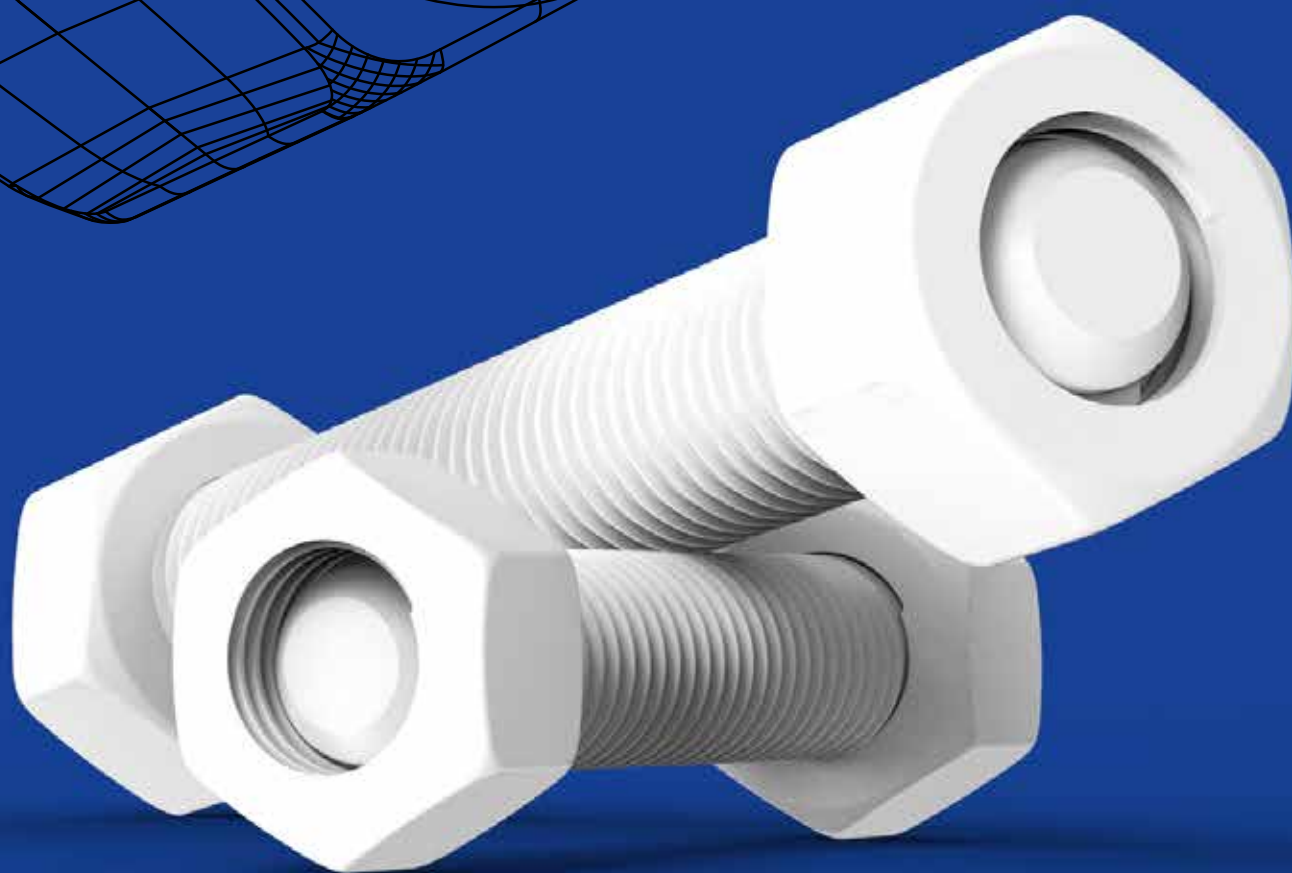


fastening present to future



TECHNICAL catalogue

SPECIAL FASTENERS
BOLTS STUDBOLTS
WASHERS NUTS
DOUBLE-ENDED STUDS
APPLIED TO THE ENERGY, CHEMICAL
AND OIL & GAS INDUSTRIES

INDEX

BEA ITALY	4-5
BEA NEDERLAND	6-7
BEA NEDERLAND EXTENSIVE STOCKS IN NORTHERN EUROPE	8-11
BEA	12-13
PRODUCTION	14-15
PRODUCES HOT FORGED NUTS	16-17
THREAD TAPPING NUTS	18-19
PRODUCES HOT FORGED BOLTS	20-21
IN-HOUSE HEAT TREATMENT	22-23
TREATMENTS TOTALLY IN HOUSE	24-25
PRODUCES STUDBOLTS	26-27
CUSTOM MADE FASTENERS	28-29
LABORATORY TESTING	30-31
AUTOMATIC WAREHOUSE - RAW MATERIAL	34-35
AUTOMATIC WAREHOUSE - FINISHED PRODUCTS	36-37
AUTOMATIC WAREHOUSE - PRODUCTION'S TOOLS	38-39

TECHNICAL TABLES

STEEL GRADES	40-43
STUDBOLTS DIMENSION	44-45
NUTS DIMENSION	46-49
BOLTS DIMENSION	50-55
WASHER DIMENSION	56-57
CUSTOMER'S DROWING	58-59
THREADING	60-61
STUDBOLTS DIMENSION FOR ALL FLANGE TYPES	62 -65
WEIGHT TABLES	66-74
OTHER TABLES	75-77
CERTIFICATION / QUALIFICATION	78-79



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ONE OF THE MOST SPECIALIZED AND EXTENSIVE STOCKS IN NORTHERN EUROPE

In 1990, due to the constant evolution of Northern European markets in the petrochemical sector, we decided to expand beyond our borders. From this strong drive and with great enthusiasm on the part of our technical and commercial staff we set up in Holland BEA NEDERLAND B.V.

BEA NEDERLAND is a sales office and stockholder for all our products. With a warehouse of 1.800 m² BEA NEDERLAND has one of the most specialized and extensive stocks in Northern Europe. The wide range of materials and diameters (both imperial and metric) make BEA NEDERLAND the most reliable source and market leader in its sector.

ITS STOCK IS COMPOSED OF STUD-BOLTS, NUTS AND THREADED BARS:

in alloy/carbon steel B7-B7M/2H-2HM-4-7 – B16/4-7 – L7-L7M/4-7-7M – L43/4-7

in stainless steel B8/8-B8M/8M-B8T/8T-B8C/8C (class 1-2-3)

in high yield corrosion resistant steels Duplex UNS S31803 – Super Duplex UNS S32760 – 660 A/D

and special and non-ferrous alloys such as A.500 – A.625 – A.718 – A.925 – etc.

Even surface treatments as Zinc Plating, Hot Dipped Galvanized or PTFE coating, can be supplied on short notice.

The in-house workshop with automatic cutting machines, enables BEA NEDERLAND to produce special items and effect shipments within 24 hours. With more than 20 years of knowledge and experience, high quality standards and high service level, BEA NEDERLAND nowadays serves clients all over the world.





BEA

Our entrepreneurial history began in **1964** and since then, **aiming for excellence** has been our goal, growing and investing constantly over time with an eye to the future to achieve our current size and results. Passion for our work, **attention to the Customer**, dedication to the pursuit of continuous improvement and scrupulous attention to product quality have always been among the principles we believe in. These are the company's distinctive values, identified by an international market that recognizes its leadership in the production of quality fastening materials in the **petrochemical, hydroelectric, nuclear, naval, high-speed rail sectors** with a recent opening to the **wind power** and **hydrogen sectors**. A leadership that also distinguishes us in the production of components for the manufacturers of valves, filters, boilers and heat exchangers of which we were the forerunners. The Customer is our priority to which we guarantee not only the excellence of the product but also the quality of the service to satisfy every need. This has always guided our continuous investments in research, technology and machinery among the foundations of an industrial reality that has continued its evolution on markets around the world for almost 60 years.

For over 30 years we have also **specialized in the processing of super alloys in exotic materials, duplex and super duplex**, especially in **hot forging and heat treatment**, which distinguishes us as world leaders for our high expertise and know-how.

The process in which we are engaged every day is overseen in all its phases by a team of highly specialized technicians, engineers and professionals divided into an almost similar percentage between female and male presence, proud to be part of a **leading international company in its sector** with a vision that always looks to the future.

Empowered by the quality of our products and the passion that distinguishes us, we try to continue being protagonists of a market in which we are committed to both satisfying and anticipating needs.

PRODUCTION

Our company's priority is the control of the entire production process, from the raw material to the finished product, tested and certified to **guarantee higher quality both for standard products such as stud bolts, nuts and bolts and for customized products**, designed at the request of our customer, which we create ad hoc to meet even the most sophisticated needs.

Through commercial agreements and strategic partnerships **we oversee the main phases of the Supply Chain**, both downstream and upstream of the production cycle, to guarantee the quality of steels, carbon and special alloys, designed and developed for specific uses. A controlled and tested production process in internal laboratories through destructive and not-destructive testing, **manned by our technicians to guarantee the quality and integrity of each product** for which we offer a unique and personalized service.





PRODUCES HOT FORGED **NUTS** UP TO 4" - M100



IN NICKEL ALLOYS
DUPLEX - SUPERDUPLEX
CARBON LOW ALLOY
STAINLESS STEELS

THREAD TAPPING **NUTS**





PRODUCES HOT FORGED BOLTS



IN-HOUSE HEAT TREATMENT

BEA EXECUTES THE FOLLOWING HEAT TREATMENTS **TOTALLY IN HOUSE:**

QUENCHING AND TEMPERING

SOLUTION ANNEALING

NORMALIZING

AGE HARDENING

TEMPERING

GENERAL All furnaces at Bea are electric type, controlled atmosphere (nitrogen or nitrogen-methanol).

SOLUTION ANNEALING Executed on all standard and special stainless steel materials. BEA's furnaces work up to a maximum temperature of 1180°C, used for the following special applications:

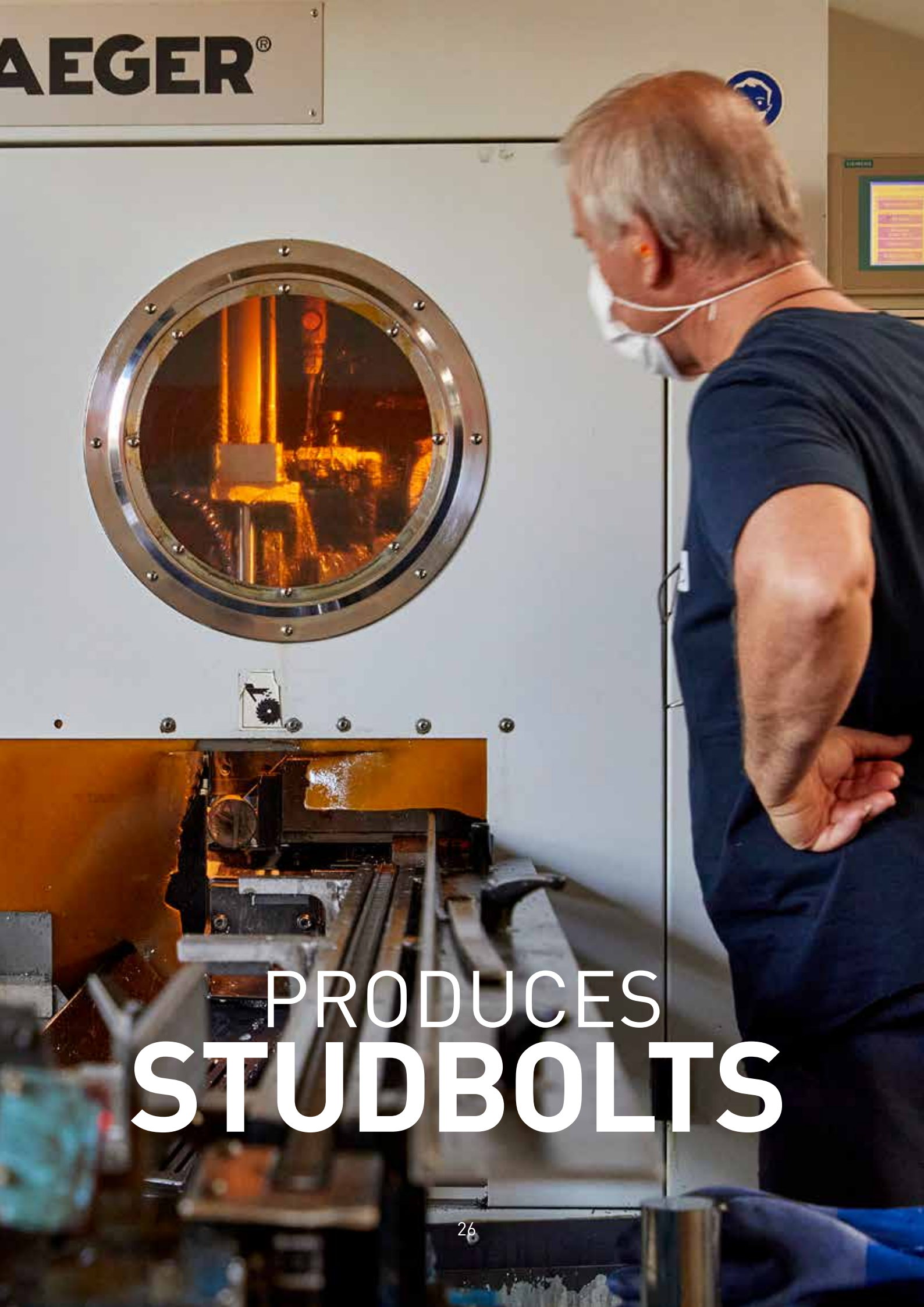
DUPLEX

SUPER DUPLEX

NICKEL-ALLOYS

QUENCHING AND TEMPERING Executed on carbon and low-alloy steel materials. Specific mechanical features can be obtained based on specific customer specifications up to a maximum temperature of 1000°C, quenching in oil or water.





