

# SUPER ALLOY AND ELECTRICAL STEEL

## GRADES STOCKED

SPECIFICATIONS	SPECIFICATIONS
<p><b>A-286 AGE HARD (1650° SOL. TREATED)</b>            AMS-5737, ASTM-A-638 GR. 660 TYPE 1, ASTM-A-453 GR. 660 CL. A</p> <p><b>A-286 AGE HARD (1800° SOL. TREATED)</b>            AMS-5732 (SUPERSEDES AMS-5735), ASTM-A-638 GR. 660 TYPE 2, ASTM-A-453 GR. 660 CL. B</p> <p><b>A-286 SOL. TREATED</b> AMS-5731 (SUPERSEDES AMS-5736) CAP. OF AMS-5732, MS-301, HI-SHEAR #140 TYPE 3 (CHEMS ONLY)</p> <p><b>A-286 (CAP. 160 KSI) "COLD REDUCED"</b> CHEMS ONLY TO FOLLOWING: AMS-5731, AMS-5732, AMS-5734, AMS-5736, AMS-5737, AMS-5853, SPS-M-118 (CHECK TRS), HI-SHEAR #140 TYPE 1</p> <p><b>A-286 (CAP. 210 KSI) "COLD REDUCED"</b> AMS-5726, SPS-M-250 (CHECK TRS), CHEMS ONLY TO FOLLOWING: AMS-5731, AMS-5732, AMS-5734, AMS-5736, AMS-5737, HI-SHEAR #140 TYPE 2</p> <p><b>NICKEL "200"</b> ASTM-B-160</p> <p><b>NICKEL "400"</b> AMS-4675 (CHEMS ONLY), QQN-281 CL. A, ASTM-B-164</p> <p><b>NICKEL "405"</b> AMS-4674, QQN-281 CL. B, ASTM-B-164 CL. B, ASME-B-164 CL. B</p> <p><b>NICKEL "K-500" SOL. TR.</b> AMS-4676 CHEMS ONLY, QQN-286 FORM 1 REV E ONLY (H.F. ANN. &amp; UNAGED)</p> <p><b>NICKEL "K-500" SOL. TR. &amp; AGED</b> AMS-4676 CHEMS ONLY, QQN-286 FORM 2 REV E ONLY (H.F. ANN. &amp; AGED)</p> <p><b>NICKEL "600"</b> AMS-5665 (CHEMS ONLY), ASTM-B-166 (CHEMS ONLY), MIL-N-6710 AMD. 2 (EXC. MAX. TENS.)</p> <p><b>NICKEL "625"</b> AMS-5666, ASTM-B-446 GRD. 1</p> <p><b>NICKEL "800"</b> ASTM-B-408, ASME-B-408 (CHEMS ONLY BOTH SPECS)</p> <p><b>NICKEL "800 H"</b> ASTM-B-408, ASME-B-408</p> <p><b>NICKEL "800 HT"</b> ASTM-B-408, ASME-B-408</p> <p><b>NICKEL "825"</b> ASTM-B-425, ASME-B-425</p>	<p><b>718 VAC. MELT.</b> AMS-5662, ASTM-B-637, ASME-SB-637, CAP. OF AMS-5663, B50TF15 CL. D, SPS-M-275 (CHEMS ONLY), C50TF13 (CHEMS ONLY), B50T69A, HI-SHEAR #156 (CHEMS ONLY), EN 2404 (UNDER 4" ROUND ONLY)</p> <p><b>718 VAC. MELT. (CAP. 220 KSI) "COLD REDUCED"</b> AMS-5962, SPS-M-637, CHEMS ONLY TO FOLLOWING: AMS-5662, B50TF15, HI SHEAR #156, C50TF13, VMS-110, AIC-MS-110. DMS-2209</p> <p><b>X-750</b> AMS-5667, B50YP44B1 (EXC. HARDNESS)</p> <p><b>L-605 VAC. MELT.</b> AMS-5759</p> <p><b>MARAGING "300"</b> AMS-6514, MIL-S-46850 TYPE 4 (EXC. PARA. 3.5.3), LBO-160-164, MBO-160-006 (EXC. SONIC), HMS-6-1404</p> <p><sup>2</sup> <b>WASPALLOY "HEADING QUALITY"</b> AMS-5708 TYPE 2, CAP. OF AMS-5709</p> <p><sup>2</sup> <b>WASPALLOY "COLD REDUCED"</b> AMS-5708 &amp; AMS-5709 (CHEMS ONLY BOTH SPECS), EXC. HARDNESS TO FOLLOWING: SPS-M-175, VSM-1333, VMS-112, Voi-Shan-S-71001</p> <p><b>4MP 35N</b> AMS-5844, CAP. OF AMS 5845, SPS-M-646</p> <p><b>4MP 159</b> AMS-5842, CAP. OF AMS-5843</p> <p><b>FRY ALLOY X</b> AMS-5754</p> <p><b>FRY ALLOY C</b> AMS-5750, ASTM-B-574, ASME-B-574</p> <p><sup>3</sup> <b>AERMET 100</b> AMS-6532, AMS-2300, MIL-S-2154 TYPE 1 CLASS A, MMS-217 (EXC. TRANS. IMPACT)</p>
	<b>ELECTRICAL STEELS</b>
	<p><b>INVAR 36 "FM"</b> MIL-S-16598 &amp; MBO-160-151 (CHEMS ONLY BOTH SPECS)</p> <p><sup>3</sup> <b>KOVAR</b> AMS-7727, ASTM-F-15, MIL-I-23011 CL. 1, AMS-I-23011 CL. 1</p> <p><b>4750</b> AMS-7718 EXC. HARDNESS, CAP. OF MIL-N-14411 COMP. 3, ABO-170-014</p>

**AUTOMATIC EXCEPTIONS TO THE SPECS LISTED ARE: LINE MARKING AND INSPECTION (I.E. MAG., SONIC, ETC.)**

<sup>2</sup> Trademark United Technology

<sup>3</sup> Trademark Carpenter Technology

<sup>4</sup> Trademark SPS Technology

Refer to pages 81 through 88 for tolerances, weights, recommended stock removal, chemical analysis, machinability.

General information in back of book.

**ROUNDS  
 STOCKED IN 12' R/L**

SIZE	TYPE	FINISH.	SIZE	TYPE	FINISH.
1/8"	INVAR-36 "FM" Fry Alloy X	C.G. C.G.	.270"	718 V.M. C.R. (Cap. 220 KSI) Waspaloy H.Q. Waspaloy C.R. MP 35N MP 159	C.G. C.G. C.G. C.G. C.G.
3/16"	A-286 Aged (1650°) A-286 Aged (1800°) A-286 Sol. Tr. Nickel "600" 718 V.M. X-750 Waspaloy H.Q. Fry Alloy X INVAR-36 "FM" 4750	C.G. C.G. C.G. C.G. C.G. C.G. C.G. C.G. C.G. C.G.	9/32"	A-286 C.R. (Cap. 160 KSI) A-286 C.R. (Cap. 210 KSI) 718 V.M.	C.G. C.G. C.G.
.1925"	A-286 Aged (1650°) A-286 Aged (1800°)	C.G. C.G.	.290"	718 V.M. C.R. (Cap. 220 KSI)	C.G.
.1975"	A-286 Sol. Tr.	C.G.	19/64"	A-286 C.R (Cap. 210 KSI) 718 V.M.	C.G. C.G.
13/64"	718 V.M.	C.G.	5/16"	A-286 Aged (1650°) A-286 Aged (1800°) A-286 Sol. Tr. Nickel "200" Nickel "400" Nickel "K-500" Ann. Nickel "600" Nickel "625" 718 V.M. X-750 Waspaloy H.Q. Fry Alloy X INVAR 36 "FM" 4750	C.G. C.G. C.G. C.G. C.D.-S.R. H.F.-C.G. C.G. C.G. C.G. C.G. C.G. C.G. C.G.
.205"	L-605	C.G.	.3175"	A-286 Aged (1650°) A-286 Aged (1800°)	C.G. C.G.
7/32"	A-286 Aged (1650°) A-286 Aged (1800°) A-286 Sol. Tr. Waspaloy H.Q.	C.G. C.G. C.G. C.G.	.3225"	A-286 Sol. Tr. A-286 C.R. (Cap. 160 KSI) A-286 C.R. (Cap. 210 KSI) Nickel "625" 718 V.M. 718 V.M. C.R. (Cap. 220 KSI) L-605 Waspaloy H.Q. Waspaloy C.R. MP 35N	C.G. C.G. C.G. C.G. C.G. C.G. C.G. C.G. C.G. C.G.
.220"	Waspaloy C.R.	C.G.	.328"	Waspaloy C.R.	C.G.
15/64"	718 V.M.	C.G.	.3325"	MP 159	C.G.
1/4"	A-286 Aged (1650°) A-286 Aged (1800°) A-286 Sol. Tr. Nickel "200" Nickel "400" Nickel "405" Nickel "K-500" Ann. Nickel "600" Nickel "625" 718 V.M. X-750 L-605 Maraging "300" Waspaloy H.Q. Fry Alloy X Fry Alloy C INVAR-36 "FM" Kovar 4750	C.G. C.G. C.G. C.G. C.D.-S.R. C.G. H.F.-C.G. C.G. C.G. C.G. C.G. C.G. C.G. C.G. C.G. C.G. C.G. C.G. C.G. C.G. C.G. C.G. C.G.	21/64"	A-286 C.R. (Cap. 210 KSI) 718 V.M. Waspaloy H.Q.	C.G. C.G. C.G.
.255"	A-286 Aged (1650°) A-286 Aged (1800°)	C.G. C.G.	11/32"	A-286 C.R. (Cap. 160 KSI) 718 V.M.	C.G. C.G.
.260"	A-286 Aged (1650°) A-286 Sol. Tr. A-286 C.R. (Cap. 160 KSI) A-286 C.R. (Cap. 210 KSI) Nickel "625" 718 V.M. 718 V.M. (Cap. 220 KSI) L-605 Waspaloy H.Q. Waspaloy C.R.	C.G. C.G. C.G. C.G. C.G. C.G. C.G. C.G. C.G. C.G.	.352"	718 V.M. C.R. (Cap. 220 KSI)	C.G.
17/64"	A-286 C.R. (Cap. 210 KSI) 718 V.M.	C.G. C.G.	23/64"	A-286 C.R. (Cap. 210 KSI) 718 V.M.	C.G. C.G.
			3/8"	A-286 Aged (1650°) A-286 Aged (1800°) A-286 Sol. Tr. Nickel "200" Nickel "400" Nickel "405" Nickel "K-500" Ann. Nickel "600"	C.G. C.G. C.G. C.G. C.D.-S.R. C.G. H.F.-C.G. C.G.

