Ultra High Purity Products

For A Better Tomorrow

Catalog No. U-Simple
Jan. 2017_CN



HY-LOK CORPORATION

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Fittings



Tube Weld Fittings

Catalog No. H-250CF

Applications
High purity gas line, Vacuum system

Features
Auto welding design 316, 316L, VOD, VIM/VAR Stainless Steel
Cleaning : 18MΩcm Hot D.I. water
Cleanness : class 10
Helium leak rate $1x10^{-9}$ atm.cc/sec.



Metal Gasket Face Seal Fittings

Catalog No. H-250CF

Applications
High purity gas line, Vacuum system

Features
Metal Gasket Face Seal design 316, 316L, VOD, VIM/VAR Stainless Steel
Cleaning : 18MΩcm Hot D.I. water
Cleanness : class 10
Helium leak rate $1x10^{-9}$ atm.cc/sec.

Regulators



Regulators (400, 800 Series)

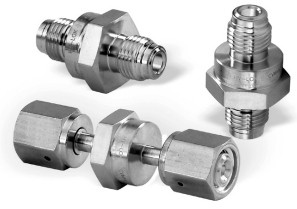
Catalog No. H-HPGR400S, HPGR800S

Applications
Semiconductor, Research Laps

Features
Point-of-use
Free poppet / Tied diaphragm type
10 Ra or 5 Ra microinch internal surface
Metal to metal body to diaphragm seal
Low Particle entrapment

Outlet Pressure Range :
1-30psig, 1-60psig, 1-100psig, 1-150psig, 1-250psig
(1-2.1barg),(1~4.2barg),(1-7.0barg), (1-10.5barg) (1-17.5barg)

Valves



All Welded Check Valves

Catalog No. H-CW100

Applications
Semiconductor, Biotech, Pharmaceutical
Ultra Pure, Flammable or Toxic Fluid Line

Features
All welded design
316L VOD Stainless Steel
Compact Design
Low particle entrapment

Description	Maximum Operating Pressure @100°F(38°C)	Temperature		Material			Connection Type	End Connection Size (Max.)	Catalog
		Min	Max	S316/316L	VOD	VIM/VAR			
Tube Weld Fittings	9000psi 630bar	-350°F -210°C	1000°F 538°C	O	O	O	Butt Weld	1 in 25mm	H-250CF
Metal Gasket Face Seal Fittings	9000psi 630bar	-350°F -210°C	1000°F 538°C	O	O	O	ZCR Metal Gasket Seal	1 in 25mm	H-250CF
Regulators (400, 800 Series)	3500psi 241bar	-40°F -40°C	350°F 177°C		O	O	ZCR(M), ZCR(F), Butt Weld, Hy-Lok Type	1/2 in	H-HPGR400S H-HPGR800S
All Welded Check Valves	3000psi 207bar	-10°F -23°C	400°F 204°C		O	O	ZCR(M), ZCR(F), Butt Weld, Hy-Lok Type	1/2 in	H-CW100

Valves

Catalog No. H-BL100



Bellows Valves

Applications
Semiconductor, Biotech, Pharmaceutical

Features
2-way Design
316L VOD Stainless Steel
Metal bellows seal
Long life cycle
PCTFE seats

Catalog No. H-BL200



Forged Bellows Valves

Applications
Semiconductor, Biotech, Pharmaceutical

Features
2-way Forged Body Design
316L VOD Stainless Steel
Metal bellows seal
Long life cycle
PCTFE seats

Catalog No. H-BLY100S



Y-Type Manual Bellows Valves

Applications
High-purity gas distribution system control
High-purity gas valves for point-of-use service
Superior containment and cleanliness for
most critical valve application

Features
Bellows Design for High Purity and long cycle life
Compact Design
10Ra or 5Ra microinch internal surface
Downstream Purge connections are available

Catalog No. H-DV100

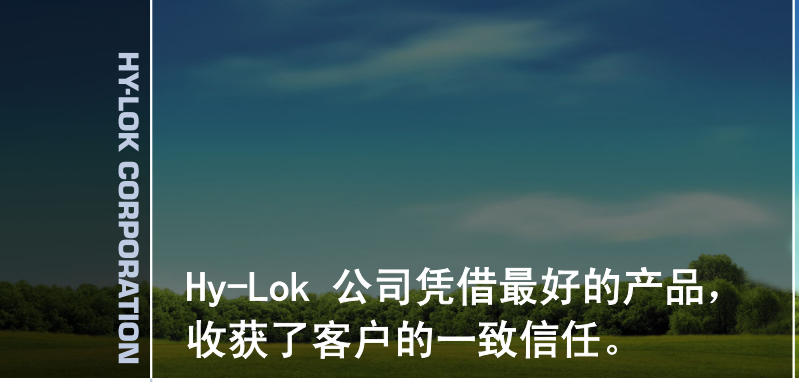


Diaphragm Valves

Applications
Semiconductor, Biotech, Pharmaceutical

Features
Metal to metal diaphragm seal
Low particle entrapment
10 Ra or 5 Ra microinch internal surface

