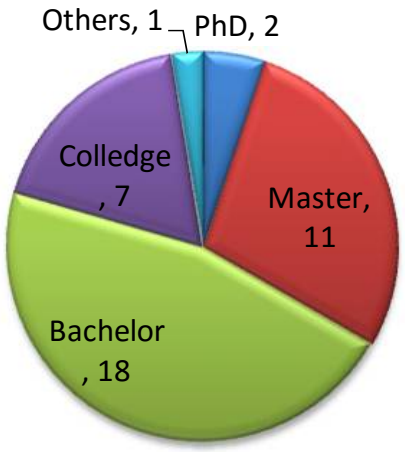
ANTS

Specific Vacuum (transport) Components Supplier

Company Profile

- Applied Nano Technology Science, Inc., ANTS

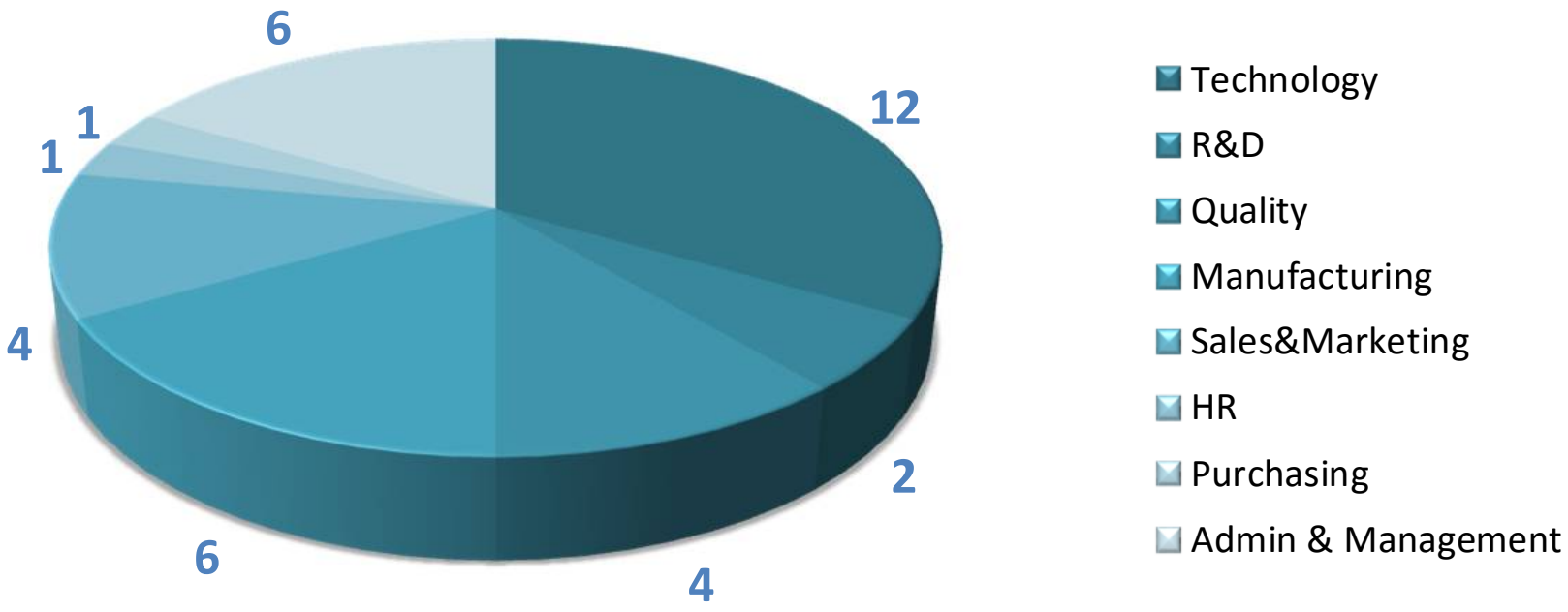
Established in 2001 by Dr. Ih-Hong Loh and other co-founders.



Employee:
36 persons in total

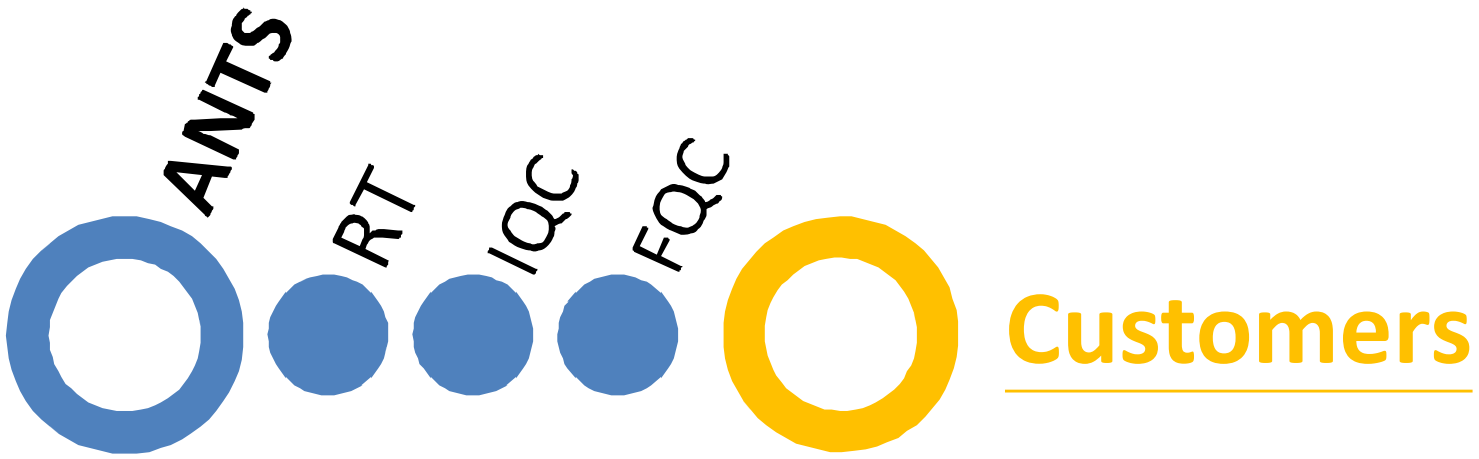
* New plant will be operated in Q2, 2016.