Finish: C.D. – Cold Drawn  
 C.F. – Cold Finish  
 C.G. – Centerless Ground  
 R.T. – Rough Turned  
 H.F. – Hot Finished

Condition: Ann. – Annealed  
 Sol trt – Solution Treated  
 H.T. – Heat treated (RC 26/32)

ESR – Electroslag Re-melt  
 Sel – Selenium  
 "B" – Hi Tensile  
 S – Sulfur  
 H.Q. – Heading Quality

V.M. – Vacuum Arc Re-melt  
 C.R. – Cold Reduced  
 L – Low Carbon  
 "FM" – Free Machining  
 S.R. – Stress Relieved

**ROUNDS  
 STOCKED IN 12' R/L**

SIZE	TYPE	FINISH	SIZE	TYPE	FINISH
3/8"	Nickel "625"	C.G.	.448"	Waspaloy C.R.	C.G.
	718 V.M.	C.G.	29/64"	A-286 C.R. (Cap. 210 KSI)	C.G.
	X-750	C.G.		718 V.M.	C.G.
	L-605	C.G.		Waspaloy H.Q.	C.G.
	Maraging "300"	C.G.	15/32"	A-286 C.R. (Cap. 160 KSI)	C.G.
	Waspaloy H.Q.	C.G.		A-286 C.R. (Cap. 210 KSI)	C.G.
	Fry Alloy X	C.G.		718 V.M.	C.G.
	Fry Alloy C	C.G.	31/64"	A-286 C.R. (Cap. 210 KSI)	C.G.
	INVAR-36 "FM"	C.G.		718 V.M.	C.G.
	Kovar	C.G.		718 V.M. C.R. (Cap. 220 KSI)	C.G.
4750	C.G.	MP 35N		C.G.	
.380"	A-286 Aged (1650°)	C.G.	MP 159	C.G.	
.385"	A-286 Aged (1800°)	C.G.	1/2"	A-286 Aged (1650°)	C.G.
	A-286 Sol. Tr.	C.G.		A-286 Aged (1800°)	C.G.
	A-286 C.R. (Cap. 160 KSI)	C.G.		A-286 Sol. Tr.	C.G.
	A-286 C.R. (Cap. 210 KSI)	C.G.		Nickel "200"	C.G.
	Nickel "625"	C.G.		Nickel "400"	C.D.-S.R.
	718 V.M.	C.G.		Nickel "405"	C.G.
	718 V.M. C.R. (Cap. 220 KSI)	C.G.		Nickel "K-500" Ann.	H.F.-C.G.
	L-605	C.G.		Nickel "K-500" Ann. & Aged	H.F.-C.G.
	Waspaloy H.Q.	C.G.		Nickel "600"	C.G.
	Waspaloy C.R.	C.G.		Nickel "625"	C.G.
25/64"	A-286 C.R. (Cap. 210 KSI)	C.G.	Nickel "800"	C.G.	
	718 V.M.	C.G.	Nickel "800"HT	C.G.	
	718 V.M. C.R. (Cap. 220 KSI)	C.G.	Nickel "825"	C.G.	
	Waspaloy H.Q.	C.G.	718 V.M.	C.G.	
.400"	MP 35N	C.G.	X-750	C.G.	
	MP 159	C.G.	L-605	C.G.	
13/32"	A-286 C.R. (Cap. 160 KSI)	C.G.	Maraging "300"	C.G.	
	A-286 C.R. (Cap. 210 KSI)	C.G.	Fry Alloy C	C.G.	
27/64"	718 V.M.	C.G.	Fry Alloy X	C.G.	
			INVAR-36 "FM"	C.G.	
7/16"	A-286 Aged (1650°)	C.G.	Kovar	C.G.	
	A-286 Aged (1800°)	C.G.	4750	C.G.	
	A-286 Sol. Tr.	C.G.	.505"	A-286 Aged (1650°)	C.G.
	Nickel "200"	C.G.		A-286 Aged (1800°)	C.G.
	Nickel "400"	C.D.-S.R.	.510"	A-286 Sol. Tr.	C.G.
	Nickel "K-500" Ann.	H.F.-C.G.		A-286 C.R. (Cap. 160 KSI)	C.G.
	Nickel "625"	C.G.		A-286 C.R. (Cap. 210 KSI)	C.G.
	718 V.M.	C.G.		Nickel "625"	C.G.
	X-750	C.G.		718 V.M.	C.G.
	L-605	C.G.		718 V.M. C.R. (Cap. 220 KSI)	C.G.
Waspaloy H.Q.	C.G.	L-605		C.G.	
Fry Alloy X	C.G.	Waspaloy H.Q.		C.G.	
INVAR-36 "FM"	C.G.	33/64"		A-286 C.R. (Cap. 210 KSI)	C.G.
4750	C.G.			718 V.M.	C.G.
.4425"	A-286 Aged (1650°)	C.G.	.524"	Waspaloy H.Q.	C.G.
	A-286 Aged (1800°)	C.G.		Waspaloy C.R.	C.G.
.4475"	A-286 Sol. Tr.	C.G.	.525"	718 V.M. C.R. (Cap. 220 KSI)	C.G.
	A-286 C.R. (Cap. 160 KSI)	C.G.		MP 35N	C.G.
	A-286 C.R. (Cap. 210 KSI)	C.G.	17/32"	A-286 C.R. (Cap. 160 KSI)	C.G.
	Nickel "625"	C.G.		A-286 C.R. (Cap. 210 KSI)	C.G.
	718 V.M.	C.G.		718 V.M.	C.G.
	718 V.M. C.R. (Cap. 220 KSI)	C.G.	.535"	A-286 C.R. (Cap. 160 KSI)	C.G.
	L-605	C.G.		MP 159	C.G.
	Waspaloy H.Q.	C.G.			

**NOTE:** IT IS NOT ADVISABLE TO TRY TO FINISH ON SIZE FROM THE SIZE PURCHASED.  
 NOTE: BARS ARE NOT PERFECTLY ROUND, SQUARE, OR STRAIGHT.  
 PLEASE REFER TO THE VARIOUS CHARTS IN THIS BOOK.





