-1.92E+05	1.41E+06
97.66	-1.86E+06	1.00E+05	-5.54E+04	-1.85E+06	1.52E+06	3.14E+05	-3.12E+05	1.55E+06
107.42	-1.82E+06	3.11E+04	-1.43E+05	-1.89E+06	1.63E+06	3.09E+05	-4.27E+05	1.66E+06
117.19	-1.89E+06	-5.53E+04	-1.46E+05	-1.96E+06	1.65E+06	4.29E+05	-4.31E+05	1.79E+06
126.95	-2.01E+06	-1.23E+05	-2.01E+05	-2.09E+06	1.62E+06	7.90E+05	-2.73E+05	1.68E+06
136.72	-3.27E+06	1.49E+06	1.15E+06	-4.14E+06	-9.71E+04	2.63E+06	1.73E+06	-4.48E+05

Table A.124 Raw data for test seal at 5,000 rpm, 90% GVF and 0.5 PR (*Zero* Preswirl)

Freq.	*Re*(H_{XX})	*Re*(H_{XY})	*Re*(H_{YX})	*Re*(H_{YY})	*Im*(H_{XX})	*Im*(H_{XY})	*Im*(H_{YX})	*Im*(H_{YY})
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.08E+06	1.45E+05	-1.55E+05	-1.17E+06	8.63E+04	-1.26E+05	-1.17E+04	8.51E+04
19.53	-1.15E+06	-3.29E+03	-4.70E+04	-1.15E+06	2.87E+05	-2.72E+04	9.77E+04	1.48E+05
29.3	-9.63E+05	-1.98E+05	-7.89E+04	-1.02E+06	1.12E+06	-8.73E+05	-7.56E+05	1.42E+06
39.06	-1.13E+06	-1.83E+04	4.25E+04	-1.25E+06	6.24E+05	-3.63E+03	-2.70E+04	5.18E+05
48.83	-1.22E+06	-6.50E+03	6.33E+04	-1.35E+06	6.68E+05	7.59E+03	2.94E+02	7.21E+05
58.59	-1.19E+06	6.91E+04	1.87E+05	-1.41E+06	7.56E+05	1.56E+04	-8.50E+04	9.63E+05
68.36	-1.51E+06	7.08E+04	1.21E+05	-1.51E+06	9.58E+05	-2.65E+04	-2.50E+05	9.54E+05
78.13	-1.52E+06	-8.97E+04	6.27E+03	-1.50E+06	1.11E+06	8.59E+04	-1.44E+05	1.05E+06
87.89	-1.54E+06	-1.77E+05	-8.98E+04	-1.52E+06	1.37E+06	1.48E+05	-6.60E+04	1.26E+06
97.66	-1.70E+06	-1.02E+04	1.12E+05	-1.73E+06	1.58E+06	1.23E+05	-1.66E+05	1.41E+06
107.42	-1.65E+06	-8.19E+04	8.62E+03	-1.73E+06	1.70E+06	9.97E+04	-2.28E+05	1.54E+06
117.19	-1.75E+06	-1.39E+05	3.39E+04	-1.84E+06	1.76E+06	1.85E+05	-2.14E+05	1.63E+06
126.95	-1.90E+06	-1.58E+05	-6.33E+03	-1.94E+06	1.71E+06	4.66E+05	-1.50E+04	1.63E+06
136.72	-3.44E+06	1.72E+06	1.69E+06	-4.26E+06	3.26E+05	1.96E+06	1.57E+06	-1.93E+05

Table A.125 Raw data for test seal at 10,000 rpm, 90% GVF and 0.5 PR (*Zero* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-9.93E+05	4.11E+05	-3.80E+05	-1.42E+06	-2.33E+04	-1.59E+05	-5.45E+03	-8.44E+04
19.53	-1.31E+06	1.70E+05	-1.54E+05	-1.31E+06	2.98E+05	-7.61E+04	2.48E+05	2.33E+05
29.3	-7.80E+05	-4.18E+05	-4.74E+05	-7.12E+05	1.22E+06	-8.75E+05	-8.37E+05	1.61E+06
39.06	-1.21E+06	1.57E+05	-4.74E+04	-1.32E+06	6.10E+05	9.82E+03	1.23E+04	6.07E+05
48.83	-1.28E+06	3.87E+04	-3.20E+02	-1.38E+06	7.20E+05	5.42E+04	3.77E+04	7.08E+05
58.59	-1.26E+06	2.23E+05	1.05E+05	-1.52E+06	7.07E+05	1.60E+05	-4.95E+04	9.73E+05
68.36	-1.55E+06	1.50E+05	4.55E+04	-1.66E+06	8.86E+05	1.64E+05	-1.93E+05	9.69E+05
78.13	-1.68E+06	1.11E+05	1.14E+04	-1.68E+06	1.02E+06	1.30E+05	-9.21E+04	1.15E+06
87.89	-1.77E+06	-4.60E+04	-7.48E+04	-1.69E+06	1.42E+06	9.25E+04	-1.40E+05	1.40E+06
97.66	-1.80E+06	4.42E+04	5.22E+04	-1.87E+06	1.57E+06	2.33E+05	-2.12E+05	1.50E+06
107.42	-1.77E+06	6.45E+04	-2.14E+04	-1.92E+06	1.72E+06	2.18E+05	-3.24E+05	1.66E+06
117.19	-1.85E+06	-4.40E+04	-9.63E+03	-2.02E+06	1.74E+06	3.15E+05	-3.22E+05	1.82E+06
126.95	-2.04E+06	-5.66E+04	1.34E+03	-2.12E+06	1.75E+06	5.36E+05	-1.75E+05	1.87E+06
136.72	-3.55E+06	1.65E+06	1.61E+06	-4.29E+06	7.23E+05	1.78E+06	9.90E+05	4.06E+05

Table A.126 Raw data for test seal at 15,000 rpm, 90% GVF and 0.5 PR (*Zero* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.13E+06	5.15E+05	-3.41E+05	-1.33E+06	1.09E+05	6.38E+04	1.27E+05	-6.06E+04
19.53	-1.40E+06	2.50E+05	-3.50E+05	-1.46E+06	2.07E+05	-5.94E+04	2.46E+05	2.64E+05
29.3	-1.10E+06	-1.19E+05	-5.43E+05	-1.13E+06	1.18E+06	-8.94E+05	-7.76E+05	1.60E+06
39.06	-1.32E+06	1.34E+05	-1.56E+05	-1.38E+06	6.32E+05	4.63E+04	2.68E+03	6.83E+05
48.83	-1.36E+06	1.78E+05	-1.22E+05	-1.44E+06	7.25E+05	1.34E+05	4.89E+02	8.36E+05
58.59	-1.37E+06	3.14E+05	-4.62E+02	-1.55E+06	6.68E+05	1.24E+05	-8.51E+04	1.05E+06
68.36	-1.66E+06	3.00E+05	-1.04E+05	-1.67E+06	9.39E+05	1.95E+05	-2.64E+05	1.08E+06
78.13	-1.71E+06	1.45E+05	-1.38E+05	-1.68E+06	1.11E+06	1.97E+05	-1.95E+05	1.23E+06
87.89	-1.80E+06	2.98E+04	-2.09E+05	-1.73E+06	1.43E+06	2.41E+05	-1.86E+05	1.43E+06
97.66	-1.93E+06	1.59E+05	-3.26E+03	-1.94E+06	1.58E+06	2.91E+05	-3.30E+05	1.59E+06
107.42	-1.87E+06	6.62E+04	-1.54E+05	-1.98E+06	1.69E+06	2.85E+05	-3.94E+05	1.68E+06
117.19	-2.00E+06	-1.90E+04	-1.15E+05	-2.12E+06	1.73E+06	4.03E+05	-4.27E+05	1.85E+06
126.95	-2.13E+06	-4.15E+04	-1.34E+05	-2.26E+06	1.74E+06	6.64E+05	-2.97E+05	1.87E+06
136.72	-3.58E+06	1.65E+06	1.38E+06	-4.41E+06	2.33E+05	2.16E+06	1.43E+06	2.04E+05

Table A.127 Raw data for test seal at 5,000 rpm, 100% GVF and 0.4 PR (*Zero* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-3.37E+05	-2.21E+05	-2.51E+05	-4.91E+05	2.81E+04	-5.02E+04	3.38E+04	9.73E+04
19.53	-4.88E+05	-3.79E+05	-1.33E+05	-4.39E+05	9.35E+04	1.12E+04	4.81E+04	1.46E+05
29.3	-3.11E+05	-6.47E+05	-3.49E+05	-1.78E+05	1.61E+05	6.91E+04	-2.21E+04	1.98E+05
39.06	-5.48E+05	-3.55E+05	-1.14E+05	-4.71E+05	2.98E+05	3.40E+04	-5.01E+04	2.93E+05
48.83	-7.04E+05	-3.43E+05	-5.43E+04	-5.75E+05	4.05E+05	4.44E+04	-9.15E+04	4.38E+05
58.59	-7.08E+05	-3.43E+05	-1.39E+04	-7.20E+05	5.61E+05	1.67E+04	2.10E+04	5.12E+05
68.36	-7.64E+05	-4.41E+05	-1.14E+05	-6.36E+05	5.02E+05	1.14E+05	-2.55E+05	5.76E+05
78.13	-8.04E+05	-4.51E+05	-2.03E+05	-6.52E+05	6.73E+05	1.86E+05	-1.69E+05	6.09E+05
87.89	-8.51E+05	-5.56E+05	-3.44E+05	-7.12E+05	8.44E+05	7.77E+04	-3.48E+05	7.97E+05
97.66	-1.03E+06	-4.57E+05	-1.60E+05	-8.76E+05	1.05E+06	2.56E+05	-1.89E+05	8.07E+05
107.42	-8.37E+05	-5.24E+05	-3.00E+05	-8.74E+05	1.21E+06	1.48E+05	-3.84E+05	9.02E+05
117.19	-7.09E+05	-7.29E+05	-4.70E+05	-7.74E+05	1.14E+06	2.40E+05	-3.07E+05	9.89E+05
126.95	-5.26E+05	-9.00E+05	-7.87E+05	-5.85E+05	9.13E+05	5.76E+05	2.77E+04	7.95E+05
136.72	-6.92E+05	-7.43E+05	-9.20E+05	-1.02E+06	-1.60E+06	3.52E+06	3.05E+06	-2.71E+06

Table A.128 Raw data for test seal at 10,000 rpm, 100% GVF and 0.4 PR (*Zero* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-4.40E+05	-2.89E+05	-2.92E+05	-6.24E+05	5.15E+03	-8.58E+03	7.60E+03	1.12E+05
19.53	-5.65E+05	-3.63E+05	-1.70E+05	-5.86E+05	9.93E+04	7.99E+04	2.42E+04	1.28E+05
29.3	-3.09E+05	-7.47E+05	-4.61E+05	-2.09E+05	2.18E+05	3.17E+04	-1.29E+05	2.67E+05
39.06	-6.73E+05	-3.10E+05	-1.52E+05	-6.79E+05	2.66E+05	8.59E+04	-5.70E+04	2.57E+05
48.83	-7.84E+05	-3.59E+05	-1.28E+05	-8.36E+05	3.74E+05	1.10E+05	-2.15E+05	3.82E+05
58.59	-9.10E+05	-3.04E+05	-2.32E+03	-9.94E+05	5.41E+05	1.39E+05	-1.16E+04	5.22E+05
68.36	-8.85E+05	-4.73E+05	-2.56E+04	-1.04E+06	5.30E+05	2.17E+05	-3.34E+05	6.16E+05
78.13	-1.13E+06	-4.82E+05	1.01E+05	-9.02E+05	7.82E+05	9.17E+04	-3.88E+05	9.35E+05
87.89	-9.37E+05	-5.77E+05	-2.88E+05	-9.28E+05	9.37E+05	2.90E+05	-5.57E+05	9.00E+05
97.66	-1.19E+06	-5.32E+05	-1.81E+05	-1.12E+06	1.09E+06	4.38E+05	-4.11E+05	9.61E+05
107.42	-9.75E+05	-6.03E+05	-3.26E+05	-9.86E+05	1.34E+06	3.98E+05	-5.44E+05	1.12E+06
117.19	-8.36E+05	-8.26E+05	-4.45E+05	-8.98E+05	1.26E+06	5.50E+05	-5.56E+05	1.16E+06
126.95	-6.44E+05	-1.01E+06	-7.61E+05	-7.24E+05	1.10E+06	9.08E+05	-3.04E+05	9.71E+05
136.72	-6.95E+05	-8.31E+05	-9.78E+05	-1.09E+06	-1.47E+06	3.92E+06	2.69E+06	-2.60E+06