Technology	R & D	Quality	Manufacturing	Sales & Marketing	HR	Purchasing	Admin & Management
12	2	4	6	4	1	1	6



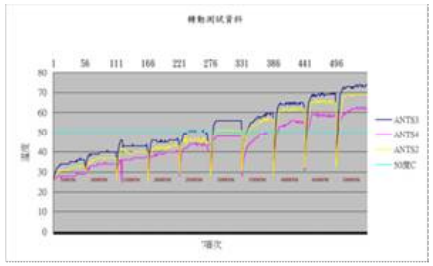
AMAT OEM Supplier

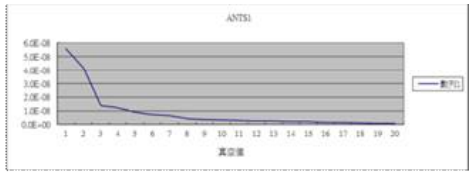
- Applied Nano Technology Science, Inc. had been certificated by ISO 9001:2008 in 2011.

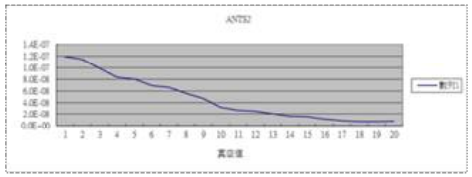


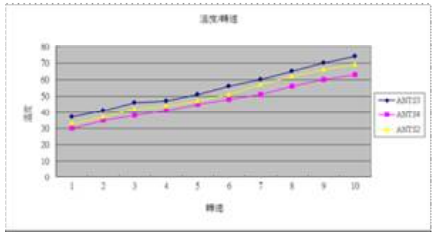
RT_
Strict reliability test

- Extreme pressure test
- Dynamic and static ultimate pressure bias test
- Dynamic and static Helium detection test
- Extreme rotation speed test







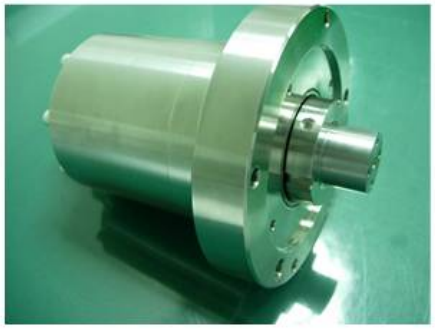


軸封耐壓測試

實驗目標	1. 在相同的降低50%磁力，維持相同耐壓

測試方式	主要使用材料	
	品名	磁力係數
	ANTS2	
	ANTS3(對照組)	
	ANTS4	
	C TYPE磁環零件	

1. 將六組C TYPE磁環零件分別裝入ANTS2、ANTS3及ANTS4(每顆磁波套2顆軸封)。



2. 測試機連接氮氣瓶進行加壓，將chamber加壓至2kg/cm²的壓力，關閉氮閥，以60rpm速度驅動軸封旋轉，8小時後記錄壓力值。若壓降需小於0.1kg/cm²。
3. 每次增加0.5kg/cm²，直到壓降大於0.1kg/cm²為軸封最高耐壓。

測試結果
1. ANTS2耐壓可達5kg/cm²以上，因設備所限無法測試更高壓力。 2. ANTS3耐壓可達4kg/cm²。 3. ANTS4耐壓可達5kg/cm²。

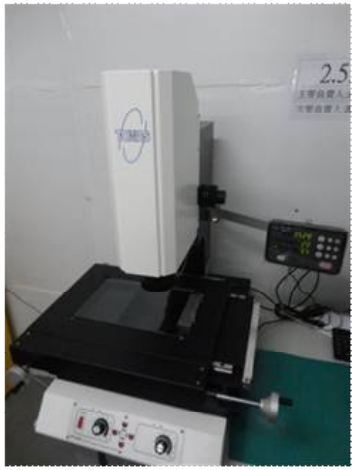
結論
磁力係數與軸封耐壓是成正比關係，磁力係數越高可耐的壓差越大，代表在相同的結構設計下，磁力係數高的磁波只需較小的磁力可到真空密封的效果，以目前測試的磁波可增加35%以上的耐壓，真對未來特殊環境的軸封使用，調整磁力係數可達需求。

