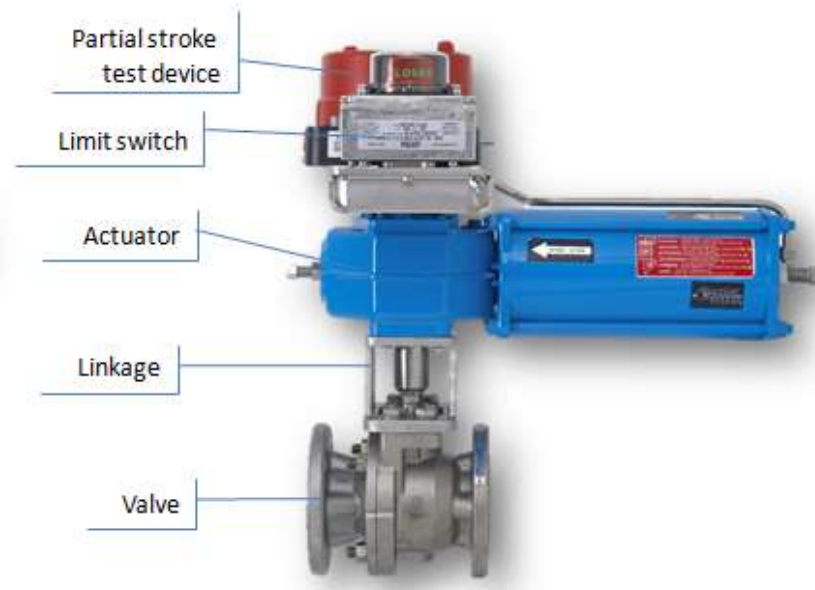




Neles金属密封球阀

美卓 – 基于应用的阀门设计

- 角行程技术先驱，60年金属球阀设计&制造经验
- 基于应用的设计和选型
- 给客户id提供整体解决方案
- 产品覆盖面广泛
- 全球大量的使用，具有坚固结实，长寿命，少维护的产品特点



Neles球阀

球阀生产始于1959', 诸多严苛工况的成功经验
基于应用的阀座设计和 涂层选择

阀门设计

- 设计标准 ASME B16.34 ,ASME B16.5, ASME B16.10 , ISO 5211
- 固定球 / 浮动球
- 各种密封等级 ANSI FCI 70-2 / ISO 5208 / API 598, 基于实际工况需求, 提供长时间可靠密封

磅级

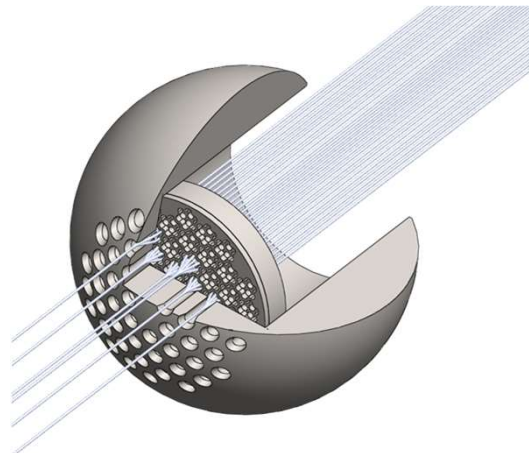
- #150 - #1500

口径

- 1/2" - 36"

