

AF	Inspection Standard					담당	검토	승인		
Head	General Test(1)					결재	김민기			
Spec of Standard Inspection										
1. Purpose - Control of manufacturing process made by EP & BA procedure - For that estimate adaptable quality and define characteristic of EP&BA										
2. Standards & Test Clause 1) CHEMICAL COMPOSITION										
Chemical Comp.(Wt%)	C	Si	Mn	P	S	Cu	Ni	Cr	Mo	Al
Standard Composition (316L Double Material)	≤ 0.010	≤ 0.30	≤ 0.40	≤ 0.030	≤ 0.003	≤ 0.25	14.5 15.0	16.50 17.00	2.20 2.50	≤ 0.010
Standard Composition (316L Single Material)	≤ 0.030	≤ 1.00	≤ 2.00	≤ 0.045	≤ 0.030		12.0 16.0	16.00 -18.00	2.00 3.00	≤ 0.010
(Extra Chemical standard - > N ≤ 0.015 , O ≤ 0.0015 , H ≤ 0.0002)										
A. Basis on chemical composition table of SEMI 20 standard B. Test with inspection data at warehousing (ASTM/JIS) C. Fail to pass that detect of one component D. Bring a test to cluster per every year E. According to customer's need request the inspection spec.										
2) SURFACE ROUGHNESS										
Product	Inside (Ra)		Rmax(Ry)		Outside (Ra)	Test length : 4~16mm Cutoff length : 0.8mm speed : 0.5~1.0	Gathering			
	EP	BA	EP	BA						
CLANE FITTINGS	≤ 5uinch	≤ 10uinch	≤ 0.7um	≤ 2.5um	≤ 30uinch		Sample			
PIPE & TUBE FITTINGS	≤ 5uinch	≤ 10uinch	≤ 0.7um	≤ 2.5um	≤ 30uinch		Sample			
PIPE & TUBE	≤ 5uinch	≤ 10uinch	≤ 0.7um	≤ 3um	≤ 30uinch		3-Cutting			
Machining Productor	≤ 7uinch	≤ 15uinch	≤ 0.8um	≤ 4.5um	≤ 50uinch		Sample			
A. Basis on the surface roughness data table of ISO4288 standard B. Fail to pass on over rate standard C. Unless measurement inspect samples with the naked eye D. Above standard according to costomer's need each value are ASFLOW spec. E. Accoding to customer's need change the inspection spec. F. According to customer's need request the inspection spec.										
3) SEM A. Basis on the SEM test of SEMASPEC90120401-STD B. Magnification of SEM Test: X3500±100 C. Check point: 2~5point (random) D. Fail that find one particle over 2.5um size/point E. Fail that find ten particles under 2.5um size/point F. Fail that find 25 particle under 2.5um size/5point G. According to customer's need request the inspection spec.										
4) AES(Auger)										
Element	Atomic Percentage									
Carbon	≤ 30									
Sulfur	≤ 1									
Phosphorus	≤ 2									
Silicon	≤ 1.5									
Nitrogen	≤ 2									
A. Basis on AES(Auger) standard data of SEMASPEC 91060573-STD B. Within 10A, Cr/Fe ratio must be over 1.5 except carbon layer. C. Oxide layer must be over 30A except carbon layer. D. Accoding to customer's need change the inspection spec. E. According to customer's need request the inspection spec										

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5) XPS

- A. Basis on XPS standard data of SEMASPEC 90120403-STD
- B. Cr/Fe ratio must be over 2.0
- C. CrO/FeO ratio must be over 3.0
- D. According to customer's need change the inspection spec.
- E. According to customer's need request the inspection spec

6) D.I. Water

item	class	256kb	1Mb	4Mb~16Mb	16Mb~64MB	64Mb~256Mb
		Rate of resistance	17~18	17.5~18	>18	>18.1
Particle (pcs/ml)	0.1um	50~150	10~20	<5		
	0.05um			<10	<5	<1
	0.03um					<10
	0.02um					
TOC(ppb)		50~100	30~50	<10	<5	<2
Oxigen(ppb)		50~100	30~50	<50	<10	<5
Silica(ppb)		10	5	<1	<1	<0.5

- A. Basis on DI Water data table of ASTM D5127-99
- B. Rate of resistance control more 18MΩ
- C. Bring a test to cluster per every year
- D. According to customer's need request the inspection spec.