IQC_
Thorough incoming quality check

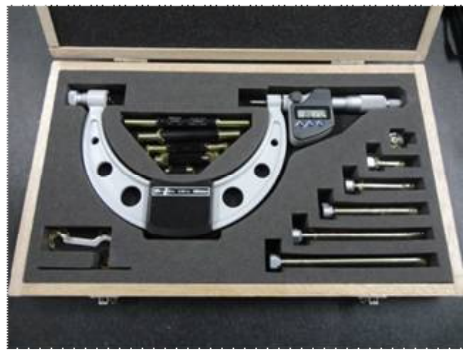
- 高度儀-600 mm

- 高度儀-300 mm

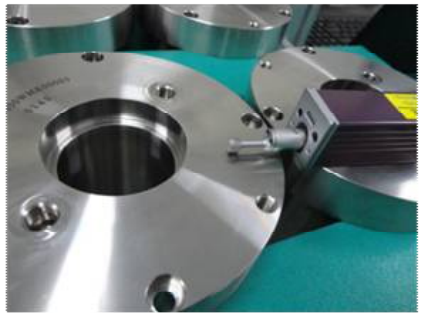
- 2.5D幾何量測



- 數位分厘卡



- 表面粗度儀



⇧以上使用於材料及加工件檢驗

- 氦氣測漏儀

⇧以上使用於密封檢驗

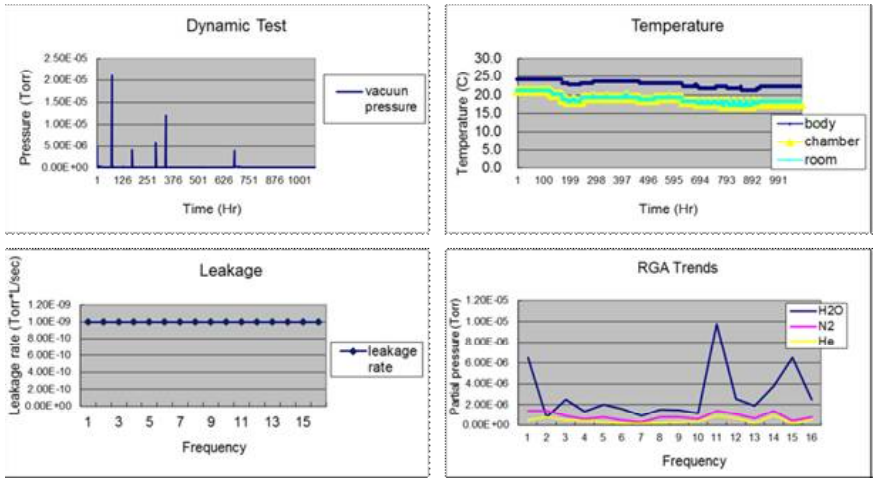
- 轉速計

- 張力計

⇧以上使用於馬達內置/外置型磁流體軸封檢驗

FQC_
100% Final Quality Check

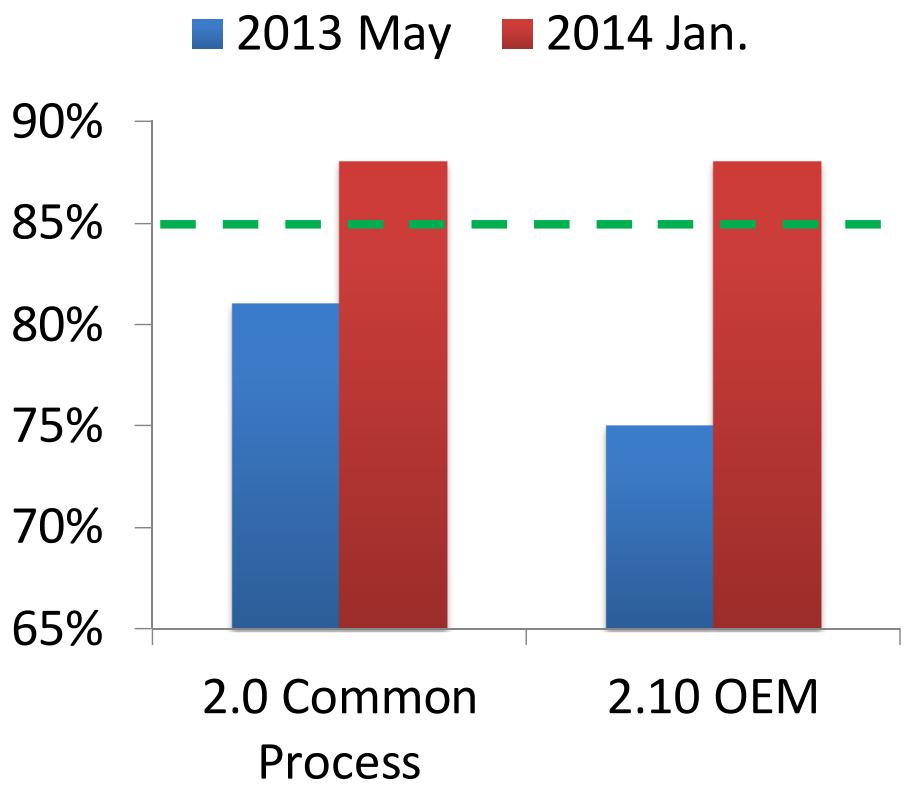
- Quality assurance - dynamic test
  - Vacuum testing under dynamic environment
  - Dynamic Helium Leak check
  - Fully automated testing