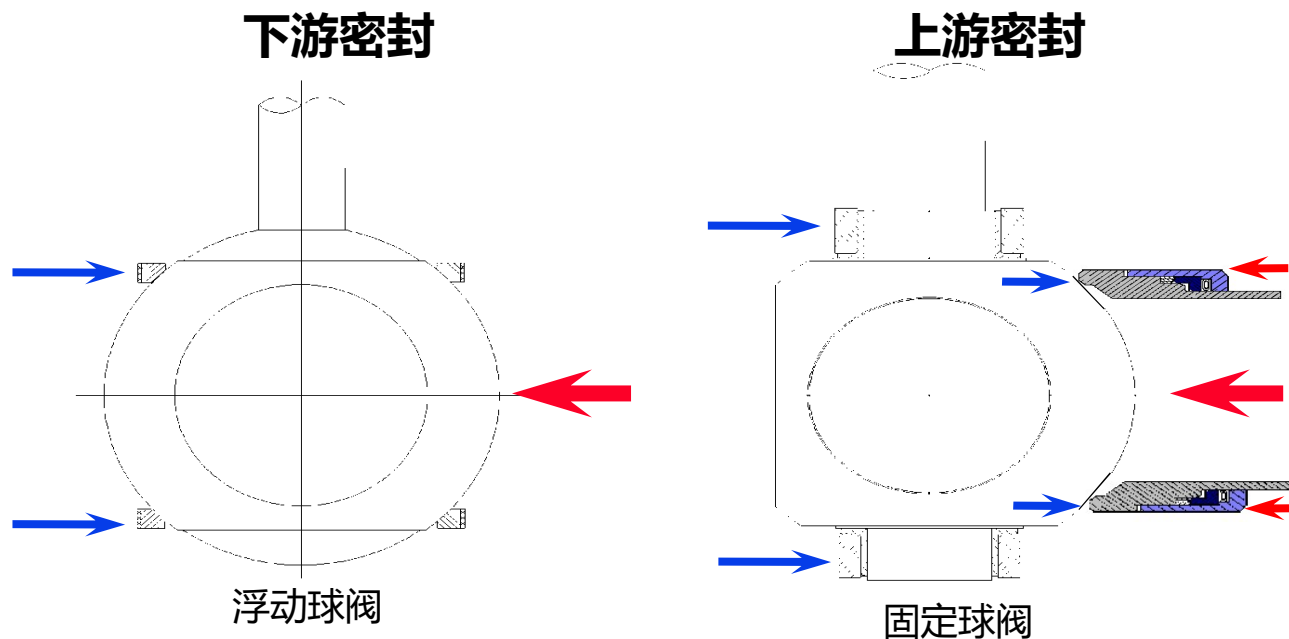
温度范围

- 涵盖低温深冷 直至 高温工况



球阀的固定球和浮动球

- 金属球阀可以根据设计特点不同分为浮动球和固定球
 - 浮动球顾名思义球是可以动的，球是由两个阀座支撑的
 - 固定球是由上下两个轴承把球固定在阀体里



