

## Sealing Solutions for Wind Mill

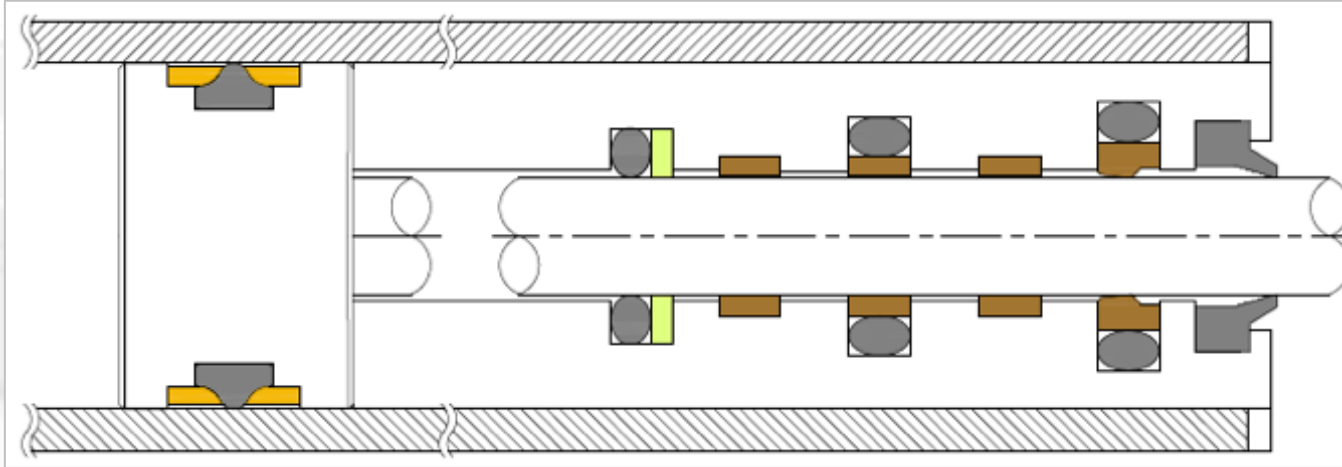
*Spareage with its wide range of seal profile and elastomers is fully capable of serving the Wind Power Industries.*



### Applications

- Pitch Cylinders
- Rotor Bearings
- Main Shaft (Low Speed Shaft)
- Gear Box
- Yaw Drive
- High Speed Shaft

## Pitch Cylinders



Hydraulic pitch control is a system where the blade angle is controlled by one or more hydraulic cylinders placed in the hub of the turbine. The flow to and from the cylinders is controlled by a number of valves, in particular a proportional valve which is a valve where the opening area is controllable.

## Piston Seals



C43

**NBR+Acetal** Speed: **0.5 m/s** Pressure: **200 Bar**  
 Double acting piston seal with assembly of NBR energiser and guide ring made of Acetal.  
**App.** : Used in Injection molding machines, earth moving equipments, Medium to heavy duty cylinders.

## Rod Seals



STO

**NBR+BFT** Speed: **10 m/s** Pressure: **400 Bar**  
 A Rubber energizer O Ring with Bronze filled Teflon Sealing element.  
**App.** : Used in Hydraulic Cylinders