PRODUCES
STUDBOLTS



CUTTING

CHAMFERING

THREAD ROLLING





CUSTOM MADE
FASTENERS

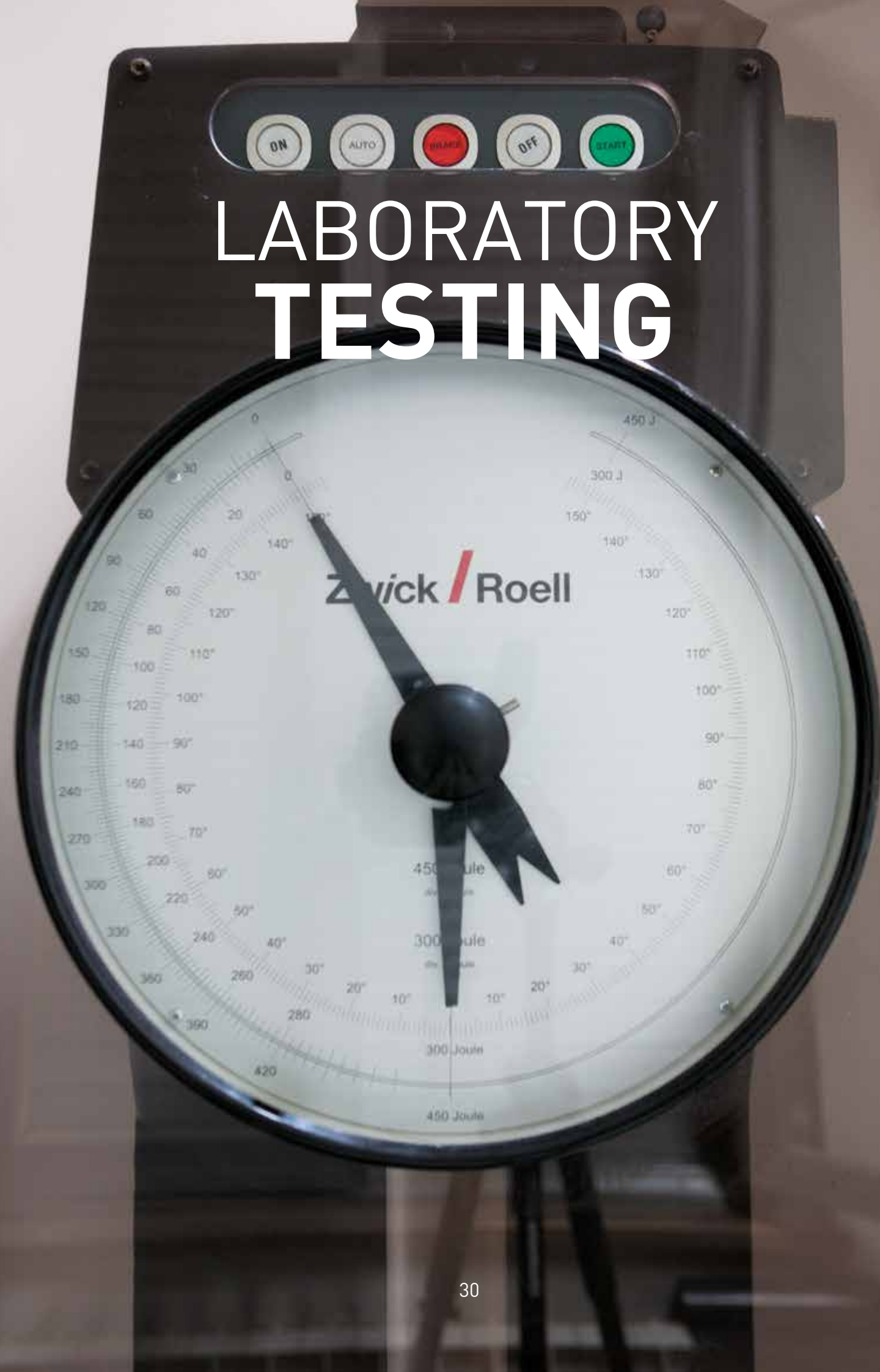


CNC LATHES

MACHINING CENTERS



LABORATORY TESTING



TENSILE TEST

PROOF LOAD TEST

HARDNESS TEST

(Brinell - Rockwell C - Rockwell B)

IMPACT TEST

(from room temperature to -196°C)



ULTRASONIC TEST

MAGNETIC PARTICLE INSPECTION

LIQUID PENETRANT EXAMINATION

POSITIVE MATERIAL IDENTIFICATION

NON
DESTRUCTIVE
TESTING

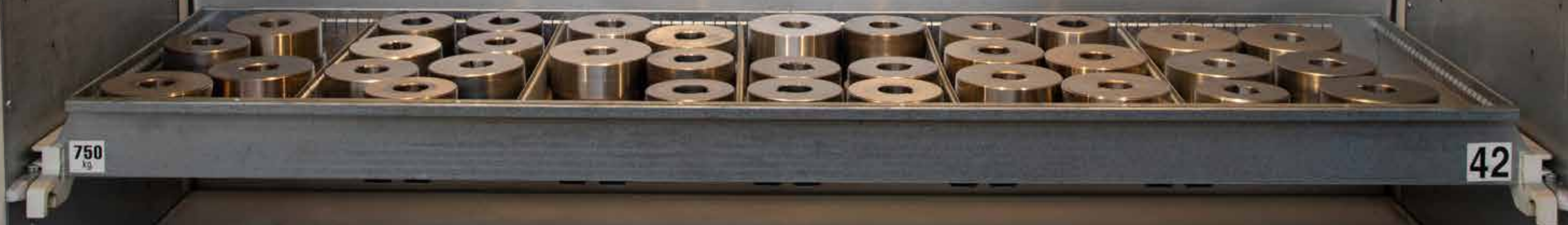


HIGHLY
SPECIALIZED
TECHNICIANS
PRESIDE OVER
EACH PHASE
OF THE PRODUCTION
PROCESS

AUTOMATIC WAREHOUSE RAW MATERIAL

AUTOMATIC WAREHOUSE FINISHED PRODUCTS

AUTOMATIC WAREHOUSES PRODUCTION'S TOOLS



PRODUCES WITH THESE

ALLOY and STAINLESS STEEL ASTM A 193 for HIGH TEMPERATURE SERVICE										
MECHANICAL REQUIREMENTS										
ALLOY	ASTM	AISI	UNS	W.-Nr.	dia	Tensile Strength min. Mpa	Yield min.0,2%Mpa	Elongation in 4 D. min %	Reduction of Area min %	HB max
B5	A193	501	S50100	1.7302	up to 4", incl	690	550	16	50	-
B6	A193	410	S41000	1.4006	up to 4", incl	760	585	15	50	-
B7	A193	4140	S41400	1.7225	21/2 and under	860	720	16	50	321
B7M	A193	4140	G41400	1.7225	over 21/2 to 4"	795	655	16	50	302
					over 4" to 7"	690	515	18	50	277
					21/2 and under	690	550	18	50	235
					over 21/2 to 4"	690	550	18	50	235
					over 4" to 7"	690	515	18	50	235
B16	A193	-	K14072	1.7711	21/2 and under	860	725	18	50	321
					over 21/2 to 4"	790	655	17	45	302
					over 4" to 7"	690	585	16	45	277
B8	A193	304	S30400	1.4301	all sizes	515	205	30	50	223
B8A	A193	304	S30400	1.4301	all sizes	515	205	30	50	192
B8T	A193	321	S32100	1.4341	all sizes	515	205	30	50	223
B8TA	A193	321	S32100	1.4341	all sizes	515	205	30	50	192
B8C	A193	347	S34700	1.4550	all sizes	515	205	30	50	223
B8CA	A193	347	S34700	1.4550	all sizes	515	205	30	50	192
B8M	A193	316	S31600	1.4401	all sizes	515	205	30	50	223
B8MA	A193	316	S31600	1.4401	all sizes	515	205	30	50	192
B8R	A193	-	S20910	1.3964	all sizes	690	380	35	55	271
B8S	A193	-	S21800	-	all sizes	655	345	35	55	271
B8MLCuN	A193	-	S31254	1.4547	all sizes	660	240	30	40	223
B8cl2	A193	304	S30400	1.4401	3/4 and under	860	690	12	35	321
B8Tcl2	A193	321	S32100	1.4341	over 3/4 to 1	795	550	15	35	321
B8Ccl2	A193	347	S34700	1.4550	over 1 to 11/4	725	450	20	35	321
					over 11/4 to 11/2	690	345	28	45	321
B8Mcl2	A193	316	S31600	1.4401	3/4 and under	760	655	15	45	321
B8MLCuNcl2	A193	-	S31254	1.4547	over 3/4 to 1	690	550	20	45	321
					over 1 to 11/4	655	450	25	45	321
					over 11/4 to 11/2	620	345	30	45	321
B8M2cl2B	A193	316	S31600	1.4401	2 and under	655	515	25	40	321
B8cl2B	A193	304	S30400	1.4301	over 2 to 21/2	620	450	30	40	321
					over 21/2 to 3	550	380	30	40	321
					2 and under	585	450	30	60	321
B8M3cl2C	A193	316	S31600	1.4401	over 2	585	415	30	60	321

ALLOY and STAINLESS STEEL ASTM A 320 for LOW TEMPERATURE SERVICE											
MECHANICAL REQUIREMENTS											
ALLOY	ASTM	AISI	UNS	W.-Nr.	dia	Tensile Strength min. Mpa	Yield min.0,2%Mpa	Elongation in 4 D. min %	Reduction of Area	HB	Impact Test -101° C -73° C average(min)Joules
L7	A320	4140	G4140	1.7225	4" and under	860	725	16	50	235 max	27(20)
L7M	A320	4140	G4140	1.7225	all sizes	690	550	18	50		27(20)
L43	A320	4340	G4340	1.6565	over 21/2	860	725	16	50		27(20)
B8	A320	304	S30400	1.4301	all sizes	515	205	35	50	223	
B8A	A320	304	S30400	1.4301	all sizes	515	205	35	50	192	
B8T	A320	321	S32100	1.4541	all sizes	515	205	35	50	123	
B8TA	A320	321	S32100	1.4541	all sizes	515	205	35	50	192	
B8C	A320	347	S34700	1.4550	all sizes	515	205	35	50	223	
B8CA	A320	347	S34700	1.4550	all sizes	515	205	35	50	192	
B8M	A320	316	S31600	1.4401	all sizes	515	205	35	50	223	
B8MA	A320	316	S31600	1.4401	all sizes	515	205	35	50	192	
B8cl2	A320	304	S30400	1.4301	3/4 and under	860	690	12	35	321	
B8Tcl2	A320	321	S32100	1.4541	over 3/4 to 1"	725	450	20	35	321	
B8Ccl2	A320	347	S34700	1.4550	over 1" to 11/4	795	550	15	35	321	
					over 11/4 to 11/2	690	345	28	45	321	
B8Mcl2	A320	316	S31600	1.4550	3/4 and under	760	655	15	45	321	
					over 3/4 to 1"	690	550	20	45	321	
					over 1" to 11/4	655	450	25	45	321	
					over 11/4 to 11/2	620	345	30	45	321	

STEEL GRADES

ASTM A193 - A320 composition percent												
CHEMICAL REQUIREMENTS												
ASTM	C max	P max	S max	Mn max	Si max	Cr	Ni	Mo	V	Ti	N	Other max
B5	0,10 min	0,040	0,030	1,00	1,00	4,00-6,00	-	0,40-0,65	-	-	-	-
B6	0,08-0,15	0,040	0,030	1,00	1,00	11,5-13,5	-	-	-	-	-	-
B7-B7M	0,38-0,48	0,035	0,040	0,75-1,00	0,15-0,35	0,80-1,10	-	0,15-0,25	-	-	-	-
B16	0,36-0,47	0,035	0,040	0,45-0,70	0,15-0,35	0,80-1,15	-	0,50-0,65	0,25-0,35	-	-	Al 0,015
L7-L7M	0,38-0,48	0,035	0,040	0,75-1,00	0,15-0,35	0,80-1,10	-	0,15-0,25	-	-	-	-
L43	038-0,43	0,035	0,040	0,60-0,85	0,15-0,35	0,70-0,90	1,65-2,0	2,0-3,0	-	-	-	-
B8	0,08	0,045	0,030	2,00	1,00	18,0-20,0	8,0-11,0	-	-	-	-	-
B8A	0,08	0,045	0,030	2,00	1,00	18,0-20,0	8,0-11,0	-	-	-	-	-
B8C	0,08	0,045	0,030	2,00	1,00	17,0-19,0	9,0-12,0	-	-	-	-	Cb+Ta 10xC 0,05 under content min; 1,1
B8CA	0,08	0,045	0,030	2,00	1,00	17,0-19,0	9,0-12,0	-	-	-	-	-
B8M	0,08	0,045	0,030	2,00	1,00	16,0-18,0	10,0-14,0	2,0-3,0	-	-	-	-
B8MA	0,08	0,045	0,030	2,00	1,00	16,0-18,0	10,0-14,0	2,0-3,0	-	-	-	-
B8MLCuN	0,02	0,030	0,010	1,00	0,80	19,5-20,5	17,5-18,5	6,0-6,5	-	-	0,18-0,22	Cu 0,5-1,0
B8R	0,06	0,045	0,030	4,0-6,0	1,00	20,5-23,5	11,5-13,5	1,5-3,0	0,1-0,3	-	0,20-0,40	Cb+Nb 0,1-0,3
B8S	0,10	0,060	0,030	7,0-9,0	3,5-4,5	16,0-18,0	8,0-9,0	-	-	-	0,08-0,18	-
B8T	0,08	0,045	0,030	2,00	1,00	17,0-19,0	9,0-12,0	-	-	(5xC+N)min^a	-	-
B8TA	0,08	0,045	0,030	2,00	1,00	17,0-19,0	9,0-12,0	-	-	(5xC+N)min^a	-	-
B8cl2	0,08	0,045	0,030	2,00	1,00	18,0-20,0	8,0-11,0	-	-	-	-	-
B8Ccl2	0,08	0,045	0,030	2,00	1,00	17,0-19,0	9,0-12,0	-	-	-	-	Cb+Ta 10xC 0,05 under content min; 1,1
B8Mcl2	0,08	0,045	0,030	2,00	1,00	16,0-18,0	10,0-14,0	2,0-3,0	-	-	-	-
B8Tcl2	0,08	0,045	0,030	2,00	1,00	17,0-19,0	9,0-12,0	-	-	5xC min^a	-	-
B8MLCuNcl2	0,02	0,030	0,010	1,00	0,80	19,5-20,5	17,5-18,5	6,0-6,5	-	-	0,18-0,22	Cu 0,5-1,0