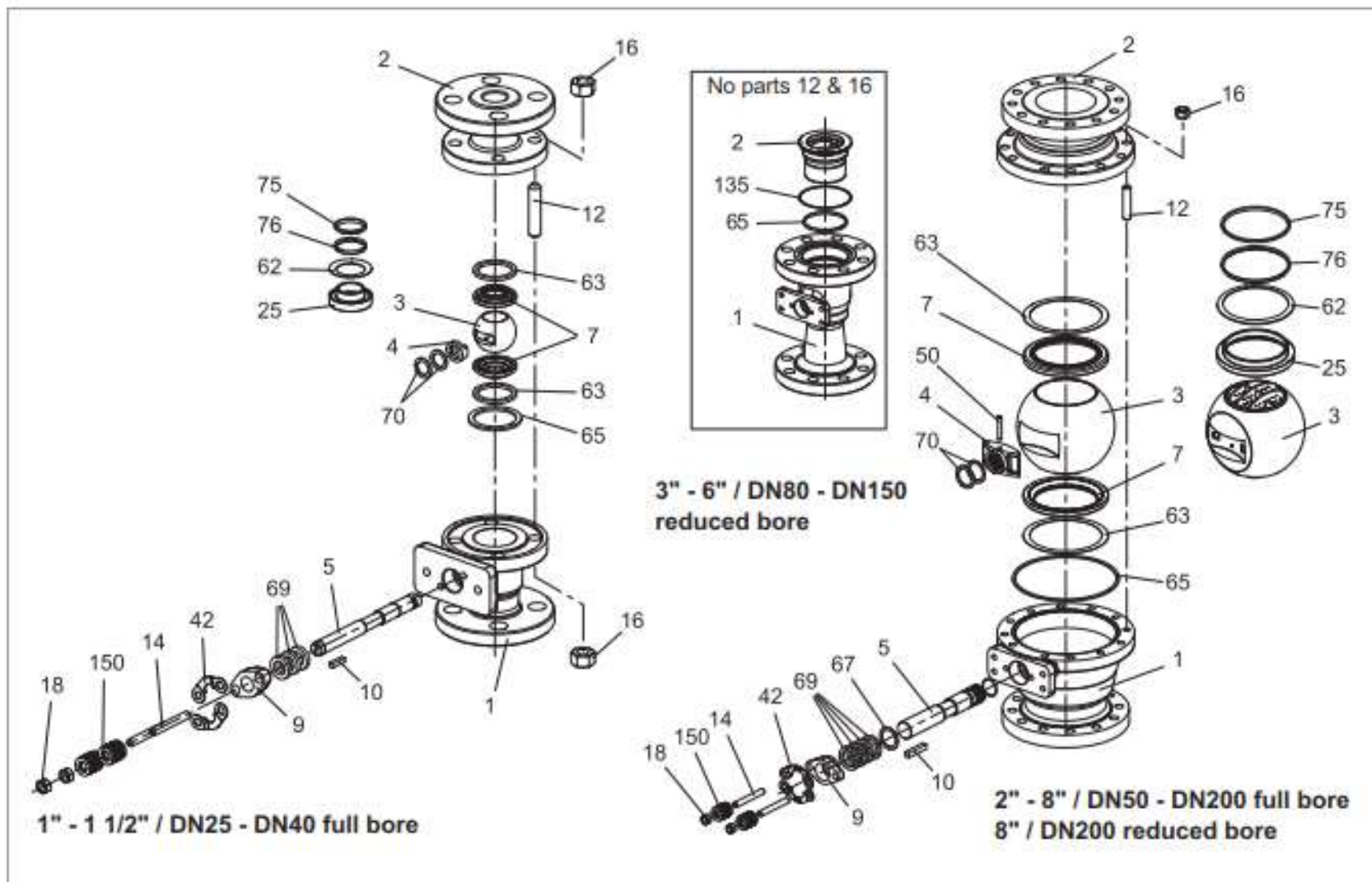
浮动球vs 固定球

如何选择球阀? 考虑球阀与阀座间的压力，太高的压力会导致球/座的损坏，还有昂贵涂层的损坏以及需要大的气动执行机构

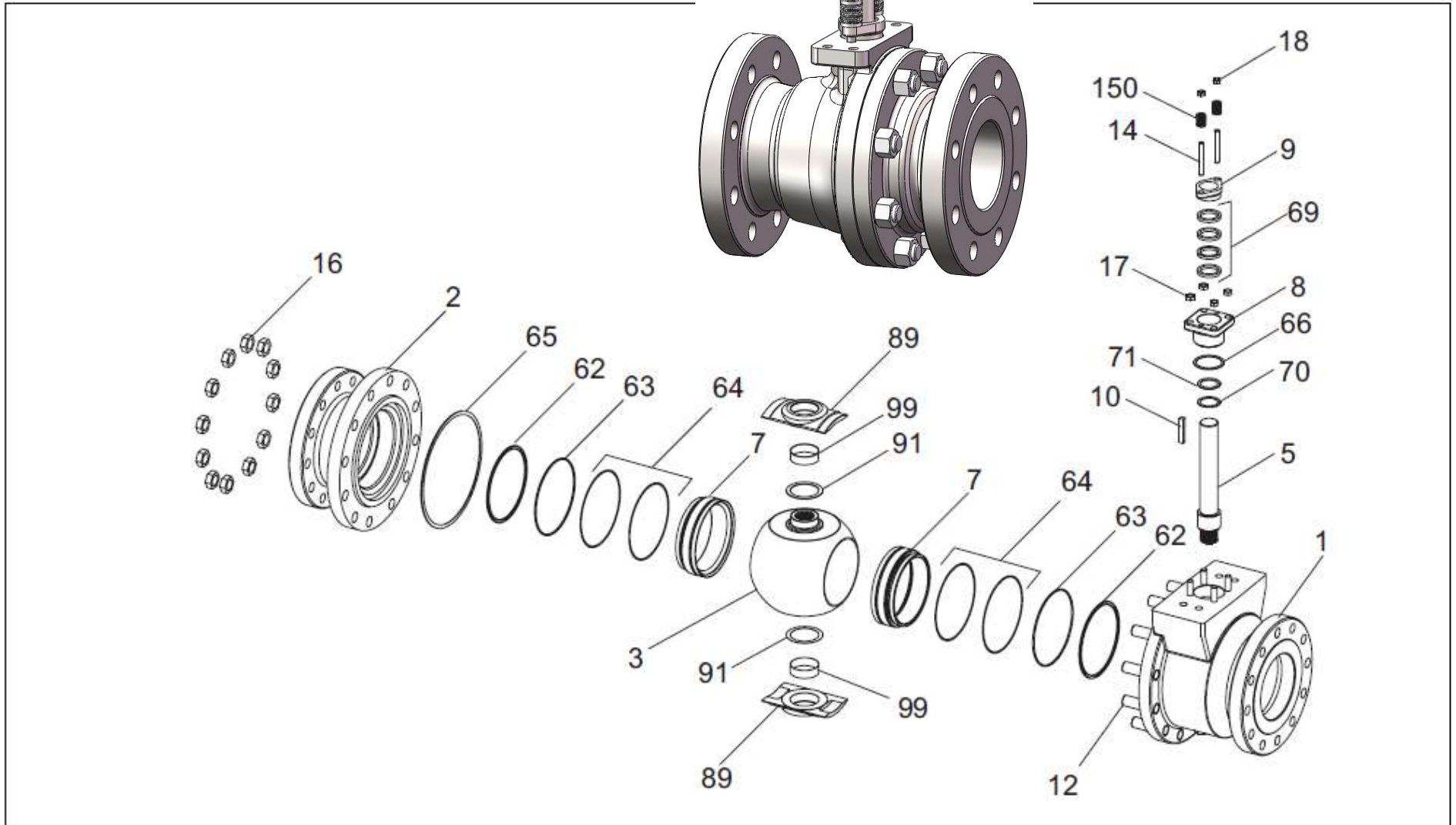
美卓推荐（成本及合理性角度）

- 浮动球一般推荐用于150/300磅 8”以下， 600磅4“以下