**ROUNDS  
 STOCKED IN 12' R/L**

SIZE	TYPE	FINISH.	SIZE	TYPE	FINISH.
1-1/16"	A-286 Aged (1650°) 718 V.M. INVAR-36 "FM" L-605	C.G. C.G. C.G. C.G.	1.260"	A-286 C.R. (Cap. 160 KSI) A-286 C.R. (Cap. 210 KSI) Nickel "625" 718 V.M. C.R. (Cap. 220 KSI)	C.G. C.G. C.G. C.G.
1-1/8"	A-286 Aged (1650°)	C.G.	1.270"	718 V.M. C.R. (Cap. 220 KSI)	C.G.
	A-286 Aged (1800°)	C.G.	1.279"	Waspaloy H.Q.	C.G.
	A-286 Sol. Tr.	C.G.		MP 35N	C.G.
	Nickel "200"	C.G.		MP159	C.G.
	Nickel "K-500" Ann. & Aged	H.F.-C.G.	1-5/16"	A-286 Aged (1650°)	C.G.
	Nickel "600"	C.G.		718 V.M.	C.G.
	Nickel "625"	C.G.	1-3/8"	A-286 Aged (1650°)	C.G.
	Nickel "800"	C.G.		A-286 Aged (1800°)	C.G.
	Nickel "800" H	C.G.		A-286 Sol. Tr.	C.G.
	Nickel "800" HT	C.G.		Nickel "200"	C.G.
Nickel "825"	C.G.	Nickel "400"		C.D.-S.R.	
718 V.M.	C.G.	Nickel "600"		C.G.	
X-750	C.G.	Nickel "625"		C.G.	
L-605	C.G.	Nickel "800"		C.G.	
Maraging "300"	C.G.	Nickel "800" H		C.G.	
Fry Alloy C	C.G.	Nickel "800" HT		C.G.	
Fry Alloy X	C.G.	Nickel "825"	C.G.		
INVAR-36 "FM"	C.G.	718 V.M.	C.G.		
Kovar	C.G.	X-750	C.G.		
4750	C.G.	L-605	C.G.		
1.135"	A-286 C,R, (Cap. 160 KSI) A-286 C.R. (Cap. 210 KSI) Nickel "625" 718 V.M. 718 V.M. C.R. (Cap. 220 KSI) Waspaloy H.Q.	C.G. C.G. C.G. C.G. C.G. C.G.		Maraging "300"	C.G.
				Fry Alloy X	C.G.
				INVAR-36 "FM"	C.G.
				Kovar	C.G.
				4750	C.G.
1.147"	718 V.M. C.R. (Cap. 220 KSI)	C.G.	1.385"	A-286 C.R. (Cap. 210 KSI)	C.G.
1.155"	MP 35N MP159	C.G. C.G.	1.390"	718 V.M. C.R. (Cap. 220 KSI)	C.G.
				MP 35N	C.G.
				MP 135	C.G.
1-3/16"	A-286 Aged (1650°) 718 V.M.	C.G. C.G.		Waspaloy H.Q.	C.G.
1-1/4"	A-286 Aged (1650°)	C.G.	1-7/16"	A-286 Aged (1650°)	C.G.
	A-286 Aged (1800°)	C.G.		718 V.M.	C.G.
	A-286 Sol Tr.	C.G.	1-1/2"	A-286 Aged (1650°)	C.G.
	Nickel "200"	C.G.		A-286 Aged (1800°)	C.G.
	Nickel "400"	C.D.-S.R.		A-286 Sol. Tr.	C.G.
	Nickel "405"	C.G.		Nickel "200"	C.G.
	Nickel "K-500" Ann.	H.F.-C.G.		Nickel "400"	C.D.-S.R.
	Nickel "K-500" Ann. & Aged	H.F.-C.G.		Nickel "405"	C.G.
	Nickel "600"	C.G.		Nickel "K-500" Ann.	H.F.-C.G.
	Nickel "625"	C.G.		Nickel "K-500" Ann. & Aged	H.F.-C.G.
Nickel "800"	C.G.	Nickel "600"		C.G.	
Nickel "800" H	C.G.	Nickel "625"		C.G.	
Nickel "800" HT	C.G.	Nickel "800"	C.G.		
Nickel "825"	C.G.	Nickel "800" H	C.G.		
718 V.M.	C.G.	Nickel "800" HT	C.G.		
X-750	C.G.	Nickel "825"	C.G.		
L-605	C.G.	718 V.M.	C.G.		
Maraging "300"	C.G.	X-750	C.G.		
Waspaloy H.Q.	C.G.	L-605	C.G.		
Fry Alloy C	C.G.	Maraging "300"	C.G.		
Fry Alloy X	C.G.	Waspaloy H.Q.	C.G.		
INVAR-36 "FM"	C.G.	Fry Alloy C	C.G.		
Kovar	C.G.	Fry Alloy X	C.G.		
4750	C.G.	INVAR-36 "FM"	C.G.		

Finish: C.D. – Cold Drawn  
 C.F. – Cold Finish  
 C.G. – Centerless Ground  
 R.T. – Rough Turned  
 H.F. – Hot Finished

Condition: Ann. – Annealed  
 Sol trt – Solution Treated  
 H.T. – Heat treated (RC 26/32)

ESR – Electroslag Re-melt  
 Sel – Selenium  
 "B" – Hi Tensile  
 S – Sulfur  
 H.Q. – Heading Quality

V.M. – Vacuum Arc Re-melt  
 C.R. – Cold Reduced  
 L – Low Carbon  
 "FM" – Free Machining  
 S.R. – Stress Relieved

**ROUNDS  
 STOCKED IN 12' R/L**

SIZE	TYPE	FINISH	SIZE	TYPE	FINISH
1-1/2"	Kovar 4750 Aermet 100	C.G. C.G. C.G.	2"	Nickel "200"	C.G.
1.510"	A-286 C.R. (Cap. 210 KSI) 718 V.M. C.R. (Cap. 220 KSI)	C.G. C.G.		Nickel "400"	C.D.-S.R.
1.520"	MP35N	C.G.		Nickel "405"	C.G.
1-9/16"	A-286 Aged (1650°) 718 V.M.	C.G. C.G.		Nickel "K-500" Ann.	H.F.-C.G.
1-5/8"	A-286 Aged (1650°)	C.G.		Nickel "K-500" Ann. & Aged	H.F.-C.G.
	A-286 Aged (1800°)	C.G.		Nickel "600"	C.G.
	Nickel "200"	C.G.		Nickel "625"	C.G.
	Nickel "400"	C.D.-S.R.		Nickel "800"	C.G.
	Nickel "625"	C.G.		Nickel "800" H	C.G.
	718 V.M.	C.G.		Nickel "800" HT	C.G.
	X-750	C.G.	Nickel "825"	C.G.	
	L-605	C.G.	718 V.M.	C.G.	
	Maraging "300"	C.G.	718 V.M. C.R. (Cap. 220 KSI)	C.G.	
	Fry Alloy X	C.G.	X-750	C.G.	
INVAR-36 "FM"	C.G.	L-605	C.G.		
Kovar	C.G.	Maraging "300"	C.G.		
4750	C.G.	Fry Alloy C	C.G.		
		Fry Alloy X	C.G.		
		INVAR-36 "FM"	C.G.		
		Kovar	C.G.		
		4750	C.G.		
		Aermet 100	C.G.		
1-11/16"	A-286 Aged (1650°) 718 V.M.	C.G. C.G.	2-1/16"	A-286 Aged (1650°) 718 V.M.	C.G. C.G.
1-3/4"	A-286 Aged (1650°)	C.G.	2-1/8"	A-286 Aged (1650°)	C.G.
	A-286 Aged (1800°)	C.G.		Nickel "400"	C.D.-S.R.
	A-286 Sol. Tr.	C.G.		Nickel "625"	C.G.
	Nickel "200"	C.G.	718 V.M.	C.G.	
	Nickel "400"	C.D.-S.R.	X-750	C.G.	
	Nickel "K-500" Ann.	H.F.-C.G.	2-1/4"	A-286 Aged (1650°)	C.G.
	Nickel "600"	C.G.		A-286 Aged (1800°)	C.G.
	Nickel "625"	C.G.		A-286 Sol. Tr.	C.G.
	Nickel "800"	C.G.		Nickel "400"	C.D.-S.R.
	Nickel "800" H	C.G.		Nickel "K-500" Ann.	H.F.-C.G.
Nickel "800" HT	C.G.	Nickel "K-500" Ann. & Aged		H.F.-C.G.	
Nickel "825"	C.G.	Nickel "600"		C.G.	
718 V.M.	C.G.	Nickel "625"		C.G.	
718 V.M. C.R. (Cap. 220 KSI)	C.G.	Nickel "800"		C.G.	
X-750	C.G.	Nickel "800" H		C.G.	
L-605	C.G.	Nickel "800" HT	C.G.		
Maraging "300"	C.G.	Nickel "825"	C.G.		
Fry Alloy C	C.G.	718 V.M.	C.G.		
Fry Alloy X	C.G.	X-750	C.G.		
INVAR-36 "FM"	C.G.	L-605	C.G.		
Kovar	C.G.	Maraging "300"	C.G.		
4750	C.G.	Fry Alloy C	C.G.		
		Fry Alloy X	C.G.		
		INVAR-36 "FM"	C.G.		
		Aermet 100	C.G.		
1-13/16"	A-286 Aged (1650°) 718 V.M.	C.G. C.G.	2-3/8"	A-286 Aged (1650°)	C.G.
1-7/8"	A-286 Aged (1650°)	C.G.		Nickel "400"	C.D.-S.R.
	718 V.M.	C.G.		Nickel "625"	C.G.
	718 V.M. C.R. (Cap. 220 KSI)	C.G.	718 V.M.	C.G.	
	X-750	C.G.	L-605	C.G.	
	INVAR-36 "FM"	C.G.	2-1/2"	A-286 Aged (1650°)	C.G.
4750	C.G.	A-286 Aged (1800°)		C.G.	
Maraging "300"	C.G.	A-286 Sol. Tr.		C.G.	
		Nickel "400"		C.D.-S.R.	
		Nickel "K-500" Ann.		H.F.-C.G.	
2"	A-286 Aged (1650°)	C.G.			
	A-286 Aged (1800°)	C.G.			
	A-286 Sol. Tr.	C.G.			