CARBON, ALLOY and STAINLESS STEEL NUTS ASTM A 194								
MECHANICAL REQUIREMENTS								
ALLOY	ASTM	AISI	UNS	W.-Nr.	dia	HB	HRC max	HRB min
2	A194	1040	K04002	1.1191	all sizes	159 to 327	-	-
2H	A194	1040	K04002	1.1191	11/2 and under	248 to 327	24 to 28	-
2HM	A194	1040	K04002	1.1191	over 11/2	212 to 327	38	95
					all sizes	159 to 235	22	-
3	A194	501	S50100	1.7362	all sizes	248 to 327	24 to 38	-
6-6F	A194	410	S41000	1.4006	all sizes	228 to 271	20 to 28	-
7L	A194	4140	S41400	1.7225	all sizes	248 to 327	24 to 38	-
7ML	A194	4140	S41400	1.7225	all sizes	159 to 235	22	-
8	A194	304	S30400	1.4301	all sizes	126 to 300	-	60 to 105
8C	A194	347	S34700	1.4550	all sizes	126 to 300	-	60 to 105
8M	A194	316	S31600	1.4401	all sizes	126 to 300	-	60 to 105
8MLCuN	A194	-	S31254	-	all sizes	126 to 300	-	-
8T	A194	321	S32100	1.4541	all sizes	126 to 300	-	60 to 105
8R	A194	-	S20910	-	all sizes	183 to 271	-	-
8S	A194	-	S21800	-	all sizes	183 to 271	-	-
8A	A194	304	S30400	1.4301	all sizes	126 to 192	-	60 to 90
8CA	A194	347	S34700	1.4550	all sizes	126 to 192	-	60 to 90
8MA	A194	316	S31600	1.4401	all sizes	126 to 192	-	60 to 90
8TA	A194	321	S32100	1.4541	all sizes	126 to 192	-	60 to 90

ASTM A 194 composition percent												
CHEMICAL REQUIREMENTS												
ASTM	C max	P max	S max	Mn max	Si max	Cr	Ni	Mo	V	Ti	Al max	Other max
2H	0,40 min	0,040	0,050	1,00	0,40	-	-	-	-	-	-	-
2HM	0,40 min	0,040	0,050	1,00	0,40	-	-	-	-	-	-	-
3	0,10 min	0,040	0,030	1,00	1,00	4,0 - 6,0	-	0,40-0,65	-	-	-	-
6	0,15	0,040	0,030	1,00	1,00	11,5-13,5	-	-	-	-	-	-
6F	0,15	0,060	0,150	1,25	1,00	12,0-14,0	0,05	-	-	-	-	-
7L-7ML	0,38-0,48	0,040	0,040	0,75-1,00	0,15-0,35	0,80-1,10	-	0,15-0,25	-	-	-	-
16	0,36-0,47	0,035	0,040	0,45-0,70	0,15-0,35	0,80-1,15	-	0,50-0,65	0,25-0,35	-	0,015	-
8-8A	0,08	0,045	0,030	2,00	1,00	18,0-20,0	8,0-10,5	-	-	-	-	-
8C-8CA	0,08	0,045	0,030	2,00	1,00	17,0-19,0	9,0-12,0	-	-	0,050	-	Cb+Ta 10xC 0,05 under content min; 1,1
8M-8MA	0,08	0,045	0,030	2,00	1,00	16,0-18,0	10,0-14,0	2,0-3,0	-	-	-	-
8T-8TA	0,08	0,045	0,030	2,00	1,00	17,0-19,0	9,0-12,0	-	-	5xC min	-	-
8MLCuN	0,02	0,030	0,010	1,00	0,80	19,5-20,5	17,5-18,5	6,0-6,5	-	-	-	Cu 0,5-1,0 /N 0,18-0,22
8R	0,06	0,045	0,030	4,0-6,0	1,00	20,5-23,5	11,5-13,5	1,5-3,0	0,1-0,3	-	-	Cb+Ta 0,1-0,3 /N 0,20-0,40
8S	0,10	0,060	0,030	7,0-9,0	3,5-4,5	16,0-18,0	8,0-9,0	-	-	-	-	N 0,08-0,18

PRODUCES WITH THESE

HIGH TEMPERATURE RESISTING ALLOYS MECHANICAL REQUIREMENTS										
ALLOY	ASTM	UNS	W.-Nr.	Heat Treatment	dia	Tensile	Yield	Elongation	Reduction	HB
						min. Mpa	min.0,2%Mpa	in 4 D. min %	of Area	
600	B166	N06600	2.4816	solution annealed	under 1/2	655	310	20	-	-
				solution annealed	1/2 to 3"	620	275	25	-	-
				solution annealed	over 3"	585	240	30	-	-
660A-B-C 660D	A453	S66286	1.4980	sol+prec.harden	all sizes	895	585	15	18	248-341
	A453	S66286	1.4980	sol+prec.harden	all sizes	895	725	15	18	248-321
HX	B572	N06002	2.4606	solution annealed	all sizes	660	240	35	-	-
718	B637	N07718	2.4668	sol+prec.harden	all sizes	1275	1034	12	15	331
718 API	-	N07718	2.4668	sol+prec.harden	all sizes	1034	1000	20	25	298-363
725	B637	N07725	-	sol+prec.harden	all sizes	1034	827	20	35	43 HRC
X-750	B637	N07750	2.4669	solution annealed	all sizes	965	620	8	-	262 min
800HT	B408	N08811	1.4876	solution annealed	all sizes	450	170	30	-	-
80A	B637	N07080	2.4952	solution annealed	all sizes	930	620	20	-	-
925	B637	N09925	-	sol+prec.harden	5/8 - 3"	965	724	18	25	38 HRC
				sol+prec.harden	over 1"	965	758	18	25	38 HRC

CORROSION RESISTING ALLOYS MECHANICAL REQUIREMENTS										
ALLOY	ASTM	UNS	W.-Nr.	Heat Treatment	dia	Tensile	Yield	Elongation	Reduction	HRC
						min. Mpa	min.0,2%Mpa	in 4 D. min %	of Area	
276 400	F468	N10276	2.4819	solution annealed	all sizes	760	310	25	-	20-32
	F468	N04400	2.4360	solution annealed	1/4 to 7/8	550	275	20	-	75-103HRB
				solution annealed	1" to 11/2	480	205	20	-	60-103HRB
500	F468	N05500	2.4375	sol+prec.harden	1/4 to 7/8	900	620	20	-	24-37
				sol+prec.harden	1" to 11/2	900	590	20	-	24-37
600	B166	N06600	2.4816	solution annealed	under 1/2	655	310	20	-	-
				solution annealed	1/2 to 3"	620	275	25	-	-
				solution annealed	1/2 to 3"	585	240	30	-	-
625 G1	B446	N06625	2.4856	solution annealed	up to 4"	825	415	30	-	-
625 G2	B446	N06625	2.4856	solution annealed	all sizes	690	275	30	-	-
660A-B-C	A453	S66286	1.4980	sol+prec.harden	all sizes	895	585	15	18	248-341HB
660D	A453	S66286	1.4980	sol+prec.harden	all sizes	895	725	15	18	248-341HB
686	F467-8	N06686	2.4606	solution annealed	all sizes	1100	1030	20	-	25-49
718	B637	N07718	2.4668	sol+prec.harden	all sizes	1275	1034	12	15	331HB
718 API	B637	N07718	2.4668	sol+prec.harden	all sizes	1034	1000	20	25	298-363HB
B2	B335	N10665	2.4617	solution annealed	all sizes	760	350	40	-	-
C22	B574	N06022	2.4602	solution annealed	all sizes	690	310	45	-	-

CHEMICAL REQUIREMENTS composition percent															
ASTM	C max	P max	S max	Mn max	Si max	Cr max	Ni min	Mo	Ti	Cu max	Fe max	Al max	Cb+Ta max	Other max	
276	0,020	0,040	0,030	1,00	0,08	14,5-16,5	balance	15,0-17,0	-	-	4,0 - 7,0	-	-	W 3,0-4,5 /Co2,5	
400	0,30	-	0,024	2,00	0,50	-	63,0-70,0	-	-	balance	2,50	-	-	Co balance	
500	0,25	-	0,010	1,50	0,50	-	63,0-70,0	-	0,35-0,85	balance	2,00	2,3-3,15	-	Co balance	
600	0,15	-	0,015	1,00	0,50	14,0-17,0	72,00	-	-	0,50	6,0 -10,0	-	-	-	
625 G1	0,10	0,015	0,015	0,50	0,50	20,0-23,0	58,00	8,0-10,0	0,40 max	-	5,00	0,40	3,15-4,15	Co 1,0	
625 G2	0,10	0,015	0,015	0,50	0,50	20,0-23,0	58,00	8,0-10,0	0,40 max	-	5,00	0,40	3,15-4,15	Co 1,0	
660	0,08	0,040	0,030	2,00	1,00	13,5-16,0	24,0-27,0	1,00-1,50	1,90-2,35	-	-	0,35	-	B 0,001-0,01 /V 0,1-0,5	
686	0,01	0,040	0,020	0,75	0,08	19,0-23,0	balance	15,0-17,0	0,02-0,25	-	5,00	-	-	W 3,0-4,4	
718API	0,045	0,010	0,010	0,35	0,35	17,0-21,0	50,0-55,0	2,80-3,30	0,80-1,15	0,23	balance	0,40-0,60	4,87-5,2	B 0,006 /Co 1,0	
718	0,08	0,015	0,015	0,35	0,35	17,0-21,0	50,0-55,0	2,80-3,30	0,65-1,15	0,30	balance	0,20-0,80	4,75-5,5	B 0,006 /Co 1,0	
HX	0,05-0,15	0,040	0,030	1,00	1,00	20,5-23,0	balance	8,0-10,0	-	-	17,0-20,0	-	-	Co 0,5-2,5 /W 0.2-1,0	
725	0,03	0,015	0,010	0,35	0,20	19,0-22,5	55,0-59,0	7,0-9,5	1,0-1,7	-	balance	0,35	2,75-4,0	-	
X-750	0,08	-	0,010	1,00	0,50	14,0-17,0	70,00	-	2,25-2,75	0,50	5,0 - 9,0	0,4-1,0	0,70-1,2	Co 1,0	
800HT	0,06-0,1	-	0,015	1,50	1,00	19,0-23,0	30,0-35,0	-	0,15-0,60	0,75	min 39,5	0,15-0,60	-	-	
80A	0,10	-	0,015	1,00	1,00	18,0-21,0	balance	-	1,80-2,70	-	3,00	0,5-1,8	-	-	
925	0,030	0,030	0,030	1,00	0,50	19,5-22,5	42,0-46,0	2,5-3,5	1,9-2,4	1,5-3,0	min 22	0,1-0,5	0,50	-	
B2	0,020	0,040	0,030	1,00	0,10	1,00	balance	26,0-30,0	-	-	2,00	-	-	Co 1,0	
C22	0,015	0,020	0,020	0,50	0,08	20,0-22,5	balance	12,5-14,5	-	-	2,0 - 6,0	-	-	W 2,5-3,5 /V 0,5 /Co 2,5	

STEEL GRADES

CORROSION RESISTING ALLOYS with HIGH YIELD LIMITS MECHANICAL REQUIREMENTS										
ALLOY	ASTM	UNS	W.-Nr.	Heat Treatment	dia	Tensile	Yield	Elongation	Reduction	HB
						min. Mpa	min.0,2%Mpa	in 4 D. min %	of Area	
F51	A182	S31803	1.4462	solution annealed	all sizes	620	450	25	50	-
F60	A182	S32205	1.4462	solution annealed	all sizes	655	450	25	-	290
F44	A182	S31254	1.4547	solution annealed	all sizes	650	300	35	50	290
F53	A182	S32750	1.4468	solution annealed	all sizes	800	550	15	-	310
F55 A	A276	S32760 A	1.4501	solution annealed	all sizes	750	550	25	-	290
F55 S	A276	S32760 S	1.4501	sol ann+cold fin	all sizes	860	720	15	-	335
F61	A182	S32550	1.4515	solution annealed	all sizes	760	550	15	-	297
500	F468	N05500	2.4375	sol+prec.harden	1/4 to 7/8	900	620	20	-	24-37 RC
				sol+prec.harden	1 to 11/2	900	590	20	-	24-37 RC
660 A-B-C	A453	S66286	1.4980	sol+prec.harden	all sizes	895	585	15	18	248-341
660 D	A453	S66286	1.4980	sol+prec.harden	all sizes	895	725	15	18	248-321
31050	A182	S31050	1.4466	solution annealed	all sizes	580	270	30	-	-