- 600磅 (>4”) 及600磅以上压力一般都需要固定球
- 固定球的小扭矩，气缸小，成本高。浮动球成本低。

浮动球阀



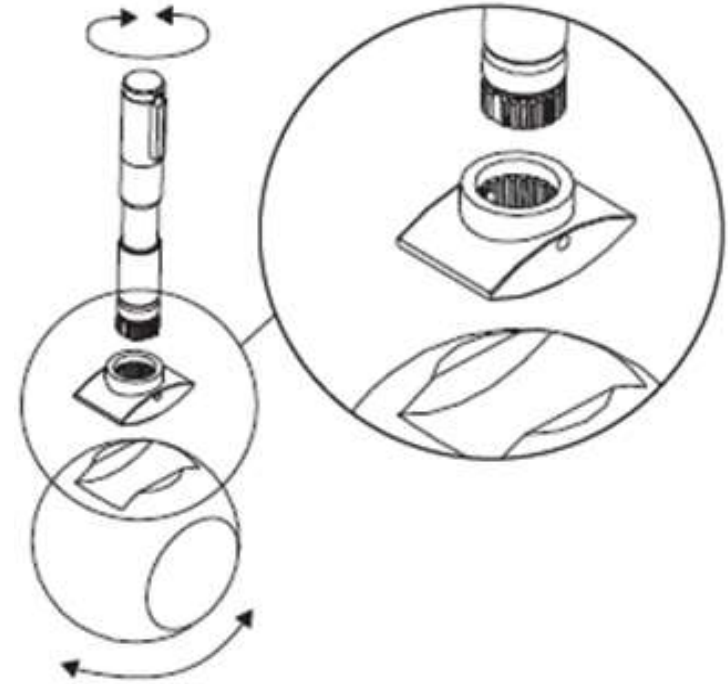
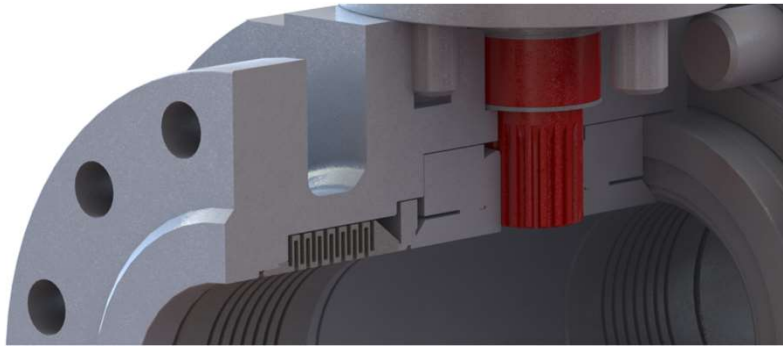
固定球阀



