



**SUMINISTROS
INDUSTRIALES
DÍAZ**

CATÁLOGO ESPÁRRAGOS



VISÍTENOS EN:

Av. Puebla 515 Col. Palma Sola, CP 93320.

Poza Rica Veracruz, México

Teléfonos: 7821606595, 7821604051 y 7821610766



contacto@sidadz.com



www.sidadz.com





ASTM A-193 / ASME SA - 193

Aceros aleados e inoxidables para servicios de alta presión y alta temperatura
Alloy steel and stainless steel bolting for high-temperature

	FERRITIC STEEL					AUSTENITIC STEEL			
	B5	B6	B7	B7M	B16	B8	B8M	B8T	B8C
AISI	501	410	4140			304	316	321	347
DIN	12CrMo 19-5	X10Cr13	42CrMo4		24CrMo V55	X5CrNi 18-8	X5CrNiMo 17-12-2	X6CrNiTi 18-10	X6CrNiNb 18-10
W.-Nr.	1.7362	1.4006	1.7225		1.7711	1.4301	1.4401	1.4541	1.4550

COMPOSICIÓN QUÍMICA / CHEMICAL REQUIREMENTS

	0,10 min	0,08-0,15	0,37-0,49	0,36-0,47	0,08 max.	0,08 max.	0,08 max.	0,08 max.
C%								
Mn %	1 max	1 max.	0,65-1,10	0,45-0,70	2 max.	2 max.	2 max.	2 max.
Si %	1 max.	1 max.	0,15-0,35	0,15-0,35	1 max.	1 max.	1 max.	1 max.
P max. %	0,040	0,040	0,035	0,035	0,045	0,045	0,045	0,045
S max. %	0,030	0,030	0,040	0,040	0,030	0,030	0,030	0,030
Cr. %	4-6	11,5-13,5	0,75-1,20	0,80-1,15	18-20	16-18	17-19	17-19
Ni %					8-11	10-14	9-12	9-12
Mo %	0,40-0,65		0,15-0,25	0,50-0,65		2-3		
V %				0,25-0,35				
Al Max. %				0,015				
Ti %							5x(C+N)min. 0,70 max.	
Cb+Ta								10xC min. 1,10 max.

PROPIEDADES MECÁNICAS / MECHANICAL REQUIREMENTS

Diameter	up to 4"	up to 4"	2 1/2" and under	2 1/2" and under	2 1/2" and under	Class 1: All Diameters			
T.S. min. Mpa	690	760	860	690	860	515	515	515	515
Y.S. min 0.2% Mpa	550	585	720	550	725	205	205	205	205
Elongation min. %	16	15	16	18	18	30	30	30	30
Red. of Area min. %	50	50	50	50	50	50	50	50	50
Hardness max. HB			321	235	321	223	223	223	223
			B7	B7M	B16	B8 CL2 - B8T CL2 - B8C CL2			
Diameter			over 2 1/2" to 4"	over 2 1/2" to 4"	over 2 1/2" to 4"	3/4" and under	over 3/4" to 1"	over 1" to 1 1/4"	over 1 1/4" to 1 1/2"
T.S.min.Mpa			795	690	760	860	795	725	690
Y.S. min 0.2% Mpa			655	650	655	690	550	450	345
Elongation min. %			16	18	17	12	15	20	28
Red. of Area min. %			50	50	45	35	35	35	45
Hardness max. HB			321	235	321	321	321	321	321
			B7	B7M	B16	B8M		CL2	
Diameter			over 4" to 7"	over 4" to 7"	over 4" to 7"	3/4" and under	over 3/4" to 1"	over 1" to 1 1/4"	over 1 1/4" to 1 1/2"
T.S.min.Mpa			690	690	690	760	690	655	620
Y.S min. 0.2% Mpa			515	515	586	655	550	450	345
Elongation min. %			18	18	16	15	20	25	30
Hardness max. HB			321	235	321	321	321	321	321
Red. of Area min. %			50	50	45	45	45	45	45





