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CHEMICAL PROPERTIES OF STEEL FASTENERS

SPECIFICATION	CHEMICAL COMPOSITION (%)											REMARK
		C	Si	Mn	P	S	Ni	Cr	Mo	B	V	
SAE J429 GRADE 1	MAX	0.55			0.048	0.058						
	MIN											
SAE J429 GRADE 2	MAX	0.55			0.048	0.058						
	MIN											
SAE J429 GRADE 4	MAX	0.55			0.048	0.130						
	MIN											
SAE J429 GRADE 5	MAX	0.55			0.048	0.058						
	MIN	0.28										
SAE J429 GRADE 5.1	MAX	0.3			0.048	0.058						
	MIN	0.15										
SAE J429 GRADE 5.2	MAX	0.25			0.048	0.058				0.0005		
	MIN	0.15		0.74								
SAE J429 GRADE 7	MAX	0.55			0.048	0.045						
	MIN	0.28										
SAE J429 GRADE 8	MAX	0.55			0.040	0.045						
	MIN	0.28										
SAE J429 GRADE 8.1	MAX	0.55			0.040	0.058						
	MIN	0.28										
SAE J429 GRADE 8.2	MAX	0.25			0.040	0.058				0.0005		
	MIN	0.15		0.74								
ASTM A193 / 193M Grade B6	MAX	0.15	1.00	1.00	0.040	0.03		13.50				
	MIN							11.50				
ASTM A193 / 193M Grade B7	MAX	0.49	0.35	1.10	0.035	0.040		1.20	0.25			
	MIN	0.37	0.15	0.65				0.75	0.15			
ASTM A193 / 193M Grade B16	MAX	0.47	0.35	0.70	0.035	0.040		1.15	0.65		0.35	
	MIN	0.36	0.15	0.45				0.80	0.50		0.25	
ASTM A193 / 193M Class 1 Grade B8	MAX	0.08	1.00	2.00	0.045	0.030	10.50	20.00				
	MIN						8.00	18.00				
ASTM A193 / 193M Class 1 Grade B8M	MAX	0.08	1.00	2.00	0.045	0.030	14.00	18.00	3.00			
	MIN						10.00	16.00	2.00			
ASTM A194 / 194M Grade 1	MAX		0.40	1.00	0.040	0.050						
	MIN	0.15										
ASTM A194 / 194M Grade 2.2H	MAX		0.40	1.00	0.040	0.050						
	MIN	0.4										
ASTM A194 / 194M Grade 4	MAX	0.5	0.35	0.90	0.035	0.040			0.30			
	MIN	0.4	0.15	0.70					0.20			
ASTM A194 / 194M Grade 6	MAX	0.15	1.0	1.00	0.040	0.030		13.50				
	MIN							11.50				
ASTM A194 / 194M Grade 7	MAX	0.49	0.35	1.10	0.04	0.04		1.20	0.25			
	MIN	0.37	0.15	0.65				0.75	0.15			