Table A.129 Raw data for test seal at 15,000 rpm, 100% GVF and 0.4 PR (*Zero* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-6.32E+05	-3.54E+05	-2.99E+05	-9.07E+05	3.01E+04	1.80E+04	-2.24E+04	1.07E+05
19.53	-8.45E+05	-4.58E+05	-1.97E+05	-7.62E+05	9.51E+04	1.45E+05	-8.04E+04	1.51E+05
29.3	-6.21E+05	-7.02E+05	-4.67E+05	-4.69E+05	2.43E+05	1.85E+05	-1.51E+05	2.87E+05
39.06	-8.68E+05	-3.51E+05	-2.35E+05	-8.92E+05	2.62E+05	3.27E+05	-2.03E+05	3.05E+05
48.83	-1.01E+06	-3.58E+05	-1.89E+05	-1.01E+06	3.78E+05	3.60E+05	-3.11E+05	3.69E+05
58.59	-9.48E+05	-2.81E+05	-2.41E+03	-1.25E+06	5.63E+05	4.12E+05	-2.08E+05	5.81E+05
68.36	-1.09E+06	-4.19E+05	-7.98E+04	-1.21E+06	6.21E+05	4.95E+05	-3.99E+05	5.70E+05
78.13	-1.11E+06	-3.90E+05	-2.48E+05	-1.23E+06	6.67E+05	5.25E+05	-4.95E+05	7.95E+05
87.89	-1.25E+06	-4.48E+05	-3.30E+05	-1.18E+06	8.40E+05	4.65E+05	-6.64E+05	9.72E+05
97.66	-1.45E+06	-4.76E+05	-2.42E+05	-1.35E+06	1.09E+06	6.49E+05	-6.64E+05	1.04E+06
107.42	-1.23E+06	-4.90E+05	-3.95E+05	-1.21E+06	1.24E+06	6.58E+05	-7.93E+05	1.15E+06
117.19	-1.11E+06	-7.33E+05	-5.11E+05	-1.10E+06	1.28E+06	8.34E+05	-7.88E+05	1.20E+06
126.95	-9.21E+05	-8.44E+05	-8.24E+05	-9.27E+05	1.07E+06	1.23E+06	-5.31E+05	9.63E+05
136.72	-1.11E+06	-6.33E+05	-9.46E+05	-1.41E+06	-1.46E+06	4.24E+06	2.46E+06	-2.58E+06

Table A.130 Raw data for test seal at 5,000 rpm, 98% GVF and 0.4 PR (*Zero* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-5.46E+05	-8.43E+04	-4.46E+05	-8.69E+05	4.02E+04	-1.01E+05	3.25E+04	8.33E+04
19.53	-7.41E+05	-2.49E+05	-2.37E+05	-8.08E+05	1.55E+05	-3.94E+04	8.13E+04	1.80E+05
29.3	-6.60E+05	-4.32E+05	-2.63E+05	-7.16E+05	2.97E+05	-4.08E+04	2.36E+04	3.46E+05
39.06	-8.07E+05	-2.42E+05	-1.60E+05	-8.69E+05	4.28E+05	1.10E+04	-3.00E+04	3.94E+05
48.83	-9.53E+05	-2.82E+05	-1.43E+05	-1.01E+06	4.80E+05	4.88E+03	-5.30E+04	5.54E+05
58.59	-8.48E+05	-2.82E+05	7.54E+04	-1.19E+06	7.00E+05	4.36E+04	-3.15E+04	7.75E+05
68.36	-1.07E+06	-2.91E+05	-1.23E+05	-1.10E+06	8.38E+05	7.01E+04	-2.09E+05	8.24E+05
78.13	-1.02E+06	-3.88E+05	-2.67E+05	-1.05E+06	8.96E+05	9.90E+04	-1.70E+05	9.65E+05
87.89	-1.18E+06	-4.84E+05	-3.70E+05	-1.10E+06	1.15E+06	8.41E+04	-2.29E+05	1.15E+06
97.66	-1.31E+06	-4.01E+05	-2.50E+05	-1.19E+06	1.45E+06	2.45E+05	-2.36E+05	1.20E+06
107.42	-1.09E+06	-4.42E+05	-4.27E+05	-1.10E+06	1.57E+06	1.57E+05	-3.18E+05	1.29E+06
117.19	-9.65E+05	-5.81E+05	-5.01E+05	-1.11E+06	1.60E+06	2.67E+05	-2.78E+05	1.36E+06
126.95	-7.88E+05	-7.54E+05	-7.92E+05	-9.95E+05	1.35E+06	5.67E+05	-2.05E+03	1.21E+06
136.72	-1.12E+06	-2.18E+05	-6.29E+05	-1.79E+06	-1.05E+06	3.42E+06	3.10E+06	-2.07E+06

Table A.131 Raw data for test seal at 10,000 rpm, 98% GVF and 0.4 PR (*Zero* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-7.88E+05	1.03E+05	-4.98E+05	-9.76E+05	9.59E+04	-8.98E+04	6.06E+04	-3.47E+04
19.53	-9.14E+05	-7.79E+04	-4.42E+05	-9.16E+05	7.97E+04	-1.58E+04	9.86E+04	1.09E+05
29.3	-8.85E+05	-1.80E+05	-3.89E+05	-9.05E+05	2.96E+05	-2.67E+04	7.20E+04	3.18E+05
39.06	-9.71E+05	-9.11E+04	-3.45E+05	-1.01E+06	3.66E+05	3.87E+04	4.74E+04	3.23E+05
48.83	-1.11E+06	-1.02E+05	-2.28E+05	-1.20E+06	5.23E+05	9.13E+04	-6.20E+04	5.11E+05
58.59	-9.85E+05	-9.22E+04	-1.03E+05	-1.37E+06	6.70E+05	1.42E+05	-7.88E+04	7.58E+05
68.36	-1.21E+06	-1.93E+05	-1.84E+05	-1.35E+06	8.45E+05	8.83E+04	-2.22E+05	8.27E+05
78.13	-1.17E+06	-2.47E+05	-3.37E+05	-1.34E+06	8.90E+05	1.92E+05	-2.19E+05	1.02E+06
87.89	-1.36E+06	-3.35E+05	-3.99E+05	-1.29E+06	1.20E+06	1.81E+05	-3.74E+05	1.27E+06
97.66	-1.43E+06	-2.55E+05	-3.12E+05	-1.40E+06	1.43E+06	3.71E+05	-2.71E+05	1.34E+06
107.42	-1.23E+06	-3.63E+05	-4.60E+05	-1.31E+06	1.56E+06	3.61E+05	-4.34E+05	1.44E+06
117.19	-1.07E+06	-5.10E+05	-5.14E+05	-1.28E+06	1.58E+06	4.80E+05	-3.64E+05	1.48E+06
126.95	-9.36E+05	-6.89E+05	-7.91E+05	-1.13E+06	1.34E+06	7.96E+05	-1.36E+05	1.39E+06
136.72	-1.27E+06	-3.76E+04	-7.16E+05	-1.94E+06	-1.00E+06	3.70E+06	2.93E+06	-1.89E+06

Table A.132 Raw data for test seal at 15,000 rpm, 98% GVF and 0.4 PR (*Zero* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-9.98E+05	3.47E+05	-6.39E+05	-1.24E+06	-5.44E+04	-1.65E+03	1.02E+05	1.96E+04
19.53	-1.13E+06	1.18E+05	-5.10E+05	-1.21E+06	1.59E+05	-3.13E+03	1.55E+05	1.72E+05
29.3	-1.25E+06	9.87E+04	-5.40E+05	-1.25E+06	2.60E+05	-5.76E+04	-7.55E+04	5.48E+05
39.06	-1.20E+06	1.08E+05	-3.70E+05	-1.29E+06	4.17E+05	1.11E+05	8.29E+03	4.67E+05
48.83	-1.41E+06	1.02E+05	-3.92E+05	-1.40E+06	5.84E+05	1.67E+05	-9.09E+04	5.98E+05
58.59	-1.36E+06	1.82E+05	-2.48E+05	-1.50E+06	6.29E+05	1.96E+05	-1.42E+05	8.61E+05
68.36	-1.40E+06	7.20E+04	-2.72E+05	-1.54E+06	7.99E+05	2.53E+05	-2.39E+05	8.68E+05
78.13	-1.49E+06	-4.40E+04	-3.89E+05	-1.61E+06	9.85E+05	2.76E+05	-2.30E+05	1.08E+06
87.89	-1.53E+06	-2.01E+05	-5.46E+05	-1.48E+06	1.20E+06	3.11E+05	-4.40E+05	1.36E+06
97.66	-1.64E+06	-2.02E+04	-3.37E+05	-1.63E+06	1.48E+06	4.86E+05	-4.36E+05	1.48E+06
107.42	-1.51E+06	-1.56E+05	-5.46E+05	-1.50E+06	1.59E+06	4.63E+05	-5.71E+05	1.59E+06
117.19	-1.35E+06	-2.75E+05	-6.04E+05	-1.48E+06	1.56E+06	6.19E+05	-5.64E+05	1.64E+06
126.95	-1.27E+06	-4.20E+05	-8.77E+05	-1.33E+06	1.38E+06	9.54E+05	-3.07E+05	1.53E+06
136.72	-1.62E+06	3.42E+05	-5.91E+05	-2.22E+06	-9.56E+05	3.79E+06	2.70E+06	-1.73E+06

Table A.133 Raw data for test seal at 5,000 rpm, 96% GVF and 0.4 PR (*Zero* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-7.95E+05	-4.48E+04	-3.78E+05	-1.07E+06	7.26E+04	-1.20E+05	-8.85E+03	1.16E+05
19.53	-9.58E+05	-2.10E+05	-2.57E+05	-9.73E+05	2.32E+05	-1.51E+04	4.87E+04	1.89E+05
29.3	-1.12E+06	-4.08E+04	2.63E+04	-1.29E+06	7.28E+05	-6.38E+05	-4.10E+05	1.11E+06
39.06	-1.01E+06	-1.84E+05	-1.86E+05	-1.07E+06	4.37E+05	1.80E+04	-1.45E+03	4.36E+05
48.83	-1.16E+06	-2.03E+05	-1.23E+05	-1.20E+06	5.75E+05	2.17E+04	-3.12E+04	5.43E+05
58.59	-1.09E+06	-1.89E+05	8.79E+04	-1.25E+06	7.09E+05	4.28E+04	-7.20E+04	8.37E+05
68.36	-1.13E+06	-2.36E+05	-6.53E+04	-1.20E+06	8.56E+05	4.43E+04	-1.52E+05	7.78E+05
78.13	-1.24E+06	-3.14E+05	-1.97E+05	-1.33E+06	1.01E+06	6.11E+04	-1.60E+05	8.89E+05
87.89	-1.33E+06	-3.93E+05	-3.18E+05	-1.33E+06	1.27E+06	1.29E+05	-1.23E+05	1.15E+06
97.66	-1.38E+06	-2.44E+05	-1.22E+05	-1.46E+06	1.38E+06	1.69E+05	-1.83E+05	1.20E+06
107.42	-1.26E+06	-3.48E+05	-2.99E+05	-1.38E+06	1.61E+06	1.45E+05	-2.42E+05	1.30E+06
117.19	-1.20E+06	-4.42E+05	-3.56E+05	-1.43E+06	1.52E+06	1.99E+05	-2.19E+05	1.33E+06
126.95	-1.17E+06	-5.34E+05	-6.31E+05	-1.40E+06	1.37E+06	4.48E+05	5.14E+04	1.34E+06
136.72	-1.65E+06	4.59E+05	-6.49E+04	-2.64E+06	-9.18E+05	2.98E+06	2.95E+06	-1.73E+06