CHEMICAL REQUIREMENTS composition percent													
ASTM	C max	P max	S max	Mn max	Si max	Cr	Ni	Mo max	Ti	Al max	B max	N	Other max
F51	0,03	0,030	0,020	2,00	1,00	21,0-23,0	4,5-6,5	2,5-3,5	-	-	-	0,08-0,2	-
F44	0,02	0,030	0,010	1,00	0,80	19,5-20,5	17,5-18,5	6,0-6,5	-	-	0,50-1,0	0,18-0,22	-
F53	0,03	0,035	0,020	1,20	0,80	24,0-26,0	6,0-8,0	3,0-5,0	-	-	0,50	0,24-0,32	-
F55	0,03	0,030	0,010	1,00	1,00	24,0-26,0	6,0-8,0	3,0-4,0	-	-	0,50-1,0	0,2-0,3	W 0,5-1,0
F60	0,03	0,030	0,020	2,00	1,00	22,0-23,0	4,5-6,5	3,0-3,5	-	-	-	0,14-0,2	-
F61	0,04	0,040	0,030	1,50	1,00	24,0-27,0	4,5-6,5	2,9-3,9	-	-	1,50-2,5	0,1-0,25	-
500	0,25	-	0,010	1,50	0,50	-	63,0-70,0	1,50	0,35-0,85	2,3-3,15	-	-	Cu balance Fe 2,00
660	0,08	0,040	0,030	2,00	1,00	13,5 - 16	24,0-27,0	1,0-1,5	1,90-2,35	0,35	-	-	V 0,1 - 0,5 /B 0,001-0,01
31050	0,03	0,030	0,015	2,00	0,40	24,0-26,0	21,0-23,0	2,0-3,0	-	-	-	0,1-0,18	-

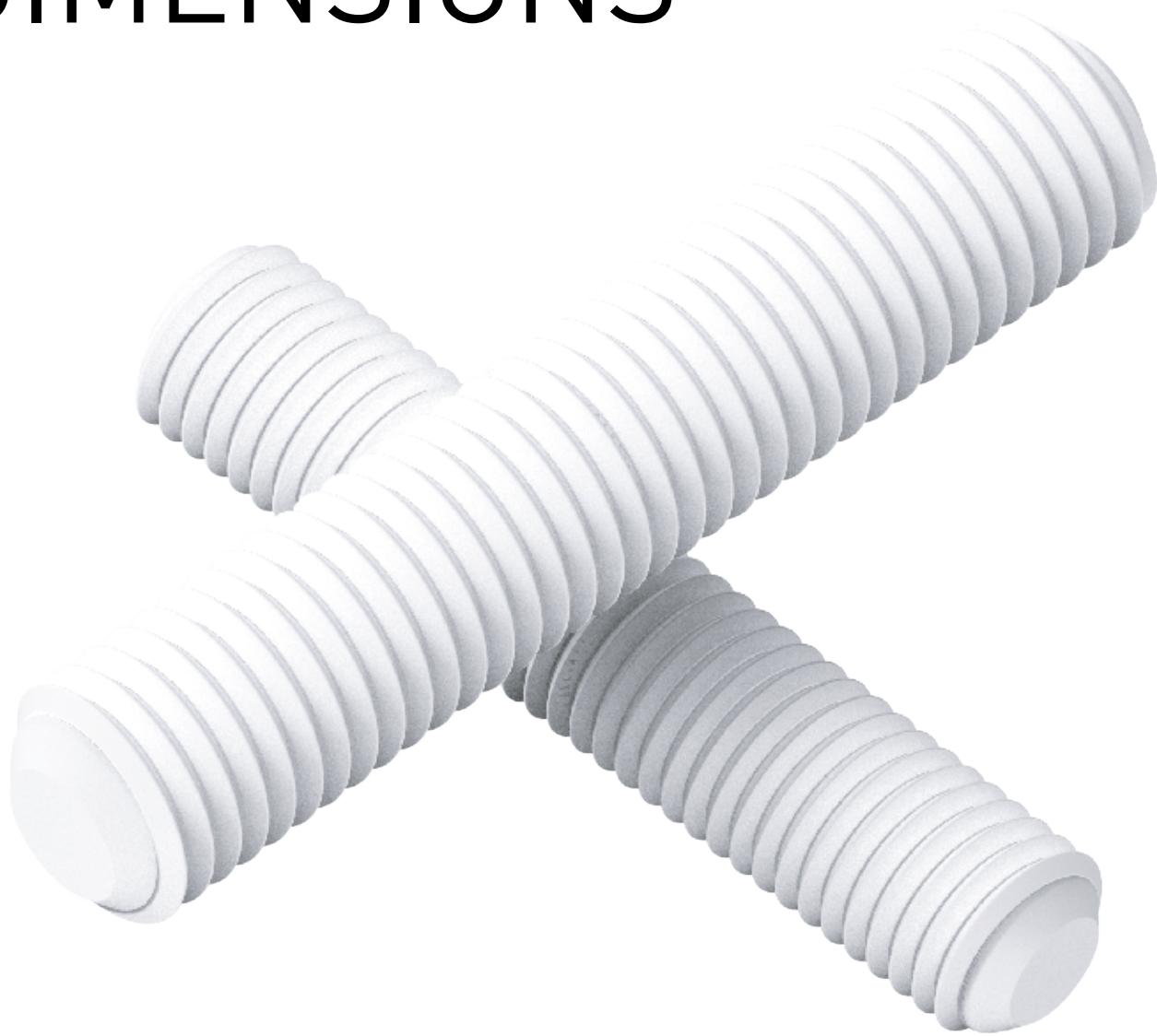
CORROSION RESISTING ALLOYS with LOW DENSITY MECHANICAL REQUIREMENTS								
ALLOY	ASTM	UNS	W.-Nr.	dia	Tensile	Yield	Elongation	Reduction
					Strength		in 4 D.	of Area
					min. Mpa	min.0,2%Mpa	min %	
Ti gr 2	B348	R50400	3.7035	all sizes	345	275	20	30
Ti gr 5	B348	R56400	3.7165	all sizes	895	828	10	25

CORROSION RESISTING BRONZE ALLOYS									
MECHANICAL REQUIREMENTS									
ALLOY	ASTM	UNS	W.-Nr.	dia	Tensile	Yield	Elongation	Reduction	HB
					Strength		in 4 D.	of Area	
					min. Mpa	min.0,2%Mpa	min %		
614	F467/8	C61400	2.0932	all sizes	520	240	30	-	122-208
630	F467/8	C63000	2.0966	all sizes	690	345	5	-	166-230
655	F467/8	C65500	2.1525	all sizes	345	105	20	-	105-148

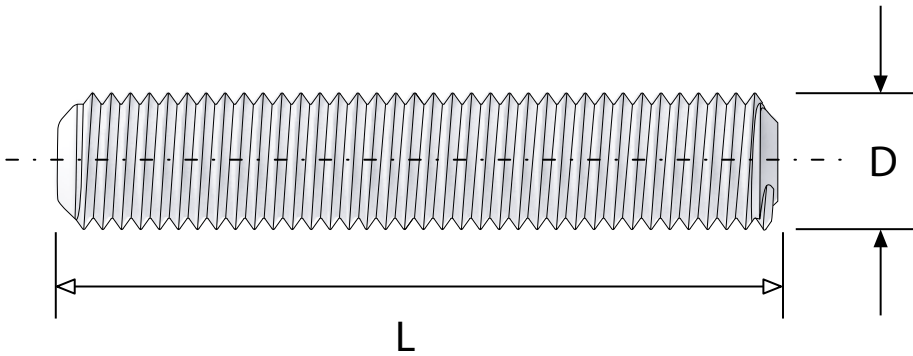
CHEMICAL REQUIREMENTS composition percent															
ASTM	C max	Mn max	SI max	Ni max	Fe max	Ti	Al	V	Cu min	Zn max	O max	N max	H max	Other each max	total max
Ti gr.2	0,08	-	-	-	0,30	balance	-	-	-	-	0,25	0,03	0,015	0,10	0,40
Ti gr.5	0,08	-	-	-	0,40	balance	5,5-6,75	3,5-4,5	-	-	0,20	0,05	0,015	0,10	0,40
614	-	1,00	-	-	1,5-3,5	-	6,0-7,5	-	88,0	-	-	-	-	-	-
630	-	1,50	0,25	4,0-5,5	2,0-4,0	-	9,0-11,0	-	78,0	-	-	-	-	-	-
655	-	1,50	2,8-3,8	0,60	0,80	-	-	-	94,8	1,50	-	-	-	Pb 0,05	-

STUDBOLTS

DIMENSIONS



IMPERIAL RANGE 5/16" - 6"
METRIC RANGE M6 - M150



STUDBOLTS: SIZE AND DIMENSIONS TOLERANCE

SECTION D - STUDBOLTS FOR PRESSURE - TEMPERATURE PIPING

LENGHT

The length of the stud bolt, measured parallel to the axis, is the distance from first thread to first thread. First thread is defined as the intersection of the major diameter of the thread with the base of the point.

METRIC SERIES The length of the stud bolt, measured parallel to the axis, is the distance from each end of the studbolt, including the end point.

Length inch	Length inch	Tolerance mm
to 12	± 0,052	± 1,3208
over 12 to 18	± 0,125	± 3,175
over 18	± 0,250	± 6,35

THREADS

Nominal size or diameter INCH SERIES	1" and smaller UNIFIED COARSE THREAD SERIES CLASS 2A ASME B1.1	1 1/8" and larger UNIFIED 8 THREAD SERIES CLASS 2A ASME B1.1
Nominal size or diameter METRIC SERIES	M33 and smaller METRIC COARSE THREAD SERIES	M36 and larger METRIC FINE AND COARSE PITCH THREADS CLASS 6g ISO 68 / ISO 965

MARKING

MARKING CONFORMS TO ASTM DESIGNATION FOR STEEL FASTENERS.

NUTS

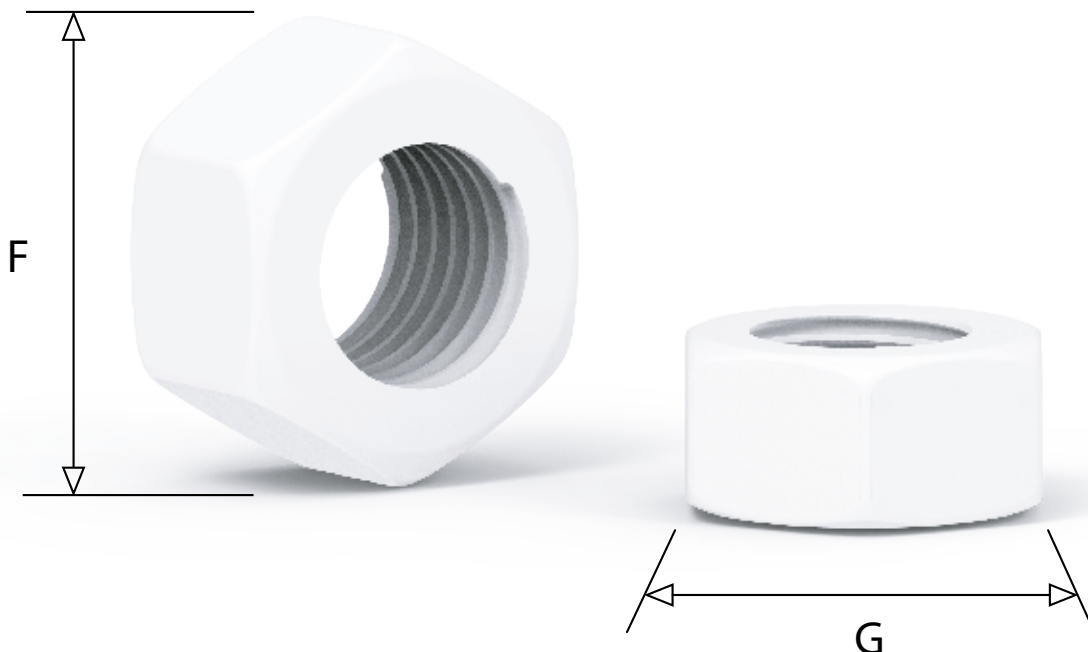
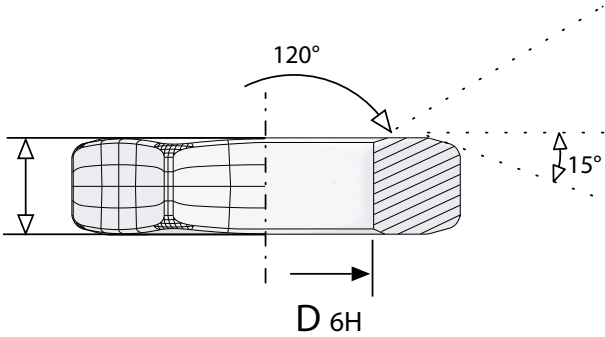
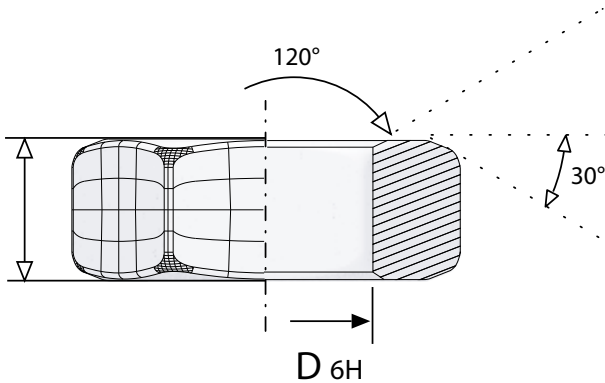
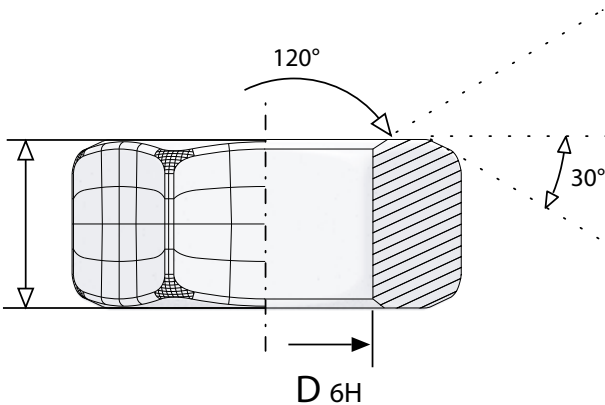
DIMENSIONS