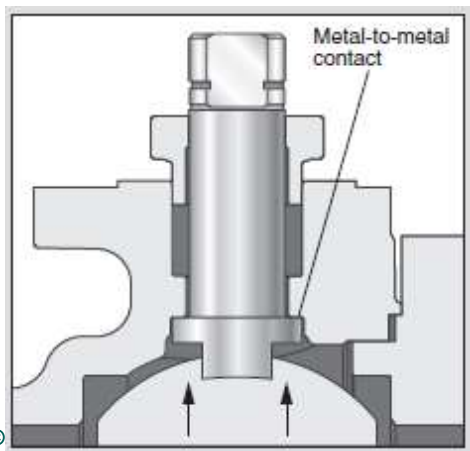
球阀阀杆的连接

- 美卓球阀

- 阀杆和阀球采用花键连接设计，阀杆与阀球连接面积增大，减小挤压应力。具有大扭矩传递，精确的动作，长运行寿命的优良特性



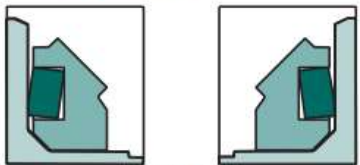
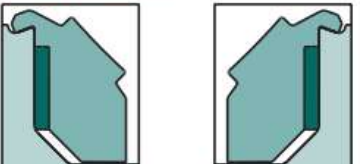
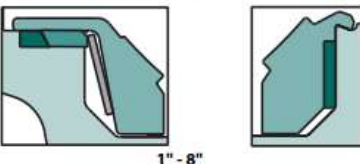
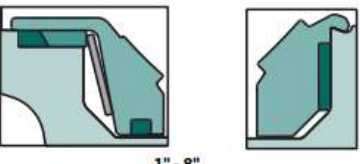
- 常见连接方式



基于应用的阀座设计

浮动球阀阀座

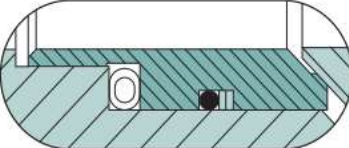
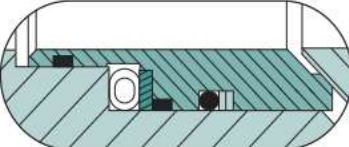
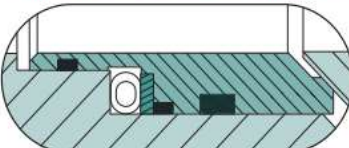
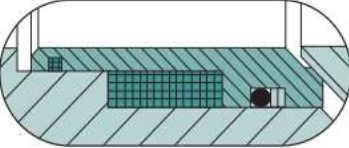
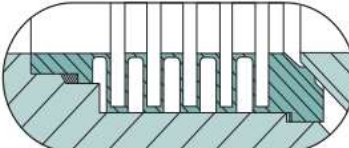
STANDARD SEATS CONSTRUCTIONS AND MATERIALS

Seat type	Standard materials
S Scraping general seat  1" - 8"	Ball seat: Stainless steel + hard facing Seat seal: PTFE Temp. range: -50 ... +230 °C / -58 ... +440 °F Note: Available only in sizes 1" ... 8" / DN 25 ... 200
K Scraping locked seat  1" - 8"	Ball seat: Stainless steel + hard facing Seat seal: PTFE Temp. range: -50 ... +260 °C / -58 ... +480 °F Note: Available in sizes 1" ... 8" / DN 25 ... 200
H High temperature seat  1" - 8"	Ball seat: Stainless steel + hard facing Seat seal: Graphite Spring: INCOLOY 825 Temp. range: -200 ... +538 °C / -330 ... +1000 °F (+600 °C/+1110 °F with NiBo or carbide coated ball and Inconel 718 spring)
G Dust proof seat  1" - 8"	Ball seat: SS steel + hard facing Seat seal: Graphite Spring: INCOLOY 825 Temp. range: -200 ... +538 °C / -330 ... +1000 °F (+600 °C/+1110 °F with NiBo or carbide coated ball and Inconel 718 spring)

基于应用的阀座设计

固定球阀阀座

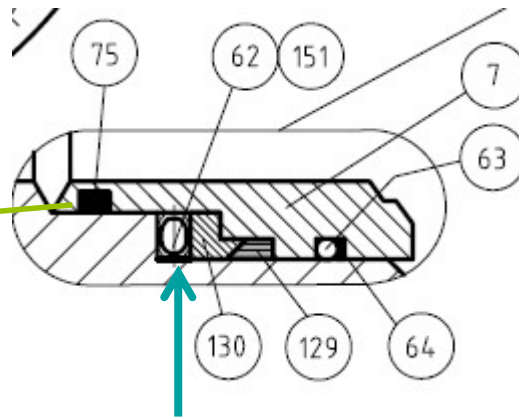
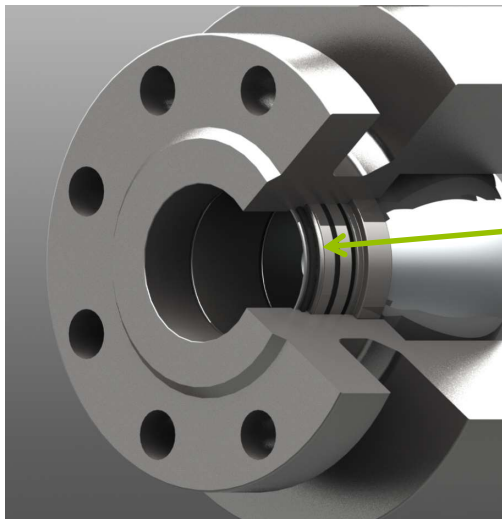
STANDARD SEAT CONSTRUCTIONS AND MATERIALS