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**ROUNDS  
 STOCKED IN 12' R/L**

SIZE	TYPE	FINISH.	SIZE	TYPE	FINISH.
2-1/2"	Nickel "K-500" Ann. & Aged	H.F.-C.G.	3"	Maraging "300"	C.G.
	Nickel "600"	C.G.		Aermet 100	R.T.
	Nickel "625"	C.G.	3-1/8"	A-286 Aged (1650°)	C.G.
	Nickel "800"	C.G.		3-1/4"	A-286 Aged (1650°)
	Nickel "800" H	C.G.	A-286 Aged (1800°)		C.G.
	Nickel "800" HT	C.G.	Nickel "400"		C.D.-S.R.
	Nickel "825"	C.G.	Nickel "K-500" Ann.		H.F.-R.T.
	718 V.M.	C.G.	Nickel "600"		C.G.
	X-750	C.G.	Nickel "800"		C.G.
	L-605	C.G.	Nickel "800" H		C.G.
	Maraging "300"	C.G.	Nickel "800" HT		C.G.
	Fry Alloy C	C.G.	718 V.M.		R.T.
	Fry Alloy X	C.G.	X-750		R.T.
	INVAR-36 "FM"	C.G.	Maraging "300"	C.G.	
	Kovar	C.G.	Fry Alloy X	C.G.	
4750	C.G.	Aermet 100	C.G.		
Aermet 100	C.G.				
2-5/8"	A-286 Aged (1650°)	C.G.	3-3/8"	A-286 Aged (1650°)	C.G.
	Nickel "400"	C.D.-S.R.		3-1/2"	A-286 Aged (1650°)
	Nickel "625"	C.G.	A-286 Aged (1800°)		C.G.
718 V.M.	C.G.	Nickel "400"	C.D.-S.R.		
Fry Alloy X	C.G.	Nickel "K-500" Ann.	H.F.-R.T.		
2-3/4"	A-286 Aged (1650°)	C.G.	Nickel "K-500" Ann. & Aged		H.F.-R.T.
	A-286 Aged (1800°)	C.G.	Nickel "600"		C.G.
	Nickel "400"	C.D.-S.R.	Nickel "625"		C.G.
	Nickel "K-500" Ann.	H.F.-C.G.	Nickel "800"		C.G.
	Nickel "K-500" Ann. & Aged	H.F.-C.G.	Nickel "800" H		C.G.
	Nickel "600"	C.G.	Nickel "800" HT		C.G.
	Nickel "625"	C.G.	718 V.M.	R.T.	
	Nickel "800"	C.G.	X-750	R.T.	
	Nickel "800" H	C.G.	L-605	C.G.	
	Nickel "800" HT	C.G.	Maraging "300"	C.G.	
	718 V.M.	C.G.	Fry Alloy C	R.T.	
	X-750	C.G.	Fry Alloy X	C.G.	
	L-605	C.G.	INVAR-36 "FM"	C.G.	
	Maraging "300"	C.G.	4750	C.G.	
	Fry Alloy C	C.G.	Aermet 100	R.T.	
Fry Alloy X	C.G.				
Aermet 100	C.G.				
2-7/8"	A-286 Aged (1650°)	C.G.	3-5/8"	A-286 Aged (1650°)	R.T.
	A-286 Sol. Tr.	C.G.	3-3/4"	A-286 Aged (1650°)	R.T.
3"	A-286 Aged (1650°)	C.G.		A-286 Aged (1800°)	R.T.
	A-286 Aged (1800°)	C.G.		Nickel "400"	C.D.-S.R.
	A-286 Sol. Tr.	C.G.	Nickel "625"	R.T.	
	Fry Alloy C	C.G.	718 V.M.	R.T.	
	Fry Alloy X	C.G.	Maraging "300"	C.G.	
	L-605	C.G.	Fry Alloy X	R.T.	
	4750	C.G.			
	INVAR-36 "FM"	C.G.	3-7/8"	718 V.M.	R.T.
	Nickel "400"	C.D.-S.R.		4"	A-286 Aged (1650°)
	Nickel "405"	C.G.	A-286 Aged (1800°)		R.T.
	Nickel "K-500" Ann.	H.F.-C.G.	A-286 Sol. Tr.		R.T.
	Nickel "K-500" Ann. & Aged	H.F.-C.G.	Nickel "400"		C.D.-S.R.
	Nickel "600"	C.G.	Nickel "K-500" Ann.		H.F.-R.T.
	Nickel "625"	C.G.	Nickel "K-500" Ann. & Aged		H.F.-R.T.
	Nickel "800"	C.G.	Nickel "600"		R.T.
Nickel "800" H	C.G.	Nickel "625"	R.T.		
Nickel "800" HT	C.G.	Nickel "800"	R.T.		
Nickel "825"	C.G.	Nickel "800" H	R.T.		
718 V.M.	C.G.	Nickel "800" HT	R.T.		
		718 V.M.	R.T.		
		X-750	R.T.		
		L-605	C.G.		

Finish: C.D. – Cold Drawn  
 C.F. – Cold Finish  
 C.G. – Centerless Ground  
 R.T. – Rough Turned  
 H.F. – Hot Finished

Condition: Ann. – Annealed  
 Sol trt – Solution Treated  
 H.T. – Heat treated (RC 26/32)

ESR – Electroslag Re-melt  
 Sel – Selenium  
 "B" – Hi Tensile  
 S – Sulfur  
 H.Q. – Heading Quality

V.M. – Vacuum Arc Re-melt  
 C.R. – Cold Reduced  
 L – Low Carbon  
 "FM" – Free Machining  
 S.R. – Stress Relieved