## Wiper Seals

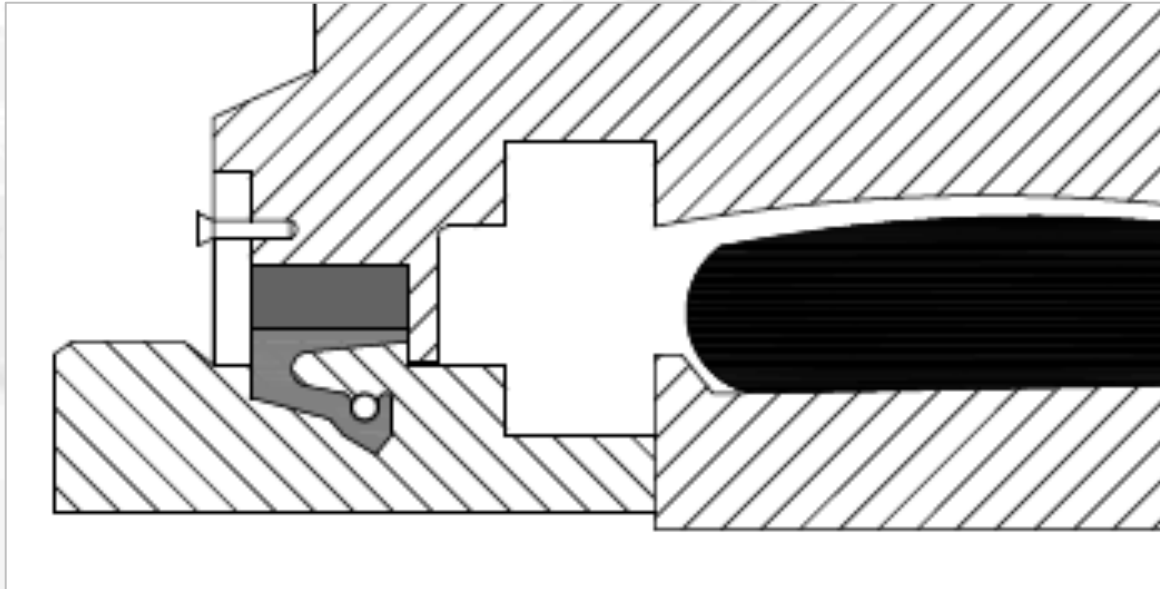


PW2

**NBR** Speed: **2 m/s** Pressure: **N.A.**  
 Most commonly used wiper seal which designed to remove dirt, mud, dust etc. accumulating on the Rod.  
**App.** : Used in Hydraulic Cylinders



## Rotor Bearings (Main Bearing)



*Rotor Bearings directly transfer the unwanted load on the rotor towards main structure, bypassing the drive train.*



FB1

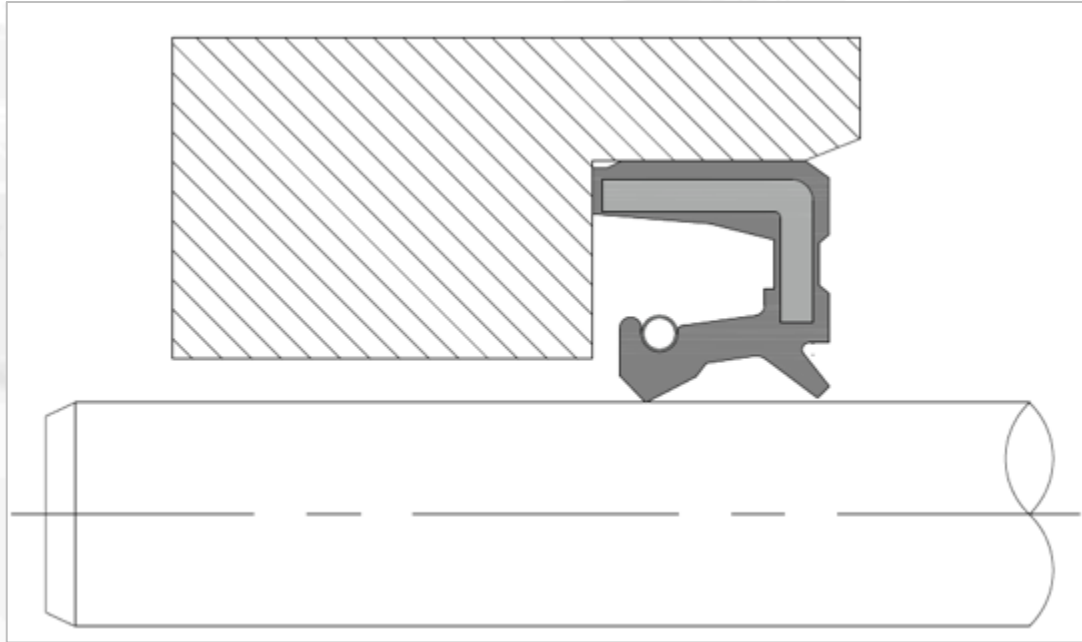
**NBR-Fabric** Speed: **10 m/s** Pressure: **0.5 Bar**  
A spring loaded NBR Sealing lip bonded with NBR-Fabric exterior. To be installed back to back with a metal spacer (lantern ring) to provide lubricant between the seals.  
**App.** : Used in Heavy machinery & engineering industries.



FB12

**NBR-Fabric** Speed: **10 m/s** Pressure: **0.5 Bar**  
A seal is similar to FB1 but spring groove made deeper so that spring will not come out from the groove during running conditions.  
**App.** : Used in Rolling Mills, Work Roll Chocks etc.