Table A.134 Raw data for test seal at 10,000 rpm, 96% GVF and 0.4 PR (*Zero* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-8.23E+05	1.12E+05	-4.66E+05	-1.13E+06	6.58E+04	-1.23E+05	6.01E+04	-1.92E+04
19.53	-9.92E+05	-1.10E+05	-4.40E+05	-1.07E+06	1.40E+05	-6.00E+04	1.61E+05	1.15E+05
29.3	-1.06E+06	-1.11E+05	-1.50E+05	-1.25E+06	4.80E+05	-3.10E+05	-6.84E+04	7.32E+05
39.06	-1.07E+06	-1.46E+05	-1.99E+05	-1.14E+06	4.33E+05	-5.43E+03	9.96E+04	4.15E+05
48.83	-1.23E+06	-1.40E+05	-1.66E+05	-1.25E+06	6.15E+05	3.81E+04	-2.22E+04	5.26E+05
58.59	-1.09E+06	-1.17E+05	-4.54E+04	-1.45E+06	6.93E+05	9.84E+04	-5.50E+04	7.83E+05
68.36	-1.19E+06	-1.55E+05	-5.23E+04	-1.44E+06	8.41E+05	2.03E+05	-1.59E+05	7.57E+05
78.13	-1.31E+06	-2.30E+05	-1.53E+05	-1.47E+06	9.19E+05	2.27E+05	-1.42E+05	1.00E+06
87.89	-1.43E+06	-3.56E+05	-2.89E+05	-1.45E+06	1.22E+06	1.72E+05	-2.88E+05	1.26E+06
97.66	-1.50E+06	-2.21E+05	-8.96E+04	-1.67E+06	1.50E+06	3.46E+05	-2.35E+05	1.30E+06
107.42	-1.39E+06	-3.14E+05	-3.15E+05	-1.58E+06	1.63E+06	3.52E+05	-3.52E+05	1.45E+06
117.19	-1.24E+06	-4.35E+05	-3.91E+05	-1.55E+06	1.56E+06	4.20E+05	-3.17E+05	1.57E+06
126.95	-1.19E+06	-5.67E+05	-5.71E+05	-1.49E+06	1.41E+06	6.53E+05	-9.84E+04	1.63E+06
136.72	-1.65E+06	2.75E+05	-1.59E+05	-2.43E+06	-8.75E+05	3.09E+06	2.70E+06	-1.24E+06

Table A.135 Raw data for test seal at 15,000 rpm, 96% GVF and 0.4 PR (*Zero* Preswirl)

Freq.	*Re*(H_{XX})	*Re*(H_{XY})	*Re*(H_{YX})	*Re*(H_{YY})	*Im*(H_{XX})	*Im*(H_{XY})	*Im*(H_{YX})	*Im*(H_{YY})
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.13E+06	2.65E+05	-6.09E+05	-1.28E+06	3.74E+04	1.41E+04	1.55E+05	1.67E+04
19.53	-1.29E+06	1.67E+05	-6.42E+05	-1.39E+06	-5.95E+03	-8.57E+04	2.45E+05	9.19E+04
29.3	-1.41E+06	1.46E+05	-3.23E+05	-1.65E+06	5.78E+05	-5.07E+05	-1.59E+05	9.20E+05
39.06	-1.39E+06	1.07E+04	-3.05E+05	-1.42E+06	4.38E+05	-9.10E+03	1.16E+05	5.22E+05
48.83	-1.55E+06	-4.88E+04	-3.13E+05	-1.50E+06	6.13E+05	1.05E+05	-1.62E+04	6.99E+05
58.59	-1.45E+06	5.76E+04	-1.79E+05	-1.58E+06	6.77E+05	1.67E+05	-8.11E+04	8.85E+05
68.36	-1.46E+06	-1.06E+05	-8.86E+04	-1.70E+06	8.78E+05	1.68E+05	-2.28E+05	9.43E+05
78.13	-1.57E+06	-1.39E+05	-2.48E+05	-1.69E+06	1.02E+06	2.56E+05	-2.46E+05	1.15E+06
87.89	-1.72E+06	-2.38E+05	-3.78E+05	-1.63E+06	1.24E+06	3.01E+05	-3.43E+05	1.40E+06
97.66	-1.77E+06	-5.18E+04	-1.74E+05	-1.82E+06	1.46E+06	4.27E+05	-4.04E+05	1.52E+06
107.42	-1.65E+06	-2.27E+05	-3.83E+05	-1.68E+06	1.60E+06	4.46E+05	-5.16E+05	1.57E+06
117.19	-1.56E+06	-3.07E+05	-4.06E+05	-1.70E+06	1.56E+06	5.74E+05	-4.93E+05	1.68E+06
126.95	-1.51E+06	-4.36E+05	-6.35E+05	-1.61E+06	1.39E+06	8.59E+05	-2.81E+05	1.63E+06
136.72	-2.04E+06	4.34E+05	-1.52E+05	-2.66E+06	-9.26E+05	3.57E+06	2.53E+06	-1.53E+06

Table A.136 Raw data for test seal at 5,000 rpm, 94% GVF and 0.4 PR (*Zero* Preswirl)

Freq.	*Re*(H_{XX})	*Re*(H_{XY})	*Re*(H_{YX})	*Re*(H_{YY})	*Im*(H_{XX})	*Im*(H_{XY})	*Im*(H_{YX})	*Im*(H_{YY})
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-9.05E+05	-5.09E+04	-2.71E+05	-1.10E+06	1.17E+05	-1.14E+05	-9.73E+04	1.75E+05
19.53	-1.06E+06	-1.76E+05	-2.55E+05	-1.03E+06	2.02E+05	-4.91E+04	9.53E+04	1.59E+05
29.3	-1.11E+06	-8.93E+04	2.34E+04	-1.34E+06	8.31E+05	-7.22E+05	-4.95E+05	1.18E+06
39.06	-1.10E+06	-1.97E+05	-1.75E+05	-1.11E+06	4.95E+05	-3.94E+04	4.64E+04	4.18E+05
48.83	-1.26E+06	-2.03E+05	-1.53E+05	-1.26E+06	6.42E+05	-2.51E+04	-6.79E+03	5.71E+05
58.59	-1.19E+06	-1.85E+05	8.94E+03	-1.27E+06	7.18E+05	3.19E+04	-4.41E+04	7.76E+05
68.36	-1.27E+06	-2.67E+05	3.11E+04	-1.31E+06	8.96E+05	-1.13E+04	-1.88E+05	8.25E+05
78.13	-1.34E+06	-2.53E+05	-2.18E+05	-1.41E+06	1.02E+06	7.62E+04	-1.32E+05	8.90E+05
87.89	-1.44E+06	-3.76E+05	-2.54E+05	-1.39E+06	1.29E+06	1.03E+05	-1.25E+05	1.20E+06
97.66	-1.45E+06	-2.37E+05	-7.81E+04	-1.52E+06	1.44E+06	2.01E+05	-1.75E+05	1.23E+06
107.42	-1.40E+06	-3.11E+05	-2.61E+05	-1.46E+06	1.62E+06	1.47E+05	-2.64E+05	1.32E+06
117.19	-1.35E+06	-4.30E+05	-2.88E+05	-1.53E+06	1.53E+06	2.00E+05	-1.90E+05	1.37E+06
126.95	-1.35E+06	-5.05E+05	-4.95E+05	-1.48E+06	1.40E+06	4.78E+05	9.29E+04	1.28E+06
136.72	-1.93E+06	5.38E+05	1.38E+05	-2.77E+06	-8.85E+05	3.19E+06	2.96E+06	-1.92E+06

Table A.137 Raw data for test seal at 10,000 rpm, 94% GVF and 0.4 PR (*Zero* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-9.62E+05	2.19E+05	-4.86E+05	-1.28E+06	2.28E+04	-1.66E+05	5.53E+04	-1.18E+05
19.53	-1.15E+06	-1.25E+05	-4.49E+05	-1.23E+06	8.36E+04	-7.03E+04	3.13E+05	1.28E+05
29.3	-1.20E+06	-1.15E+05	-1.10E+05	-1.40E+06	9.00E+05	-8.00E+05	-6.04E+05	1.38E+06
39.06	-1.16E+06	-1.50E+05	-1.61E+05	-1.25E+06	4.88E+05	9.84E+03	2.85E+04	4.41E+05
48.83	-1.35E+06	-1.31E+05	-1.27E+05	-1.48E+06	6.27E+05	5.57E+04	8.85E+04	5.77E+05
58.59	-1.24E+06	-1.03E+05	9.02E+03	-1.48E+06	7.89E+05	1.40E+05	-7.18E+04	8.08E+05
68.36	-1.28E+06	-1.07E+05	1.85E+04	-1.54E+06	7.73E+05	1.58E+05	-1.22E+05	7.84E+05
78.13	-1.49E+06	-2.41E+05	-7.85E+04	-1.63E+06	9.54E+05	2.27E+05	-2.06E+05	9.50E+05
87.89	-1.54E+06	-3.66E+05	-2.76E+05	-1.55E+06	1.29E+06	2.66E+05	-1.78E+05	1.23E+06
97.66	-1.59E+06	-1.90E+05	-7.75E+04	-1.78E+06	1.39E+06	3.50E+05	-2.10E+05	1.26E+06
107.42	-1.51E+06	-3.40E+05	-3.01E+05	-1.75E+06	1.54E+06	3.31E+05	-2.52E+05	1.36E+06
117.19	-1.49E+06	-3.65E+05	-2.51E+05	-1.81E+06	1.49E+06	4.72E+05	-2.38E+05	1.50E+06
126.95	-1.49E+06	-3.68E+05	-4.32E+05	-1.75E+06	1.36E+06	7.43E+05	-1.08E+04	1.46E+06
136.72	-2.13E+06	8.53E+05	2.75E+05	-3.35E+06	-9.14E+05	3.34E+06	2.86E+06	-1.63E+06

Table A.138 Raw data for test seal at 15,000 rpm, 94% GVF and 0.4 PR (*Zero* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.24E+06	4.45E+05	-5.07E+05	-1.33E+06	1.65E+05	3.69E+04	2.13E+05	-1.03E+05
19.53	-1.46E+06	1.64E+05	-4.04E+05	-1.53E+06	1.63E+05	-1.27E+05	3.24E+05	1.29E+05
29.3	-1.38E+06	7.37E+04	-1.71E+05	-1.75E+06	8.38E+05	-7.01E+05	-4.46E+05	1.28E+06
39.06	-1.42E+06	-4.25E+03	-1.84E+05	-1.53E+06	5.45E+05	-1.73E+04	9.36E+04	5.48E+05
48.83	-1.54E+06	2.23E+04	-1.39E+05	-1.61E+06	7.28E+05	4.12E+04	5.52E+04	6.89E+05
58.59	-1.50E+06	1.04E+05	1.43E+04	-1.69E+06	7.58E+05	5.98E+04	1.75E+04	9.15E+05
68.36	-1.55E+06	2.63E+04	3.03E+04	-1.70E+06	9.05E+05	2.04E+05	-2.44E+05	9.72E+05
78.13	-1.60E+06	-8.87E+04	-1.48E+05	-1.75E+06	9.69E+05	2.80E+05	-1.88E+05	1.14E+06
87.89	-1.70E+06	-1.60E+05	-2.69E+05	-1.74E+06	1.27E+06	3.26E+05	-2.28E+05	1.37E+06
97.66	-1.77E+06	-3.84E+03	-3.61E+04	-1.84E+06	1.42E+06	3.52E+05	-3.62E+05	1.46E+06
107.42	-1.72E+06	-1.17E+05	-2.04E+05	-1.84E+06	1.52E+06	4.08E+05	-4.48E+05	1.53E+06
117.19	-1.73E+06	-2.09E+05	-1.92E+05	-1.88E+06	1.51E+06	4.97E+05	-4.86E+05	1.68E+06
126.95	-1.80E+06	-2.62E+05	-3.58E+05	-1.93E+06	1.43E+06	6.98E+05	-3.05E+05	1.69E+06
136.72	-2.60E+06	8.75E+05	4.44E+05	-3.32E+06	-5.11E+05	2.98E+06	2.02E+06	-1.02E+06

