2023 Version

Product Catalogue

HYG

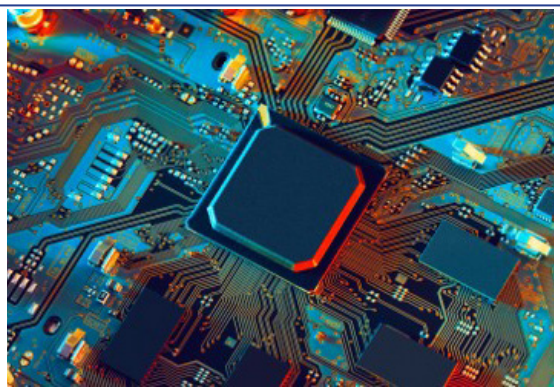
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Product Guide

Ultra High Purity

Products Offered

Ultra High Purity – Seamless & Welded



For Semiconductor, Microelectronics Applications	
Item	Seam Type：Welded or Seamless
Applicable Specifications	ASTM A249, A269, A632, ASME SA249, SA269 ASTM A213, ASME SA213 JIS G3459
Typical Materials	316L single melt, EN1.4404, 316L double melt (optional) * Other materials available upon request
Finish Options	✓ EP ID 0.2µm max, OD Mechanically Polished 0.80µm (ID 0.20µm max targeted) ✓ BA ID 0.38µm max, OD Mechanically Polished 0.80µm
Dimension	Imperial Sizes ✓ OD .125" – 6" A Sizes ✓ OD 15A – 600A * Please refer to dimension chart pg. 22
Technical Requirements	✓ Hardness max. 90 HRB or max. HV 200 ✓ 100% PMI Tested ✓ 100% Visual & Surface Inspected ✓ Surface Roughness Tested acc. ASME B46.1 ✓ 100% Eddy Current Tested acc. to ASTM A1016/A1016M & E426 ✓ Particle & Oil Residue Tested ✓ Intergranular Corrosion Tested acc. to ASTM A262 Practice E (optional)
Documentation	✓ Material test report in accordance to EN10204 3.1
Linemarking	✓ HYG UHP EP A213/A269 TP316L OD ¼" x WT 0.89 SMLS HEAT XXXX ✓ DAON UHP EP A213/A269 TP316L OD ¼" x WT 0.89 SMLS HEAT XXXX
Cleaning Packaging	✓ Precision cleaned with warm ultra pure supersonic immerse & inner cleaning ✓ N2 purged with heated and filtered nitrogen (gas purity 99.9998%) ✓ Cleaned, purged and packaged in clean room Class 1000 ✓ Individually End-capped, Double PE Sleeved, Wooden Box Packaging

Products Offered

Ultra High Purity – Coaxial



Ultra High Purity – Coaxial TubesFor Special Gas Handling Applications	
Item	Stainless Steel Coaxial Tubes
Applicable Specifications	ASTM A213, A269, A632, JIS G3459
Typical Materials	✓ Inner Process Tube 316L single melt – seam type : seamless 316L double melt (optional) ✓ Outer Containment Tube : 304 – seam type : welded 304, 304L, 316L : seam type - seamless (optional)
Finish Options	✓ EP | Inner Process Tube ID 0.2µm max or 10 Ra max (0.20µm max targeted) ✓ BA | Outer Containment Tube ID Bright Annealed, OD Mechanically Polished 0.80µm
Dimension	Imperial Sizes ✓.250" x .500" ✓ .750" x 1.00" ✓ 1.50" x 2.00" ✓.375" x .625" ✓ 1.00" x 1.25" ✓ 2.00" x 2.50" ✓.500" x .750" ✓ 1.00" x 1.50" Length ✓ 4m ✓ 6m
Technical Requirements	✓ Hardness max. 90 HRB or max. HV 200 ✓ 100% PMI Tested ✓ 100% Visual & Surface Inspected ✓ Surface Roughness Tested acc. ASME B46.1 ✓ 100% Eddy Current Tested acc. to ASTM A1016/A1016M & E426 ✓ Particle & Oil Residue Tested ✓ Outer Containment Tube - Helium-leak Tested (optional) ✓ Intergranular Corrosion Tested acc. to ASTM A262 Practice E (optional)
Documentation	✓ Material test report in accordance to EN10204 3.1
Linemarking	✓ HYG UHP EP A213/A269 TP316L OD ¼" x ½" SMLS HEAT IN# XXXX OUT# XXXX ✓ DAON UHP EP A213/A269 TP316L OD ¼" x ½" SMLS HEAT IN# XXXX OUT# XXXX
Cleaning Packaging	✓ Precision cleaned with warm ultra pure supersonic immerse & inner cleaning ✓ N2 purged with heated and filtered nitrogen (gas purity 99.9998%) ✓ Cleaned, purged and packaged in clean room Class 1000 ✓ Individually End-capped, Double PE Sleeved, Wooden Box Packaging