Description	Maximum Operating Pressure @100°F(38°C)	Temperature		Material			Connection Type	End Connection Size (Max.)	Catalog
		Min	Max	S316/316L	VOD	VIM/VAR			
Bellows Valves	500psi 34.4bar	-20°F -28°C	200°F 93°C		O	O	ZCR(M), ZCR(F), Butt Weld, Hy-Lok Type	1/2 in	H-BL100
Forged Bellows Valves	145psi 10bar	-20°F -28°C	200°F 93°C	O	O		ZCR(M), ZCR(F), Butt Weld, Hy-Lok Type	3/4~1 1/4in	H-BL200
Y-Type Bellows Valves	100psi 7bar	-10°F -23°C	150°F 65°C		O	O	Butt Weld	1/2~3/4in	H-BLY100S
Diaphragm Valves	3000psi 207bar	-10°F -23°C	150°F 65°C		O	O	ZCR(M), ZCR(F), Butt Weld, Hy-Lok Type	3/4in	H-DV100





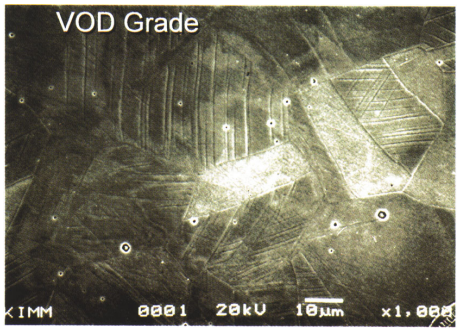
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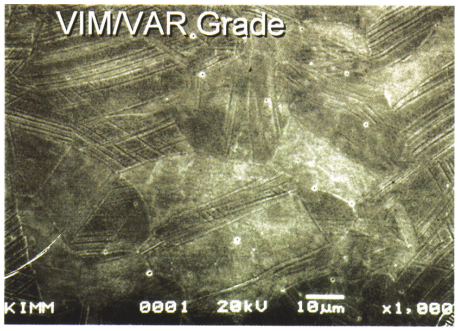
材　料

高纯度流体系统中，原材料的清洁度决定着成品的表面光滑程度，焊接性和耐腐蚀性。因此，碳，硫，锰的含量是需要严格控制的。

Hy-Lok Stainless Steel Specification (WT %, Max.)

Chemical Compositions	Single Melt VOD		Double Melt VIM / VAR		Triple Melt VIM / VAR / VAR		Remark
	Spec.	Actual	Spec.	Actual	Spec.	Actual	
碳 (C)	0.030	0.020	0.020	0.010	0.010	0.006	防止粒界腐蚀
硫 (S)	0.010	0.005	0.005	0.003	0.002	0.001	提高焊接质量
锰 (Mn)	1.000	0.050	0.500	0.030	0.050	0.030	提高焊接质量





■ Photos by scanning electron microscope (SEM X 1000)





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制造工艺

Hy-Lok 的高纯度流体系统用高清洁度接头和阀门，在材料的相容性，安全性，清洁度，产品表面光滑度上严格遵守设计标准生产而成，扼制了杂质的生成以及泄漏的发生。

■ 机械加工

为了能做到 0.25㎛ (10μin) Ra 以下标准的表面处理，Hy-Lok 投入了超精密的加工技术设备。为了避免接头和阀门产品的内表面产生坑槽或者毛刺，不仅在设计上做了特别处理，在内表面加工上更是使用了特殊工艺，以求做到精益求精。

■ 电解抛光 & 钝化处理

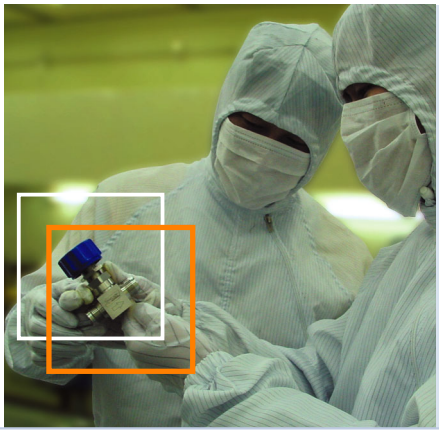
我们对接头和阀门的表面进行电解抛光处理，使其表面产生粗糙度达到 0.13㎛ (5μin) Ra 以下标准，并具备耐腐蚀性的铬氧化物。电解抛光过后，通过钝化处理，去除产品表面已经分离出来的铁离子。