Table A.139 Raw data for test seal at 5,000 rpm, 92% GVF and 0.4 PR (*Zero* Preswirl)

Freq.	*Re(H_{XX})*	*Re(H_{XY})*	*Re(H_{YX})*	*Re(H_{YY})*	*Im(H_{XX})*	*Im(H_{XY})*	*Im(H_{YX})*	*Im(H_{YY})*
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-9.56E+05	2.15E+04	-2.44E+05	-1.12E+06	7.73E+04	-1.03E+05	-7.42E+04	1.24E+05
19.53	-1.13E+06	-8.87E+04	-1.84E+05	-1.11E+06	2.44E+05	-6.21E+04	1.05E+05	1.42E+05
29.3	-1.09E+06	-1.50E+05	-7.15E+04	-1.12E+06	9.55E+05	-9.85E+05	-6.98E+05	1.58E+06
39.06	-1.20E+06	-9.54E+04	-3.66E+04	-1.16E+06	5.45E+05	1.60E+03	1.65E+04	4.22E+05
48.83	-1.31E+06	-1.28E+05	-5.77E+04	-1.28E+06	6.63E+05	4.26E+03	-1.49E+04	6.17E+05
58.59	-1.28E+06	-5.12E+04	6.41E+04	-1.35E+06	7.59E+05	3.66E+04	-6.00E+04	8.23E+05
68.36	-1.28E+06	-1.65E+05	4.10E+04	-1.38E+06	8.77E+05	4.50E+04	-1.95E+05	8.64E+05
78.13	-1.40E+06	-2.00E+05	-6.17E+04	-1.45E+06	1.03E+06	5.96E+04	-1.17E+05	9.30E+05
87.89	-1.46E+06	-3.03E+05	-1.76E+05	-1.43E+06	1.36E+06	7.79E+04	-1.34E+05	1.20E+06
97.66	-1.56E+06	-1.45E+05	2.34E+04	-1.59E+06	1.48E+06	1.02E+05	-2.45E+05	1.24E+06
107.42	-1.49E+06	-2.16E+05	-1.58E+05	-1.57E+06	1.60E+06	9.87E+04	-2.59E+05	1.36E+06
117.19	-1.51E+06	-3.18E+05	-1.49E+05	-1.65E+06	1.58E+06	1.44E+05	-2.35E+05	1.48E+06
126.95	-1.58E+06	-3.42E+05	-3.18E+05	-1.70E+06	1.51E+06	3.42E+05	2.04E+04	1.52E+06
136.72	-2.44E+06	9.62E+05	6.20E+05	-3.33E+06	-4.07E+05	2.52E+06	2.40E+06	-1.23E+06

Table A.140 Raw data for test seal at 10,000 rpm, 92% GVF and 0.4 PR (*Zero* Preswirl)

Freq.	*Re(H_{XX})*	*Re(H_{XY})*	*Re(H_{YX})*	*Re(H_{YY})*	*Im(H_{XX})*	*Im(H_{XY})*	*Im(H_{YX})*	*Im(H_{YY})*
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.14E+06	2.10E+05	-4.60E+05	-1.36E+06	-2.96E+04	-1.62E+05	8.98E+04	-8.09E+04
19.53	-1.29E+06	-4.14E+04	-3.40E+05	-1.33E+06	2.37E+05	-9.98E+04	2.81E+05	1.82E+05
29.3	-1.13E+06	-3.30E+05	-1.46E+05	-1.18E+06	1.05E+06	-9.70E+05	-7.12E+05	1.61E+06
39.06	-1.28E+06	-1.25E+05	-7.95E+04	-1.34E+06	5.21E+05	2.06E+04	6.61E+04	4.58E+05
48.83	-1.33E+06	-1.37E+05	-8.76E+04	-1.46E+06	7.61E+05	8.07E+04	7.17E+04	6.60E+05
58.59	-1.34E+06	-3.83E+04	5.85E+04	-1.52E+06	6.70E+05	8.74E+04	-3.04E+04	8.35E+05
68.36	-1.45E+06	-8.45E+04	8.71E+04	-1.54E+06	8.04E+05	8.71E+04	-1.36E+05	9.09E+05
78.13	-1.52E+06	-1.48E+05	-1.17E+05	-1.63E+06	9.85E+05	1.29E+05	-1.40E+05	1.06E+06
87.89	-1.58E+06	-3.18E+05	-1.67E+05	-1.62E+06	1.32E+06	2.52E+05	-1.33E+05	1.24E+06
97.66	-1.67E+06	-1.14E+05	2.03E+04	-1.80E+06	1.44E+06	3.18E+05	-2.14E+05	1.31E+06
107.42	-1.59E+06	-1.96E+05	-1.36E+05	-1.80E+06	1.51E+06	3.35E+05	-2.92E+05	1.45E+06
117.19	-1.65E+06	-2.56E+05	-1.18E+05	-1.87E+06	1.52E+06	3.87E+05	-2.54E+05	1.58E+06
126.95	-1.74E+06	-2.69E+05	-2.17E+05	-1.94E+06	1.48E+06	5.62E+05	-5.96E+04	1.64E+06
136.72	-2.76E+06	1.15E+06	8.23E+05	-3.71E+06	-3.36E+05	2.63E+06	2.14E+06	-8.37E+05

Table A.141 Raw data for test seal at 15,000 rpm, 92% GVF and 0.4 PR (*Zero* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.03E+06	3.76E+05	-4.73E+05	-1.33E+06	-1.65E+04	1.04E+05	-1.01E+04	-1.16E+05
19.53	-1.47E+06	1.74E+05	-3.76E+05	-1.54E+06	1.27E+05	-1.10E+05	3.73E+05	1.26E+05
29.3	-1.38E+06	-1.13E+05	-2.12E+05	-1.32E+06	1.16E+06	-1.01E+06	-6.76E+05	1.57E+06
39.06	-1.47E+06	3.22E+04	-1.04E+05	-1.52E+06	5.36E+05	-2.23E+04	1.04E+05	5.61E+05
48.83	-1.53E+06	2.28E+04	-2.79E+03	-1.63E+06	7.54E+05	6.45E+04	3.98E+04	7.32E+05
58.59	-1.59E+06	2.09E+04	4.99E+04	-1.64E+06	8.40E+05	1.17E+05	-4.72E+04	9.34E+05
68.36	-1.54E+06	-4.04E+03	1.13E+05	-1.74E+06	8.79E+05	1.92E+05	-2.65E+05	9.16E+05
78.13	-1.59E+06	-9.18E+04	-7.71E+04	-1.79E+06	9.56E+05	2.39E+05	-2.31E+05	1.10E+06
87.89	-1.74E+06	-1.57E+05	-1.47E+05	-1.75E+06	1.32E+06	3.34E+05	-2.02E+05	1.35E+06
97.66	-1.80E+06	-2.53E+02	1.15E+05	-1.95E+06	1.35E+06	3.44E+05	-3.60E+05	1.41E+06
107.42	-1.75E+06	-9.63E+04	-1.18E+05	-1.94E+06	1.49E+06	3.55E+05	-4.28E+05	1.49E+06
117.19	-1.85E+06	-1.73E+05	-1.13E+05	-2.00E+06	1.46E+06	4.40E+05	-4.31E+05	1.67E+06
126.95	-1.96E+06	-2.15E+05	-2.24E+05	-2.09E+06	1.42E+06	6.21E+05	-2.46E+05	1.67E+06
136.72	-3.04E+06	1.24E+06	9.12E+05	-3.92E+06	-2.70E+05	2.53E+06	1.78E+06	-5.23E+05

Table A.142 Raw data for test seal at 5,000 rpm, 90% GVF and 0.4 PR (*Zero* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.10E+06	1.16E+05	-2.43E+05	-1.28E+06	3.14E+04	-1.28E+05	1.18E+04	1.22E+05
19.53	-1.20E+06	-4.04E+04	-9.50E+04	-1.21E+06	2.82E+05	-4.19E+04	1.24E+05	2.14E+05
29.3	-9.89E+05	-5.36E+05	-2.19E+05	-7.51E+05	1.09E+06	-9.98E+05	-8.41E+05	1.61E+06
39.06	-1.20E+06	-7.55E+04	-1.29E+04	-1.27E+06	5.17E+05	-1.23E+04	3.75E+03	4.86E+05
48.83	-1.42E+06	-6.25E+04	-2.10E+04	-1.37E+06	6.51E+05	-4.36E+04	-6.70E+03	6.83E+05
58.59	-1.31E+06	1.36E+03	1.17E+05	-1.46E+06	7.20E+05	1.35E+04	-6.31E+04	8.42E+05
68.36	-1.41E+06	-1.47E+04	1.46E+05	-1.56E+06	8.95E+05	1.01E+04	-1.71E+05	8.84E+05
78.13	-1.51E+06	-1.53E+05	-2.97E+04	-1.52E+06	1.05E+06	3.45E+04	-1.51E+05	9.58E+05
87.89	-1.51E+06	-1.71E+05	-1.20E+05	-1.56E+06	1.41E+06	1.03E+05	-1.28E+05	1.19E+06
97.66	-1.66E+06	-1.94E+04	8.88E+04	-1.75E+06	1.48E+06	5.49E+04	-2.22E+05	1.28E+06
107.42	-1.53E+06	-1.18E+05	-8.34E+04	-1.76E+06	1.60E+06	6.88E+04	-2.90E+05	1.37E+06
117.19	-1.62E+06	-2.27E+05	-7.86E+04	-1.82E+06	1.64E+06	6.99E+04	-2.47E+05	1.56E+06
126.95	-1.78E+06	-2.11E+05	-1.96E+05	-1.93E+06	1.55E+06	1.94E+05	-5.03E+04	1.79E+06
136.72	-2.96E+06	1.19E+06	1.13E+06	-3.67E+06	-3.42E+05	1.50E+06	2.25E+06	3.16E+04

