

Modentic Valves

SUPER ALLOY SERIES



The typical Austenitic Stainless Steel – 18%Cr + 10% Ni have been adopted in corrosion resistant application for decades. In accordance with more and more application, the typical Austenitic stainless steel is not capable for more severe environment. More and stronger corrosion resistant ability by manifesting the feature of various element, are demanded by the market. With wider sources of castings and bar material, this year, 2010, Modentic decide to involve more in this field. Besides the casting, Modentic also storage the bar material. **Ball valves in sizes below 6" are available in the short delivery from the warehouse, and we also accept the customized products machined from bar.**

Material Code	Main Ingredient	Casting		
		ASTM	DIN	UNS
Austenitic Stainless Steel				
SS304	18Cr-8Ni	A351 CF8	1.4308	J92600
SS304L	18Cr-8Ni-LC	A351 CF3	1.4306	J92500
SS316	18Cr-9Ni-2Mo	A351 CF8M	1.4408	J92900
SS316L	18Cr-9Ni-2Mo-C<0.03%	A351 CF3M	1.4404	J92800
SS317	18Cr-12Ni-3.5Mo	A351 CG8M	1.4412	J93000
SS317L	18Cr-12Ni-3.5Mo-C<0.03%	A351 CG3M	1.4438	J92999
SS347	18Cr-10Ni-Nb	A351 CF8C	1.4552	J92710
904L	19Cr-23Ni-4.0Mo	-	1.4539	-
Alloy 20	29Ni-20.5Cr-3.5Cu-2.5Mo	A351 CN7M	1.4536	J95150
Super Austenitic Stainless Steel				
254 Mo	20Cr-18Ni-6.5Mo-N-Cu	A351 CK3MCuN	1.4308	J93254
Nickel Based Alloy				
Ni-Cu Alloy				
Monel 400	67Ni-30Cu	A494 M-35-1	2.4365	N24135
Ni-Cr Alloy				
Inconel 600	78Ni-15Cr-5Fe	A494 CY-40	2.4816	N06040
Ni-Mo Alloy				
Hastelloy B	67Ni-28Mo-5Fe	A494 N-12MV	2.4882	N30012
Hastelloy B2	67Ni-30Mo-1Fe	A494 N-7M	2.4617	
Ni-Cr-Mo Alloy				
Hastelloy C276	64Ni-18Cr-18Mo	A494 CW6M	2.4819	N30107
Hastelloy C22	58Ni-21Cr-14Mo-4Fe-3W	A494 CX2MW	9.4602	N26022
Hastelloy C	58Ni-16Cr-16Mo-6Fe-4W	A494 CW12MW	2.4686	N30002
inconel 625	65Ni-22Cr-9Mo-3.5Nb	A494 CW6MC	2.4856	N26625
Nickel				
Nickel CZ100	97Ni	A494 CZ-100	2.4066	N02100
Duplex Stainless Steel				
1A	25Cr-5Ni-Mo-Cu	A890 Gr.1A CD4MCu	1.4507	J93370
1B	25Cr-5Ni-Mo-Cu-N	A890 Gr.1B CD4MCuN	1.4507	J93372
2A	24Cr-5Ni-Mo-N	A955 Gr.2A CE8MN		J93345
2205/4A	22Cr-5Ni-Mo-N	A955 Gr.4A CD3MN	1.4462	J92205
Super Duplex Stainless Steel				
2507/5A	25Cr-7Ni-4Mo-N	A890 Gr.5A CE3MN		J93404
Z100/6A	25Cr-7Ni-3Mo-Cu-N-W	A890 Gr.6A CD3MWCuN	1.4468	J93380
329	25Cr-7Ni-3Mo-N		1.4507	

Effect of Major Alloying Elements

Comparative Corrosion Performance

CHROMIUM

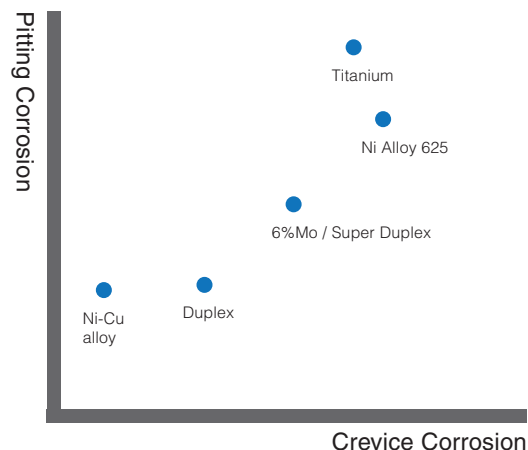
A stainless steel contains a minimum of 10.5% chromium because this level of chromium causes the spontaneous formation of a stable, transparent, passive, protective film. Increasing the level of chromium enhances corrosion resistance. At elevated temperatures, chromium provides resistance to oxidation and sulfur-containing and other corrosive atmospheres; contributes to high temperature creep and rupture strength; and, in some alloys, increases resistance to carburization.