■ 去离子水清洗 & 干燥

在制造过程中，所有产品在每一个阶段都会通过清洗工艺来保持彻底的清洁度，通过所有的清洁工艺，将杂质和有机物以及离子物质彻底的去除。最后在 Class 100 标准的清洁室中，进行超声波清洗，去离子水清洗，以及用干燥过后的高纯度氮气对产品进行干燥。在产品清洗过程中用到的去离子水都是严格经过紫外线杀菌，活性炭有机物过滤，杂质过滤，离子物质去除，以及臭氧杀菌等方法生产出来的。去离子水的电阻为 (18㏁·㎝) 总有机碳和硅的含量是经过严格控制的。

■ 组装，检查和包装

产品在 Class 100 标准的清洁室中完成最终清洗过程后，会在 Class 10 环境下进行最终的组装和氦泄漏试验，然后进行包装。为防止水分附着，各个产品要进行高纯度氮气清洗，为防止污染物质产生，还要用尼龙包装纸进行个别包装。特别是阀门的连接处还要用聚乙烯帽进行保护，注入干燥的高纯度氮气然后进行包装。



Our Goal

Hy-Lok公司致力于在各个领域打造世界一流品牌！

最高品质
客户满意
国际化经营管理

这是 Hy-Lok 公司“为了更好的明天”信念的源动力。



03

检查过程

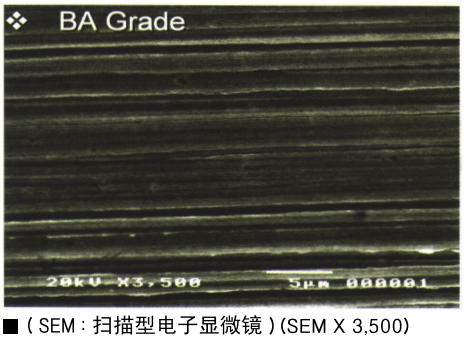
为了确保产品的可靠性，要根据产品制造工艺的不同对表面粗糙度，表面缺陷，表面组成，杂质粒子，残留油分浓度，水分，碳氢化合物，离子清洁度等产品特性进行测定。
以及按照严格的标准进行氦泄漏试验。

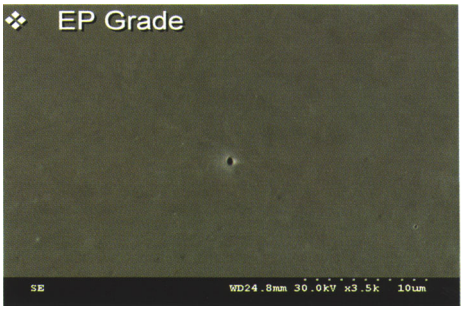
■ 表面粗糙度测定

表面粗糙程度决定着产品的清洁程度（是否夹杂和生成杂质，是否减少污染）。
表面粗糙度以 BA Grade (Ra 0.25㎛) 和 EP Grade (Ra 0.13㎛) 为标准进行严格管理。

■ 表面状态分析

利用显微镜，对原材料和最终成品的表面状态（加工，瑕疵，杂质）进行测定和分析。
将接头和阀门放大3500倍进行 SEMASPEC 9012401B-STD 试验分析。
(SEM : 扫描型电子显微镜)





■ (SEM : 扫描型电子显微镜) (SEM X 3,500)

■ 杂质粒子计数法测定

为测试阀门的清洁度，使用 Laser Particle Counter (LPC)，以 ASTM F1394 为标准，
对 0.1㎛ 以上的杂质粒子进行测定。

■ 离子清洁度分析

为了确定清洁过程的有效性，要对残留的离子和有机物进行检测分析。
SEMASPEC 90.10399B-STD & ASTM F1374 为测定标准，离子色谱法为检测方法。

■ 氦泄漏试验

接头和阀门的初次性能决定着系统流体的密封与否。
Face Seal 接头和阀门以 ASTM E498 (Method A) / E499 (Method B) 为标准，
进行 Inboard / Outboard 的氦泄漏试验。
Face Seal 接头进行标本提取抽样检查，Bellows 阀门和 Diaphragm 阀门则全数进行试验检查。

- Inboard Leak Rate : Standard
  Face Seal Fitting : $1X10^{-10}$std. ㎤/s.
  Bellows Valve : $4X10^{-9}$std. ㎤/s.
  Diaphragm Valve : $1X10^{-9}$std. ㎤/s.