IMPERIAL RANGE 1/4" - 6"

DIMENSIONS of HEAVY HEX NUTS and HEAVY HEX JAM NUTS in mm
ASME B 18.2.2 - TABLE 10

Nominal Sizes	Width Across Flats F		Width Across Corners G		Thickness H		Thickness H1	
	min	max	min	max	min	max	min	max
1/4	12,40	12,70	14,12	14,65	5,54	6,35	3,96	4,78
5/16	13,86	14,29	15,80	16,51	7,11	7,97	4,72	5,59
3/8	16,99	17,46	19,38	20,17	8,66	9,58	5,49	6,40
7/16	18,49	19,05	21,08	22,00	10,24	11,20	6,27	7,24
1/2	21,59	22,22	24,61	25,65	11,78	12,80	7,04	8,05
9/16	23,08	23,81	26,34	27,50	13,36	14,42	7,80	8,86
5/8	26,18	26,98	29,84	31,16	14,90	16,02	8,56	9,68
3/4	30,78	31,75	35,10	36,65	18,03	19,25	10,11	11,33
7/8	35,40	36,51	40,36	42,16	21,15	22,48	11,63	12,95
1	40,00	41,27	45,61	47,65	24,28	25,70	13,18	14,61
1 1/8	44,60	46,03	50,85	53,13	27,40	28,93	14,71	16,23
1 1/4	49,22	50,80	56,11	58,65	30,14	31,77	17,45	19,08
1 3/8	53,82	55,56	61,37	64,16	33,27	35,00	18,97	20,70
1 1/2	58,42	60,32	66,60	69,64	36,39	38,22	20,52	22,35
1 5/8	63,01	65,09	71,83	75,15	39,52	41,45	22,05	23,98
1 3/4	67,61	69,85	77,09	80,64	42,64	44,67	23,60	25,63
1 7/8	72,23	74,61	82,34	86,15	45,77	47,90	25,12	27,25
2	76,83	79,37	87,60	91,64	48,89	51,13	26,67	28,91
2 1/4	86,00	88,90	98,09	102,65	54,71	57,17	29,34	31,78
2 1/2	95,25	98,42	108,58	113,63	60,98	63,62	35,59	38,23
2 3/4	104,44	107,95	119,07	124,63	67,23	70,27	38,66	41,50
3	113,66	117,47	129,59	135,63	73,48	76,53	41,73	44,78
3 1/4	122,88	127,00	140,08	146,65	79,34	82,60	44,40	47,65
3 1/2	132,08	136,52	150,57	157,65	85,60	89,05	47,50	50,95
3 3/4	141,27	146,05	161,06	168,65	91,85	95,50	50,55	54,20
4	150,50	155,57	171,57	179,65	98,10	101,95	53,64	57,51
4 1/4	159,71	165,10	182,07	190,65	104,35	108,40	-	-
4 1/2	168,91	174,62	192,56	201,65	110,60	114,85	-	-
4 3/4	178,11	184,15	203,05	212,64	116,84	121,31	-	-
5	187,33	193,67	213,57	223,64	123,09	127,76	-	-
5 1/4	196,53	203,20	224,05	234,64	129,34	134,21	-	-
5 1/2	205,74	212,73	234,54	245,63	135,59	140,67	-	-
5 3/4	214,95	222,25	245,04	256,63	141,83	147,12	-	-
6	224,16	231,78	255,54	267,63	148,08	153,57	-	-

Dimensions in mm



NUTS

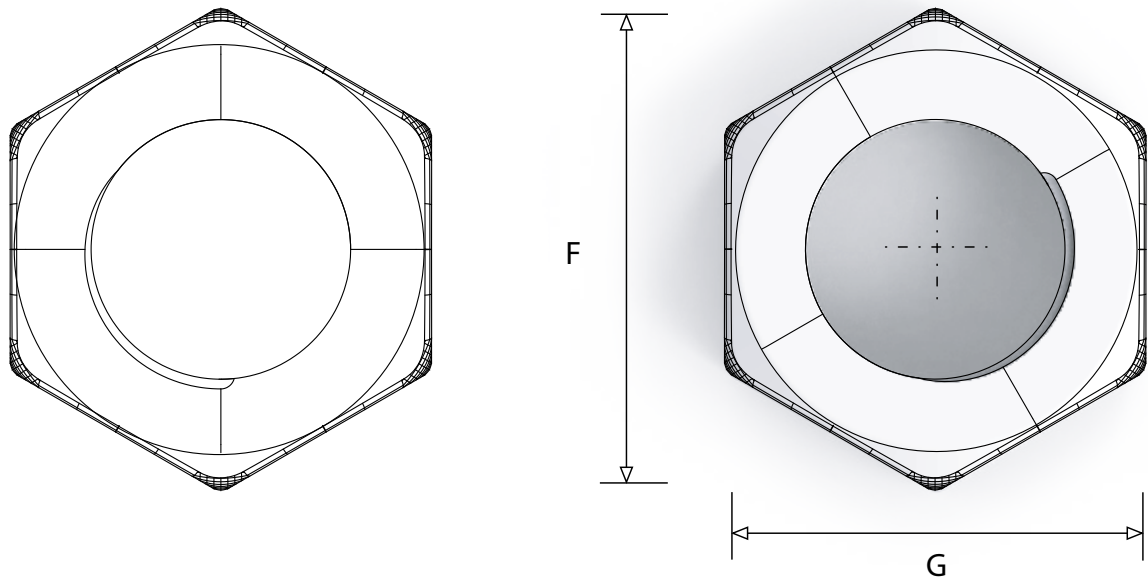
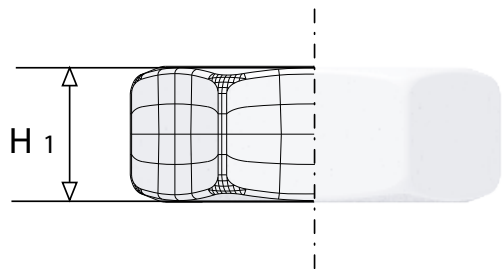
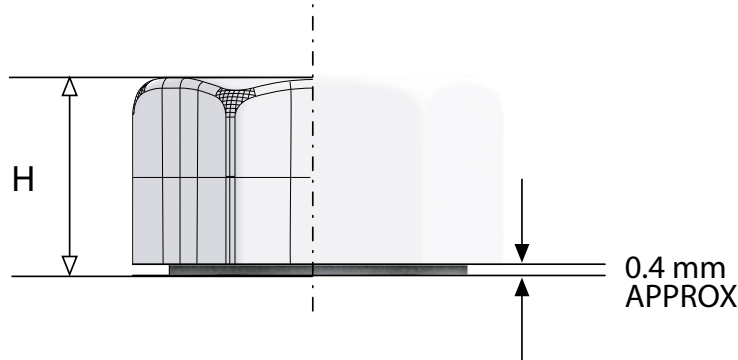
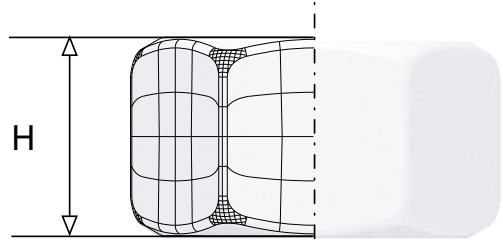
DIMENSIONS

METRIC RANGE M6 - M150

DIMENSIONS of HEX NUTS with METRIC COARSE and FINE PITCH THREAD

Nominal Size	Width Across Flats F		Width Across Corners G		DIN 934 H=D		DIN 934 H1		DIN 936 H2	
	min	max	min	max	min	max	min	max	min	max
M 6	9,78	10,00	11,05	11,55	5,70	6,00	4,70	5,00	-	-
M 8	12,73	13,00	14,38	15,00	7,64	8,00	6,14	6,50	4,70	5,00
M 10	16,73	17,00	18,90	19,60	9,64	10,00	7,64	8,00	5,70	6,00
M 12	18,67	19,00	21,10	21,90	11,57	12,00	9,64	10,00	6,64	7,00
M 14	21,67	22,00	24,49	25,40	13,57	14,00	10,30	11,00	7,42	8,00
M 16	23,67	24,00	26,75	27,70	15,57	16,00	12,30	13,00	7,42	8,00
M 18	26,67	27,00	30,14	31,10	17,57	18,00	14,30	15,00	8,42	9,00
M 20	29,67	30,00	33,53	34,60	19,48	20,00	14,90	16,00	8,10	9,00
M 22	31,61	32,00	35,72	36,90	21,48	22,00	16,90	18,00	9,10	10,00
M 24	35,58	36,00	39,98	41,50	23,48	24,00	17,70	19,00	9,10	10,00
M 27	40,38	41,00	45,63	47,30	26,48	27,00	20,70	22,00	10,90	12,00
M 30	45,38	46,00	51,28	53,10	29,48	30,00	22,70	24,00	10,90	12,00
M 33	49,38	50,00	55,80	57,70	32,38	33,00	24,70	26,00	12,90	14,00
M 36	54,26	55,00	61,31	63,50	35,38	36,00	27,40	29,00	12,90	14,00
M 39	59,26	60,00	66,96	69,30	38,38	39,00	29,40	31,00	14,90	16,00
M 42	64,26	65,00	72,61	75,00	41,38	42,00	32,40	34,00	14,90	16,00
M 45	69,26	70,00	78,26	80,80	44,38	45,00	34,40	36,00	16,90	18,00
M 48	74,26	75,00	83,91	86,50	47,38	48,00	36,40	38,00	16,90	18,00
M 52	79,26	80,00	89,56	92,40	51,26	52,00	40,40	42,00	18,70	20,00
M 56	84,13	85,00	95,07	98,10	55,26	56,00	43,40	45,00	20,70	22,00
M 60	89,13	90,00	100,72	103,90	59,26	60,00	46,40	48,00	22,70	24,00
M 64	94,13	95,00	106,37	109,70	63,26	64,00	49,10	51,00	24,70	26,00
M 68	99,13	100,00	112,02	115,50	67,26	68,00	52,10	54,00	24,70	26,00
M 72	104,13	105,00	117,67	121,25	71,26	72,00	56,10	58,00	26,70	28,00
M 76	109,13	110,00	123,32	127,00	75,26	76,00	59,10	61,00	28,70	30,00
M 80	114,13	115,00	128,97	132,80	79,26	80,00	62,10	64,00	30,40	32,00
M 85	119,13	120,00	134,62	138,60	84,13	85,00	66,10	68,00	32,40	34,00
M 90	129,00	130,00	145,77	150,10	89,13	90,00	70,10	72,00	34,40	36,00
M 95	134,00	135,00	151,42	155,90	94,13	95,00	74,10	76,00	36,40	38,00
M 100	144,00	145,00	162,72	167,40	99,13	100,00	78,10	80,00	38,40	40,00
M105	147,50	150,00	168,37	173,21	102,80	105,00	81,80	84,00	40,40	42,00
M110	152,50	155,00	172,32	178,98	107,80	110,00	85,80	88,00	42,40	44,00
M115	162,50	165,00	185,32	190,53	112,80	115,00	89,80	92,00	44,40	46,00
M120	167,50	170,00	190,97	196,30	117,80	120,00	93,80	96,00	46,40	48,00
M125	177,50	180,00	200,57	207,85	122,50	125,00	97,80	100,00	48,40	50,00
M130	180,40	185,00	207,75	213,62	127,50	130,00	101,80	104,00	50,10	52,00
M135	185,40	190,00	213,40	219,40	132,50	135,00	105,80	108,00	52,10	54,00
M140	195,40	200,00	220,80	230,95	137,50	140,00	109,80	112,00	54,10	56,00
M145	205,40	210,00	236,00	242,49	142,50	145,00	113,80	116,00	56,10	58,00
M150	205,40	210,00	236,00	242,49	147,50	150,00	117,80	120,00	58,10	60,00