Feedthrough dynamic process testing

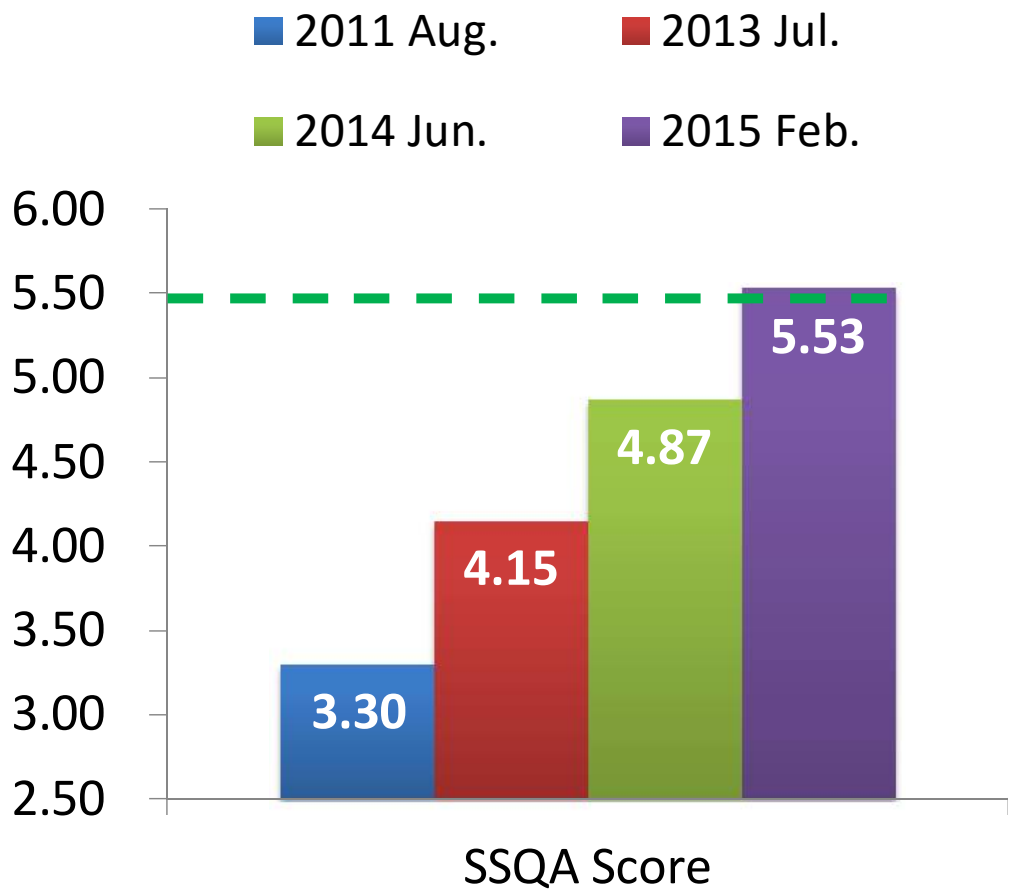
AMAT Quality System Assessment

- TA revalidation
  - Finished on Jan. 15, 2014
  - P2-0 (Common Section)
    - 81% ➔ 88% - Approved
      - 1 minor finding
  - P2-10 (OEM)
    - 75 % ➔ 88% - Approved
      - 4 minor findings



APPLIED MATERIALS

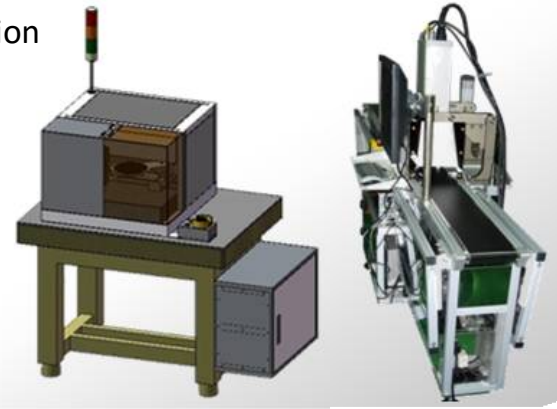
- ISAT (Integrated Supplier Assessment Tool)
  - Pillar 1 – Overall SSQA Assessment Score
  - Pillar 2 – TA
  - Pillar 3 – Special Process TA
  - Pillar 4 – Business Alignment
  - Pillar 5 – Business Infrastructure