**ROUNDS  
 STOCKED IN 12' R/L**

SIZE	TYPE	FINISH	SIZE	TYPE	FINISH
4"	Maraging "300"	R.T.	6"	Nickel "600"	R.T.
	Fry Alloy C	R.T.		Nickel "625"	R.T.
	Fry Alloy X	R.T.		718 V.M.	R.T.
	INVAR-36 "FM"	C.G.		Maraging "300"	R.T.
4750	C.G.	X-750	R.T.		
Aermet 100	R.T.	Fry Alloy X	R.T.		
4-1/8"	A-286 Aged (1650°)	R.T.	INVAR-36 "FM"	R.T.	
4-1/4"	A-286 Aged (1650°)	R.T.	Aermet 100	R.T.	
	A-286 Aged (1800°)	R.T.	6-1/4"	A-286 Aged (1650°)	R.T.
	718 V.M.	R.T.	6-1/2"	A-286 Aged (1650°)	R.T.
	Fry Alloy X	R.T.	Nickel "400"	H.R.-S.R.	
4-1/2"	A-286 Aged (1650°)	R.T.	Nickel "K-500" Ann.	H.F.-R.T.	
	A-286 Aged (1800°)	R.T.	Nickel "K-500" Ann. & Aged	H.F.-R.T.	
	Nickel "400"	H.R.-S.R.	Fry Alloy X	R.T.	
	Nickel "K-500" Ann.	H.F.-R.T.	7"	A-286 Aged (1650°)	R.T.
	Nickel "K-500" Ann. & Aged	H.F.-R.T.		Nickel "400"	H.R.-S.R.
	Nickel "600"	R.T.		Nickel "K-500" Ann.	H.F.-R.T.
	Nickel "625"	R.T.		718 V.M.	R.T.
	718 V.M.	R.T.	Fry Alloy X	R.T.	
	X-750	R.T.	7-1/2"	A-286 Aged (1650°)	R.T.
	Maraging "300"	R.T.		Nickel "400"	H.R.-S.R.
Fry Alloy X	R.T.	Nickel "K-500" Ann.	H.F.-R.T.		
Aermet 100	R.T.	8"	A-286 Aged (1650°)	R.T.	
4-3/4"	A-286 Aged (1650°)		R.T.	Nickel "400"	H.R.-S.R.
	718 V.M.		R.T.	Nickel "K-500" Ann.	H.F.-R.T.
Fry Alloy X	R.T.		Nickel "625"	R.T.	
5"	A-286 Aged (1650°)	R.T.	718 V.M.	R.T.	
	A-286 Aged (1800°)	R.T.	8-1/2"	A-286 Aged (1650°)	R.T.
	Nickel "400"	H.R.-S.R.		9"	A-286 Aged (1650°)
	Nickel "K-500" Ann.	H.F.-R.T.	718 V.M.		R.T.
	Nickel "K-500" Ann. & Aged	H.F.-R.T.	9-1/2"	A-286 Aged (1650°)	R.T.
	Nickel "600"	R.T.		10"	A-286 Aged (1650°)
	Nickel "625"	R.T.	718 V.M.		R.T.
	718 V.M.	R.T.	11"	A-286 Aged (1650°)	R.T.
	X-750	R.T.		718 V.M.	R.T.
	Maraging "300"	R.T.	12"	A-286 Aged (1650)	R.T.
Fry Alloy X	R.T.	718 V.M.		R.T.	
INVAR-36 "FM"	R.T.	5-1/4"			
Aermet 100	R.T.				
5-1/2"	A-286 Aged (1650°)		R.T.		
	Nickel "400"		H.R.-S.R.		
	Nickel "K-500" Ann.		H.F.-R.T.		
	Nickel "K-500" Ann. & Aged		H.F.-R.T.		
	Nickel "625"		R.T.		
	718 V.M.		R.T.		
	Maraging "300"		R.T.		
	Fry Alloy X		R.T.		
	Aermet 100	R.T.			
	5-3/4"	A-286 Aged (1650°)	R.T.		
Fry Alloy X		R.T.			
6"	A-286 Aged (1650°)	R.T.			
	A-286 Aged (1800°)	R.T.			
	Nickel "400"	H.R.-S.R.			
	Nickel "K-500" Ann.	H.F.-R.T.			
Nickel "K-500" Ann. & Aged	H.F.-R.T.				



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**HEXAGONS**  
 STOCKED IN 12' R/L



SIZE	TYPE	FINISH.	SIZE	TYPE	FINISH.
1/4"	A-286 Aged (1800°)	C.D.	13/16"	A-286 Aged (1650°)	C.D.
5/16"	A-286 Aged (1650°) A-286 Aged (1800°)	C.D. C.D.	7/8"	A-286 Aged (1650°) A-286 Aged (1800°) A-286 C.R. (Cap. 160 KSI)	C.D. C.D. C.D.
3/8"	A-286 Aged (1650°) A-286 Aged (1800°) A-286 C.R. (Cap. 160 KSI)	C.D. C.D. C.D.		15/16"	A-286 Aged (1650°) A-286 C.R. (Cap. 160 KSI)
7/16 "	A-286 Aged (1650°) A-286 Aged (1800°) A-286 C.R. (Cap. 160 KSI)	C.D. C.D. C.D.	1"		A-286 Aged (1650°) A-286 Aged (1800°) A-286 C.R. (Cap. 160 KSI)
1/2"	A-286 Aged (1650°) A-286 Aged (1800°) A-286 C.R. (Cap. 160 KSI)	C.D. C.D. C.D.		1-1/16"	A-286 Aged (1650°) A-286 C.R. (Cap. 160 KSI)
			1-1/8"	A-286 Aged (1650°)	C.D.
9/16"	A-286 Aged (1650°) A-286 Aged (1800°) A-286 C.R. (Cap. 160 KSI)	C.D. C.D. C.D.	1-1/4"	A-286 Aged (1650°)	C.D.
			1-5/16"	A-286 Aged (1650°)	C.D.
5/8"	A-286 Aged (1650°) A-286 Aged (1800°) A-286 C.R. (Cap. 160 KSI)	C.D. C.D. C.D.	1-3/8"	A-286 Aged (1650°)	C.D.
			1-7/16"	A-286 Aged (1650°)	C.D.
11/16"	A-286 Aged (1650°)	C.D.	1-1/2"	A-286 Aged (1650°)	C.D.
3/4"	A-286 Aged (1650°) A-286 Aged (1800°) A-286 C.R. (Cap. 160 KSI)	C.D. C.D. C.D.			



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 C.G. – Centerless Ground  
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V.M. – Vacuum Arc Re-melt  
 C.R. – Cold Reduced  
 L – Low Carbon  
 "FM" – Free Machining  
 S.R. – Stress Relieved

**FLATS AND SQUARES**  
 STOCKED IN 12' R/L

SIZE	TYPE	FINISH	SIZE	TYPE	FINISH
	<b>FLATS</b>			<b>SQUARES</b>	
1/2" x 1"	A-286 Aged (1650°) 718 V.M.	H.R. H.R.	1/2"	A-286 Aged (1650°)	C.D.
1/2" x 1-1/2"	A-286 Aged (1650°) 718 V.M.	H.R. H.R.	5/8"	A-286 Aged (1650°)	C.D.
1/2" x 2"	A-286 Aged (1650°) 718 V.M.	H.R. H.R.	3/4"	A-286 Aged (1650°)	C.D.
3/4" x 1"	A-286 Aged (1650°)	H.R.	1"	A-286 Aged (1650°)	C.D.
3/4" x 1-1/2"	718 V.M.	H.R.	1-1/4"	A-286 Aged (1650°)	H.R.
3/4" x 2"	A-286 Aged (1650°) 718 V.M.	H.R. H.R.	1-1/2"	A-286 Aged (1650°)	H.R.
3/4" x 4"	718 V.M.	H.R.	2"	A-286 Aged (1650°)	H.R.
1" x 1-1/2"	A-286 Aged (1650°)	H.R.	2-1/2"	A-286 Aged (1650°)	H.R.
1" x 2"	A-286 Aged (1650°) 718 V.M.	H.R. H.R.	3"	A-286 Aged (1650°)	H.R.
1" x 2-1/2"	A-286 Aged (1650°)	H.R.			
1" x 3"	A-286 Aged (1650°) 718 V.M.	H.R. H.R.			
1" x 4"	718 V.M.	H.R.			
1-1/2" x 2"	A-286 Aged (1650°)	H.R.			
1-1/2" x 3"	A-286 Aged (1650°)	H.R.			
2" x 3"	A-286 Aged (1650°)	H.R.			
3" x 4"	A-286 Aged (1650°)	H.R.			



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# WEIGHTS

<b>Weights for L-605</b>		
Size	WT/FT	WT/Bar
.205"	.13	1.560
1/4"	.207	2.484
.260"	.209	2.508
.3225"	.320	3.840
3/8"	.437	5.246
.385"	.459	5.508
7/16"	.610	7.320
.4475"	.620	7.440
1/2"	.778	9.336
.510"	.806	9.672
5/8"	1.210	14.520
.635"	1.250	15.000
3/4"	1.750	21.000
.760"	1.790	21.480
7/8"	2.370	28.440
.885"	2.430	29.160
1"	3.100	37.200
1-1/4"	4.840	58.080
1-3/8"	5.880	70.560
1-1/2"	6.980	83.760
1-5/8"	8.213	98.556
1-3/4"	9.526	114.312
2"	12.440	149.280

<b>Weights for Nickel 200, 400, 405, Fry Alloy C</b>		
Size	WT/FT	WT/Bar
1/4"	.19	2.280
5/16"	.294	3.528
3/8"	.426	5.112
7/16"	.576	6.913
1/2"	.755	9.060
9/16"	.9558	11.470
5/8"	1.180	14.160
11/16"	1.427	17.124
3/4"	1.700	20.400
13/16"	1.994	23.928
7/8"	2.310	27.720
1"	3.020	36.240
1-1/8"	3.822	45.864
1-1/4"	4.720	56.640
1-3/8"	5.710	68.520
1-1/2"	6.790	81.480
1-5/8"	7.975	95.700
1-3/4"	9.207	110.490
2"	12.080	144.960
2-1/8"	13.600	163.200
2-1/4"	15.240	182.880
2-3/8"	16.980	203.760
2-1/2"	18.790	225.480
2-5/8"	20.740	248.880
2-3/4"	22.740	272.880
3"	27.100	325.200
3-1/4"	31.760	381.120
3-1/2"	36.830	441.960
3-3/4"	42.330	507.960
4"	48.100	577.200
4-1/2"	60.960	731.520
5"	75.250	903.000
5-1/2"	90.950	1091.400
6"	108.200	1298.400
6-1/2"	127.100	1525.200
7"	147.320	1767.840
7-1/2"	169.120	2029.440
8"	192.400	2308.800