S	<p>Metal seat</p> 	<p>Ball seat: Stainless steel + hard facing. Seat seal: Viton® GF O-ring. Spring: INCONEL® 625. Temp. range: -30 ... +200 °C / -22 ... +390 °F.</p>
B	<p>Solids proof metal seat</p> 	<p>Ball seat: Stainless steel + hard facing. Seat seal: Viton® GF O-ring/graphite. Spring: INCONEL® 625. Temp. range: -30 ... +200 °C / -22 ... +390 °F.</p>
K	<p>High temperature solids proof metal seat</p> 	<p>Ball seat: Stainless steel + hard facing. Seat seal: Graphite/graphite. Spring: INCONEL® 625. Temp. range: -50 ... 450 °C / -60 ... +840 °F.</p>
L	<p>Polymer proof seat</p> 	<p>Ball seat: Stainless steel + hard facing. Seat seal: Viton GF O-ring / Graphite. Temp. range: -30 ... +200 °C / -22 ... +390 °F. Note: - Sizes 2" - 8" - Size 10" with single seat design only. - For larger sizes, use B-seats.</p>
H	<p>Bellows seat</p> 	<p>Ball seat: Stainless steel + hard facing. Seat seal: Graphite. Temp. range: -50 ... +400 °C / -60 ... +750 °F. Note: For temperature above +400 °C / +750 °F please consult factory.</p>

阀座设计案例

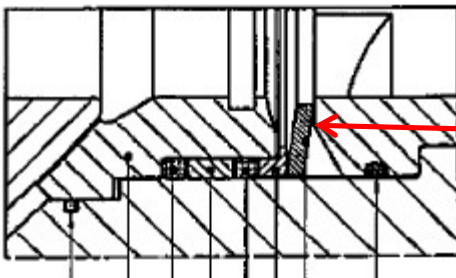
-----美卓防颗粒阀座

- Closed seat design → Will work! 美卓采用封闭式阀座设计
- Some competitors have open seats → jamming, 竞争对手使用开放式, 抱死



The critical area is protected!苛刻的区域被保护到

- Many other vendor say that the open design works because the particles can get out of the seat → Particles go to cavities and the seat will not work as it supposed to!



Cavity where particles can accumulate → Seat is stuck, 颗粒会聚集在阀座腔体内, 阀球和阀座抱死, 阀门不动作。