## Main Shaft (Low Speed Shaft)



*The main shaft (low-speed shaft) has important functions. It supports the rotor (hub and blades), as well as transmits the rotary motion of the rotor and torque moments to the gearbox and/or generator. The thrust loads are taken by the shaft and transmitted to the nacelle and to the top of the tower. The low-speed shaft (main shaft) is a massive part usually built from forged or cast iron.*



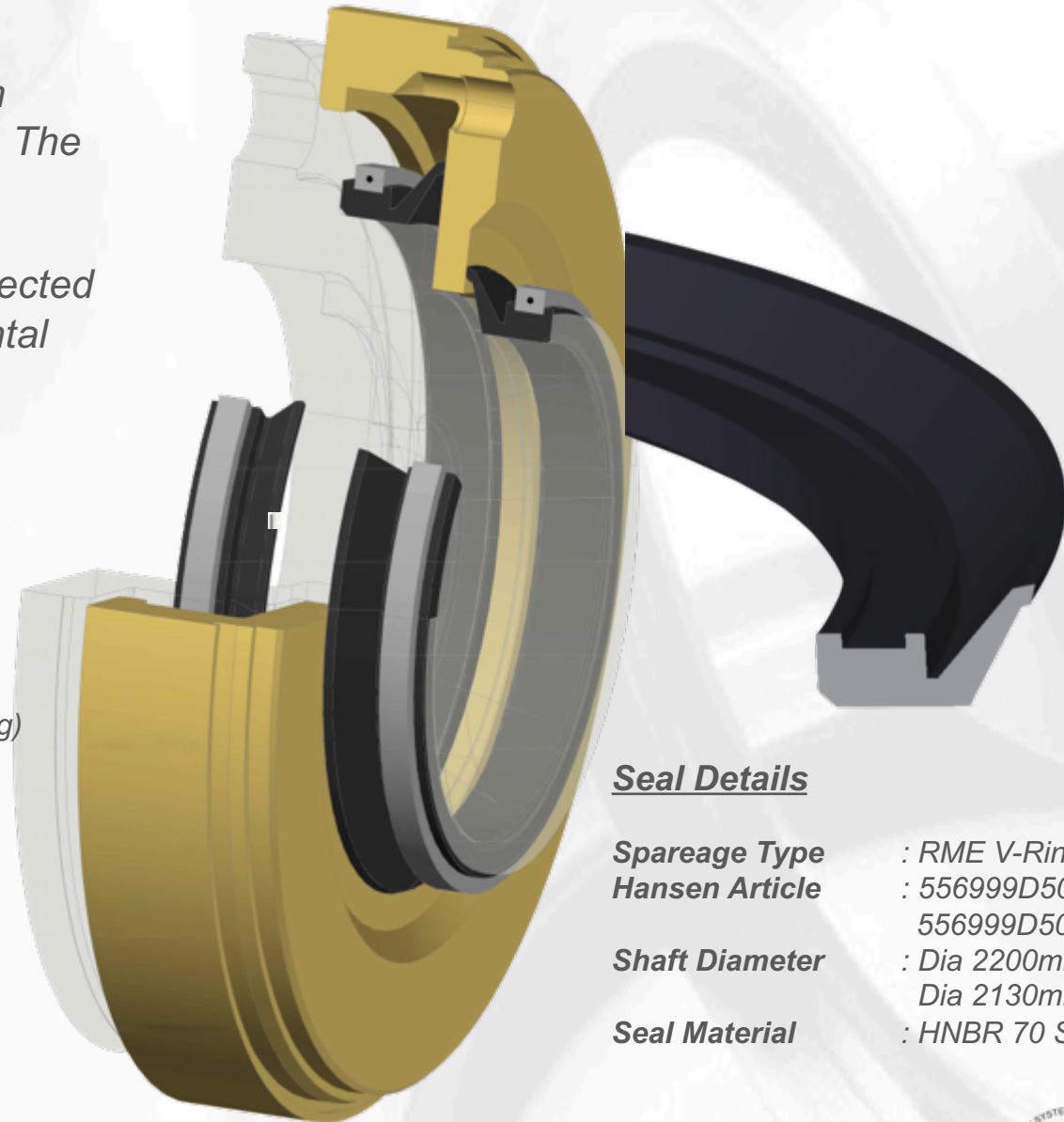
**NBR-Fabric** Speed: **10 m/s** Pressure: **0.5 Bar**  
A rubber covered OD Seal, bonded with spring loaded lip & additional dust lip.  
**App.** : For use in various types of industrial gear boxes.



**NBR-Fabric** Speed: **10 m/s** Pressure: **0.5 Bar**  
Similar to CC profile outside covered with rubber without spring & additional dust lip.  
**App.** : For use in various types of industrial gear boxes.