<b>Weights  <sup>4</sup>MP 35N, <sup>4</sup>MP159</b>		
Size	WT/FT	WT/Bar
.270"	.209	2.508
.3225"	.298	3.576
25/64"	.438	5.256
.400"	.454	5.448
31/64"	.671	8.052
.525"	.790	9.480
.535"	.812	9.744
.587"	.987	11.844
.649"	1.210	14.520
.774"	1.716	20.592
.900"	2.320	27.840
1.022"	2.990	35.880
1.025"	2.980	35.760
1.155"	3.770	45.240
1.279"	4.620	55.440
1.390"	5.540	66.480
1.520"	6.620	79.440



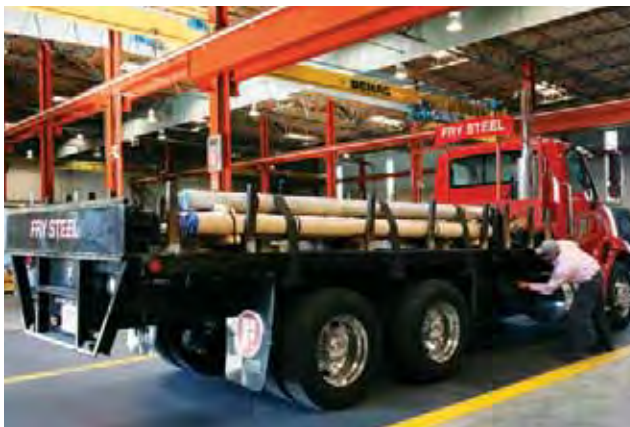
<sup>4</sup> Trademark SPS Technology

# WEIGHTS

● <b>Weights</b> 800, 800H, 800HT, <sup>3</sup> Aermet 100 ●		
Size	WT/FT	WT/Bar
1/2"	.676	8.117
5/8"	1.056	12.679
3/4"	1.521	18.259
7/8"	2.071	24.852
1"	2.705	32.460
1-1/8"	3.423	41.076
1-1/4"	4.227	50.724
1-3/8"	5.114	61.368
1-1/2"	6.086	73.032
1-3/4"	8.284	99.408
2"	10.820	129.840
2-1/4"	13.690	164.280
2-1/2"	16.910	202.920
2-3/4"	20.460	245.520
3"	24.340	292.080
3-1/4"	28.570	342.840
3-1/2"	33.140	397.680
4"	43.280	519.360
4-1/2"	54.380	652.560
5"	67.170	806.040
5-1/2"	81.260	975.120
6"	96.700	1160.400

● <b>Weights for Nickel 500, 600, 625</b> ●		
Size	WT/FT	WT/Bar
3/16"	.101	1.218
1/4"	.180	2.164
.260"	.194	2.332
5/16"	.281	3.380
.3225"	.299	3.588
3/8"	.405	4.867
.385"	.426	5.112
7/16"	.552	6.624
.4475"	.556	6.677
1/2"	.721	8.652
.510"	.747	8.972
9/16"	.840	10.560
.5725"	.942	11.310
5/8"	1.127	13.524
.635"	1.159	13.908
11/16"	1.310	15.720
3/4"	1.622	19.464
.760"	1.660	19.920
13/16"	1.900	22.800
7/8"	2.208	26.496
.885"	2.250	27.000
1"	2.884	34.608
1.010"	2.930	35.160
1-1/8"	3.620	43.440
1.135"	3.700	44.400
1-1/4"	4.506	54.072
1.260"	4.560	54.720
1-3/8"	5.200	62.400
1-1/2"	6.489	77.868
1-5/8"	7.330	87.960
1-3/4"	8.830	105.960
2"	11.540	138.480
2-1/4"	15.230	182.760
2-1/2"	18.030	216.360
2-3/4"	21.810	261.720
3"	25.960	311.520
3-1/4"	30.520	366.240
3-1/2"	35.330	423.960
3-3/4"	39.050	468.600
4"	46.150	553.800
4-1/2"	58.520	702.240
5"	72.250	867.000
6"	103.900	1246.800
6-1/2"	121.850	1462.200
7"	141.320	1695.840
7-1/2"	162.220	1946.640
8"	184.580	2214.960

■ <b>Weights for 718</b> ■		
Size	WT/FT	WT/Bar
1/2" x 1"	1.770	21.240
1/2" x 1-1/2"	2.650	31.800
1/2" x 2"	3.540	42.480
3/4" x 1-1/2"	3.980	47.760
3/4" x 2"	5.310	63.720
3/4" x 4"	10.610	127.320
1" x 2"	7.070	84.840
1" x 3"	10.610	127.320
1" x 4"	14.150	169.800



<sup>3</sup> Trademark Carpenter Technology

## WEIGHTS

Weights For 718, X-750, <sup>2</sup> WASPALLOY, FRY ALLOY X, 825			Weights For 718, X-750, <sup>2</sup> WASPALLOY, FRY ALLOY X, 825		
Size	WT/FT	WT/Bar	Size	WT/FT	WT/Bar
1/8"	.0442	.530	25/32"	1.690	20.280
3/16"	.098	1.176	.790"	1.740	20.880
13/64"	.114	1.368	13/16"	1.830	21.960
7/32"	.133	1.600	7/8"	2.120	25.440
15/64"	.153	1.836	.885"	2.180	26.156
1/4"	.170	2.040	.900"	2.260	27.120
.260"	.188	2.256	15/16"	2.440	29.280
17/64"	.195	2.340	1"	2.790	33.480
.270"	.202	2.424	1.010"	2.800	33.600
9/32"	.218	2.616	1.022"	2.890	34.680
.290"	.235	2.820	1-1/16"	3.134	37.608
19/64"	.244	2.928	1-1/8"	3.540	42.480
5/16"	.271	3.252	1.135"	3.578	42.936
.3225"	.289	3.456	1.147"	3.680	44.160
21/64"	.300	3.600	1-3/16"	3.920	47.040
11/32"	.332	3.984	1-1/4"	4.360	52.320
.352"	.3457	4.148	1.260"	4.400	52.800
23/64"	.359	4.308	1.270"	4.500	54.000
3/8"	.379	4.548	1-5/16"	4.784	57.408
.380"	.385	4.620	1-3/8"	5.300	63.600
.385"	.411	4.932	1.390"	5.383	64.596
25/64"	.424	5.088	1-7/16"	5.738	68.856
13/32"	.457	5.484	1-1/2"	6.270	75.240
27/64"	.494	5.928	1.510"	6.420	77.040
7/16"	.531	6.372	1-9/16"	6.850	82.200
.4475"	.556	6.677	1-5/8"	7.330	87.960
29/64"	.570	6.840	1-11/16"	7.900	94.800
15/32"	.607	7.284	1-3/4"	8.540	102.480
31/64"	.651	7.812	1-13/16"	9.124	109.488
1/2"	.707	8.484	1-7/8"	9.760	117.120
.510"	.722	8.664	2"	11.160	133.920
33/64"	.738	8.856	2-1/16"	11.814	141.768
.524"	.763	9.156	2-1/8"	12.610	151.320
.525"	.769	9.228	2-1/4"	14.130	169.560
17/32"	.781	9.372	2-3/8"	15.660	187.920
.540"	.813	9.756	2-1/2"	17.400	208.800
35/64"	.833	9.996	2-5/8"	19.180	230.160
9/16"	.879	10.548	2-3/4"	21.000	252.000
.5725"	.900	10.800	3"	25.000	300.000
37/64"	.928	11.136	3-1/4"	29.340	352.080
.587"	.960	11.520	3-1/2"	34.200	410.400
19/32"	.975	11.700	3-3/4"	39.190	470.280
39/64"	1.030	12.360	4"	44.600	535.200
5/8"	1.090	13.080	4-1/4"	50.600	607.200
.635"	1.120	13.440	4-1/2"	56.240	674.880
41/64"	1.140	13.680	4-3/4"	63.200	758.400
.645"	1.150	13.800	5"	69.600	835.200
.649"	1.180	14.160	5-1/4"	77.200	926.400
21/32"	1.190	14.280	5-1/2"	84.700	1016.400
43/64"	1.253	15.036	5-3/4"	92.600	1111.200
11/16"	1.310	15.720	6"	100.200	1202.400
45/64"	1.370	16.440	6-1/2"	117.900	1414.800
23/32"	1.429	17.148	7"	136.000	1632.000
47/64"	1.500	18.000	8"	178.000	2136.000
3/4"	1.570	18.840	9"	216.500	2598.000
.760"	1.600	19.200	10"	278.000	3336.000
49/64"	1.627	19.524	11"	343.000	4116.000
.775"	1.670	20.040	12"	398.000	4776.000