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		C	Si	Mn	P	S	Ni	Cr	Mo	B	V	
ASTM A194 / 194M Grade 8	MAX	0.08	1.00	2.00	0.045	0.030	10.50	20.00				
	MIN						8.00	18.00				
ASTM A194 / 194M Grade 8M	MAX	0.08	1.00	2.00	0.045	0.030	14.00	18.00	3.00			
	MIN						10.00	16.00	2.00			
ASTM A307 Grade A	MAX				0.06	0.15						
	MIN											
ASTM A307 Grade B	MAX				0.04	0.05						
	MIN											
ASTM A320/320 M Grade L7	MAX	0.48	0.35	1.00	0.035	0.040		1.10	0.25			
	MIN	0.38	0.15	0.75				0.80	0.15			
ASTM A320/320 M Class 1 Grade B8	MAX	0.08	1.00	2.00	0.045	0.030	10.50	20.00				
	MIN						8.00	18.00				
ASTM A320/320 M Class 1 Grade B8M	MAX	0.08	1.00	2.00	0.045	0.030	14.00	18.00	3.00			
	MIN						10.00	16.00	2.00			
ASTM A325 Type 1	MAX	0.52	0.35		0.035	0.040						Alloy Steel
	MIN	0.30	0.15	0.60								
ASTM A325 Type 1	MAX	0.52			0.040	0.050						Carbon Steel
	MIN	0.30		0.60								
ASTM A325 Type 1	MAX	0.52			0.040	0.050				0.003		Boron Steel
	MIN	0.30		0.60						0.0005		
ASTM A325M Type 1	MAX	0.55			0.048	0.058						
	MIN	0.25										
ASTM A325M Type 2	MAX	0.40			0.048	0.058				0.0005		
	MIN	0.15		0.74								
ASTM A449 Type 1	MAX	0.55			0.040	0.050						
	MIN	0.28		0.60								
ASTM A449 Type 2	MAX	0.55			0.040	0.050						
	MIN	0.28		0.60								
ASTM A490 Type 1	MAX	0.34			0.040	0.040						
	MIN	0.15										
ASTM A490 Type 2	MAX	0.53			0.040	0.050				0.0005		
	MIN	0.20		0.70								
ASTM A490 Type 3	MAX	0.55			0.040	0.050						
	MIN	0.20		0.40			0.20	0.45	0.15			
ASTM A490M Type 1	MAX	0.40			0.040	0.045						
	MIN	0.15										
ASTM A490M Type 2	MAX	0.55			0.048	0.058						
	MIN			0.74								
ASTM A563 Grade O,A,B,C	MAX	0.55			0.12	0.15						
	MIN											
ASTM A563 Grade D	MAX	0.55			0.04	0.05						
	MIN			0.30								
ASTM A563 Grade DH	MAX	0.55			0.04	0.05						
	MIN	0.20		0.30								

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		C	Si	Mn	P	S	Ni	Cr	Mo	B	V												
ASTM A563M Grade 8S	MAX	0.55			0.04	0.15																	
	MIN																						
ASTM A563M Grade 10S	MAX	0.55			0.04	0.05																	
	MIN			0.30																			
JIS B1051 KS B0233 4T	MAX	0.55			0.050	0.060																	
	MIN																						
JIS B1051 KS B0233 8.8T	MAX	0.55			0.35	0.035																	
	MIN	0.25																					
JIS B1051 KS B0233 8.8T	MAX	0.40			0.035	0.035						Additives e.g. B, Mn, Cr											
	MIN	0.15																					
JIS B1051 KS B0233 10.9T	MAX	0.55		0.60	0.035	0.035						Alloy Steel											
	MIN	0.20																					
JIS B1051 KS B0233 10.9T	MAX	0.35			0.035	0.035						Additives e.g. B, Mn, Cr											
	MIN	0.15																					
JIS B1051 KS B0233 12.9T	MAX	0.50		0.70	0.035	0.035						Alloy Steel											
	MIN	0.20																					
JIS B1186 KS B1010 F8T	MAX	NOT REQUIRED																					
	MIN																						
JIS B1186 KS B1010 F10T	MAX																						
	MIN																						
JIS B1186 KS B1010 F11T	MAX																						
	MIN																						
JIS B1052 KS B0234 4T	MAX	0.50			0.110	0.150																	
	MIN																						
JIS B1052 KS B0234 8T	MAX	0.58			0.060	0.150																	
	MIN			0.25																			
JIS B1052 KS B0234 10T	MAX	0.58			0.048	0.058																	
	MIN			0.30																			
JIS B1186 KS B1010 F8	MAX	NOT REQUIRED																					
	MIN																						
JIS B1186 KS B1010 F10	MAX																						
	MIN																						
SAE J995 Grade 2	MAX												0.47			0.12	0.15						
	MIN																						
SAE J995 Grade 5	MAX	0.55			0.05	0.15																	
	MIN			0.30																			
SAE J995 Grade 8	MAX	0.55			0.04	0.05																	
	MIN			0.30																			