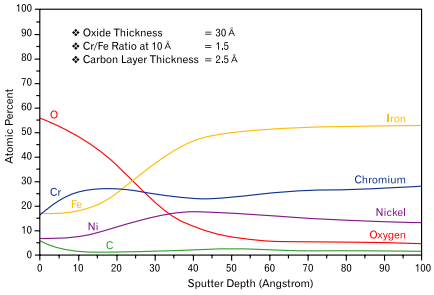
- Outboard Leak Rate : Optional
  Face Seal Fitting : $1X10^{-10}$std. ㎤/s.
  Bellows Valve : $4X10^{-9}$std. ㎤/s.
  Diaphragm Valve : $1X10^{-9}$std. ㎤/s.



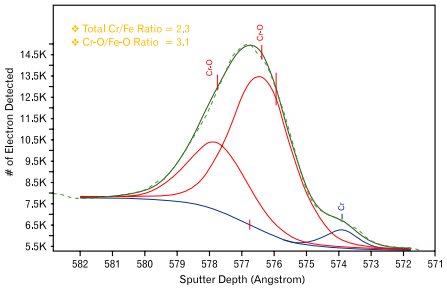
■ 表面构成和化学成分分析

为了测定因电解抛光在产品表面形成的铬氧化物层，以及测定产品的钝化状态，
需要通过 AES (Auger Electron Spectroscopy) 和 XPS (X-Ray Photoelectron Spectroscopy),
对铬/铁元素比，氧化铬/氧化铁构成比，和氧化层厚度进行测定分析。
此外还要通过 SEMASPEC 91060573B-STD (AES) SEMASPEC 90120430B-STD (XPS)
对产品表面污染物质残留程度进行测定分析。

AES Depth Profile



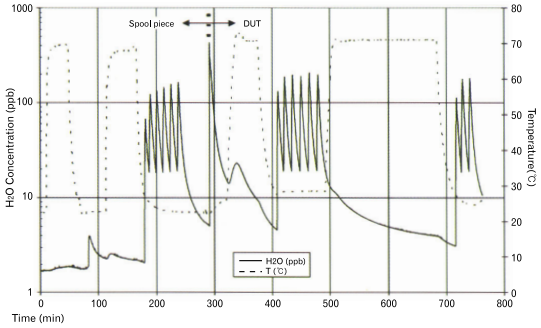
XPS Surface Chemistry Analysis

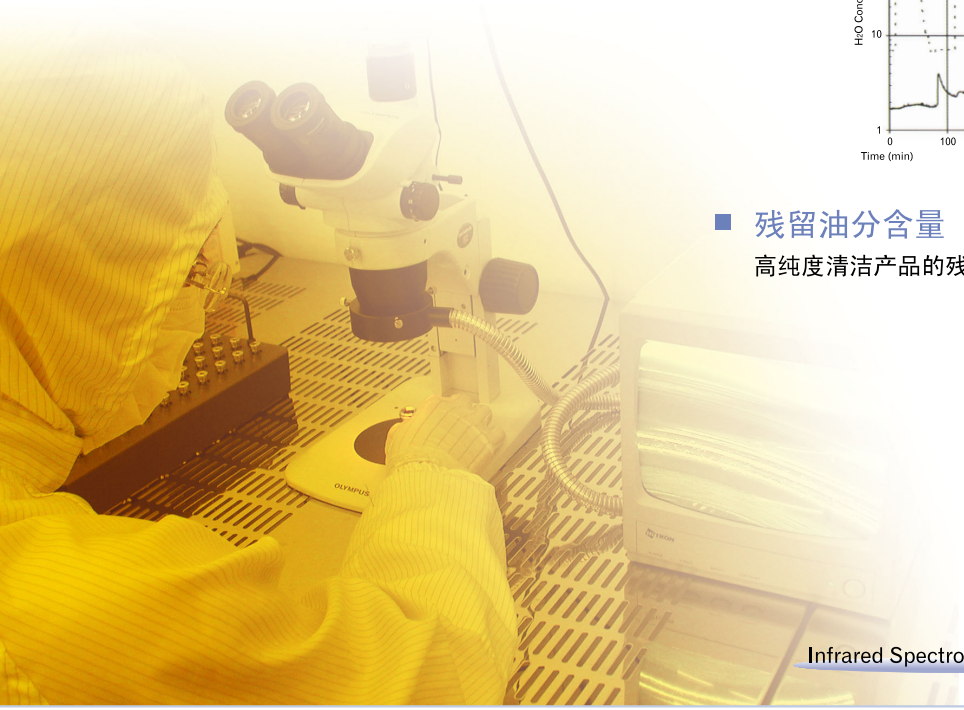


■ 水分分析

根据 SEMASPEC 90120396B-STD, 对产品内部附着水分的总含量进行测定分析。

Moisture Contribution Analysis





■ 残留油分含量

高纯度清洁产品的残留油分浓度必须控制在 0.01 以下。



Infrared Spectroscopy Analyzer

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