ASTM A-194 / ASME SA 194

Aceros para tuercas / Carbon and Alloy Steel Nuts

Grade	2H	2HM	3	4	6	6F	7	7M	8	8T	8M	8C
COMPOSICIÓN QUÍMICA / CHEMICAL REQUIREMENTS												
C %	≤ 0.40	≤ 0.40	≤ 0.10	0.40-0.50	≤ 0.15	0.15	0.37-0.49	0.37-0.49	0.08	0.08	0.08	0.08
Mn %	≤ 1	≤ 1	≤ 1	0.70-0.90	≤ 1.00	1.25	0.65-1.10	0.65-1.10	2	2	2	2
P max.%	0.04	0.04	0.04	0.035	0.04	0.06	0.035	0.035	.045	.045	.045	.045
S max.%	0.05	0.05	0.03	0.04	0.03	0.06	0.04	0.04	0.03	0.03	0.03	0.03
Si %	≤ 0.40	≤ 0.40	≤ 1	0.15-0.35	≤ 1	≤ 1	0.15-0.35	0.15-0.35	≤ 1	≤ 1	≤ 1	≤ 1
Ni %									8-11	9-12	10-14	9-12
Cr %			4-6		11.5-13.5	12-14	0.75-1.20	0.75-1.20	18-20	17-19	16-18	17-19
Mo %			0.40-0.65	0.20-0.30			0.15-0.25	0.15-0.25			2-3	
Ti %										5xC+N min 0.7max		
Se %						≤ 0.15						
Cb + Ta %												10xC. min.
PROPIEDADES MECÁNICAS / MECHANICAL REQUIREMENTS												
Brinell Hardness Limits	To 1 1/2" inc. 248-327	159	248	248	228	228	248	159	126	126	126	126
	Over 1 1/2" 212-327	235	327	327	271	271	327	235	300	300	300	300
EQUIVALENCES												
AISI	1040	1040	501		410	416 Se	4140	4140	304	321	316	347
UNS	K04002	K04002	S50100	K14510	S41000	S41623	G41400	S 30400	S 32100	G 41400	S 31600	S 34700
DIN	C45	C45	12CrMo 19-5		x10Cr13		42CrMo4	42CrMo4	X5CrNi 18.8	X10CrNi Ti 18.10	X5CrNi Mo 17-12-2	X6CrNi Nb 18.10
W-NR	1.1191	1.1191	1.7362		1.4006		1.7225	1.7225	1.4301	1.4541	1.4401	1.4550





SUMINISTROS INDUSTRIALES DÍAZ

Aceros aleados e inoxidables para la baja temperatura
Alloy steel bolting for low-temperature

ASTM A-320 / SA-320

Aceros para tornillos y tuercas / Carbon steel bolts and nuts

	ASTM A-320 / ASME SA-320 Alloy steel bolting for low-temperature						ASTM A-307 / SA-307 Carbon steel bolts and nuts			
	FERRITIC STEEL			AUSTENITIC STEEL				CARBON STEEL		
	L7	L7M	L43	B8	B8M	B8T	B8C	GR.A	GR.B	GR.C
AISI	4140		4340	304	316	321	347			
DIN	42CrMo4		40NiCr Mo6	X5CrNi18-8	X5CrNiMo 17-12-2	X6CrNiTi 18-10	X6CrNiNb 18-10			
W-Nr.	1.7225		1.6565	1.4301	1.4401	1.4541	1.4550			
COMPOSICIÓN QUÍMICA / CHEMICAL REQUIREMENTS										
C%	0,38-0,48		0,38-0,43	0,08 max.	0,08max.	0,08max.	0,08 max	0,29 max.		
Mn %	0,75-1,00		0,60-0,85	2 max.	2 max.	2 max.	2 max.	0,90 max.		
Si %	0,15-0,35		0,15-0,35	1 max.	1 max.	1 max.	1 max.	0,50 max.		
P max. %	0,035		0,035	0,045	0,045	0,045	0,045	0,04 max.		
S max. %	0,040		0,040	0,030	0,030	0,030	0,030	0,15	0,05	
Cr %	0,80-1,10		0,70-0,90	18-20	16-18	17-19	17-19			
Ni %			1,65-2,00	8-11	10-14	9-12	9-12			
Mo%	0,15-0,25		0,20-0,30		2-3					
Ti %						5xC min.				
Cb+Ta							10 x C min. 1,10 max.			
PROPIEDADES MECÁNICAS / MECHANICAL REQUIREMENTS										
Diameter	2 1/2" and under	2 1/2" and under	4" and under	Class 1 : all diameters				All diameters		
T.S. min Mpa	860	690	860	515	515	515	515	415	415-690	400-500
Y.S. min 0.2% Mpa	725	550	725	205	205	205	205			248
Elongation min. %	16	18	16	30	30	30	30	18	18	23
Red. of Area min. %	50	50	50	50	50	50	50			
Impact. Test Min. (J)	Ind. (20) med. (27)									
Temp.	-101°C	-73°C	-101°C							
Hardness max. HB		235		223	223	223	223	121-241	121-212	
B8 CL2 - B8T CL2 - B8C CL2										
Diameter				3/4" and under	over 3/4" to 1"	over 1" to 1 1/4"	over 1 1/4" to 1 1/2"			
T.S. min. Mpa				860	795	725	690			
Y.S. min. 0.2 % Mpa				690	550	450	345			
Elongation min. %				12	15	20	28			
Red. of Area min. %				35	35	35	45			
Hardness max. HB				321	321	321	321			
B8M CL2										
Diameter				3/4" and under	over 3/4" to 1"	over 1" to 1 1/4"	over 1 1/4" to 1 1/2"			
T.S. min. Mpa				760	690	655	620			
Y.S. min. 0.2% Mpa				655	550	450	345			
Elongation min. %				15	20	25	30			
Red. of Area min. %				45	45	45	45			
Hardness max. HB				321	321	321	321			