Table A.143 Raw data for test seal at 10,000 rpm, 90% GVF and 0.4 PR (*Zero* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.08E+06	2.98E+05	-3.15E+05	-1.47E+06	1.54E+05	-1.19E+05	8.10E+03	-1.11E+05
19.53	-1.31E+06	-2.66E+04	-1.66E+05	-1.47E+06	2.47E+05	-1.06E+05	2.61E+05	2.49E+05
29.3	-1.06E+06	-4.39E+05	-3.37E+05	-9.80E+05	1.10E+06	-9.12E+05	-7.40E+05	1.51E+06
39.06	-1.31E+06	-2.83E+04	-7.11E+04	-1.42E+06	5.82E+05	-5.04E+02	3.85E+04	5.16E+05
48.83	-1.40E+06	-5.54E+04	-1.75E+04	-1.50E+06	7.17E+05	4.28E+04	5.41E+04	6.81E+05
58.59	-1.41E+06	4.40E+04	8.81E+04	-1.62E+06	6.72E+05	1.25E+05	-4.40E+03	8.34E+05
68.36	-1.48E+06	1.52E+04	1.01E+05	-1.68E+06	7.92E+05	7.14E+04	-1.57E+05	9.05E+05
78.13	-1.58E+06	-1.57E+05	-5.48E+04	-1.70E+06	9.90E+05	1.13E+05	-1.25E+05	1.02E+06
87.89	-1.64E+06	-2.66E+05	-1.15E+05	-1.72E+06	1.33E+06	2.93E+05	-8.01E+04	1.23E+06
97.66	-1.73E+06	-5.66E+04	7.81E+04	-1.90E+06	1.39E+06	2.96E+05	-2.29E+05	1.35E+06
107.42	-1.61E+06	-1.03E+05	-9.67E+04	-1.92E+06	1.48E+06	3.51E+05	-2.89E+05	1.43E+06
117.19	-1.74E+06	-1.77E+05	-6.85E+04	-1.99E+06	1.52E+06	3.44E+05	-2.67E+05	1.63E+06
126.95	-1.86E+06	-1.54E+05	-1.39E+05	-2.15E+06	1.48E+06	4.80E+05	-1.13E+05	1.76E+06
136.72	-3.10E+06	1.45E+06	1.19E+06	-4.09E+06	-3.52E+05	1.94E+06	2.16E+06	-6.37E+04

Table A.144 Raw data for test seal at 15,000 rpm, 90% GVF and 0.4 PR (*Zero* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.30E+06	2.64E+05	-4.63E+05	-1.42E+06	-2.54E+04	2.96E+04	2.30E+05	-1.86E+04
19.53	-1.58E+06	1.13E+05	-2.88E+05	-1.56E+06	1.94E+05	-8.01E+04	2.84E+05	1.54E+05
29.3	-1.14E+06	-4.81E+05	-3.21E+05	-1.05E+06	1.03E+06	-9.61E+05	-6.60E+05	1.63E+06
39.06	-1.49E+06	4.36E+04	1.37E+04	-1.65E+06	5.94E+05	-2.85E+03	1.14E+05	5.65E+05
48.83	-1.50E+06	2.69E+03	1.17E+04	-1.69E+06	7.35E+05	7.19E+04	7.90E+04	7.84E+05
58.59	-1.56E+06	9.33E+04	5.47E+04	-1.74E+06	6.50E+05	1.15E+05	-1.43E+04	8.65E+05
68.36	-1.58E+06	8.22E+04	1.02E+05	-1.87E+06	8.21E+05	1.24E+05	-1.83E+05	9.55E+05
78.13	-1.74E+06	-5.80E+04	-2.85E+04	-1.86E+06	9.97E+05	1.99E+05	-1.20E+05	1.08E+06
87.89	-1.75E+06	-1.62E+05	-1.28E+05	-1.83E+06	1.28E+06	2.79E+05	-1.83E+05	1.34E+06
97.66	-1.90E+06	2.17E+04	1.25E+05	-2.05E+06	1.35E+06	3.10E+05	-3.34E+05	1.38E+06
107.42	-1.82E+06	-5.11E+04	-5.43E+04	-2.08E+06	1.43E+06	3.51E+05	-3.96E+05	1.51E+06
117.19	-1.97E+06	-1.16E+05	-4.56E+04	-2.13E+06	1.44E+06	4.05E+05	-4.22E+05	1.68E+06
126.95	-2.05E+06	-1.34E+05	-1.18E+05	-2.33E+06	1.46E+06	5.78E+05	-2.70E+05	1.77E+06
136.72	-3.47E+06	1.45E+06	1.41E+06	-4.31E+06	-2.38E+05	1.89E+06	1.75E+06	1.74E+05

Table A.145 Raw data for test seal at 5,000 rpm, 100% GVF and 0.3 PR (*Zero* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-7.51E+05	-3.42E+05	-1.99E+05	-8.33E+05	-4.04E+04	1.88E+04	-1.72E+04	7.70E+04
19.53	-9.50E+05	-4.55E+05	-1.19E+05	-7.54E+05	1.23E+05	3.65E+04	1.42E+05	1.15E+05
29.3	-8.92E+05	-3.51E+05	-1.01E+05	-9.98E+05	1.38E+05	-6.38E+04	-1.01E+05	3.17E+05
39.06	-9.02E+05	-4.43E+05	-5.78E+04	-8.72E+05	2.28E+05	5.38E+04	3.55E+04	2.67E+05
48.83	-1.06E+06	-4.37E+05	4.83E+04	-1.08E+06	3.99E+05	2.80E+04	2.18E+04	3.62E+05
58.59	-8.65E+05	-5.71E+05	3.43E+05	-9.30E+05	5.88E+05	1.11E+05	-1.97E+05	7.22E+05
68.36	-1.14E+06	-4.67E+05	-2.09E+04	-1.08E+06	4.98E+05	1.16E+05	-2.45E+05	4.78E+05
78.13	-1.19E+06	-5.51E+05	-5.72E+04	-1.23E+06	5.72E+05	1.48E+05	-2.00E+05	6.51E+05
87.89	-1.34E+06	-5.60E+05	-1.84E+05	-1.19E+06	8.86E+05	1.10E+05	-3.43E+05	8.62E+05
97.66	-1.31E+06	-5.41E+05	-1.02E+05	-1.24E+06	9.80E+05	2.46E+05	-1.33E+05	8.78E+05
107.42	-1.18E+06	-6.23E+05	-3.32E+05	-1.14E+06	9.00E+05	3.10E+05	-2.06E+05	8.24E+05
117.19	-1.05E+06	-7.42E+05	-3.66E+05	-1.07E+06	9.57E+05	3.53E+05	-1.90E+05	8.48E+05
126.95	-9.51E+05	-9.14E+05	-7.01E+05	-9.81E+05	6.73E+05	6.05E+05	6.03E+04	6.33E+05
136.72	-1.24E+06	-5.85E+05	-7.28E+05	-1.64E+06	-1.82E+06	3.56E+06	3.11E+06	-2.81E+06

Table A.146 Raw data for test seal at 10,000 rpm, 100% GVF and 0.3 PR (*Zero* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-6.75E+05	-4.44E+05	-2.90E+05	-9.61E+05	-2.58E+04	2.73E+04	5.71E+04	2.35E+04
19.53	-8.77E+05	-5.37E+05	-1.66E+05	-8.66E+05	5.21E+04	1.07E+05	4.01E+04	1.31E+05
29.3	-7.05E+05	-7.56E+05	-3.11E+05	-7.10E+05	1.22E+05	1.38E+05	-7.72E+04	2.57E+05
39.06	-9.34E+05	-4.78E+05	-1.57E+05	-9.54E+05	1.67E+05	1.19E+05	-2.37E+04	1.87E+05
48.83	-1.11E+06	-4.80E+05	-4.47E+04	-1.10E+06	2.57E+05	1.20E+05	-1.36E+05	3.73E+05
58.59	-1.10E+06	-4.73E+05	9.66E+04	-1.32E+06	4.80E+05	1.60E+05	1.02E+03	5.22E+05
68.36	-1.31E+06	-5.85E+05	6.02E+04	-1.23E+06	4.43E+05	2.03E+05	-2.94E+05	7.12E+05
78.13	-1.27E+06	-7.23E+05	-6.88E+04	-1.14E+06	7.11E+05	1.78E+05	-4.06E+05	8.03E+05
87.89	-1.27E+06	-7.66E+05	-2.59E+05	-1.14E+06	9.16E+05	1.67E+05	-5.96E+05	9.68E+05
97.66	-1.37E+06	-6.99E+05	-1.68E+05	-1.30E+06	1.04E+06	5.06E+05	-3.71E+05	9.04E+05
107.42	-1.14E+06	-7.82E+05	-3.26E+05	-1.15E+06	1.10E+06	3.99E+05	-5.27E+05	9.89E+05
117.19	-1.05E+06	-9.52E+05	-4.22E+05	-1.07E+06	1.08E+06	5.89E+05	-4.88E+05	1.01E+06
126.95	-9.03E+05	-1.11E+06	-7.17E+05	-8.97E+05	8.02E+05	9.02E+05	-2.31E+05	7.70E+05
136.72	-9.61E+05	-9.59E+05	-9.21E+05	-1.30E+06	-1.75E+06	3.86E+06	2.76E+06	-2.79E+06

Table A.147 Raw data for test seal at 15,000 rpm, 100% GVF and 0.3 PR (*Zero* Preswirl)

Freq.	*Re(H_{XX})*	*Re(H_{XY})*	*Re(H_{YX})*	*Re(H_{YY})*	*Im(H_{XX})*	*Im(H_{XY})*	*Im(H_{YX})*	*Im(H_{YY})*
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.00E+06	-4.15E+05	-1.36E+05	-1.06E+06	2.13E+04	3.62E+04	4.66E+03	1.17E+05
19.53	-1.07E+06	-5.20E+05	-5.67E+04	-9.33E+05	9.42E+04	1.63E+05	-2.90E+04	1.19E+05
29.3	-1.01E+06	-6.06E+05	-8.56E+04	-8.62E+05	2.45E+05	1.89E+05	-1.75E+05	2.75E+05
39.06	-1.13E+06	-4.28E+05	-6.93E+04	-9.78E+05	1.95E+05	2.74E+05	-1.85E+05	2.87E+05
48.83	-1.31E+06	-3.89E+05	-4.46E+04	-1.19E+06	3.02E+05	3.03E+05	-3.12E+05	3.07E+05
58.59	-1.22E+06	-4.22E+05	7.15E+04	-1.34E+06	3.74E+05	3.66E+05	-3.15E+05	4.62E+05
68.36	-1.42E+06	-4.46E+05	4.86E+04	-1.39E+06	5.82E+05	2.99E+05	-5.08E+05	4.40E+05
78.13	-1.46E+06	-5.88E+05	-1.43E+05	-1.38E+06	5.94E+05	3.99E+05	-5.32E+05	6.33E+05
87.89	-1.57E+06	-6.42E+05	-1.72E+05	-1.39E+06	9.53E+05	3.14E+05	-7.62E+05	9.31E+05
97.66	-1.57E+06	-5.83E+05	-1.04E+05	-1.55E+06	1.10E+06	6.10E+05	-6.38E+05	8.67E+05
107.42	-1.40E+06	-7.25E+05	-3.19E+05	-1.33E+06	1.19E+06	5.85E+05	-7.94E+05	1.02E+06
117.19	-1.28E+06	-8.63E+05	-4.03E+05	-1.26E+06	1.08E+06	7.76E+05	-7.54E+05	9.76E+05
126.95	-1.15E+06	-1.04E+06	-6.85E+05	-1.04E+06	8.58E+05	1.08E+06	-4.90E+05	7.82E+05
136.72	-1.32E+06	-8.52E+05	-8.17E+05	-1.60E+06	-1.71E+06	4.14E+06	2.45E+06	-2.73E+06

Table A.148 Raw data for test seal at 5,000 rpm, 98% GVF and 0.3 PR (*Zero* Preswirl)