Ultra High Purity – Seamless & Welded

Dimension Range

Imperial

Size	Outer Diameter (mm)	Wall Thickness mm		sch5	sch10	Grade AP	MP	BA	EP	Seam Type
1/8"	3.18	0.51	0.71			●		●	●	SMLS
1/4"	6.35	0.89	1.00			●		●	●	SMLS
3/8"	9.53	0.89	1.00			●		●	●	SMLS
1/2"	12.70	1.00	1.24			●		●	●	SMLS
5/8"	15.88	1.24	1.65			●		●	●	SMLS
3/4"	19.05	1.24	1.65			●		●	●	SMLS
1"	25.40	1.24	1.65			●	●	●	●	SMLS / WELD
1-1/4"	31.75	1.24	1.65			●	●	●	●	SMLS / WELD
1-1/2"	38.10	1.24	1.65			●	●	●	●	SMLS / WELD
2"	50.80	1.24	1.65			●	●	●	●	SMLS / WELD
2-1/2"	63.50	1.24	1.65			●	●	●	●	WELD
3"	76.20	1.24	1.65			●	●	●	●	WELD
4"	101.60	1.65	2.11			●	●	●	●	WELD
6"	152.40	2.11	2.77			●	●	●	●	WELD

A Size

Size	Outer Diameter (mm)	Wall Thickness mm	sch5	sch10	Grade AP	MP	BA	EP	Seam Type
15A	21.70		1.65	2.10	●	●	●	●	SMLS / WELD
20A	27.20		1.65	2.10	●	●	●	●	SMLS / WELD
25A	34.00		1.65	2.80	●	●	●	●	SMLS / WELD
32A	42.70		1.65	2.80	●	●	●	●	SMLS / WELD
40A	48.60		1.65	2.80	●	●	●	●	SMLS / WELD
50A	60.50		1.65	2.80	●	●	●	●	SMLS / WELD
65A	76.30		2.10	3.00	●	●	●	●	SMLS / WELD
80A	89.10		2.10	3.00	●	●	●	●	SMLS / WELD
90A	101.60		2.10	3.00	●	●	●	●	SMLS / WELD
100A	114.30		2.10	3.00	●	●	●	●	SMLS / WELD
125A	139.80		2.80	3.40	●	●		●	WELD
150A	165.20		2.80	3.40	●	●		●	WELD
200A	216.30		2.80	4.00	●	●		●	WELD
250A	267.40		3.40	4.00	●	●		●	WELD
300A	318.50		4.00	4.50	●	●		●	WELD
350A	355.60		4.00	5.00	●	●		●	WELD
400A	406.40		4.50	5.00	●	●		●	WELD
450A	457.20		4.50	5.00	●	●		●	WELD
500A	508.00		5.00	5.50	●	●		●	WELD
600A	609.60		5.50	6.50	●	●		●	WELD