阀座设计案例

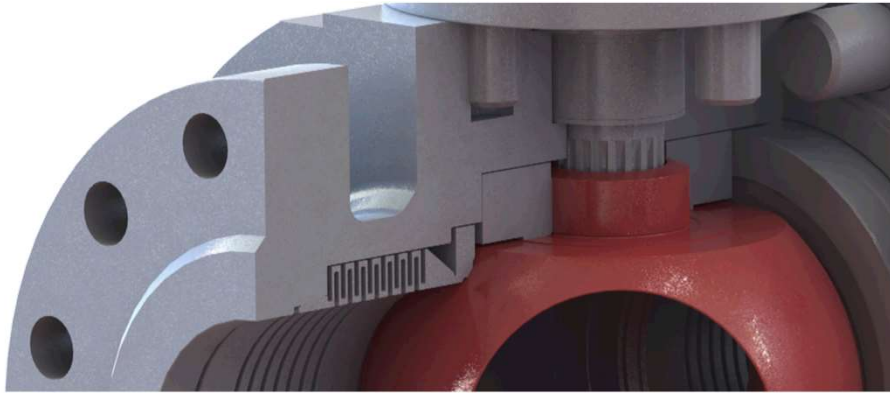
-----美卓刮刀式阀座设计

- 美卓采用刮擦式阀座设计 (scraping type seat design)
 - 当球阀动作时, 阀座会自动刮掉球体的颗粒, 清洁阀球表面



- 有些竞争对手还不是刮擦式设计, Some competitors still do not have scraping seats!!,

美卓基于工况的涂层选择



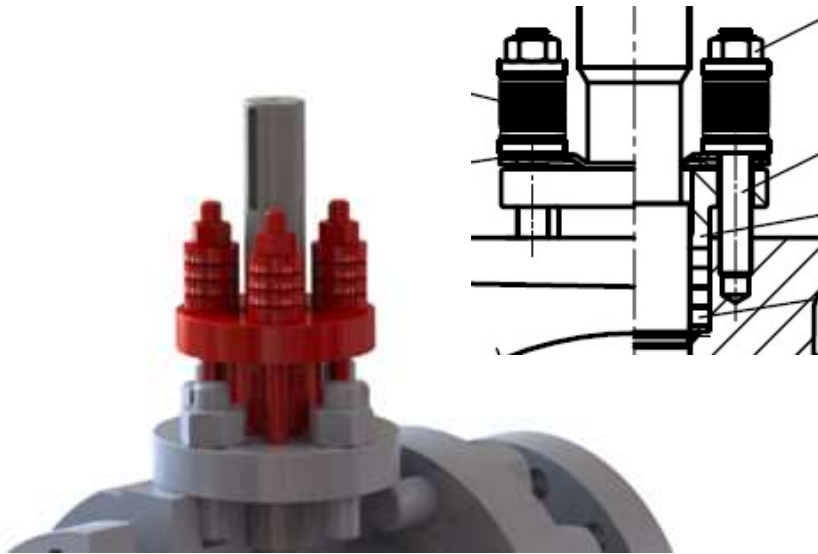
Coating	Description	Hardness, HRC/HV	Application process	Suitable substrates
HCr	Hard Chromium	70 / 1000	Electroplated	Stainless steels, nickel base alloys
NiBo	Nickel Boron	55 / 600	Spray & Fuse	CF8M, AISI 316 stainless steel
WC-Co	Tungsten Carbide	70 / 1000	HVOF	Stainless steels, nickel base alloys
(W/Cr)C	Tungsten Chromium Carbide	70 / 1000	HVOF	Stainless steels, nickel base alloys
CrC	Chromium Carbide	65 / 800	HVOF	Stainless steels, nickel base alloys
Cobalt Based Alloy		46 / 480	PTA	Stainless steels, nickel base alloys

美卓具有活载荷的阀杆密封设计

美卓产品满足ISO 15848 和TA-LUFT

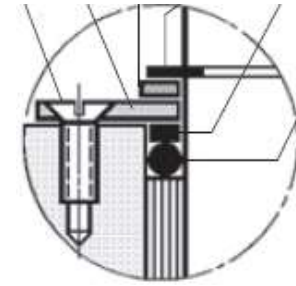
• 美卓球阀设计

- 标配可调式V形填料设计
- 重型弹簧加载设计
- 确保在温度变化和 有颗粒/结晶的情况下仍然可以有效密封



• 竞争对手:

- 标配O型圈式填料设计
- 无法通过在线操作上紧填料函
- 对温度变化和 颗粒/结晶 很敏感



逸散性泄漏

- 旋转型阀门提供了严密的轴端密封，减少了原材料和最终成品的损失
- 满足严苛的逸散性泄漏标准，如ISO 15848, TA-LUFT
- 活载荷可以提供持续的密封,维护成本低