Freq.	*Re(H_{XX})*	*Re(H_{XY})*	*Re(H_{YX})*	*Re(H_{YY})*	*Im(H_{XX})*	*Im(H_{XY})*	*Im(H_{YX})*	*Im(H_{YY})*
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-9.15E+05	-1.54E+05	-3.70E+05	-1.23E+06	-3.57E+03	-1.24E+05	-2.65E+04	1.22E+05
19.53	-1.04E+06	-3.96E+05	-2.73E+05	-1.18E+06	7.50E+04	-6.25E+04	3.17E+04	1.68E+05
29.3	-1.02E+06	-5.39E+05	-2.68E+05	-1.18E+06	2.79E+05	-1.70E+05	-6.63E+04	4.18E+05
39.06	-1.22E+06	-4.17E+05	-1.49E+05	-1.28E+06	3.23E+05	1.24E+04	2.85E+04	3.26E+05
48.83	-1.30E+06	-3.91E+05	-9.32E+04	-1.39E+06	4.24E+05	4.67E+04	-5.31E+04	4.92E+05
58.59	-1.21E+06	-4.01E+05	1.05E+04	-1.59E+06	6.31E+05	4.27E+04	6.38E+03	6.61E+05
68.36	-1.41E+06	-4.30E+05	-1.03E+05	-1.53E+06	7.33E+05	1.13E+05	-2.10E+05	7.11E+05
78.13	-1.36E+06	-4.82E+05	-2.00E+05	-1.58E+06	8.02E+05	1.35E+05	-2.20E+05	8.60E+05
87.89	-1.51E+06	-5.40E+05	-3.59E+05	-1.52E+06	1.03E+06	1.10E+05	-2.98E+05	1.03E+06
97.66	-1.60E+06	-4.55E+05	-2.69E+05	-1.62E+06	1.30E+06	2.47E+05	-2.06E+05	1.13E+06
107.42	-1.37E+06	-5.38E+05	-4.51E+05	-1.50E+06	1.37E+06	1.85E+05	-2.98E+05	1.21E+06
117.19	-1.30E+06	-6.72E+05	-5.07E+05	-1.44E+06	1.37E+06	3.01E+05	-2.59E+05	1.20E+06
126.95	-1.13E+06	-8.30E+05	-7.82E+05	-1.38E+06	1.16E+06	6.29E+05	4.17E+04	9.97E+05
136.72	-1.48E+06	-3.24E+05	-6.93E+05	-2.16E+06	-1.33E+06	3.48E+06	3.11E+06	-2.30E+06

Table A.149 Raw data for test seal at 10,000 rpm, 98% GVF and 0.3 PR (*Zero* Preswirl)

Freq.	*Re*(H_{XX})	*Re*(H_{XY})	*Re*(H_{YX})	*Re*(H_{YY})	*Im*(H_{XX})	*Im*(H_{XY})	*Im*(H_{YX})	*Im*(H_{YY})
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.07E+06	-9.73E+04	-4.11E+05	-1.39E+06	7.57E+04	-9.43E+04	2.02E+04	9.96E+03
19.53	-1.24E+06	-2.39E+05	-3.14E+05	-1.33E+06	1.17E+05	-4.18E+04	6.96E+04	7.34E+04
29.3	-1.29E+06	-3.30E+05	-2.38E+05	-1.52E+06	3.62E+05	-2.30E+05	-4.41E+04	5.01E+05
39.06	-1.29E+06	-2.79E+05	-2.41E+05	-1.45E+06	2.69E+05	4.92E+04	-1.61E+04	2.85E+05
48.83	-1.51E+06	-2.99E+05	-1.92E+05	-1.57E+06	4.25E+05	8.04E+04	-5.48E+04	4.68E+05
58.59	-1.37E+06	-2.85E+05	1.52E+04	-1.77E+06	5.51E+05	1.81E+05	-4.59E+04	6.75E+05
68.36	-1.56E+06	-3.62E+05	-5.01E+04	-1.73E+06	7.41E+05	1.00E+05	-2.53E+05	7.49E+05
78.13	-1.58E+06	-4.10E+05	-1.93E+05	-1.74E+06	8.06E+05	2.58E+05	-1.94E+05	9.03E+05
87.89	-1.70E+06	-5.27E+05	-3.70E+05	-1.71E+06	1.03E+06	2.91E+05	-3.02E+05	1.08E+06
97.66	-1.69E+06	-4.56E+05	-1.78E+05	-1.82E+06	1.36E+06	4.67E+05	-2.81E+05	1.22E+06
107.42	-1.60E+06	-5.17E+05	-3.62E+05	-1.66E+06	1.38E+06	4.70E+05	-4.32E+05	1.31E+06
117.19	-1.45E+06	-6.04E+05	-3.71E+05	-1.64E+06	1.36E+06	6.08E+05	-4.02E+05	1.30E+06
126.95	-1.35E+06	-7.33E+05	-7.34E+05	-1.53E+06	1.12E+06	9.47E+05	-1.14E+05	1.11E+06
136.72	-1.74E+06	-1.13E+05	-6.15E+05	-2.35E+06	-1.37E+06	3.85E+06	2.89E+06	-2.12E+06

Table A.150 Raw data for test seal at 15,000 rpm, 98% GVF and 0.3 PR (*Zero* Preswirl)

Freq.	*Re*(H_{XX})	*Re*(H_{XY})	*Re*(H_{YX})	*Re*(H_{YY})	*Im*(H_{XX})	*Im*(H_{XY})	*Im*(H_{YX})	*Im*(H_{YY})
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.41E+06	1.08E+05	-5.72E+05	-1.63E+06	-3.96E+04	-4.41E+04	1.75E+05	-1.20E+04
19.53	-1.62E+06	-2.62E+03	-4.82E+05	-1.55E+06	4.03E+04	1.96E+04	1.62E+05	6.29E+04
29.3	-1.65E+06	-4.81E+04	-2.90E+05	-1.77E+06	3.90E+05	-3.24E+05	-2.38E+05	7.14E+05
39.06	-1.68E+06	-5.67E+04	-3.23E+05	-1.71E+06	2.62E+05	8.09E+04	3.23E+03	3.85E+05
48.83	-1.86E+06	-3.13E+04	-2.62E+05	-1.83E+06	4.17E+05	1.49E+05	-5.40E+04	4.93E+05
58.59	-1.76E+06	2.20E+04	-9.84E+04	-1.95E+06	5.29E+05	1.84E+05	-1.09E+05	7.00E+05
68.36	-1.82E+06	-1.12E+05	-8.70E+04	-2.03E+06	7.02E+05	2.10E+05	-3.28E+05	7.12E+05
78.13	-1.94E+06	-2.30E+05	-2.20E+05	-2.05E+06	8.89E+05	2.52E+05	-3.51E+05	9.54E+05
87.89	-2.03E+06	-3.48E+05	-3.90E+05	-1.98E+06	1.07E+06	3.25E+05	-4.17E+05	1.16E+06
97.66	-2.09E+06	-2.86E+05	-2.07E+05	-2.09E+06	1.35E+06	4.56E+05	-4.18E+05	1.33E+06
107.42	-1.90E+06	-3.84E+05	-4.43E+05	-1.91E+06	1.44E+06	5.07E+05	-6.03E+05	1.39E+06
117.19	-1.78E+06	-4.72E+05	-4.87E+05	-1.94E+06	1.39E+06	6.88E+05	-5.69E+05	1.36E+06
126.95	-1.72E+06	-5.61E+05	-6.57E+05	-1.93E+06	1.19E+06	1.03E+06	-3.24E+05	1.27E+06
136.72	-2.13E+06	2.45E+05	-3.36E+05	-2.82E+06	-1.20E+06	3.98E+06	2.65E+06	-2.07E+06

Table A.151 Raw data for test seal at 5,000 rpm, 96% GVF and 0.3 PR (*Zero* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.19E+06	-6.44E+04	-2.86E+05	-1.38E+06	2.27E+04	-1.17E+05	-1.09E+04	2.11E+05
19.53	-1.31E+06	-2.36E+05	-2.60E+05	-1.31E+06	1.98E+05	-5.49E+04	7.71E+04	2.03E+05
29.3	-1.33E+06	-3.37E+05	-8.95E+04	-1.32E+06	5.24E+05	-4.11E+05	-2.70E+05	7.69E+05
39.06	-1.40E+06	-2.62E+05	-1.16E+05	-1.38E+06	4.48E+05	-4.15E+04	-5.23E+04	3.72E+05
48.83	-1.51E+06	-2.75E+05	-1.82E+05	-1.48E+06	5.42E+05	6.16E+03	-4.70E+04	4.51E+05
58.59	-1.43E+06	-2.61E+05	2.26E+04	-1.62E+06	6.28E+05	1.63E+04	-2.89E+04	6.78E+05
68.36	-1.55E+06	-2.84E+05	2.00E+04	-1.66E+06	8.35E+05	6.33E+04	-1.35E+05	6.02E+05
78.13	-1.64E+06	-3.76E+05	-1.74E+05	-1.68E+06	9.05E+05	8.12E+04	-1.38E+05	7.85E+05
87.89	-1.65E+06	-4.83E+05	-2.58E+05	-1.65E+06	1.14E+06	1.15E+05	-1.87E+05	9.04E+05
97.66	-1.65E+06	-3.26E+05	-1.02E+05	-1.81E+06	1.44E+06	1.87E+05	-2.46E+05	1.05E+06
107.42	-1.60E+06	-4.13E+05	-2.89E+05	-1.73E+06	1.45E+06	1.57E+05	-2.77E+05	1.12E+06
117.19	-1.47E+06	-4.99E+05	-3.18E+05	-1.76E+06	1.42E+06	2.31E+05	-2.64E+05	1.14E+06
126.95	-1.45E+06	-5.34E+05	-5.74E+05	-1.83E+06	1.22E+06	4.62E+05	-1.94E+04	1.07E+06
136.72	-1.91E+06	3.09E+05	-1.61E+05	-2.88E+06	-1.18E+06	3.18E+06	3.01E+06	-2.10E+06

Table A.152 Raw data for test seal at 10,000 rpm, 96% GVF and 0.3 PR (*Zero* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.27E+06	5.41E+04	-3.60E+05	-1.66E+06	2.70E+04	-2.03E+05	7.24E+04	6.39E+02
19.53	-1.45E+06	-1.39E+05	-2.64E+05	-1.61E+06	6.74E+04	-8.83E+04	2.05E+05	1.17E+05
29.3	-1.43E+06	-3.16E+05	-1.83E+05	-1.66E+06	5.97E+05	-5.11E+05	-2.45E+05	8.77E+05
39.06	-1.47E+06	-2.00E+05	-1.11E+05	-1.67E+06	3.53E+05	-8.25E+03	5.54E+04	3.68E+05
48.83	-1.58E+06	-2.75E+05	9.58E+02	-1.77E+06	5.44E+05	5.57E+04	-3.90E+04	4.98E+05
58.59	-1.58E+06	-1.95E+05	1.03E+05	-1.84E+06	5.20E+05	1.76E+05	-5.96E+04	7.14E+05
68.36	-1.63E+06	-2.57E+05	8.37E+04	-1.87E+06	7.33E+05	2.00E+05	-1.85E+05	7.33E+05
78.13	-1.69E+06	-3.17E+05	-9.20E+04	-1.93E+06	8.00E+05	2.60E+05	-1.82E+05	8.68E+05
87.89	-1.78E+06	-4.87E+05	-2.27E+05	-1.91E+06	1.06E+06	2.71E+05	-2.50E+05	1.03E+06
97.66	-1.80E+06	-3.20E+05	-4.50E+03	-2.09E+06	1.26E+06	4.26E+05	-2.56E+05	1.13E+06
107.42	-1.73E+06	-4.14E+05	-1.79E+05	-2.01E+06	1.35E+06	3.84E+05	-3.64E+05	1.24E+06
117.19	-1.69E+06	-4.76E+05	-2.24E+05	-2.04E+06	1.29E+06	5.32E+05	-3.25E+05	1.25E+06
126.95	-1.65E+06	-5.60E+05	-4.34E+05	-2.07E+06	1.11E+06	8.08E+05	-6.34E+04	1.17E+06
136.72	-2.09E+06	3.65E+05	-4.69E+03	-3.13E+06	-1.24E+06	3.57E+06	2.89E+06	-2.06E+06