## Gear Box

The gearbox is a mechanical system subjected to variable dynamic loads. The gearbox downtime is relatively high, especially for offshore units as the accessibility and availability are subjected to weather windows and environmental conditions.



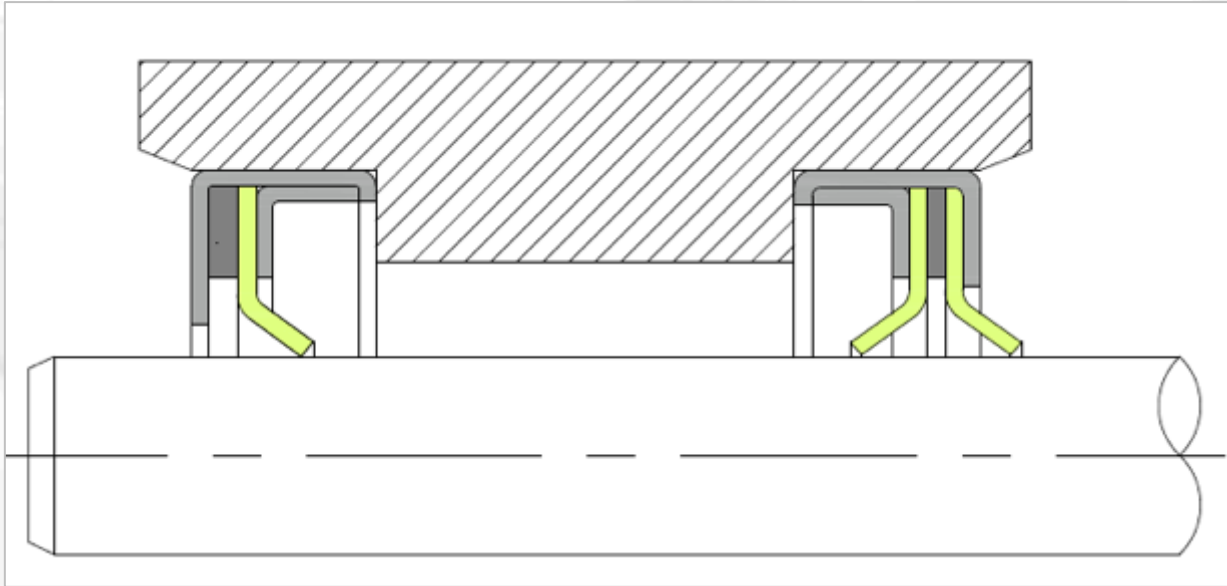
### Application details :

<b>Nominal Speed</b>	: 20RPM (Seal are Rotating)
<b>Speed range</b>	: 0 – 20 RPM
<b>Counter Face</b>	: EN-GJS-400
<b>Hardness</b>	: >130HB
<b>Ra</b>	: 1.6
<b>Temp Range</b>	: -40 °C To +150 °C
<b>Media</b>	: Sea Air
<b>Surface Finish</b>	: Ra 1.6min
<b>Lubrication</b>	: Grease

### Seal Details

<b>Spareage Type</b>	: RME V-Ring
<b>Hansen Article</b>	: 556999D501 (V2200) 556999D502 (V2130)
<b>Shaft Diameter</b>	: Dia 2200mm Dia 2130mm
<b>Seal Material</b>	: HNBR 70 Shore

## High Speed Shaft



The high speed shaft drives the generator. The rotation from the low-speed shaft is passed onto the high-speed shaft



**CFT+SS+MVQ** Speed: **30 m/s** Pressure: **10 Bar**  
TF1 comprises of SS metal cup, rubber energizer & Teflon lip. Teflon lips with fillers like bronze, carbon, glass & graphite act as a lubricant & are recommended for dry running applications. It is also used under high pressure and extreme vacuum.  
**App.** : Used in Food & Pharma, morot & gear boxes.



**CFT+SS+KFM** Speed: **15 m/s** Pressure: **30 Bar**  
TF8 comprises of SS metal cup, rubber energizer & two tandem Teflon lips. Teflon lips with fillers like bronze, carbon, glass & graphite act as a lubricant & are recommended for dry running applications. It is also used under high pressure and extreme vacuum.  
**App.** : Used in Food & Pharma, morot & gear boxes.

*Key Customers to whom Spareage supply directly and thru distributors*

## SUZLON

 **ENERCON**  
ENERGIE FÜR DIE WELT

 **WIND WORLD**  
Clean Energy Forever

**INOXWIND**

 **ReGen**  
POWERTECH