Product Briefing

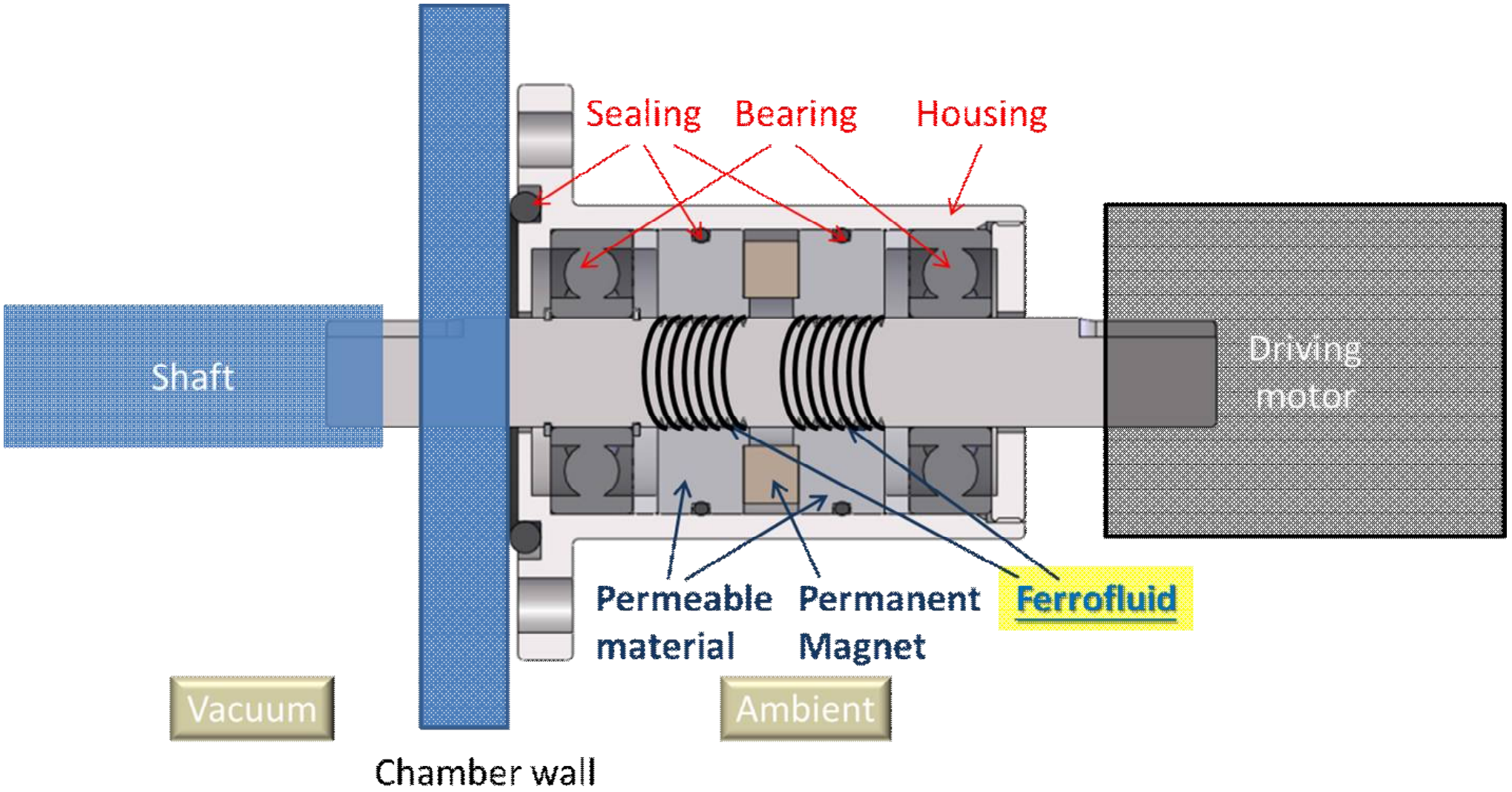
- VCA – contact angle measurement

- Automation



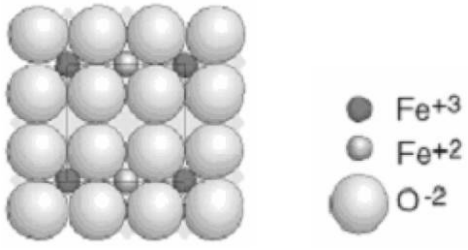
Magnetic Feedthrough / VCA / Automation

Rotary feedthrough structure

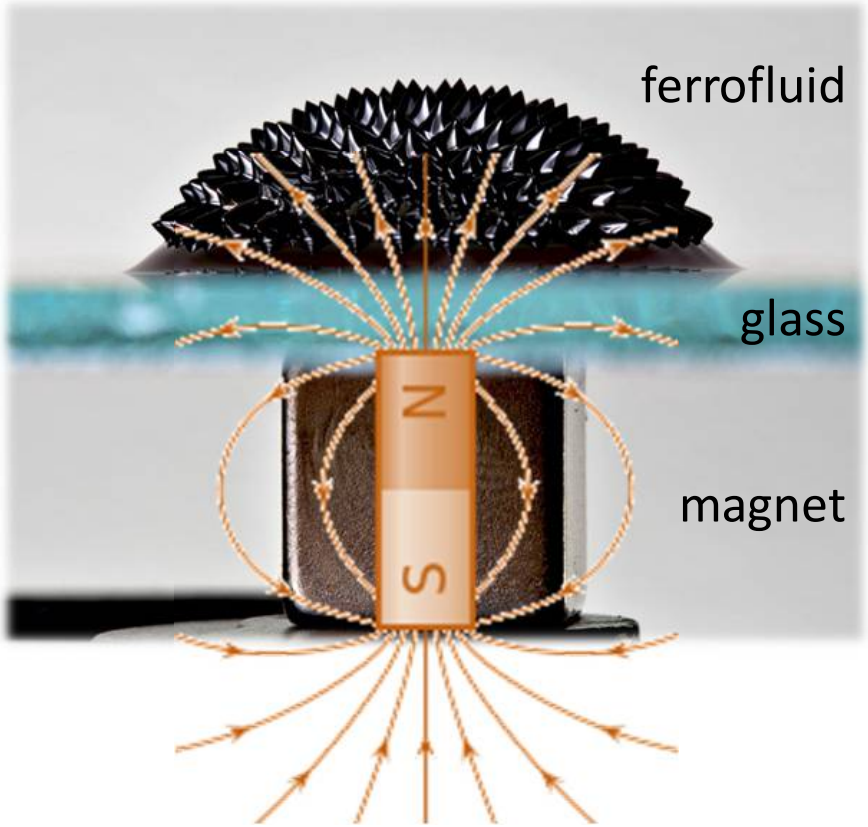


Ferrofluid

- Composition
  - Nano-scale ferromagnetic particle
  - Surfactant
  - Carrier fluid