Table A.153 Raw data for test seal at 15,000 rpm, 96% GVF and 0.3 PR (*Zero* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.55E+06	2.20E+05	-4.66E+05	-1.68E+06	7.88E+04	1.94E+03	9.28E+04	-8.97E+04
19.53	-1.81E+06	9.95E+03	-5.36E+05	-1.94E+06	-7.99E+03	-1.24E+05	2.77E+05	5.30E+04
29.3	-1.82E+06	-1.45E+05	-1.82E+05	-2.09E+06	7.82E+05	-6.33E+05	-2.97E+05	9.58E+05
39.06	-1.80E+06	-1.45E+05	-7.38E+04	-2.01E+06	5.42E+05	-1.06E+04	1.43E+05	4.99E+05
48.83	-1.98E+06	-1.89E+05	-7.76E+04	-2.09E+06	5.93E+05	9.67E+04	4.67E+04	6.98E+05
58.59	-1.90E+06	-1.26E+05	2.83E+04	-2.12E+06	6.62E+05	1.29E+05	-4.15E+04	8.87E+05
68.36	-1.94E+06	-2.21E+05	8.73E+04	-2.18E+06	7.68E+05	2.09E+05	-1.95E+05	9.29E+05
78.13	-1.98E+06	-2.86E+05	-5.50E+04	-2.17E+06	8.80E+05	3.25E+05	-2.67E+05	1.11E+06
87.89	-2.11E+06	-3.94E+05	-1.53E+05	-2.10E+06	1.16E+06	3.87E+05	-2.73E+05	1.27E+06
97.66	-2.10E+06	-2.66E+05	2.40E+04	-2.22E+06	1.33E+06	5.24E+05	-3.84E+05	1.34E+06
107.42	-2.01E+06	-3.17E+05	-1.59E+05	-2.15E+06	1.39E+06	5.36E+05	-5.41E+05	1.40E+06
117.19	-1.98E+06	-3.91E+05	-1.83E+05	-2.22E+06	1.35E+06	6.76E+05	-5.07E+05	1.47E+06
126.95	-1.98E+06	-4.09E+05	-4.08E+05	-2.21E+06	1.16E+06	9.29E+05	-2.58E+05	1.41E+06
136.72	-2.51E+06	5.75E+05	1.40E+05	-3.48E+06	-1.16E+06	3.64E+06	2.61E+06	-1.87E+06

Table A.154 Raw data for test seal at 5,000 rpm, 94% GVF and 0.3 PR (*Zero* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.34E+06	-1.10E+03	-1.94E+05	-1.54E+06	1.16E+05	-1.04E+05	5.20E+04	1.68E+05
19.53	-1.41E+06	-1.63E+05	-1.02E+05	-1.43E+06	1.36E+05	-4.67E+03	8.14E+04	2.06E+05
29.3	-1.33E+06	-2.83E+05	-9.03E+04	-1.38E+06	8.89E+05	-8.89E+05	-7.45E+05	1.30E+06
39.06	-1.49E+06	-1.55E+05	3.35E+02	-1.50E+06	4.04E+05	-3.67E+04	-2.74E+04	3.66E+05
48.83	-1.71E+06	-1.63E+05	-5.86E+04	-1.61E+06	4.83E+05	1.41E+04	-3.79E+04	5.10E+05
58.59	-1.62E+06	-1.14E+05	6.02E+04	-1.67E+06	5.35E+05	6.78E+04	-5.32E+04	6.52E+05
68.36	-1.66E+06	-1.18E+05	1.32E+05	-1.83E+06	8.05E+05	-1.92E+04	-2.38E+05	6.50E+05
78.13	-1.77E+06	-2.85E+05	-5.09E+04	-1.84E+06	9.09E+05	4.19E+04	-1.74E+05	7.54E+05
87.89	-1.84E+06	-3.78E+05	-1.19E+05	-1.86E+06	1.19E+06	1.15E+05	-1.80E+05	9.29E+05
97.66	-1.86E+06	-1.92E+05	2.51E+04	-2.00E+06	1.27E+06	1.60E+05	-2.58E+05	1.04E+06
107.42	-1.77E+06	-2.70E+05	-1.83E+05	-1.94E+06	1.40E+06	1.13E+05	-3.22E+05	1.12E+06
117.19	-1.82E+06	-3.39E+05	-1.85E+05	-2.03E+06	1.34E+06	1.76E+05	-2.72E+05	1.19E+06
126.95	-1.81E+06	-4.17E+05	-3.84E+05	-2.09E+06	1.20E+06	3.70E+05	-4.22E+02	1.26E+06
136.72	-2.55E+06	9.42E+05	4.35E+05	-3.71E+06	-1.08E+06	2.72E+06	2.82E+06	-1.69E+06

Table A.155 Raw data for test seal at 10,000 rpm, 94% GVF and 0.3 PR (*Zero* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.36E+06	2.54E+05	-1.13E+05	-1.80E+06	8.75E+04	-1.66E+05	-3.83E+04	-1.18E+05
19.53	-1.55E+06	-8.48E+04	-7.13E+04	-1.75E+06	1.69E+05	-1.42E+05	1.33E+05	1.13E+05
29.3	-1.31E+06	-6.19E+05	-3.11E+05	-1.35E+06	1.02E+06	-9.55E+05	-7.73E+05	1.40E+06
39.06	-1.68E+06	-9.91E+04	6.07E+04	-1.89E+06	4.12E+05	-4.42E+02	3.97E+04	3.77E+05
48.83	-1.79E+06	-1.64E+05	9.62E+04	-1.97E+06	5.71E+05	1.56E+04	6.98E+04	5.52E+05
58.59	-1.69E+06	-1.28E+05	1.91E+05	-2.01E+06	5.64E+05	1.09E+05	-5.36E+04	6.97E+05
68.36	-1.82E+06	-1.25E+05	2.37E+05	-2.19E+06	6.64E+05	1.40E+05	-1.99E+05	6.42E+05
78.13	-1.91E+06	-2.52E+05	8.20E+04	-2.14E+06	7.78E+05	2.70E+05	-1.92E+05	8.32E+05
87.89	-1.97E+06	-3.06E+05	-3.07E+04	-2.18E+06	1.09E+06	3.09E+05	-1.71E+05	9.95E+05
97.66	-2.01E+06	-1.41E+05	1.82E+05	-2.33E+06	1.16E+06	3.76E+05	-2.59E+05	1.10E+06
107.42	-1.99E+06	-1.70E+05	1.96E+04	-2.39E+06	1.22E+06	3.88E+05	-3.01E+05	1.19E+06
117.19	-2.06E+06	-2.62E+05	1.84E+04	-2.42E+06	1.27E+06	4.16E+05	-2.88E+05	1.35E+06
126.95	-2.20E+06	-2.43E+05	-1.18E+04	-2.55E+06	1.25E+06	5.20E+05	-1.19E+05	1.51E+06
136.72	-3.65E+06	1.42E+06	1.60E+06	-4.55E+06	-4.37E+05	1.61E+06	1.81E+06	1.16E+05

Table A.156 Raw data for test seal at 15,000 rpm, 94% GVF and 0.3 PR (*Zero* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.77E+06	3.07E+05	-4.55E+05	-1.97E+06	8.53E+03	-1.68E+05	2.62E+05	-2.55E+05
19.53	-2.03E+06	1.53E+04	-1.92E+05	-2.10E+06	1.74E+05	-2.25E+05	4.59E+05	8.05E+04
29.3	-1.68E+06	-4.42E+05	-9.51E+03	-1.99E+06	1.09E+06	-9.05E+05	-6.79E+05	1.43E+06
39.06	-1.94E+06	-1.10E+05	6.25E+04	-2.13E+06	5.47E+05	-4.10E+04	1.60E+05	5.02E+05
48.83	-2.03E+06	-1.31E+05	1.34E+05	-2.16E+06	6.10E+05	1.06E+05	1.18E+05	6.65E+05
58.59	-1.99E+06	-7.93E+04	2.38E+05	-2.18E+06	7.91E+05	2.01E+05	-4.02E+04	8.67E+05
68.36	-2.06E+06	-9.77E+04	2.62E+05	-2.24E+06	7.32E+05	3.00E+05	-2.75E+05	8.96E+05
78.13	-2.08E+06	-2.50E+05	6.91E+04	-2.19E+06	8.64E+05	3.46E+05	-3.40E+05	1.01E+06
87.89	-2.16E+06	-3.33E+05	-3.96E+04	-2.21E+06	1.09E+06	4.21E+05	-2.85E+05	1.18E+06
97.66	-2.15E+06	-1.53E+05	1.79E+05	-2.35E+06	1.15E+06	5.27E+05	-4.06E+05	1.27E+06
107.42	-2.16E+06	-2.04E+05	1.94E+04	-2.35E+06	1.29E+06	5.09E+05	-4.54E+05	1.32E+06
117.19	-2.23E+06	-2.57E+05	1.71E+04	-2.43E+06	1.26E+06	6.29E+05	-4.73E+05	1.44E+06
126.95	-2.28E+06	-2.63E+05	-6.79E+04	-2.54E+06	1.14E+06	7.93E+05	-3.19E+05	1.46E+06
136.72	-3.46E+06	1.34E+06	1.15E+06	-4.54E+06	-9.07E+05	2.71E+06	2.13E+06	-8.65E+05

Table A.157 Raw data for test seal at 5,000 rpm, 92% GVF and 0.3 PR (*Zero* Preswirl)

Freq.	*Re(H_{XX})*	*Re(H_{XY})*	*Re(H_{YX})*	*Re(H_{YY})*	*Im(H_{XX})*	*Im(H_{XY})*	*Im(H_{YX})*	*Im(H_{YY})*
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.44E+06	4.14E+04	-2.06E+05	-1.65E+06	3.48E+04	-9.30E+04	2.26E+04	1.78E+05
19.53	-1.60E+06	-1.18E+05	-5.89E+04	-1.48E+06	2.19E+05	-3.05E+04	1.94E+05	2.01E+05
29.3	-1.33E+06	-5.11E+05	-1.43E+05	-1.16E+06	9.40E+05	-1.06E+06	-6.52E+05	1.60E+06
39.06	-1.55E+06	-1.69E+05	6.48E+04	-1.59E+06	3.95E+05	-8.58E+02	-2.20E+04	3.84E+05
48.83	-1.77E+06	-1.30E+05	3.45E+04	-1.69E+06	5.43E+05	4.54E+03	2.50E+03	5.28E+05
58.59	-1.75E+06	-1.15E+05	1.44E+05	-1.75E+06	6.88E+05	2.77E+04	-4.68E+04	7.04E+05
68.36	-1.76E+06	-2.20E+05	1.66E+05	-1.80E+06	8.28E+05	-3.60E+04	-1.61E+05	7.17E+05
78.13	-1.80E+06	-2.43E+05	7.30E+04	-1.87E+06	8.64E+05	5.87E+04	-7.60E+04	8.25E+05
87.89	-1.81E+06	-3.11E+05	-8.31E+04	-1.85E+06	1.21E+06	1.52E+05	-1.49E+05	9.92E+05
97.66	-1.94E+06	-1.42E+05	1.32E+05	-2.04E+06	1.30E+06	1.04E+05	-2.07E+05	1.07E+06
107.42	-1.88E+06	-2.43E+05	-2.78E+04	-2.05E+06	1.33E+06	1.01E+05	-2.73E+05	1.17E+06
117.19	-1.96E+06	-2.69E+05	-6.62E+03	-2.12E+06	1.36E+06	1.59E+05	-2.23E+05	1.24E+06
126.95	-2.09E+06	-2.20E+05	-7.91E+04	-2.27E+06	1.27E+06	2.69E+05	-1.85E+04	1.33E+06
136.72	-3.47E+06	1.57E+06	1.40E+06	-4.49E+06	-6.27E+05	2.00E+06	2.27E+06	-8.00E+05

Table A.158 Raw data for test seal at 10,000 rpm, 92% GVF and 0.3 PR (*Zero* Preswirl)