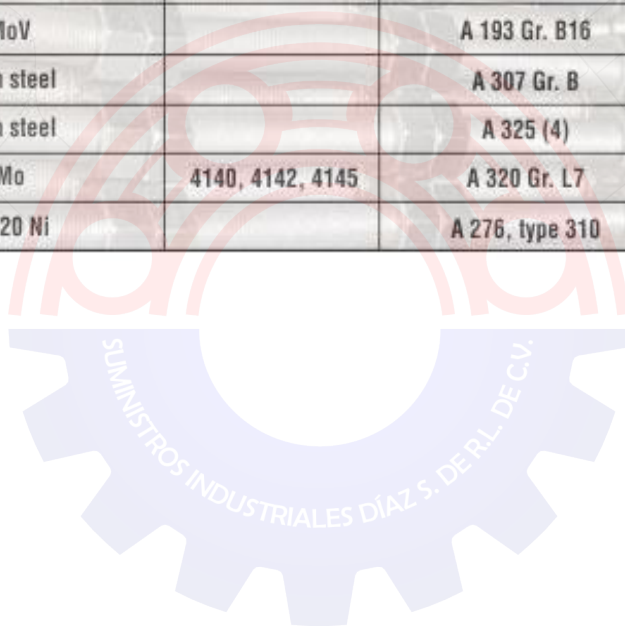


SELECCION DE MATERIALES DE TORNILLERIA

SELECTION OF RECOMMENDED MATERIALS FOR SCREW FASTENINGS

De aceros al carbono, aleados e inoxidables / Of carbon steels, steel alloys, and stainless steels

Screw	Screw fastening material (generic)	Material	ASTM Specifications (1)	
			Screw	Nuts
B5	5Cr	501	A 193 Gr. B5	A 194 Gr. 3
B6	12Cr	410	A 193 Gr. B6	A 194 Gr. 6
B7, B7M	Cr-Mo	4140, 4142 or 4145	A 193 Gr. B7, B7M	A 194 Gr. 2H, 2HM
B8(3)	18Cr-8Ni	304	A 193 Gr. B8, Cl. 1 or Cl. 2	A 194 Gr. 8
B8T	18Cr-10Ni-Ti	321	A 193 B8T	A 194 Gr. 8
B8M	18Cr-10Ni-2 Mo	316	A320 Gr. B8M Cl. 1	A 194 Gr. 8M
B16	Cr MoV		A 193 Gr. B16	A 194 Gr. 4 or 7
A-307	Carbon steel		A 307 Gr. B	A 194 Gr. 2H
A-325	Carbon steel		A 325 (4)	A 325 (4)
L7	Cr-Mo	4140, 4142, 4145	A 320 Gr. L7	A 194 Gr. 4 or 7
310	25 Cr-20 Ni		A 276, type 310	A 276, type 310





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Teléfonos

**7821606595
7821604051
7821610766**



www.sidiaz.com



Suministros Industriales Díaz



contacto@sidiaz.com



@SiDiazMex



@sidiazmex



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