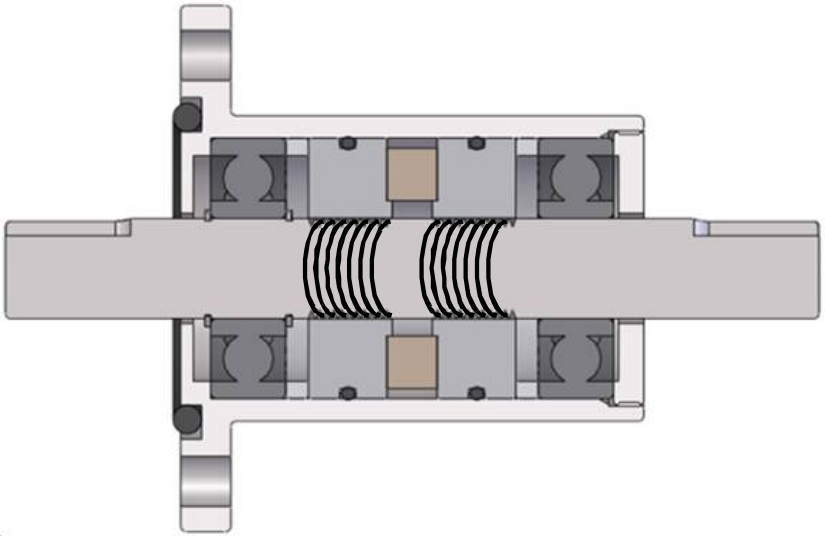


- Features
  - Magnetized colloidal fluid under magnetic field
  - Adjustable viscosity and volatile property



Pic. Source: wikipedia & ucla lecture

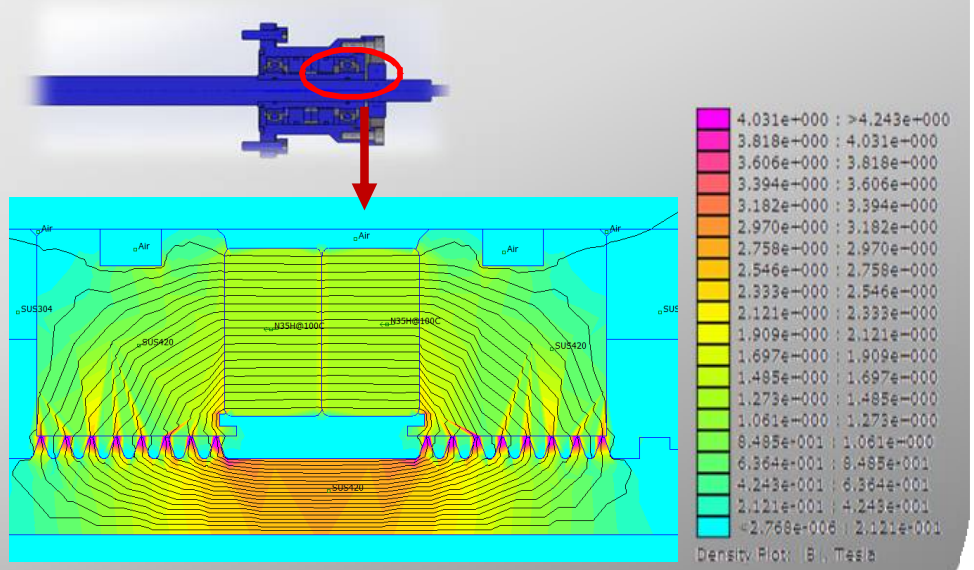
Rotary feedthrough advantages



- Long lifetime
- No friction / no particle
- Low power consumption
- High vacuum / high rpm / high reliability at high temperature