Freq.	*Re(H_{XX})*	*Re(H_{XY})*	*Re(H_{YX})*	*Re(H_{YY})*	*Im(H_{XX})*	*Im(H_{XY})*	*Im(H_{YX})*	*Im(H_{YY})*
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.47E+06	1.55E+05	-2.58E+05	-1.81E+06	-8.11E+04	-1.37E+05	9.09E+04	-2.22E+04
19.53	-1.62E+06	-4.45E+04	-8.72E+04	-1.77E+06	6.98E+04	-1.46E+05	1.86E+05	1.35E+05
29.3	-1.12E+06	-5.78E+05	-4.12E+05	-1.38E+06	9.73E+05	-1.04E+06	-7.86E+05	1.49E+06
39.06	-1.69E+06	-1.08E+05	1.09E+05	-1.82E+06	4.43E+05	-3.14E+04	4.68E+04	3.98E+05
48.83	-1.74E+06	-1.64E+05	1.46E+05	-1.87E+06	6.58E+05	2.11E+04	-1.35E+04	5.64E+05
58.59	-1.81E+06	-1.52E+05	1.96E+05	-1.99E+06	5.39E+05	3.93E+04	-7.07E+04	6.88E+05
68.36	-1.89E+06	-1.58E+05	2.41E+05	-2.05E+06	7.37E+05	9.90E+04	-2.26E+05	6.91E+05
78.13	-1.93E+06	-2.82E+05	7.19E+04	-2.08E+06	8.09E+05	1.96E+05	-1.94E+05	8.25E+05
87.89	-1.89E+06	-3.84E+05	-5.78E+04	-2.13E+06	1.11E+06	3.03E+05	-1.59E+05	9.85E+05
97.66	-2.05E+06	-1.72E+05	1.27E+05	-2.31E+06	1.17E+06	3.58E+05	-2.88E+05	1.01E+06
107.42	-2.01E+06	-2.77E+05	6.75E+03	-2.35E+06	1.27E+06	3.63E+05	-3.24E+05	1.16E+06
117.19	-2.13E+06	-2.67E+05	4.84E+04	-2.39E+06	1.26E+06	4.35E+05	-2.62E+05	1.28E+06
126.95	-2.27E+06	-2.29E+05	1.76E+04	-2.58E+06	1.20E+06	5.69E+05	-1.07E+05	1.34E+06
136.72	-3.89E+06	1.79E+06	1.80E+06	-5.09E+06	-3.61E+05	1.99E+06	1.78E+06	-4.06E+05

Table A.159 Raw data for test seal at 15,000 rpm, 92% GVF and 0.3 PR (*Zero* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.91E+06	3.53E+05	-2.78E+05	-1.97E+06	7.98E+04	-1.21E+05	3.66E+05	-2.08E+05
19.53	-2.00E+06	-4.12E+04	-2.36E+05	-2.08E+06	1.32E+05	-1.92E+05	3.92E+05	9.10E+04
29.3	-1.83E+06	-3.73E+05	-2.15E+04	-2.00E+06	9.08E+05	-9.00E+05	-3.48E+05	1.43E+06
39.06	-1.94E+06	-1.75E+05	1.75E+05	-2.06E+06	5.51E+05	3.84E+04	1.51E+05	5.26E+05
48.83	-1.96E+06	-1.85E+05	3.26E+05	-2.15E+06	7.50E+05	9.61E+04	1.44E+05	6.73E+05
58.59	-1.94E+06	-1.27E+05	3.20E+05	-2.22E+06	7.36E+05	1.79E+05	-8.13E+04	8.24E+05
68.36	-2.00E+06	-1.93E+05	3.62E+05	-2.34E+06	6.84E+05	1.96E+05	-2.25E+05	8.09E+05
78.13	-2.17E+06	-2.11E+05	2.56E+05	-2.31E+06	8.65E+05	3.16E+05	-2.49E+05	8.99E+05
87.89	-2.10E+06	-3.16E+05	4.69E+04	-2.32E+06	1.18E+06	4.55E+05	-2.44E+05	1.10E+06
97.66	-2.25E+06	-1.48E+05	2.70E+05	-2.47E+06	1.09E+06	5.35E+05	-3.79E+05	1.17E+06
107.42	-2.25E+06	-1.90E+05	8.24E+04	-2.55E+06	1.25E+06	4.91E+05	-5.04E+05	1.26E+06
117.19	-2.31E+06	-2.01E+05	1.63E+05	-2.56E+06	1.21E+06	6.46E+05	-4.26E+05	1.34E+06
126.95	-2.47E+06	-1.26E+05	7.90E+04	-2.85E+06	1.15E+06	8.32E+05	-3.01E+05	1.33E+06
136.72	-3.97E+06	1.87E+06	1.70E+06	-5.32E+06	-7.04E+05	2.72E+06	1.88E+06	-8.77E+05

Table A.160 Raw data for test seal at 5,000 rpm, 90% GVF and 0.3 PR (*Zero* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.58E+06	1.13E+05	-1.76E+05	-1.70E+06	3.18E+04	-8.28E+04	-4.98E+03	1.32E+05
19.53	-1.62E+06	-6.43E+04	-3.07E+04	-1.61E+06	2.64E+05	-4.60E+04	1.64E+05	1.90E+05
29.3	-9.98E+05	-8.16E+05	-6.33E+05	-8.82E+05	1.04E+06	-9.08E+05	-8.14E+05	1.41E+06
39.06	-1.57E+06	-1.00E+05	5.00E+04	-1.72E+06	4.74E+05	-1.27E+04	4.20E+04	4.29E+05
48.83	-1.63E+06	-1.76E+05	3.41E+04	-1.74E+06	6.20E+05	-4.43E+04	9.13E+04	5.81E+05
58.59	-1.65E+06	-1.32E+05	1.27E+05	-1.82E+06	6.62E+05	-3.33E+03	4.70E+04	7.36E+05
68.36	-1.60E+06	-2.39E+05	1.03E+05	-1.92E+06	8.52E+05	-4.53E+04	-1.84E+05	7.37E+05
78.13	-1.68E+06	-3.35E+05	-6.60E+04	-1.85E+06	9.66E+05	4.98E+04	-1.67E+05	8.77E+05
87.89	-1.54E+06	-4.26E+05	-2.16E+05	-1.85E+06	1.21E+06	1.29E+05	-9.07E+04	1.04E+06
97.66	-1.61E+06	-3.51E+05	-7.42E+04	-2.03E+06	1.26E+06	8.76E+04	-1.93E+05	1.14E+06
107.42	-1.53E+06	-4.68E+05	-2.82E+05	-2.03E+06	1.33E+06	5.92E+04	-2.64E+05	1.22E+06
117.19	-1.52E+06	-5.94E+05	-3.33E+05	-2.04E+06	1.39E+06	8.88E+04	-2.90E+05	1.36E+06
126.95	-1.62E+06	-6.22E+05	-3.75E+05	-2.19E+06	1.43E+06	1.06E+05	-1.26E+05	1.56E+06
136.72	-3.25E+06	9.95E+05	1.46E+06	-4.25E+06	4.97E+05	5.06E+05	9.12E+05	1.02E+06

Table A.161 Raw data for test seal at 10,000 rpm, 90% GVF and 0.3 PR (*Zero* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.46E+06	2.50E+05	-2.23E+05	-1.84E+06	4.29E+04	-1.69E+05	6.58E+04	-1.09E+05
19.53	-1.76E+06	-1.73E+04	3.83E+04	-1.83E+06	2.11E+05	-2.11E+05	3.06E+05	1.61E+05
29.3	-1.26E+06	-7.81E+05	-3.74E+05	-1.13E+06	1.05E+06	-1.02E+06	-7.21E+05	1.52E+06
39.06	-1.68E+06	-1.41E+05	1.77E+05	-1.87E+06	4.77E+05	-1.78E+04	2.91E+04	4.51E+05
48.83	-1.71E+06	-1.60E+05	2.05E+05	-1.90E+06	6.12E+05	6.03E+04	4.58E+04	5.72E+05
58.59	-1.89E+06	-7.01E+04	2.75E+05	-2.02E+06	6.40E+05	4.20E+04	-6.72E+04	7.10E+05
68.36	-1.85E+06	-1.08E+05	2.27E+05	-2.11E+06	7.20E+05	9.84E+04	-2.63E+05	6.73E+05
78.13	-1.97E+06	-2.02E+05	9.68E+04	-2.16E+06	7.97E+05	1.67E+05	-1.95E+05	8.50E+05
87.89	-1.97E+06	-3.08E+05	2.38E+04	-2.19E+06	1.13E+06	2.97E+05	-1.47E+05	1.01E+06
97.66	-2.20E+06	-1.39E+05	1.90E+05	-2.36E+06	1.17E+06	3.33E+05	-2.65E+05	1.07E+06
107.42	-2.13E+06	-1.64E+05	1.47E+04	-2.44E+06	1.28E+06	3.20E+05	-3.40E+05	1.21E+06
117.19	-2.24E+06	-2.10E+05	5.89E+04	-2.51E+06	1.29E+06	4.29E+05	-2.97E+05	1.32E+06
126.95	-2.40E+06	-1.45E+05	6.04E+04	-2.76E+06	1.27E+06	5.68E+05	-1.57E+05	1.38E+06
136.72	-4.00E+06	1.93E+06	1.83E+06	-5.32E+06	-2.70E+05	1.92E+06	1.71E+06	-2.58E+05

Table A.162 Raw data for test seal at 15,000 rpm, 90% GVF and 0.3 PR (*Zero* Preswirl)

Freq.	$Re(H_{XX})$	$Re(H_{XY})$	$Re(H_{YX})$	$Re(H_{YY})$	$Im(H_{XX})$	$Im(H_{XY})$	$Im(H_{YX})$	$Im(H_{YY})$
(Hz)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)	(N/m)
9.77	-1.67E+06	2.17E+05	-2.48E+05	-1.85E+06	7.42E+03	5.56E+04	1.63E+05	-6.27E+04
19.53	-1.98E+06	6.70E+03	-1.59E+05	-2.10E+06	1.63E+05	-1.95E+05	4.97E+05	5.82E+04
29.3	-1.68E+06	-6.07E+05	-4.32E+05	-1.68E+06	1.12E+06	-1.12E+06	-6.67E+05	1.58E+06
39.06	-1.97E+06	-1.94E+05	2.55E+05	-2.17E+06	5.31E+05	3.99E+04	1.47E+05	5.16E+05
48.83	-2.02E+06	-1.76E+05	3.45E+05	-2.14E+06	6.58E+05	1.32E+05	1.01E+05	6.98E+05
58.59	-1.98E+06	-1.86E+05	3.85E+05	-2.24E+06	8.45E+05	1.57E+05	-4.59E+04	8.03E+05
68.36	-2.02E+06	-2.36E+05	3.84E+05	-2.24E+06	7.71E+05	2.16E+05	-3.23E+05	8.26E+05
78.13	-2.16E+06	-2.33E+05	1.79E+05	-2.28E+06	8.58E+05	3.27E+05	-2.51E+05	9.46E+05
87.89	-2.09E+06	-2.81E+05	7.26E+04	-2.33E+06	1.18E+06	4.81E+05	-2.77E+05	1.11E+06
97.66	-2.27E+06	-1.17E+05	2.79E+05	-2.52E+06	1.16E+06	4.81E+05	-4.16E+05	1.16E+06
107.42	-2.26E+06	-1.80E+05	1.13E+05	-2.62E+06	1.24E+06	5.26E+05	-5.23E+05	1.29E+06
117.19	-2.41E+06	-1.72E+05	1.53E+05	-2.71E+06	1.28E+06	5.78E+05	-4.52E+05	1.36E+06
126.95	-2.57E+06	-1.42E+05	1.11E+05	-2.95E+06	1.22E+06	7.53E+05	-3.23E+05	1.34E+06
136.72	-4.14E+06	1.95E+06	1.85E+06	-5.56E+06	-4.55E+05	2.37E+06	1.64E+06	-5.09E+05