Dimensions in mm



BOLTS

DIMENSIONS

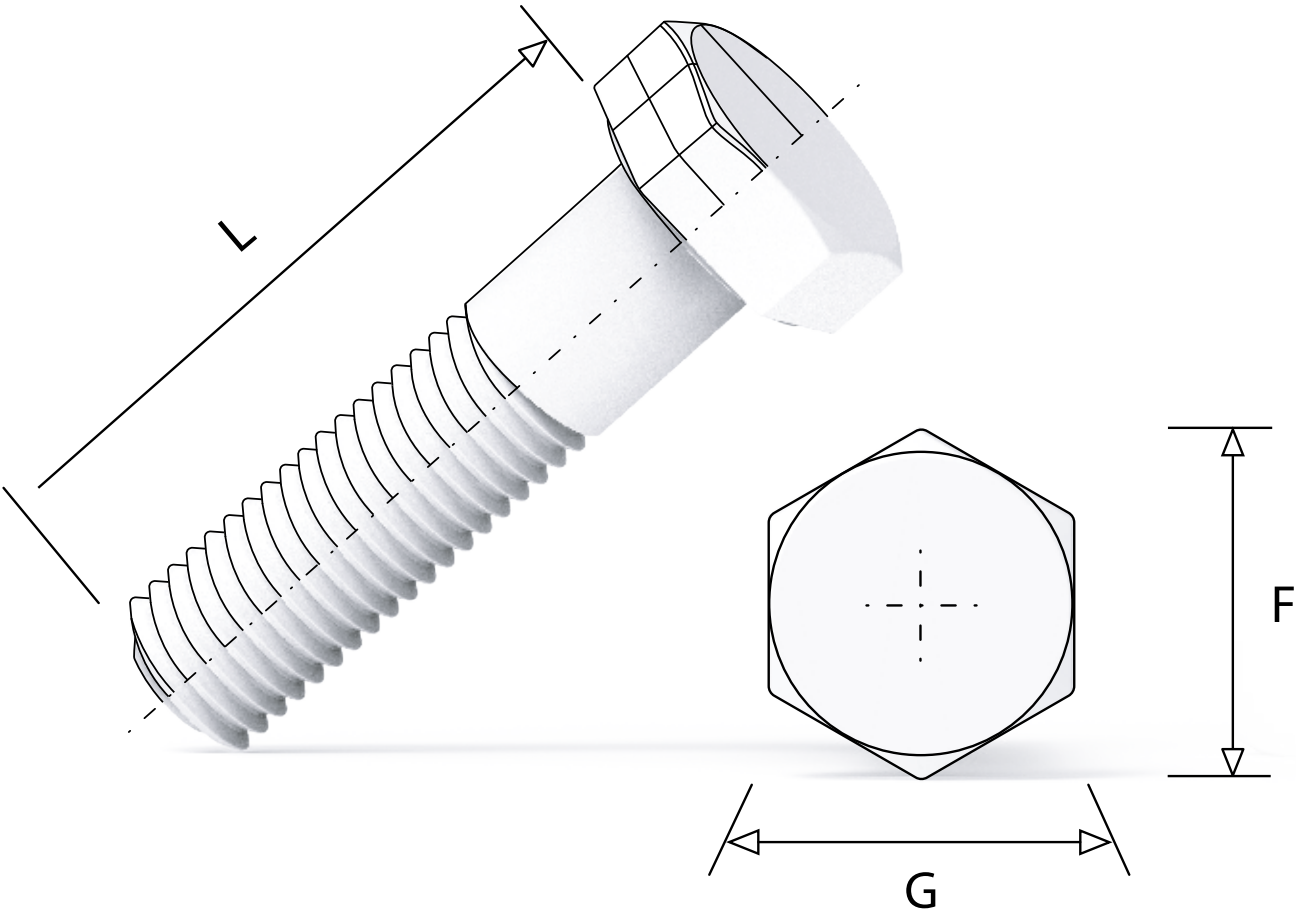
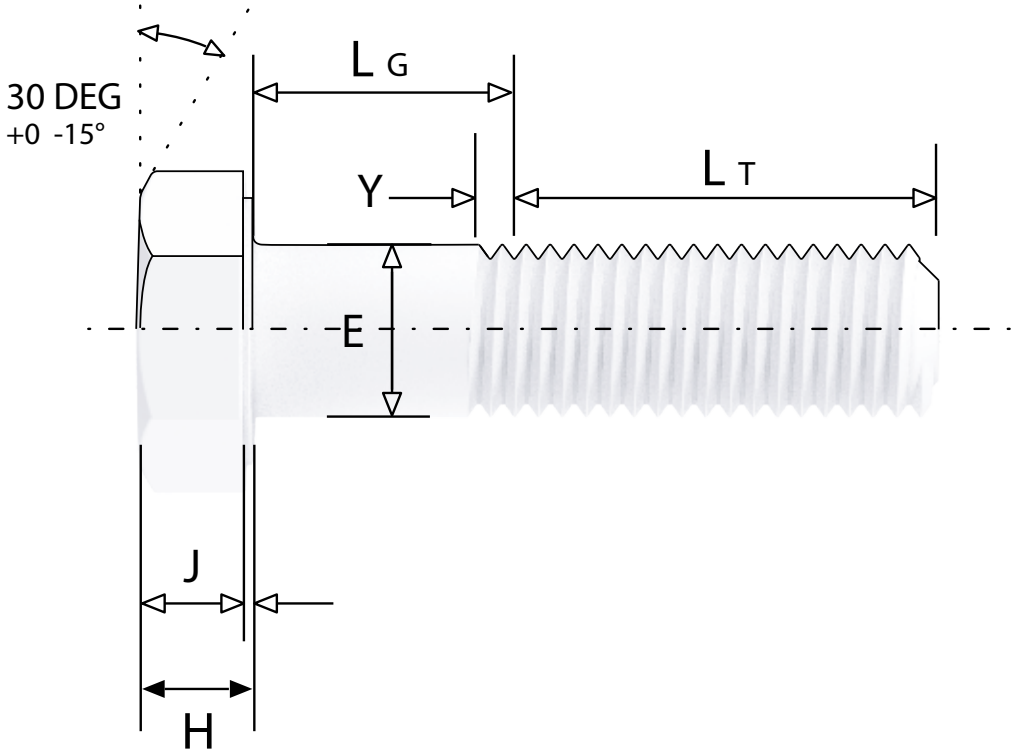
IMPERIAL RANGE 1/4 - 3" - METRIC RANGE M6 - M52

DIMENSIONS of HEX BOLTS in mm - ASME B 18.2.1 - TABLE 2											
Nominal Size	E Body Diameter		F Width Across Flats		G Width Across Corners		H Height		LT Thread Length		Y
	min	max	min	max	min	max	min	max	up to 6" basic	over 6" basic	max
1/4"	6,02	6,60	10,80	11,13	12,29	12,83	3,81	4,78	19,05	25,40	-
5/16"	7,57	8,23	12,29	12,70	14,02	14,66	4,95	5,97	22,23	28,58	-
3/8"	9,14	9,86	13,82	14,27	15,75	16,51	5,74	6,81	25,40	31,75	-
7/16"	10,69	11,48	15,32	15,88	17,45	18,34	6,91	8,03	28,58	34,93	-

DIMENSIONS of HEAVY HEX BOLTS in mm - ASME B 18.2.1 - TABLE 3											
3/8"	9,14	9,86	16,99	17,48	19,38	20,17	5,74	6,81	25,40	31,75	7,90
1/2"	12,24	13,08	21,59	22,23	24,61	25,65	7,67	9,25	31,75	38,10	9,80
5/8"	15,37	16,31	26,19	26,97	29,85	31,17	9,60	11,28	38,10	44,45	11,60
3/4"	18,52	19,51	30,78	31,75	35,13	36,65	11,56	13,31	44,45	50,80	12,70
7/8"	21,64	22,73	35,41	36,53	40,36	42,16	13,49	15,34	50,80	57,15	14,10
1"	24,79	25,96	40,01	41,28	45,62	47,65	15,01	17,78	57,15	63,50	15,90
1 1/8"	27,89	29,18	44,60	46,02	50,85	53,16	16,71	19,81	63,50	69,85	18,10
1 1/4"	31,06	32,44	49,23	50,80	56,11	58,65	19,02	22,25	69,85	76,20	18,10
1 3/8"	34,16	35,66	53,82	55,58	61,37	64,16	20,57	23,88	76,20	82,55	21,20
1 1/2"	37,34	38,89	58,42	60,33	66,60	69,65	22,91	26,31	82,55	88,90	21,20
1 3/4"	43,59	45,34	67,61	69,85	77,09	80,65	26,77	30,38	95,25	101,60	25,40
2"	49,89	51,79	76,84	79,38	87,60	91,64	29,85	35,26	107,95	114,30	28,20
2 1/4"	56,24	58,55	86,06	88,90	98,09	102,64	33,71	39,32	120,65	127,00	28,20
2 1/2"	62,51	65,00	95,25	98,43	108,59	113,64	37,57	43,38	133,35	139,70	31,80
2 3/4"	68,86	71,81	104,44	107,95	119,08	124,64	41,45	47,47	146,05	152,40	31,80
3"	75,21	78,26	113,67	117,48	129,59	135,64	46,10	52,32	158,75	165,10	31,80

DIMENSIONS of HEXAGONAL BOLTS - DIN 931 - DIN 933											
Nominal Size	E Body Diameter		F Width Across Flats		G Width Across Corners		H Height		LT Thread Length		
	min	max	min	max	min		min	max	up to 125	op to 200	over 200
M 6	6,00		9,78	10,00			3,85	4,15	18	24	
M 8	7,78	8,00	12,57	13,00		14,38	5,06	5,54	22	28	
M 10	9,78	10,00	16,57	17,00		18,90	6,11	6,69	26	32	45
M 12	11,73	12,00	18,48	19,00		21,10	7,21	7,79	30	36	49
M 14	13,73	14,00	21,16	22,00		24,49	8,51	9,09	34	40	53
M 16	15,73	16,00	23,16	24,00		26,75	9,71	10,29	38	44	57
M 18	17,73	18,00	26,16	27,00		30,14	11,15	11,85	42	48	61
M 20	19,67	20,00	29,16	30,00		33,53	12,15	12,85	46	52	65
M 22	21,67	22,00	31,00	32,00		35,72	13,65	14,35	50	56	69
M 24	23,67	24,00	35,00	36,00		39,98	14,65	15,35	54	60	73
M 27	26,48	27,00	40,00	41,00		45,20	16,65	17,35	60	66	79
M 30	29,48	30,00	45,00	46,00		50,85	18,28	19,12	66	72	85
M 33	32,38	33,00	49,00	50,00		55,37	20,58	21,42	72	78	91
M 36	35,38	36,00	53,80	55,00		60,79	22,80	22,92	78	84	97
M 39	38,38	39,00	58,80	60,00		66,44	24,58	25,42	84	90	103
M 42	41,38	42,00	63,10	65,00		71,30	25,58	26,42	90	96	109
M 45	44,38	45,00	66,10	70,00		76,95	27,58	28,42	96	102	115
M 48	47,38	48,00	73,10	75,00		82,60	29,58	30,42	102	108	121
M 52	51,26	52,00	78,10	80,00		88,25	32,50	33,50		116	129

Dimensions in mm



BOLTS

DIMENSIONS

IMPERIAL RANGE 1/4 - 3" - METRIC RANGE M6 - M52

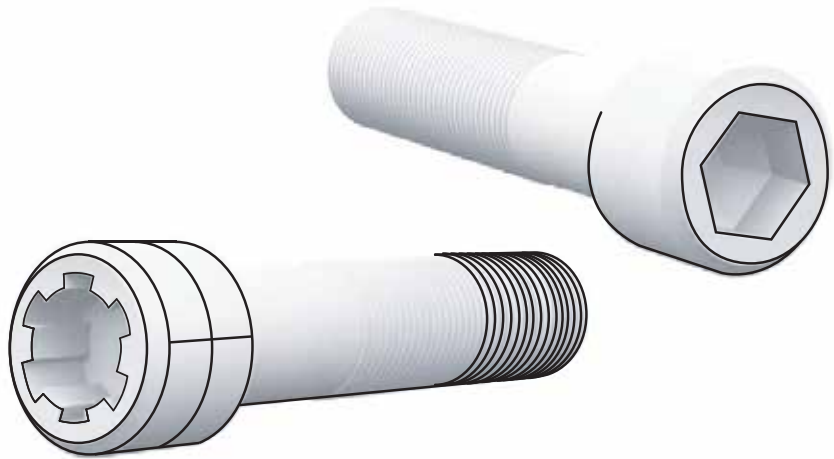
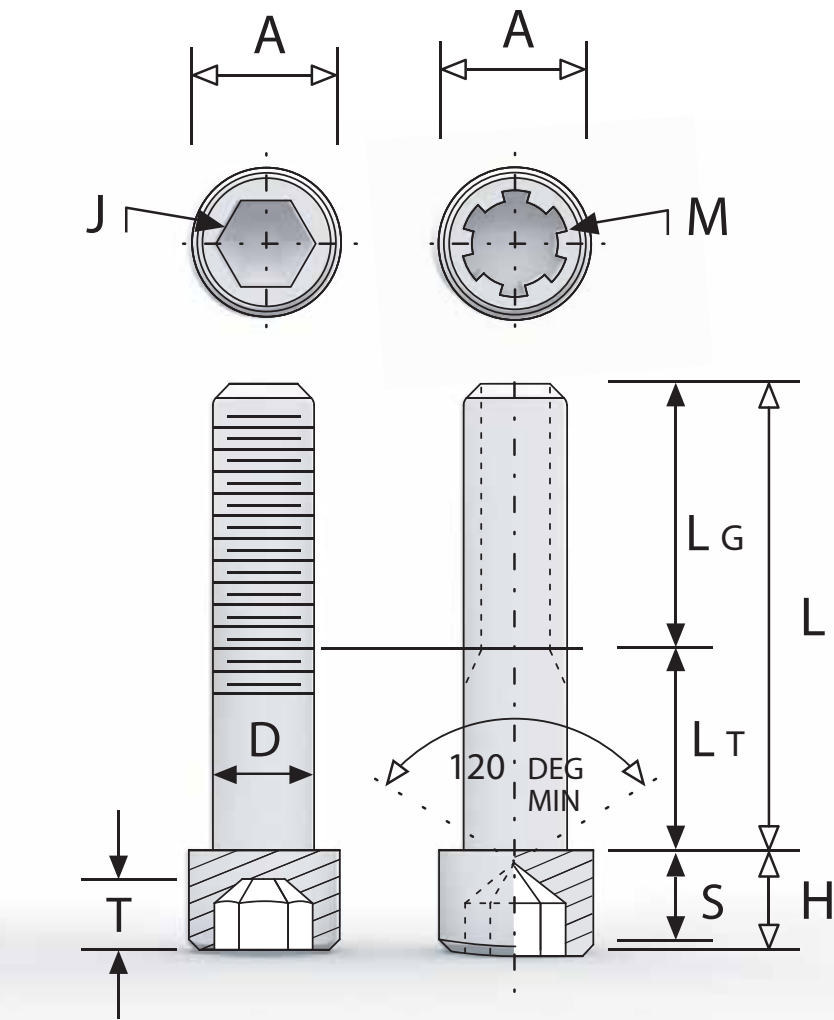
DIMENSIONS of SOCKET HEAD CAP SCREWS in mm - ANSI/ASME B 18.3 - TABLE 1