Ultra High Purity – Seamless & Welded

Dimension Range - Tolerance

Size	Outer Diameter (mm)	Wall Thickness				Tolerance	
		mm		sch5	sch10	Outer Diameter	Thickness
1/8”	3.18	0.51	0.71			+0.06, -0	±12.5%
1/4”	6.35	0.89	1.00			+0.06, -0	±10%
3/8”	9.53	0.89	1.00			+0.06, -0	
1/2”	12.70	1.00	1.24			+0.06, -0	
5/8”	15.88	1.24	1.65			+0.06, -0	
3/4”	19.05	1.24	1.65			+0.06, -0	
1”	25.40	1.24	1.65			±0.08%	
15A	21.7			1.65	2.10	±0.10%	±10%
20A	27.2			1.65	2.80		
25A	34.0			1.65	2.80		
32A	42.7			1.65	2.80	±0.30%	
40A	48.6			1.65	2.80		
50A	60.5			1.65	2.80	±0.50%	
65A	76.3			2.10	3.00	±0.60%	
80A	89.1			2.10	3.00	±0.70%	
90A	101.6			2.10	3.00	±0.80%	
100A	114.3			2.10	3.00	±1.00%	
125A	139.8			2.80	3.40	±1.0%	
150A	165.2			2.80	3.40		
200A	216.3			2.80	4.00		
250A	267.4			3.40	4.00		
300A	318.5			4.00	4.50		
350A	355.6			4.00	5.00	±0.5%	+15%, -12.5%
400A	406.4			4.50	5.00		
450A	457.2			4.50	5.00		
500A	508.0			5.00	5.50		
600A	609.6			5.50	6.50		

Ultra High Purity – Seamless & Welded

Chemical Composition & Mechanical Properties

Size	Chemical Elements (%)									Mechanical Property				
	Spec.	C	Si	Mn	P	S	Ni	Cr	Mo	Spec.	Tensile Strength (N/mm^2)	Yield Strength (N/mm^2)	Elongation (%)	Hardness (Hv)
SUS304 TP-S	Standard Value	Max 0.08	Max 1.00	Max 2.00	Max 0.04	Max 0.03	8.00 ~ 11.00	18.00 ~ 20.01	-	Standard Value	Min 520	Min 205	Min 35	-
										Value Range	600 ~ 647	235 ~ 304	54 ~ 66	145 ~ 188
	Typical Value	0.02	0.5	0.76	0.03	0.01	8.08	18.14	-	Typical Value	618	284	59	165
SUS316L TP-S	Standard Value	Max 0.03	Max 1.00	Max 2.00	Max 0.04	Max 0.03	12.00 ~ 16.00	16.00 ~ 18.00	2.00 ~ 3.00	Standard Value	Min 480	Min 175	Min 35	-
										Value Range	569 ~ 610	255 ~ 294	50 ~ 58	150 ~ 187
	Typical Value	0.01	0.6	1.8	0.03	0.002	13.03	17.27	2.08	Typical Value	588	275	53	162

Ultra High Purity – Seamless & Welded

Assurance Values of Oil & Particle

Method	Grade	Assurance Values
Oil	AP	0.1mg/ft^2 or Lower
	MP	0.01mg/ft^2 or Lower
	BA	0.01mg/ft^2 or Lower
	EP	0.01mg/ft^2 or Lower
Particle	AP	Number of Particle above 0.3㎛ Less Than 5/cf
	MP	Number of Particle above 0.1㎛ Less Than 5/cf
	BA	Number of Particle above 0.1㎛ Less Than 5/cf
	EP	Number of Particle above 0.1㎛ Less Than 5/cf

Elution Ion

ELUTION ION MEASUREMENT(+)	+ ION				
	NA+	NA+	NA+	NA+	-
Result	NA+	NA+	NA+	NA+	-

N/D : LESS THAN DETECTION

ELUTION ION MEASUREMENT(+)	+ ION				
	F+	CI+	Br+	NO^{2-}	$SO4^{2-}$
Result	N/D	N/D	N/D	N/D	N/D

N/D : LESS THAN DETECTION