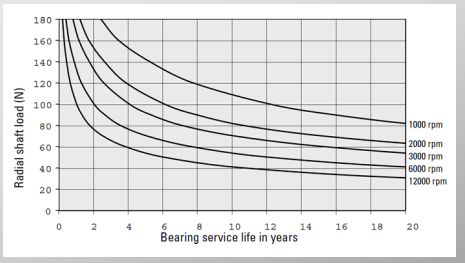
How to Fit to Diversity Application

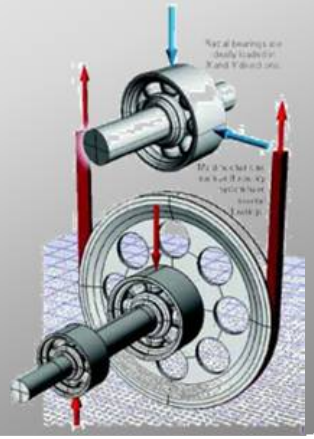
- FEMM4.2
  - Magnetism Simulation
  - Material Selection



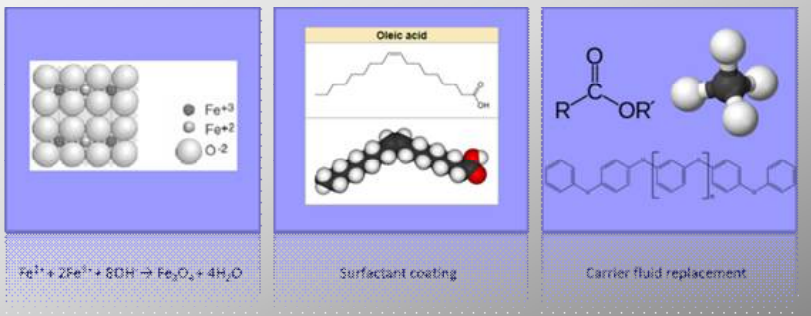
- Mechanical Calculation

$$L_{10h} = \frac{10^6}{60\,n} L_{10}$$



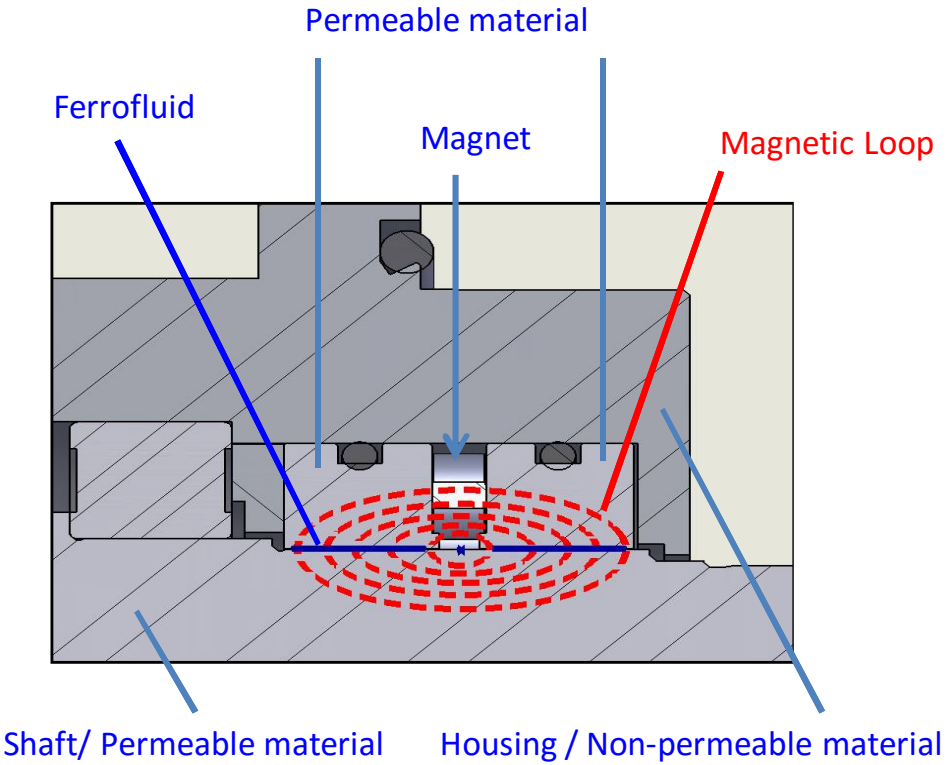


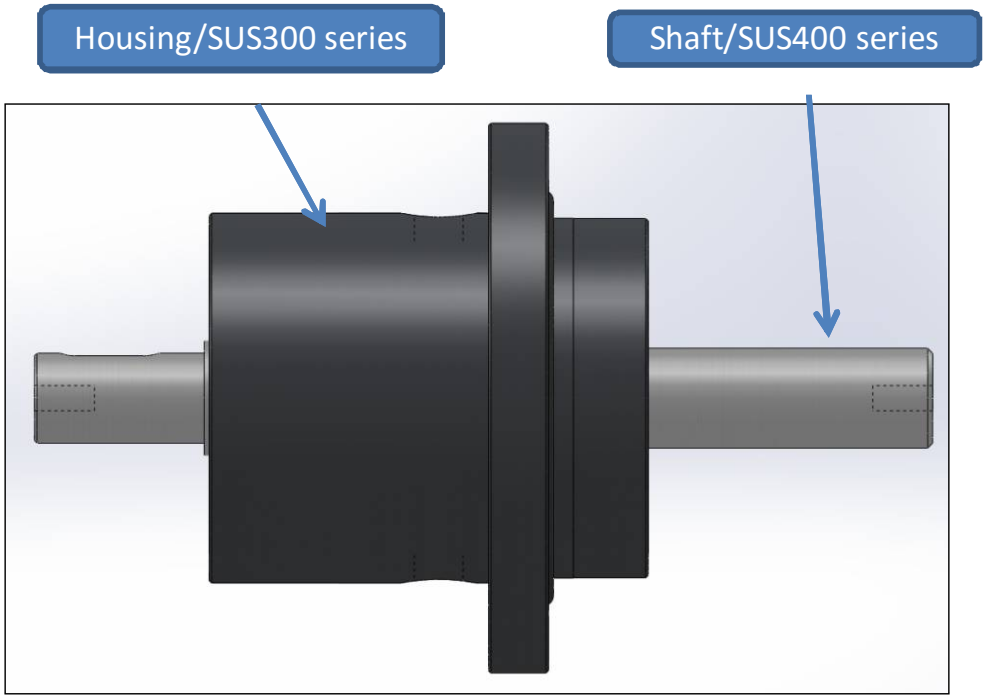
- Ferrofluid Adjustment



Material of Feedthrough

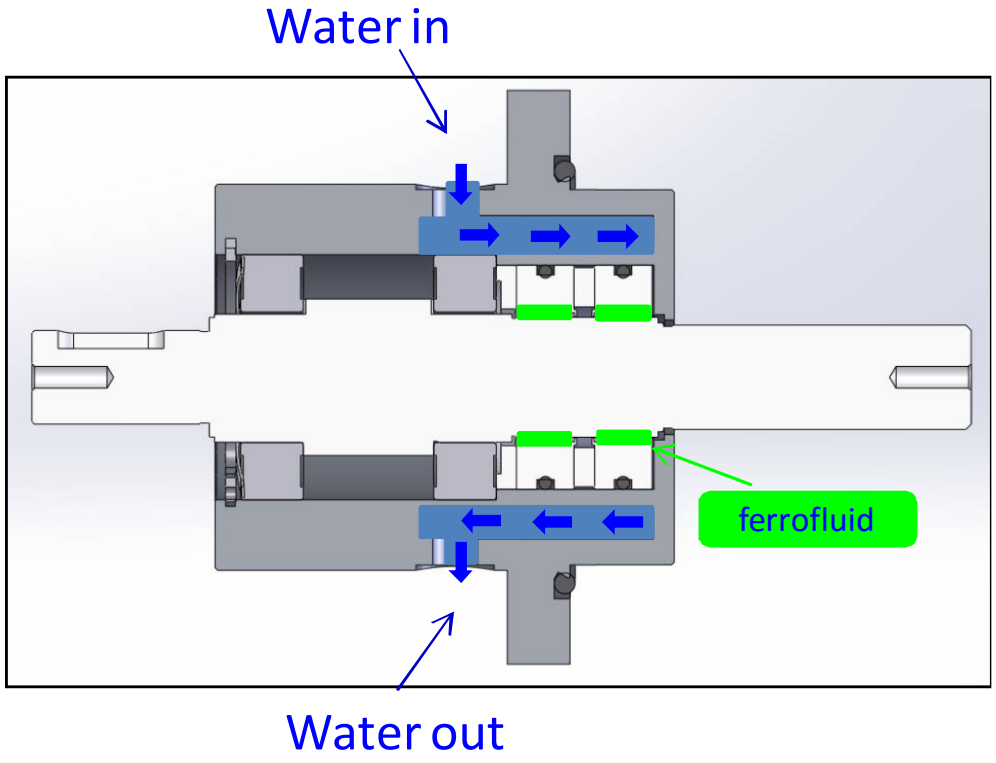
- Shaft and permeable ring are composed of SUS400 series material to form a close magnetic loop.
- Housing is composed of SUS300 series material to prevent magnetic field influence inward or outward.