Nominal Size	D Body Diameter		A Head Diameter		H Head Height		C Chamfer	J Hex Socket Size	T Key Engagement	LT Thread Length
	min	max	min	max	min	max	max	Nom	min	
1/4	6,18	6,35	9,27	9,53	6,20	6,35	0,64	4,78	3,05	25,40
5/16	7,57	7,94	11,61	11,91	7,77	7,92	0,84	6,35	3,84	28,40
3/8	9,14	9,53	13,97	14,27	9,35	9,53	1,02	7,92	4,62	31,80
7/16	10,69	11,11	16,31	16,66	10,92	11,13	1,19	9,53	5,41	35,10
1/2	12,24	13,08	18,67	19,05	12,50	12,70	1,40	9,53	6,22	38,10
9/16	14,07	14,29	21,01	21,41	14,07	14,27	1,57	11,10	7,01	38,10
5/8	15,37	16,31	23,39	23,83	15,65	15,88	1,78	12,70	7,80	44,50
3/4	18,52	19,51	28,12	28,58	18,80	19,05	2,16	15,88	9,40	50,80
7/8	21,64	22,73	32,84	33,32	21,95	22,23	2,54	19,05	10,97	57,20
1	24,79	25,96	37,57	38,10	25,10	25,40	2,90	19,05	12,57	63,50
1 1/8	27,89	29,18	42,29	42,88	28,22	28,58	3,28	22,23	14,15	71,40
1 1/4	31,06	32,44	47,04	47,63	31,39	31,75	3,66	22,23	15,75	79,20
1 3/8	34,16	35,66	51,77	52,37	34,54	34,93	4,06	25,40	17,32	87,40
1 1/2	37,34	38,89	56,49	57,15	37,72	38,10	4,47	25,40	18,92	95,30
1 3/4	43,59	45,34	65,96	66,68	44,04	44,45	5,26	31,75	22,10	111,30
2	49,89	51,79	75,44	76,20	50,37	50,80	6,05	38,10	25,27	127,00
2 1/4	56,24	58,55	84,94	85,73	56,69	57,15	6,83	44,45	28,45	142,70
2 1/2	62,51	65,00	94,41	95,25	63,02	63,50	7,62	44,45	31,62	158,80
2 3/4	68,86	71,81	103,89	104,78	69,34	69,85	8,43	50,80	34,80	174,80
3	75,21	78,26	113,39	114,30	75,67	76,20	9,22	57,15	37,97	190,50

DIMENSIONS of SOCKET HEAD CAP SCREWS DIN 912

Nominal Size	D Body Diameter		A Head Diameter		H Head Height		J Hex Socket Size		T Key Engagement	LT Thread Length
	min	max	min	max	min	max	min	max	min	
M 6	5,82	6,00	9,78	10,00	5,70	6,00	5,02	5,14	3,00	30
M 8	7,78	8,00	12,73	13,00	7,64	8,00	6,02	6,14	4,00	35
M 10	9,78	10,00	15,73	16,00	9,64	10,00	8,03	8,18	5,00	40
M 12	11,73	12,00	17,73	18,00	11,57	12,00	10,03	10,18	6,00	50
M 14	13,73	14,00	20,67	21,00	13,57	14,00	12,03	12,21	7,00	55
M 16	15,73	16,00	23,67	24,00	15,57	16,00	14,03	14,21	8,00	60
M 18	17,73	18,00	26,67	27,00	17,57	18,00	14,03	14,21	9,00	65
M 20	19,67	20,00	29,67	30,00	19,48	20,00	17,05	17,23	10,00	70
M 22	21,67	22,00	32,61	33,00	21,48	22,00	17,05	17,23	11,00	70
M 24	23,67	24,00	35,61	36,00	23,48	24,00	19,07	19,28	12,00	80
M 27	26,67	27,00	39,61	40,00	26,48	27,00	19,07	19,28	13,50	90
M 30	29,67	30,00	44,61	45,00	29,48	30,00	22,07	22,28	15,50	100
M 33	32,61	33,00	49,61	50,00	32,38	33,00	24,07	24,28	18,00	100
M 36	35,61	36,00	53,54	54,00	35,38	36,00	27,07	27,28	19,00	110
M 39	38,61	39,00	57,54	58,00	38,38	39,00	27,07	27,28	21,00	120
M 42	41,61	42,00	62,54	63,00	41,38	42,00	32,08	32,33	24,00	130
M 45	44,61	45,00	66,54	67,00	44,38	45,00	32,08	32,33	26,00	140
M 48	47,61	48,00	71,54	72,00	47,38	48,00	36,08	36,33	28,00	150
M 52	51,54	52,00	77,48	78,00	51,26	52,00	36,08	36,33	31,00	150

Dimensions in mm



WASHER DIMENSIONS

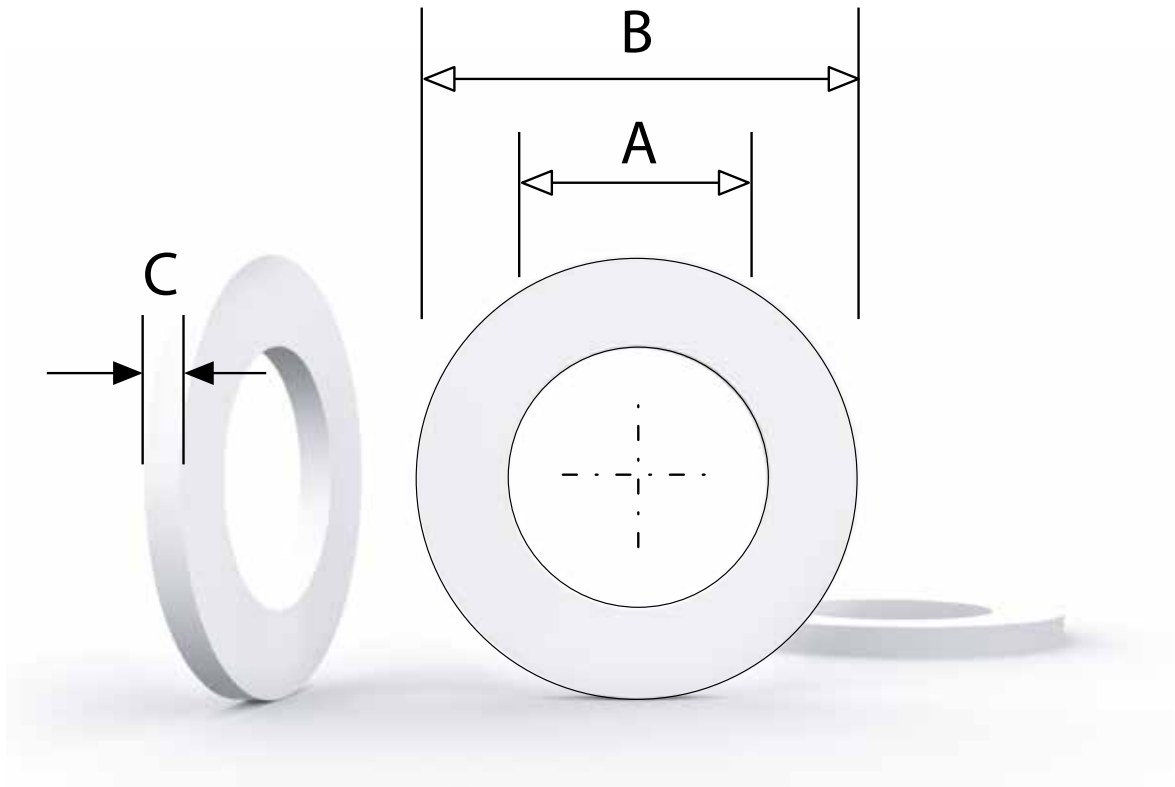
IMPERIAL RANGE 1/4"-4" - METRIC RANGE M6 - M100

DIMENSIONS of WASHERS in mm							
Nominal Size	PLAIN WASHERS DIN 125A			LOCK WASHERS DIN 127B			
	A	B	C	A	B	C	
M6 1/4	6,4	12	1,6	6,5	11,8	1,6	
M7	7,4	14	1,6	7,5	12,8	1,6	
M8 5/16	8,4	16	1,6	8,5	14,8	2	
M10 3/8	10,5	20	2	10,7	18,1	2,2	
M12 7/16	13	24	2,5	12,7	21,1	2,5	
M14 1/2	15	28	2,5	14,7	24,1	3	
M16 9/16 - 5/8	17	30	3	17	27,4	3,5	
M18	19	34	3	19	29,4	3,5	
M20 3/4	21	37	3	21,2	33,6	4	
M22 7/8	23	39	3	23,5	35,9	4	
M24	25	44	4	25,5	40	5	
M27 1	28	50	4	28,5	43	5	
M30 1 1/8	31	56	4	31,7	48,2	6	
M33 1 1/4	34	60	5	33,5	55,2	6	
M36 1 3/8	37	66	5	37,7	58,2	6	
M39 1 1/2	40	72	6	40,7	61,2	6	
M42 1 5/8	43	78	7	43,7	68,2	7	
M45 1 3/4	46	85	7	45,7	71,2	7	
M48 1 7/8	50	92	8	50,5	75	7	
M52 2	54	98	8	54,5	83	8	
M56 2 1/4	58	105	9	58,5	87	8	
M60	62	110	9	62,5	91	8	
M64 2 1/2	66	115	9	66,5	95	8	
M68	70	120	10	70,5	99	8	
M72 2 3/4	74	125	10	74,5	103	8	
M76 3	78	135	10				
M80	82	140	12	82,5	111	8	
M85 3 1/4	87	145	12				
M90 3 1/2	93	160	12	92,5	121	8	
M95 3 3/4	98	165	12				
M100 4	104	175	14	102,5	131	8	