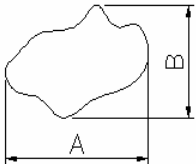
7). ELUTION ION MEASUREMENT

Elution ion Measurement (+)	+ ION						
	Na+	K+	NH4+	Mg ²⁺	Ca ²⁺		—
Result	N/D	N/D	N/D	N/D	N/D		—
N/D : Less than the detection							
Elution ion Measurement (-)	- ION						
	F-	Cl-	Br-	No ²⁻	Po ³⁻	Po ^{4³⁻}	So ^{4²⁻}
Result	N/D	N/D	N/D	N/D	N/D	N/D	N/D
N/D : Less than the detection							

- A. Basis on the elution ion measurement data table
- B. Fail to pass on over rate standard
- C. Bring a test to cluster per every year
- D. According to customer's need request the inspection spec.

8). PARTICLE SIZE (scar, cut, scratch, squeeze etc.)

-> Use that next method of calculation



$$\text{random figure size} = \frac{A + B}{2}$$

9). PRODUCT SIZE

- A. Basis on each product drawing
- B. Each size are according to detail customer spec
- C. Check 3 points per each part

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Spec of Standard Inspection						
10). LEAK TEST						
<ul style="list-style-type: none"> - CLEAN FITTINGS -> Over SIZE 3/4" twice per every year (hydor TEST 7~10 kg/cm², He & N₂) - PIPE & TUBE FITTINGS -> All Size, welding point of TEE with LEAK TEST (hydor TEST 7~10 kg/cm², He & N₂) - Maching Productor -> All Size, welding point of drawing standard 1.5 with LEAK TEST (hydor TEST standard 1.5 kg/cm², He & N₂) - According to customer need issue quality quarantee 						
11). PARTICLE TEST						
<ul style="list-style-type: none"> - CLEAN FITTING & PIPE & TUBE FITTING : No particle under 0.1um size/ea - OTHER : Fail that find 50 more particles under 0.1um size/ ea - Standard of EP According to customer's need requset the inspection 						
12). SKILL MEASUREMENT						
<ul style="list-style-type: none"> - Pressure -> FITTINGS standard 10~50kg/cm² (use fluid), bring a test to cluster Maching Productor drawing standard 1.5, fitting pressure standard under Φ100 FITTING Requet the test government (According to customer need request LEAK TEST & Pressure inspection) - Assemble -> CLEAN METAL SEAL FITTINGS NUT&GLAND, GASKET combination inspection (Combination Torque 5kg/cm² non-permition LEAK) Maching Productot non-problem skill, Under Torque 7kg/cm² combination (Use general tools) - Stability -> Non-preesure problem, Non-injury without glove at sharp point Maching Productor seperation part of cap with stability and operation efficiency 						
13). NAKED EYE						
<ul style="list-style-type: none"> -> All products follow inspection standard 						
14). PACKING						
<ul style="list-style-type: none"> - Pcking must be cleanroom (class 10) - All product must wrap double - VCR FITTING EP(blue)& BA(yellow) CAP - EP(blue) & BA(white) label - BENDING FITTING cap protect surface 						
15). According to customer's need request additional inspection and issue grade sheet by test government						

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Head	PIPE & TUBE				

Characteristic of Product

Drawing

A -> Surface
 B -> Inside surface
 C -> Tube Welding part

Spec of Standard Inspection

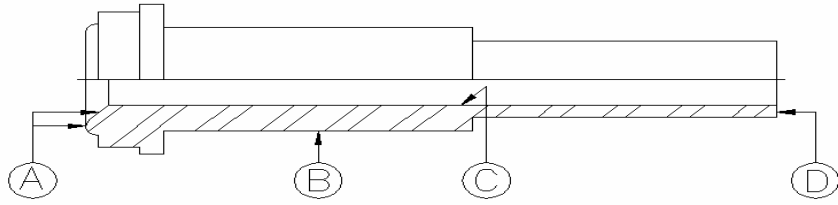
Pipe & Tube

size(inch)	Tolerance of Dimension	Tolerance of Thickness	BA Standard	EP Standard
1/4"	±0.1	±0.1	Ra≤15uinch	Ra≤7uinch
			Uniformed for inside machining Life	Uniform of glossy surface Any pit, particle, short does not exist
3/8"			SEM Test over 2point(X3500) that find ten particles under 2.5um size/point	Fail
				Result of AES Test Cr/Fe > 1.5 CrO/FeO > 2
1/2"	±0.15	±0.15	No scratch in the seal line and surface	
3/4"			Check over bent & curve	
1"	±0.20	±0.25	Precesion cleaning by18MΩ ultra purity water	
↓			Check over stain & particle	
2"			Vacuum Packing in 10class Clean Room	
↓	±0.25	±0.1		
3"				
15A	±0.1	±0.1		
20A				
25A				
32A				
40A	±0.15	±0.15		
50A				
65A	±0.3	±0.2		
80A				
100A	±0.5	±0.35		
150A				
200A	±1.0	±0.35		
250A				
300A				
	±1.8			