<sup>2</sup> Trademark United Technology

# WEIGHTS

Weights for <sup>3</sup> Kovar		
Size	WT/FT	WT/Bar
1/4"	.170	2.040
3/8"	.399	4.788
1/2"	.711	8.532
5/8"	1.110	13.320
3/4"	1.600	19.200
7/8"	2.179	26.148
1"	2.845	34.140
1-1/8"	3.600	43.200
1-1/4"	4.440	53.280
1-3/8"	5.380	64.560
1-1/2"	6.400	76.800
1-5/8"	7.520	90.240
1-3/4"	8.710	104.520
2"	11.380	136.560
2-1/2"	17.780	213.360

Weights INVAR 36 "FM" MARAGING 300		
Size	WT/FT	WT/Bar
1/8"	.043	.522
3/16"	.100	1.200
1/4"	.170	2.040
5/16"	.270	3.240
3/8"	.390	4.680
7/16"	.520	6.240
1/2"	.690	8.280
5/8"	1.070	12.840
11/16"	1.296	15.555
3/4"	1.540	18.480
13/16"	1.810	21.720
7/8"	2.100	25.200
.885"	2.150	25.800
15/16"	2.410	28.920
1"	2.740	32.880
1-1/16"	3.090	37.080
1-1/8"	3.470	41.640
1-1/4"	4.290	51.480
1-3/8"	5.190	62.280
1-1/2"	6.170	74.020
1-5/8"	7.240	86.880
1-3/4"	8.400	100.800
1-7/8"	9.640	115.680
2"	10.970	131.640
2-1/4"	13.890	166.680
2-1/2"	17.400	208.800
2-3/4"	20.200	242.400
3"	24.650	295.800
3-1/4"	28.210	338.520
3-1/2"	33.590	403.080
3-3/4"	37.600	451.200
4"	43.890	526.680
4-1/2"	54.000	648.000
5"	69.400	832.800
5-1/2"	80.800	969.600
6"	98.500	1182.000

Weights for 4750		
Size	WT/FT	WT/Bar
3/16"	.100	1.200
1/4"	.180	2.160
5/16"	.270	3.240
3/8"	.410	4.920
7/16"	.550	6.600
1/2"	.720	8.640
5/8"	1.130	13.560
3/4"	1.620	19.440
13/16"	1.930	23.160
7/8"	2.210	26.520
1"	2.920	35.040
1-1/8"	3.650	43.800
1-1/4"	4.520	54.240
1-3/8"	5.470	65.640
1-1/2"	6.560	78.720
1-5/8"	7.640	91.680
1-3/4"	8.850	106.200
1-7/8"	10.170	122.040
2"	11.560	138.720
2-1/2"	18.080	216.960
3"	27.910	334.920
3-1/2"	34.060	408.720
4"	44.500	534.000

<sup>3</sup> Trademark Carpenter Technology

**NOTE:** For A-286 Weights refer to pages 57 through 63 of Stainless Section



## SIZE TOLERANCES\*

### COLD DRAWN OR CENTERLESS GROUND BARS

Size, Inches	Tolerance Plus or Minus Inch	Out-of-Round
1/16" to 9/32"	.001"	.001"
5/16" to 11/32"	.0015"	.0015"
3/8" to 15/32"	.0015"	.0015"
1/2" to 19/32"	.002"	.002"
5/8" to 31/32"	.002"	.002"
1" to 1-15/32"	.0025"	.0025"
1-1/2" to 2-3/4"	.003"	.003"
2-13/16" to 3"	.003"	.003"
3-1/8" to 4"	.003"	.003"

### HOT ROLLED AND ROUGH TURNED ROUNDS, HOT ROLLED SQUARES

Specified Size, In.	Size Tolerance	
	Over	Under
Over 1-1/2" to 2" incl.	.016	.016
Over 2" to 2-1/2" incl.	.031	0
Over 2-1/2" to 3-1/2" incl.	.047	0
Over 3-1/2" to 4-1/2" incl.	.062	0
Over 4-1/2" to 5-1/2" incl.	.078	0
Over 5-1/2" to 6-1/2" incl.	.125	0
Over 6-1/2" to 8" incl.	.156	0
Over 8" to 10" incl.	.250	0
Over 10"	.375	0

### STAINLESS HOT FINISHED ROUNDS AND SQUARES

Specified Size, in	Over	Under	Out-of-Round or Out-of-Square
Over 5/16" to 7/16"	0.006	0.006	0.009
Over 7/16" to 5/8"	0.007	0.007	0.010
Over 5/8" to 7/8"	0.008	0.008	0.012
Over 7/8" to 1"	0.009	0.009	0.013
Over 1" to 1-1/8"	0.010	0.010	0.015
Over 1-1/8" to 1-1/4"	0.011	0.011	0.016
Over 1-1/4" to 1-3/8"	0.012	0.012	0.018
Over 1-3/8" to 1-1/2"	0.014	0.014	0.021
Over 1-1/2" to 2"	1/64	1/64	0.023
Over 2" to 2-1/2"	1/32	0	0.023
Over 2-1/2" to 3-1/2"	3/64	0	0.035
Over 3-1/2" to 4-1/2"	1/16	0	0.046
Over 4-1/2" to 5-1/2"	5/64	0	0.058
Over 5-1/2" to 6-1/2"	1/8	0	0.070
Over 6-1/2" to 8"	5/32	0	0.085

### COLD DRAWN BARS — HEXAGONS AND SQUARES

Specified Size Inches	Size Tolerance, Inches	
	Square or Hexagons	
	Over	Under
.050" to 5/16" excl.	0	.002"
5/16" to 1/2" excl.	0	.003"
1/2" to 1" incl.	0	.004"
Over 1" to 2" incl.	0	.006"
Over 2" to 3" incl.	0	.008"
Over 3" to 4" incl.	0	.010"

PER: ASTM A 484 (BAR) & ASTM A 555 ( WIRE)

**Note:** A-286 Double Size Tolerance

### HOT ROLLED BARS – FLATS

Specified Widths In.	Thickness Tolerance, In., For Thickness Given Over and Under				Width Tolerances, In	
	1/8 to 1/2 Incl.	Over 1/2 To 1 Incl.	Over 1 To 2 Incl.	Over 2 to 4 Incl.	Over	Under
Up to 1" incl.	0.008	0.010	-	- -	0.015	0.015
Over 1" to 2" incl.	0.012	0.015	0.031	- -	0.031	0.031
Over 2" to 4" incl.	0.015	0.020	0.031	0.062 0.031	0.062	0.031
Over 4" to 6" incl.	0.015	0.020	0.031	0.062 0.031	0.093	0.062
Over 6" to 8" incl.	0.016	0.025	0.031	0.062 0.031	0.125	0.156
Over 8" to 10" incl.	0.021	0.031	0.031	0.062 0.031	0.156	0.156



\* ALL TOLERANCES ON THIS PAGE ARE A CLOSE APPROXIMATION BASED ON VARIOUS MILL MFG. PRACTICES.



**Recommended Stock Removal\*\*  
 (Minimum Requirement Necessary To Qualify For Rejection)**

**COLD DRAWN: ROUNDS — HEXAGONS — SQUARES**

UP TO & INCL. 5/16" ..... .003" PER SIDE\*  
 OVER 5/16" ..... 1% OF DIAMETER PER SIDE\*

**CENTERLESS GROUND:**

ALL GROUND BAR SHOULD BE "DEFECT FREE" WITHIN THE STANDARD SIZE TOLERANCES OF ANY MANUFACTURING DEFECTS. IE: SEAMS, LAPS, AND CRACKS.

STOCK REMOVAL IS RECOMMENDED TO BELOW THE STANDARD SIZE TOLERANCES TO REMOVE ANY HANDLING MARKS THAT MAY EXIST.

EXAMPLE:

1-1/2" RD TOL IS + OR - .003"

MATERIAL SHOULD NOT HAVE ANY DEFECT UNDER -.003"

**ROUGH TURNED:**

ALL "R.T." SIZES ARE PRODUCED ON THE PLUS SIDE.

