



Comparison between Strain Hardened Nonmagnetic Mn-Cr Alloy (19Mn) and Strain Hardened AF932N[®] (UNS S31010) Alloy

Typical Chemical Composition (Residual elements max 0.5 %, Fe as balance)

	C	Mn	Cr	Ni	Mo	N	Si
Nonmagnetic 19Mn	0.05	19.6	18.7	3.8	1.8	0.58	0.55
AF932N[®] (UNS S31010)	0.02	6.3	29.5	14.6	1.7	0.82	0.33



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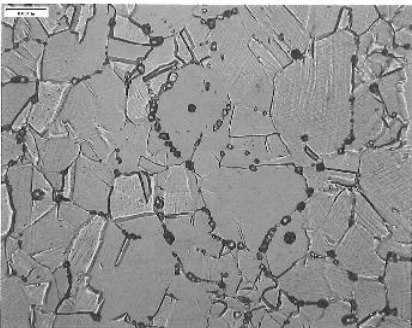
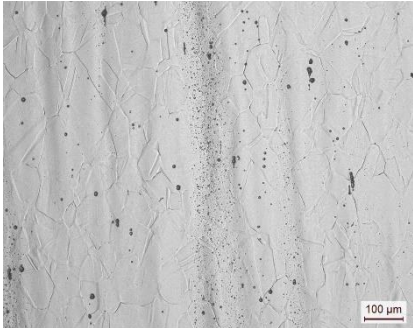
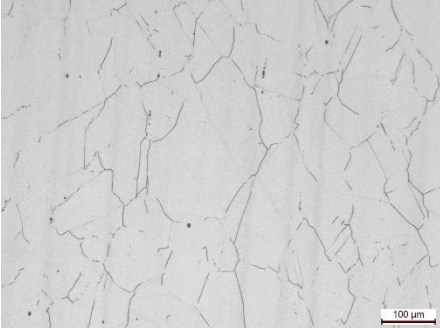
Mechanical Properties

	Requirement	Nonmagnetic 19Mn Alloy	AF932N [®] (UNS S31010) Alloy
Longitudinal Tensile Properties at Room Temperature (ASTM E8)			
0.2 % Offset Yield Strength	965 MPa (140 ksi) min	1064 MPa (154 ksi)	1066 MPa (155 ksi)
Ultimate Tensile Strength	1034 MPa (150 ksi) min	1134 MPa (165 ksi)	1173 MPa (170 ksi)
Elongation	20 % min	28 %	32 %
Reduction of Area	40 % min	72 %	73 %
Longitudinal Tensile Properties at 177 °C (ASTM E21)			
0.2 % Offset Yield Strength	827 MPa (120 ksi) min	889 MPa (129 ksi)	883 MPa (128 ksi)
Longitudinal Charpy-V-Notch Impact Properties at Room Temperature (ASTM E23)			
Absorbed Energy	120 J (89 ft-lbs) min	209 J (154 ft-lbs)	232 J (171 ft-lbs)
Brinell Hardness (ASTM E10)	300-415 HBW	381 HBW	370 HBW



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Corrosion Properties

	Requirement	Nonmagnetic 19Mn Alloy	AF932N [®] (UNS S31010) Alloy
Corrosion Resistance to ASTM A262 – Practice A	Step Structure with limited amount of carbides 	Step Structure with limited amount of carbides 	Step Structure without carbides 



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Microscopic Cleanliness

		Requirement	Nonmagnetic 19Mn Alloy	AF932N [®] (UNS S31010) Alloy
Inclusion Rating (ASTM E45 – Method A)				
Thin	Type A	1.5 max	0	0
	Type B	1.5 max	0.8	1.0
	Type C	2 max	1.0	1.0
	Type D	1.5 max	1.0	1.0
Heavy	Type A	1.5 max	0	0
	Type B	1.5 max	0.5	0.3
	Type C	2 max	0.7	1.3
	Type D	1.5 max	0.5	0.5