NICKEL

Nickel in stainless steels promotes the stability of austenite. Austenite is stronger and more stable at higher temperatures than ferrite. Less nickel is needed to retain an austenitic structure as the nitrogen or carbon levels increase. When sufficient nickel is added to a chromium stainless steel, the structure changes from ferritic to austenitic. Adding nickel improves toughness, ductility, and weldability. Nickel increases resistance to oxidation, carburization, nitriding, thermal fatigue, and strong acids, particularly reducing acids. It is an important alloying element in stainless steel and nickel-base alloys used for corrosive and high temperature applications.

MOLYBDENUM

Molybdenum additions improve resistance to pitting and crevice corrosion in chloride-containing environments and corrosion by sulfuric, phosphoric, and hydrochloric acids. The elevated temperature mechanical properties of austenitic stainless steels and the strength and tempering resistance of martensitic stainless steels are improved by molybdenum.



Material Code	Bar or Forged			Typical Application
	ASTM	DIN	UNS	
Austenitic Stainless Steel				
SS304	A276 304	1.4301	S30400	Pulp and paper mills, chemical processes, and seawater service
SS304L	A276 304L	1.4306	S30403	
SS316	A276 316	1.4401	S31600	
SS316L	A276 316L	1.4404	S31603	
SS347	A276 347	1.455	S34700	
SS317	A276 317	1.4449	S31700	
SS317L	A276 317L	1.4438	S31703	Power generation, seawater service, and oil pipelines
904L	AISI 904L	1.4539	N08904	Production and transport of sulfuric acid Paper and allied industries Gas washing Chemical and pharmaceutical industries
Alloy 20	A473 N08020	2.4460	N08020	Chemical processes handling acetic acid, alkali, dilute hydrochloric acid, dilute hydrofluoric acid, dilute fluorosilic acid and phosphoric acid, also for oil refining
Super Austenitic Stainless Steel				
254 Mo	A276 S31254		S31254	Chemical processes for highly concentrated chloride, flue gas desulfurization, acid and alkali reactor, salt manufacturing processes and seawater desalination
Nickel Based Alloy				
Ni-Cu Alloy				
Monel 400	B164 N04400	2.4360	N04400	Chemical processes handling alkali chloride and boiled acid, also for oil refining
Ni-Cr Alloy				
Inconel 600	B166 N06600	2.4817	N06600	Chemical and food processes
Ni-Mo Alloy				
Hastelloy B	B335 N10001	2.4819	N10001	Corrosion resistant processes handling chlorine, sulfuric acid, phosphoric acid, acetic acid and hydrogen chloride gas, also for processes handling chloride with high concentration at high temperature
Hastelloy B2	B335 N10665	2.4856	N10665	
Ni-Cr-Mo Alloy				
Hastelloy C276	B574 N10276	2.4819	N10276, N10002	Processes handling oxidizing acid, formic acid, acetic anhydride and seawater, also for chemical processes handling fluoride
Hastelloy C22	B574 N06022	2.4602	N06022	
Hastelloy C	B574 N10276	2.4819	N10276	
Inconel 625	B446 N06625	2.4856	N06625	High tensile, creep, rupture strength, outstanding fatigue and thermal-fatigue strength; oxidation resistance; and excellent weldability and brazeability
Nickel				
Nickel CZ100	B160 N02200	2.4068	N02200	Equipment handling corrosives such as caustics; applications where it is necessary to avoid contamination of a product with metals such as copper and iron.
Duplex Stainless Steel				
1A	A790 S31260	-	S31260	Pulp and paper mills, chemical processes, and seawater service
1B	A790 S31260	-	S31260	
2A				
2205/4A	A276 S32205	1.4462	S32205	
Super Duplex Stainless Steel				
2507/5A	A479 S32750	1.4460	S32750	salt/seawater application, sulfuric acid, phosphoric acid, formic acid, acetic acid
Z100/6A	A479 S32750	1.4460	S32750	
329	A479 S32750	1.4460	S32750	