MATERIAL SHOULD BE DEFECT FREE ON SIZE OF ANY MANUFACTURING DEFECTS.

IE: SEAMS, LAPS, AND CRACKS.

EXAMPLE:

5" RD HR-RT SHOULD BE DEFECT FREE AT 5"

<b>HR-A&amp;P FLATS &amp; SQUARES</b>								
<b>RECOMMENDED MACHINING ALLOWANCES (IN)</b>								
(A) Specified Width	(B) Removal from Thickness Each Surface Specified Thickness							(C) Removal from Width-Each Surface
	1/8" to 1/2" incl.	over 1/2" to 1" incl.	over 1" to 2" incl.	over 2" to 3" incl.	over 3" to 4" incl.	over 4" to 6" incl.	over 6" to 8" incl.	
Up to 1" Incl.	.008	.010	--	--	--	--	--	.015
Over 1"-2" Incl.	.012	.015	.031	--	--	--	--	.031
Over 2"-3" Incl.	.015	.020	.031	.047	--	--	--	.047
Over 3"-4" Incl.	.015	.020	.031	.047	.062	--	--	.062
Over 4"-6" Incl.	.015	.020	.031	.047	.062	.093	--	.093
Over 6"-8" Incl.	.024	.031	.035	.062	.078	.093	.141	.141
Over 8"-10" Incl.	.024	.031	.035	.062	.078	.125	.156	.156

(A) SELECT THE "WIDTH" FIRST AND THEN READ ACROSS TO SPECIFIED THICKNESS:  
 (B) SELECT THE READING — THIS IS THE STOCK REMOVAL FOR THE THICKNESS **PER SIDE**:  
 (C) CONTINUE ACROSS ON SAME LINE FOR READING FOR WIDTH REMOVAL **PER SIDE**.

\* **NOTE:** Product ordered to surface conditions other than ground, turned, or polished should, **after removal of the standard machining allowance**, be free from seams, laps, tears, cracks, and other defects exposed to the machined surfaces.

**NOTE:** Inspection prior to altering material is advisable.

\*\* **NOTE:** IT IS NOT ADVISABLE TO TRY TO "FINISH" ON SIZE FROM THE SIZE PURCHASED.

M – Magnetic  
 NM – Non-magnetic

CHEMICAL ANALYSES — Maximum Unless Indicated											
TYPE	CARBON	MAN-GANESE	SILICON	PHOS-PHORUS	SULFER	CHROME	MOLYB-DENUM	NICKEL	COPPER	OTHERS	
Maraging "300"	.03	.10	.10	.01	.01	.50	4.6/5.2	18./19.		Co 8.5/9.5 Ti .50/.80 Al .05/.15 B.003 Zr .02	M
INVAR-36 "FM"	.15	1.0	.35					35./36.5		Se .15/.25 Fe Bal	M
A-286	.08	2.0	1.0	.025	.025	13.5/16.0	1./1.5	24./27.	.50	Ti 1.90/2.35 V .10/.50 Al .35 B.001/.01 Co 1.0	NM
4750	.035	.80	.50	.02	.008			47./50.		Bal. Fe	M
L-605	.05/.15	1.0/2.0	.40	.04	.03	19./21.		9./11.		W 14./16. Fe 3.0 Bal Co	NM
Nickel 200	.15	.35	.35		.01			99. Min	.25	Fe .40	M
Nickel 400	.20	2.0	.50	.02	.015			63. Min		Ni + Co 63. Min Co 1.0 Al .50 Pb .006 Zn .02 Sn .006 Fe 2.5	INQUIRE
Nickel 405	.30	2.0	.50	.02	.025/.060			63./70.	28./34.	Co 1.0 Al .50 Pb .006 Zn .02 Sn .006 Fe 2.5	INQUIRE
Nickel K-500	.17	1.5	.50	.02	.01			63. Min		Al 2.30/3.15 Co 1.0 Ti .35/.85 Sn .006 Fe 2.0 Pb .006 Zn .02	INQUIRE
Nickel 600	.15	1.0	.50		.015	14./17.	.50	72. Min	.50	Al .35 Ti .50 Cb 1.0 Fe 6./10. Co 1.0 Ta .05	NM
Nickel 625	.10	.50	.50	.15	.015	20./23.	8./10.	58. Min		Al .40 Ti .40 Co 1.0 Cb 3.15/4.15 Fe 5.0 Ta .05	NM
718	.08	.35	.35	.015	.015	17./21.	2.8/3.3	50./55.	.30	Cb 4.75/5.5 Ta.05 Pb .005 Co 1.0 Bi .00003 Se .00003 Ti .65/1.15 B .006 Al .20/.80 Fe Bal	NM
X-750	.08	1.0	.50		.01	14./17.		Ni + Co 70. Min	.50	Co 1.0 Cb .70/1.2 Ti 2.25/2.75 Ta .05 Al .40/1.0 Fe 5./9.	NM
800	.10	1.5	1.0		.015	19./23.		30./35.	0.75	Al .15/.60 Ti .15/.60	NM
800-H	.05/.10	1.5	1.0		.015	19./23.		30./35.	0.75	Fe 39.5 min	
800-HT	.06/.10	1.5	1.0		.015	19./23.		30./35.	0.75		
825	.05	1.0	.50		.03	19.5/23.5	2.5/3.5	38./46.	1.5/3.0	Ti .60/1.20 Al .20 Fe 22.0 min	NM
<sup>2</sup> Waspaloy	.02/.10	.10	.15	.015	.015	18./21.	3.5/5.0	Balance	.10	Co 12./15. Pb.0005 Ti 2.75/3.25 Bi .00003 Al 1.2/1.6 Zr .02/.08 Se .0003 B .003/.01 Fe 2. Ti 1.0	NM
<sup>4</sup> MP 35N	.025	.15	.15	.015	.01	19./21.	9./10.5	33./37.		Ti 1.0 Co Bal Fe 1.0	NM
<sup>4</sup> MP 159	.04	.20	.20	.02	.01	18./20.	6.0/8.0	Balance		Al .10/.30 Ti 2.5/3.25 Cb .25/.75 Co 34./38. Fe 8./10. B .03	NM
Fry Alloy X	.05/0.15	1.0	1.0	.04	.03	20.5/23.	8./10.	Balance	.50	Co .5/2.5 W .20/1.0 B .01 Fe 17./20. Al .50 Ti .15	NM
Fry Alloy C	.01	1.0	.08	.04	.03	14.5/16.5	15./17.	Balance		Co 2.5 W 3.0/4.5 V .35 Fe 4./7.	NM
<sup>3</sup> Kovar	.04	.50	.20			.20	.20	29.0	.20	Co. 17.0 Mg.10 Fe Bal Al .10 Ti .10 Zr .10 Ti + Al + Mg + Zr .20	M
<sup>3</sup> Aermet 100	.21/.25	.10	.10	.008	.005	2.9/3.3	1.1/1.3	11./12.		Co 13./14. Ti .015 Al .015 P + S .01 N .0015 O <sub>2</sub> .002	M

The above chart is a compilation of Aerospace, ASTM, Federal and Military specifications. It is for reference only and should not be used for design or specifications.

## MACHINABILITY RATINGS

GRADE	APPROXIMATE SURF. FT. PER MIN.	%RELATIVE SPEED BASED ON C-1212 AS 100%	GRADE	APPROXIMATE SURF. FT. PER MIN.	%RELATIVE SPEED BASED ON C-1212 AS 100% (165 SFM)
Maraging "300"	60	36	X-750	20	12
A-286	54	28	800	50	22
A-286 Cold Red.	50	22	800 H	50	22
4750	60	36	800 HT	50	22
L-605	15	9	INVAR 36 "FM"	92	55
Nickel "200"	110	66	<sup>2</sup> Waspaloy	45	20
Nickel "400"	80	48	Waspaloy Cold Red	41	18
Nickel "405"	80	48	<sup>4</sup> MP 35N	45	20
Nickel "K-500"	60	36	<sup>4</sup> MP 159	45	20
Nickel "K-500" Aged	40	25	Fry Alloy C	40	18
Nickel "600"	50	22	Fry Alloy X	45	20
Nickel "625"	20	12	<sup>3</sup> Kovar	60	22
Nickel "825"	47	20	Aermet 100*	280	—
718	20	12			
718 Cold Red	18	10			

\* Based on Carbide Tooling

These machinability ratios must be recognized as approximate values.

<sup>2</sup> Trademark United Technology

<sup>3</sup> Trademark Carpenter Technology

<sup>4</sup>Trademark SPS Technology