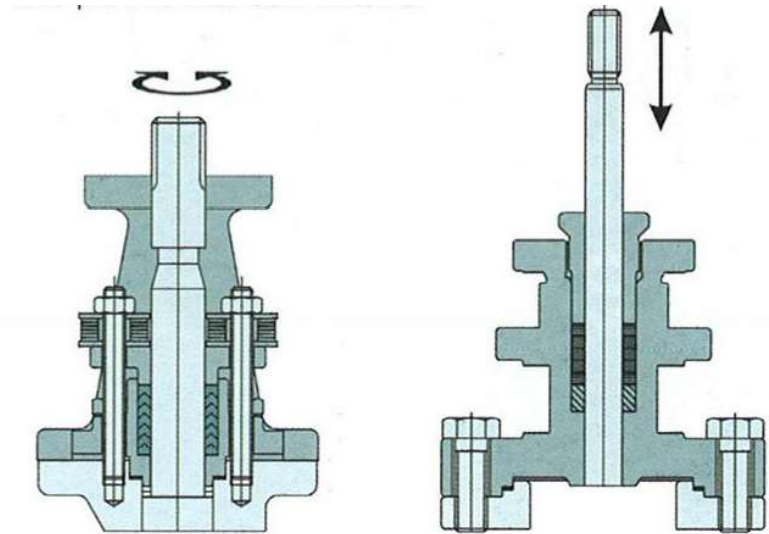
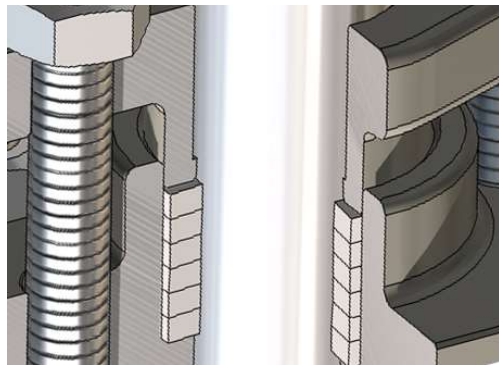
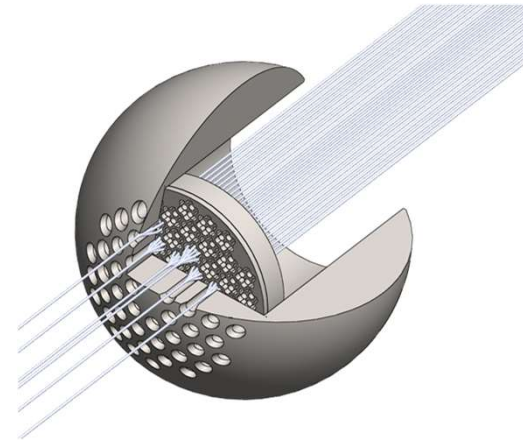
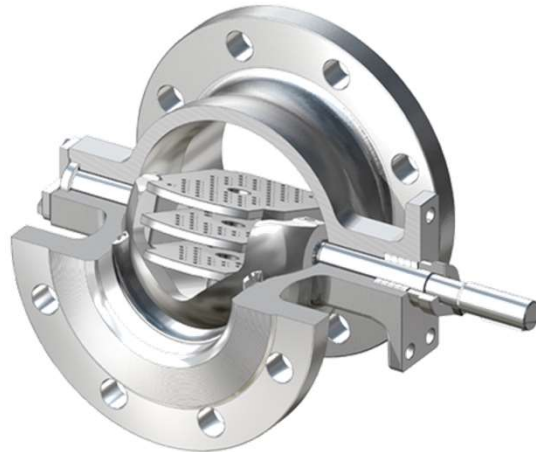
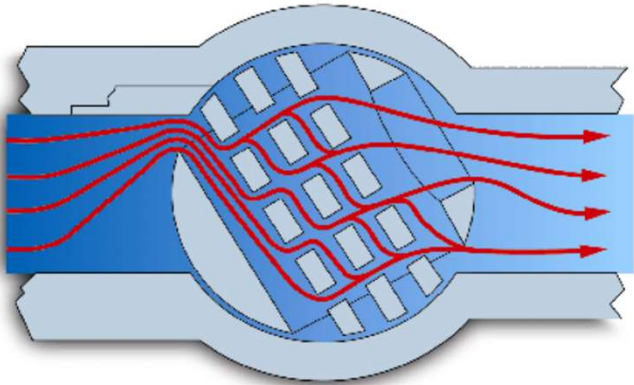
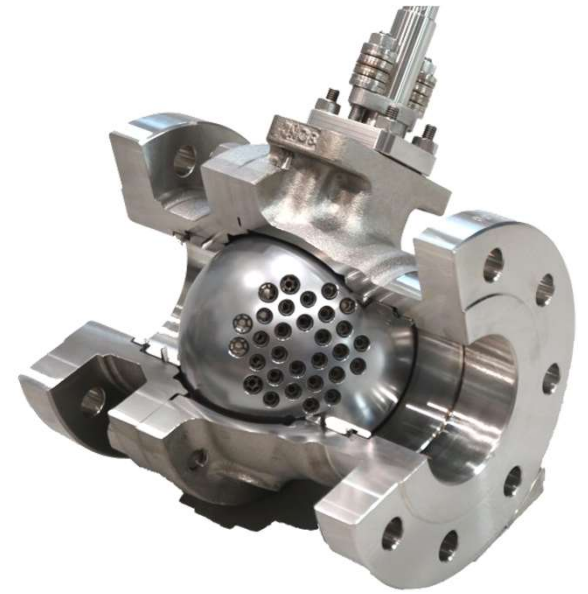


Figure 1. Rotary valve stem benefits versus linear stem design. The rotary action of the left hand valve does not drag process media up into the stem packing; the rising shaft action (right hand image) of globe and gate valves is more sensitive for this problem.

Q-trim阀芯

- 现场往往对阀门的噪音都有一个最高限制，
- Q-trim阀芯可以有效降低噪音、避免气蚀，
- Q-trim阀芯具有自清洁功能，颗粒纤维不会堵塞阀门。





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