AF	<h1 style="margin: 0;">Inspection Standard</h1>		담 당	검 토	승 인
Head	METAL SEAL FITTINGS	결 재			

Characteristic of Product

Drawing



- A -> Metal Seal 실면
- B -> Surface
- C -> State of Inside EP & BA Grade
- D -> Tube Welding part

Spec of Standard Inspection

Matal seal fitting

size(inch)	Tolerance of Dimension	Tolerance of Thickness	BA Standard	EP Standard
1/4"	±0.05	±0.05	Ra≤10uinch	Ra≤5uinch
			Uniformed for inside machining Life	Uniform of glossy surface Any pit, particle, short does not exist
3/8"			SEM Test over 2point(X3500) find ten particles under 2.5um size/point	Fail that
			Result of AES Test 1.5 Cr/Fe > 1.5 CrO/FeO > 2	
1/2"			Seal parts must do rolling process, there must not remaining tiny scratch and cut (HV≥300)	
3/4"			No scratch in the seal line and surface	
	±0.1	±0.1	Precesion cleaning by18MΩ ultra purity water	
1"			Check over stain & particle	
			Vacuum Packing in 10class Clean Room	

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Head **WELD FITTINGS**

Characteristic of Product

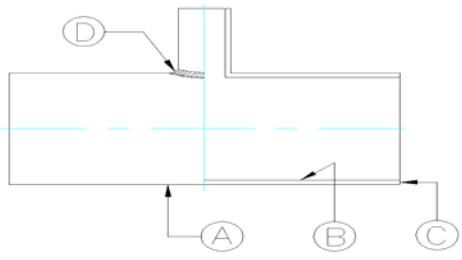
Drawing

A -> Surface
 B -> Inside surface
 C -> Tube Welding part

Spec of Standard Inspection

Clean fitting

size(inch)	Tolerance of Dimension	Tolerance of Thickness	BA Standard	EP Standard
1/4"	±0.05	±0.05	Ra≤10uinch	Ra≤5uinch
			Uniformed for inside machining Lile	Uniform of glossy surface Any pit, particle, short does not exist
3/8"			SEM Test over 2point(X3500) find ten particles under 2.5um size/point	Fail that
			Result of AES Test Cr/Fe > 1.5 CrO/FeO > 2	
1/2"	±0.1	±0.1	No scratch in the seal line and surface	
3/4"			Precesion cleaning by18MΩ ultra purity water	
			Check over stain & particle	
1"			Vacuum Packing in 10class Clean Room	

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Head	PIPE & TUBE FITTINGS			결			
Characteristic of Product				재			
Drawing				 <p>A -> Surface B -> Inside surface C -> Tube Welding part D -> Welding spot</p>			
Spec of Standard Inspection							
Pipe & Tube fitting							
size(inch)	Tolerance of Dimension	Tolerance of Thickness	BA Standard	EP Standard			
1/4"	±0.1	±0.1	Ra≤10uinch	Ra≤5uinch			
			Uniformed for inside machining Lile	Uniform of glossy surface Any pit, particle, short does not exist			
3/8"			SEM Test over 2point(X3500)	Fail that find ten particles under 2.5um size/point			
				Result of AES Test Cr/Fe > 1.5 CrO/FeO > 2			
1/2"	±0.15	±0.15	Weld products certainly havn't pin hole and must do Test of LEAK(10kg/cm ²)				
3/4"			No scratch in the seal line and surface				
1"			Fail to over ±0.5 degree rate of right angle				
↓	±0.20	±0.20	Precesion cleaning by18MΩ ultra purity water				
2"			Check over stain & particle				
↓	±0.25	±0.25	Vacuum Packing in 10class Clean Room				
3"							
15A	±0.15	±0.1					
20A							
25A							
32A							
40A	±0.4	±0.15					
50A							
65A							
80A	±0.8	±0.2					
100A							
150A	±2.0	±0.35					
200A							
250A							
300A							