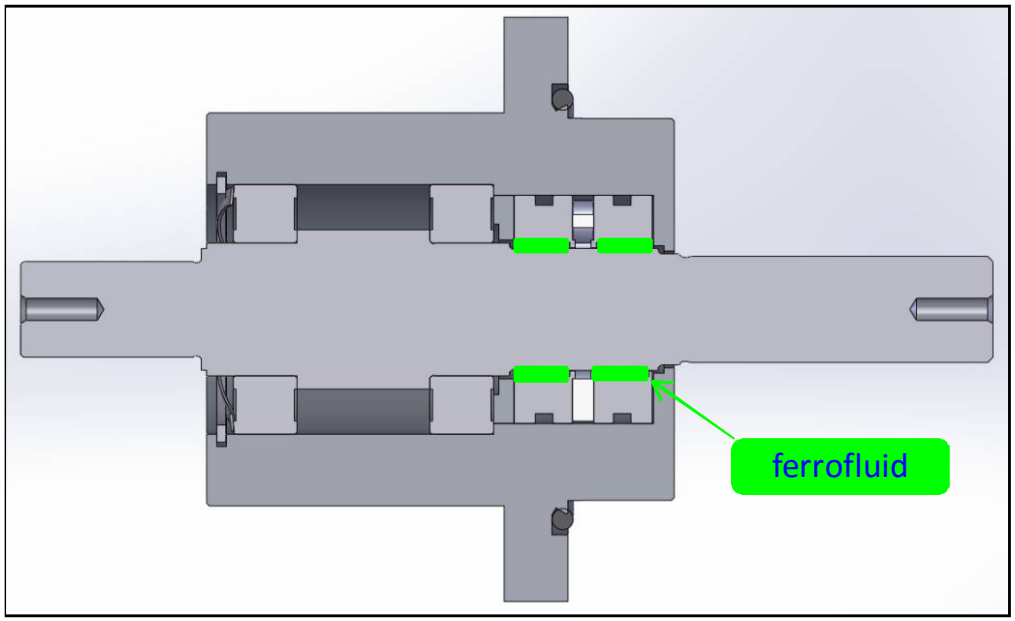




Feedthrough Cooling Type

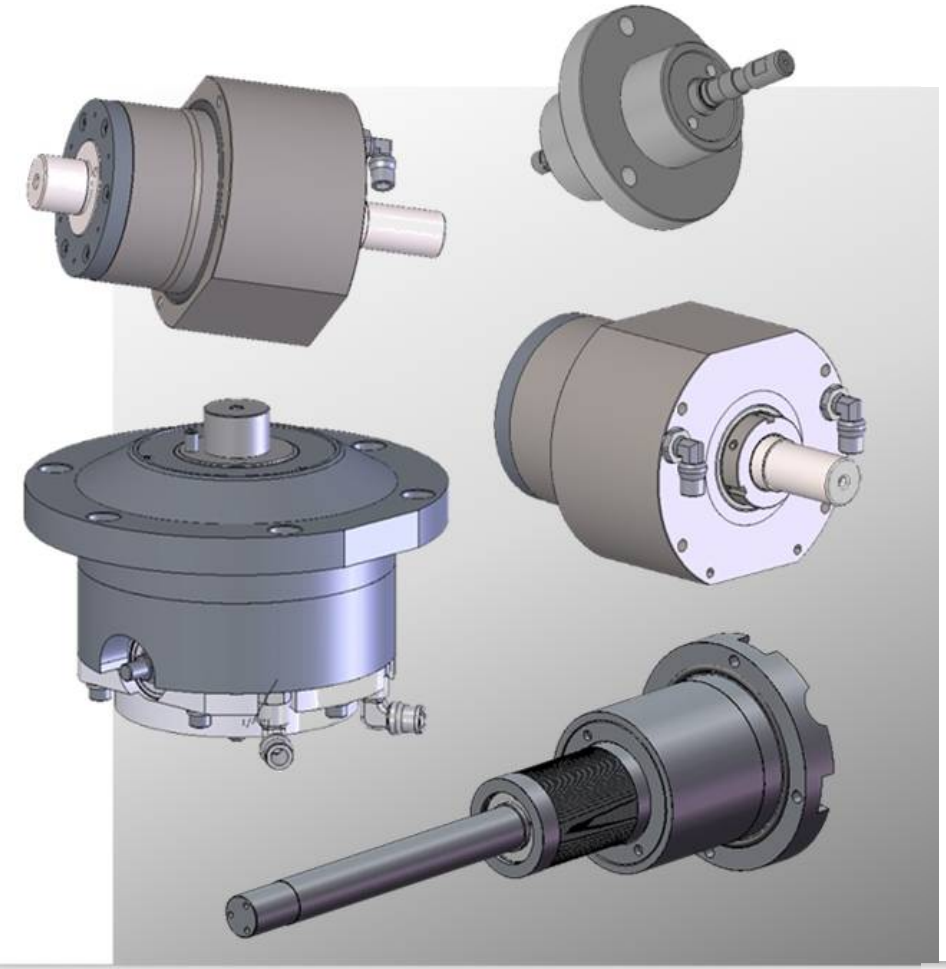
Water cooled	Air cooled





Shaft Types

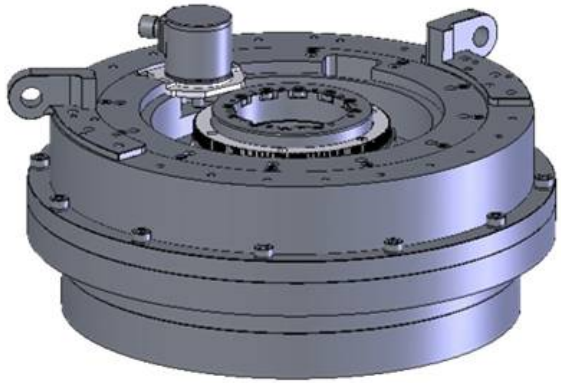
- Solid

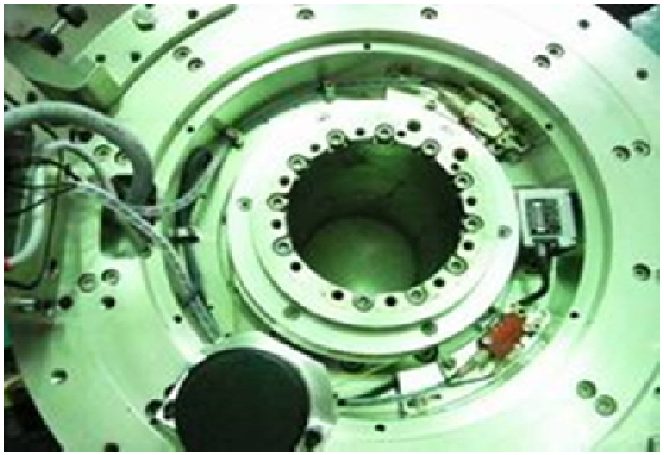


- Hollow

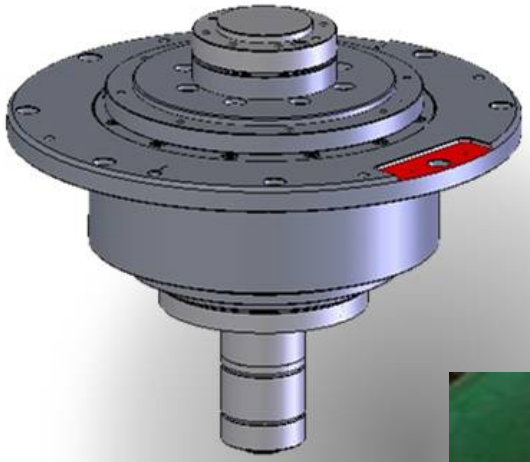
Diversity Design

- Motor integrated





- Multi-axis design



Thanks for your attention !