Application and Selection of Stainless Steel Material

Typical Application		Service Environment		ASTM Material Designations
Seawater	Seawater handling	Seawater desalination	Pitting corrosion resistance Crevice corrosion resistance	A351 CD3MWCuN (UNS S32760)
		Heat exchangers		A351 CD3MWCuN (UNS S32760)
		Pumps		A351 CN3MN
	Salt Manufacturing	Salt manufacturing process Bittern making process	Pitting corrosion resistance Crevice corrosion resistance	A351 CF3M
				A351 CD3MWCuN (UNS S32760)
				A351 CN3MN
Chemical	Sulfuric acid	Lower concentration	Acid resistance (whole surface corrosion) Intergranular corrosion resistance	A351 CK3MCuN
				A351 CK3MCuN
				A351 CF3M
				Hastelloy C276
	Nitric acid	Any concentration	Acid resistance (whole surface corrosion)	A351 CF3M
	Hydrochloric acid	Lower concentration	Acid resistance (whole surface corrosion)	A351 CD3MWCuN (UNS S32760)
				Alloy 20
				Hastelloy C276
				Hastelloy B
	Acetic acid	Any concentration	Acid resistance (whole surface corrosion) Pitting corrosion resistance	A351 CF3M
				A351 CD3MWCuN (UNS S32760)
				A351 CF3MN
				A351 CK3MCuN
				Alloy 20
Urea synthesizing	Carbamide	Acid resistance (whole surface corrosion) Delta ferrite (selective corrosion)	Hastelloy C276	
			A351 CF3M	
Soda manufacturing	30 to 50% NaOH	Whole surface corrosion resistance	A351 CD3MWCuN (UNS S32760)	
	Higher temperature and higher concentration	Whole surface corrosion resistance Stress corrosion cracking resistance	Alloy 20	
Oil Refining Petrochemical	Hydro desulfurization	H ₂ -H ₂ S	Polytheonic acid resistance Stress corrosion cracking resistance	A351 CF8C
		Wet H ₂ S	H ₂ S corrosion resistance	A351 CF3M
	Heat exchangers Piping	Seawater (cooling water)	Pitting corrosion resistance Crevice corrosion resistance (seawater resistance)	A351 CD3MWCuN (UNS S32760)
Environment	Flue gas desulfurization (wet)	Absorption	Pitting corrosion resistance Crevice corrosion resistance	A351 CF3M
				A351 CD3MWCuN (UNS S32760)
				A351 CN3MN
City garbage furnace	Superheater (for high heat efficiency at 400°C)	Molten salt corrosion resistance	A351 CK3MCuN	
Energy	Boilers	Seawater piping	Pitting corrosion resistance Crevice corrosion resistance (seawater resistance)	A351 CF3M
				A351 CD3MWCuN (UNS S32760)

1. V-006



2. V-255



3. V-155FS



4. MD-82



5. MD-54



6. HPV-40/41



7. V-S05



Super Alloy Valves
CASTING

1. V-006

2 PIECES, Full Port, Threaded End
PRESSURE: 1000 psi
SIZE: 1/2" ~ 2"

2. V-255

3 PIECES, Full / Reduced Port,
Threaded / Socket / Butt Weld End
PRESSURE: 2000 / 1500 psi
SIZE: 1/2" ~ 2"
OPTION: API607 Fire Safe Approved

3. V-155FS

3 PIECES, Full / Reduced Port,
Threaded / Socket / Butt Weld End
PRESSURE: 2000 / 1500 / 1000 psi
SIZE: 1/4" ~ 2-1/2"
OPTION: API607 Fire Safe Approved

4. MD-82

2 PIECES, Full Port, Flanged End
ANSI Class 150 / 300 / PN16 / PN40
SIZE: 1/2" ~ 4"
OPTION: API607 Fire Safe Approved

5. MD-54

3 PIECES, Full Port / Trunnion Mounted
Flanged End RF
ANSI Class 150 / 300
SIZE: 14" ~ 20"

Super Alloy Valves
BAR

6. HPV-40/41

3 PIECES, Full / Reduced Port,
Threaded / Socket / Butt Weld End
PRESSURE: 3000 / 6000 psi
SIZE: 1/4" ~ 2"
OPTION: API607 Fire Safe Approved

7. V-S05

3 PIECES, Full Port,
Threaded / Socket / Butt Weld End
PRESSURE: 1000 psi
SIZE: 1/4" ~ 2"
OPTION: API607 Fire Safe Approved

1. Gate Valve
GTF



2. Globe Valve
GBF



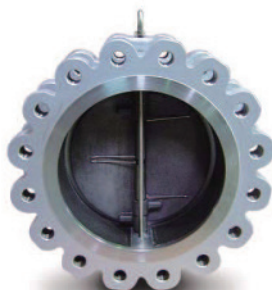
3. Check Valve
SF



4. MV-1220
Wafer Type



5. MV-1221
Lug Type



6. NV-0060
NV-0061



Super Alloy Valves

API600 / API603 Design
Gate • Globe • Check Valves

1. GTF - Gate Valve
ANSI Class 150 / 300 / 600
SIZE: 2" ~ 24"

2. GBF - Globe Valve
ANSI Class 150 / 300 / 600
SIZE: 2" ~ 24"

3. SF - Check Valve
ANSI Class 150 / 300 / 600
SIZE: 2" ~ 24"

Super Alloy Valves

API594 / API6D Design
Dual Plate Check Valves

4. MV-1220 Wafer Type
ANSI Class 150 / 300 / JIS10K / PN16 / PN40
SEAT: NBR / EPDM / Viton / Metal
SIZE: 1-1/2" ~ 60"

5. MV-1221 Lug Type
ANSI Class 150 / 300 / PN16 / PN40
SEAT: NBR / EPDM / Viton / Metal
SIZE: 2" ~ 20"

6. Needle Valve (**from bar**)
NV-0060 Female x Female
NV-0061 Male x Female
CWP: 6000 psi
SIZE: 1/4" ~ 1"