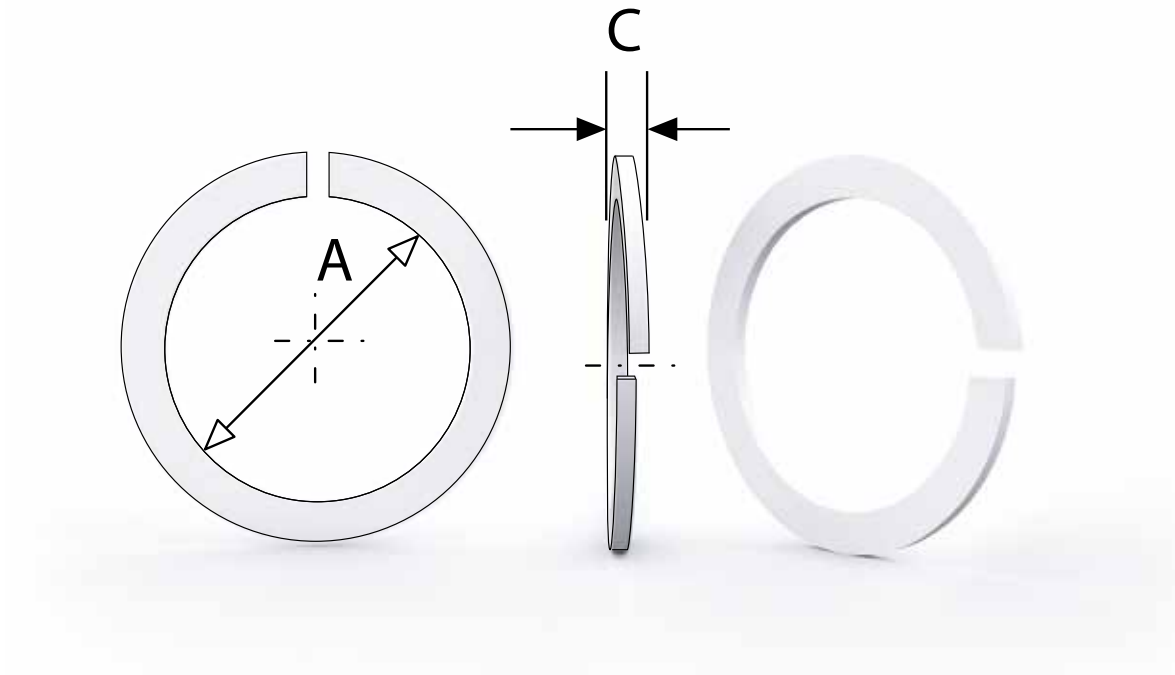
Dimensions in mm

Special and larger dimensions produced to order

125A



127B



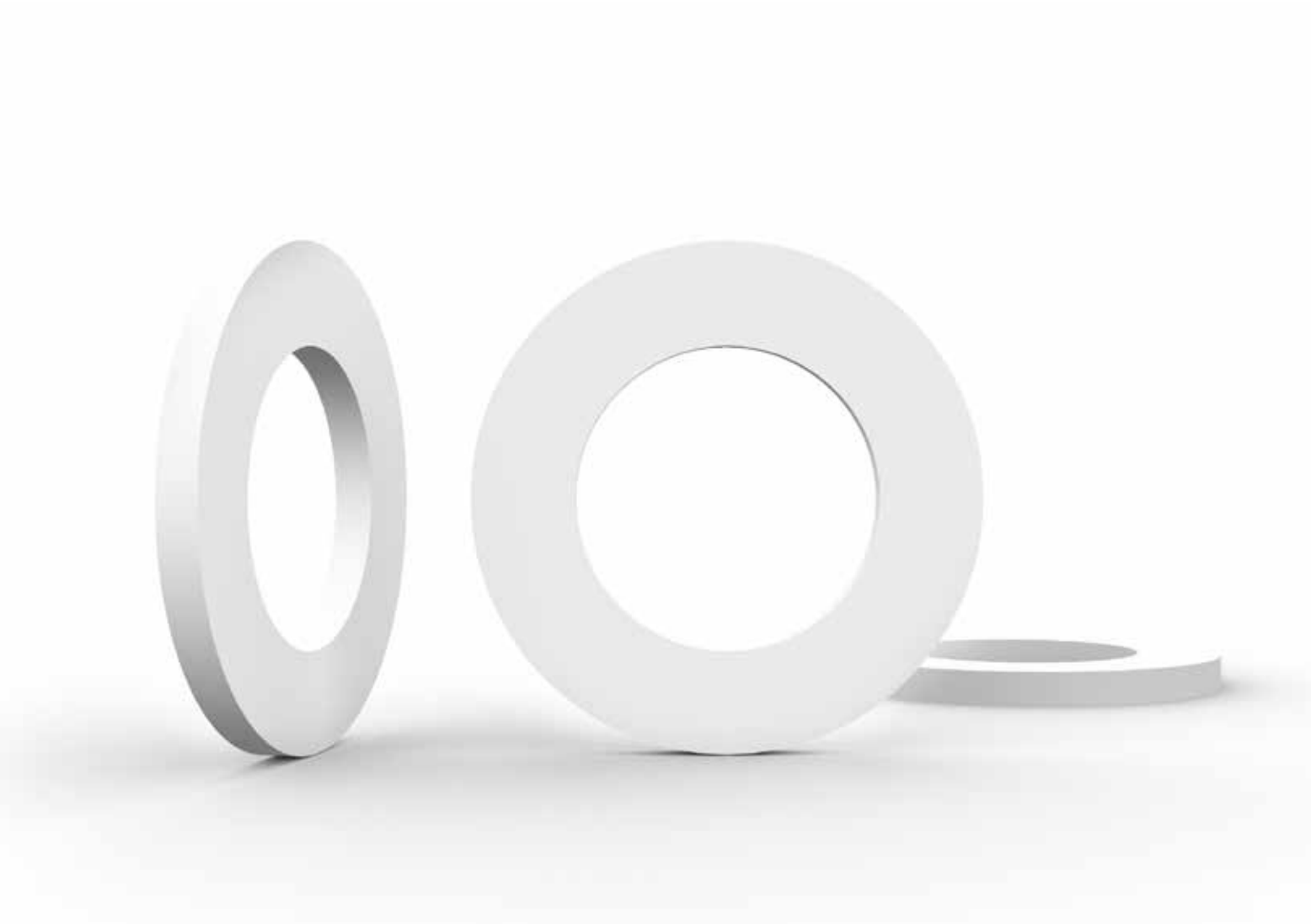
WASHER

DIMENSIONS

IMPERIAL RANGE 1/4"-4"

DIMENSIONS of WASHERS F436 in mm									
nominal size	A	TOLL. +	TOLL. -	B	TOLL. +	TOLL. -	C	MAX.	Min.
1/4"	7,1	0,8	0,0	15,9	0,8	0,8	1,60	2,03	1,30
5/16"	8,7	0,8	0,0	17,5	0,8	0,8	1,60	2,03	1,30
3/8"	10,3	0,8	0,0	20,6	0,8	0,8	1,60	2,03	1,30
7/16"	11,9	0,8	0,0	23,4	0,8	0,8	1,60	2,03	1,30
1/2"	13,5	0,8	0,0	27,0	0,8	0,8	3,00	4,50	2,46
9/16"	15,9	0,8	0,0	29,4	0,8	0,8	3,00	4,50	2,79
5/8"	17,5	0,8	0,0	33,3	0,8	0,8	3,50	4,50	3,10
3/4"	20,7	0,8	0,0	37,3	0,8	0,8	3,50	4,50	3,10
7/8"	23,8	0,8	0,0	44,5	0,8	0,8	4,00	4,50	3,45
1"	27,0	1,6	0,0	50,8	1,6	1,6	4,00	4,50	3,45
1.1/8"	30,2	1,6	0,0	57,2	1,6	1,6	4,00	4,50	3,45
1.1/4"	34,9	1,6	0,0	63,5	1,6	1,6	4,00	4,50	3,45
1.3/8"	38,1	1,6	0,0	69,9	1,6	1,6	4,00	4,50	3,45
1.1/2"	41,3	1,6	0,0	76,2	1,6	1,6	4,00	4,50	3,45
1.5/8"	44,4	1,6	0,0	82,5	1,6	1,6	4,00	4,50	3,45
1.3/4"	47,6	1,6	0,0	85,7	1,6	1,6	5,00	7,11	4,52
1.7/8"	50,0	1,6	0,0	92,0	1,6	1,6	5,00	7,11	4,52
2"	54,0	1,6	0,0	95,3	1,6	1,6	5,00	7,11	4,52
2 1/4"	60,3	1,6	0,0	101,6	1,6	1,6	6,50	8,64	6,10
2 1/2"	66,7	1,6	0,0	114,3	1,6	1,6	6,50	8,64	6,10
2 3/4"	73,0	1,6	0,0	127,0	1,6	1,6	6,50	8,64	6,10
3"	79,4	1,6	0,0	139,7	1,6	1,6	6,50	8,64	6,10
3.1/4"	85,7	3,2	0,0	152,4	3,2	3,2	6,50	8,64	6,10
3.1/2"	92,1	3,2	0,0	165,1	3,2	3,2	6,50	8,64	6,10
3.3/4"	98,4	3,2	0,0	177,8	3,2	3,2	6,50	8,64	6,10
4"	104,8	3,2	0,0	190,5	3,2	3,2	6,50	8,64	6,10

Special and larger dimensions produced to order



PRODUCES PIECES TO THE

CUSTOMER'S DRAWING

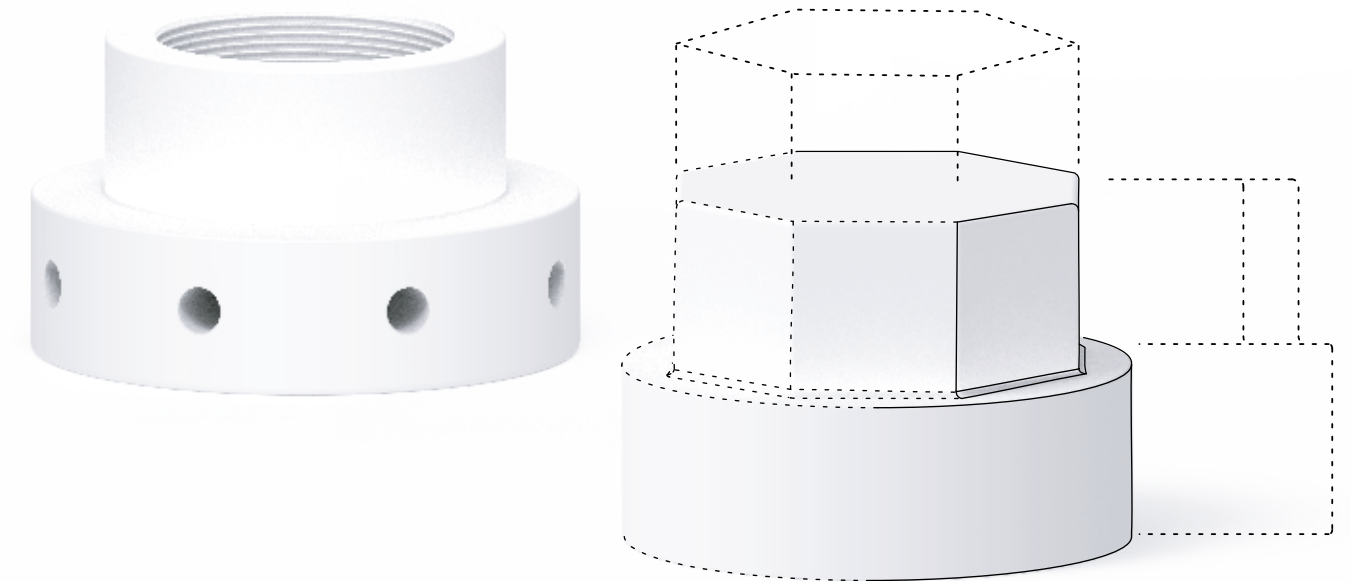
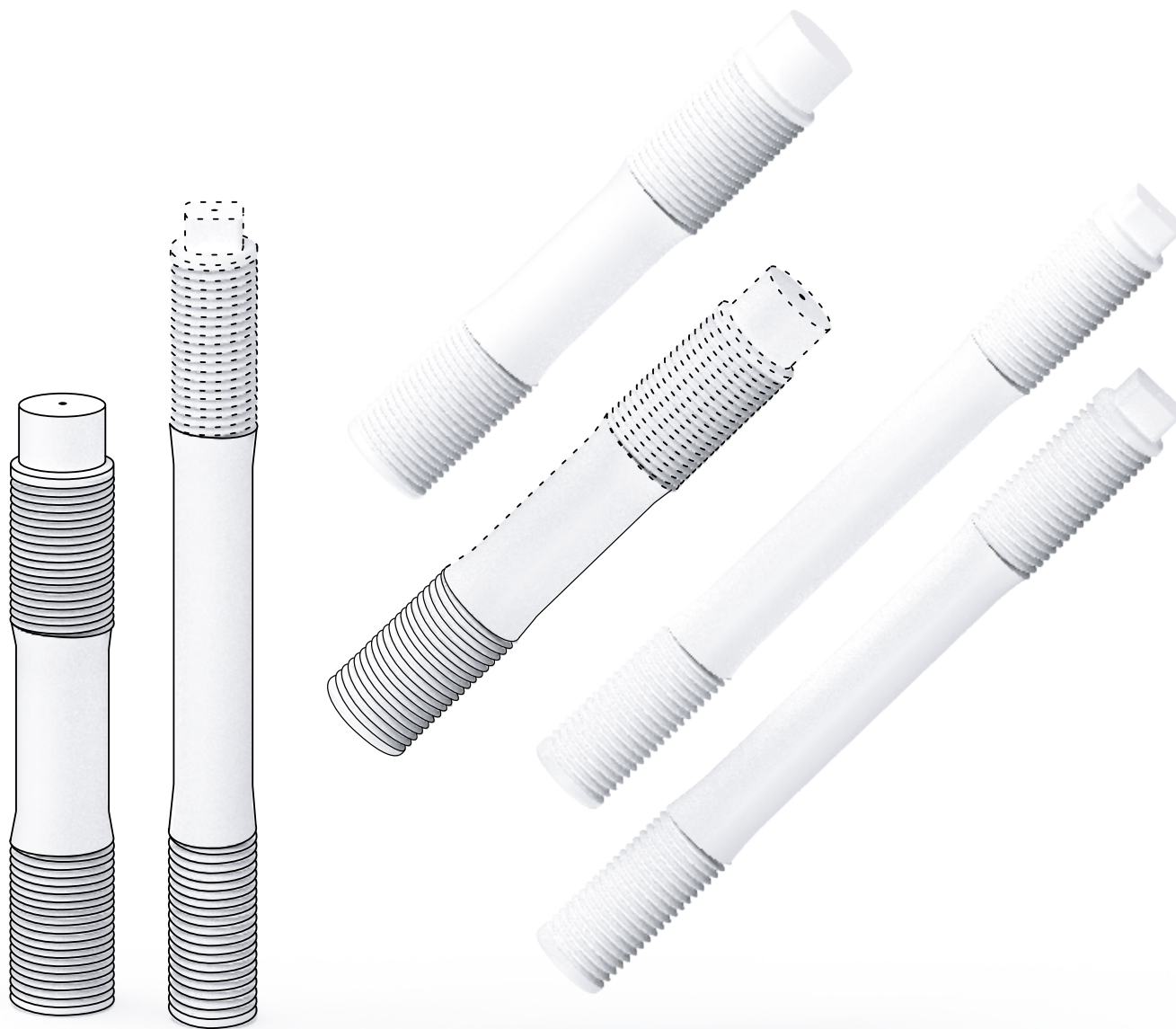
IMPERIAL RANGE 3/8"-12"

METRIC RANGE M8 - M300

BEA PRODUCES SPECIAL PIECES TO THE CUSTOMER'S OWN DRAWING IN ALL STEEL GRADES AND WITH THE FOLLOWING MAXIMUM DIMENSIONS

STUDS: MAXIMUM DIAMETER mm. 300

NUTS AND WASHERS: MAXIMUM DIAMETER mm. 400



SPECIFICATIONS

60

SPECIFICATIONS

NOMINAL SIZE												Weight x 1 mm
Nominal Size	Threads	EXTERNAL mm						INTERNAL mm				
		Major Diameter 2A		Pitch Diameter 2A		Minor	Major	Minor Diameter 2B		Pitch Diameter 2B		
		min	max	min	max	min	min	min	max	min	max	
1/4	20	6,116	6,322	5,403	5,497	4,765	6,350	4,978	5,258	5,525	5,648	0,00018
5/16	18	7,686	7,907	6,888	6,990	6,228	7,938	6,401	6,731	7,021	7,155	0,00030
3/8	16	9,253	9,492	8,349	8,461	7,600	9,525	7,798	8,153	8,494	8,639	0,00044
7/16	14	10,815	11,077	9,779	9,898	8,918	11,113	9,144	9,550	9,934	10,089	0,00060
1/2	13	12,385	12,662	11,265	11,392	10,335	12,700	10,592	11,024	11,430	11,595	0,00079
9/16	12	13,957	14,247	12,741	12,873	11,727	14,288	11,989	12,446	12,913	13,086	0,00102
5/8	11	15,525	15,832	14,194	14,333	13,081	15,875	13,386	13,868	14,376	14,559	0,00126
3/4	10	18,677	19,004	17,203	17,353	15,979	19,050	16,307	16,840	17,399	17,595	0,00185
7/8	9	21,824	22,176	20,183	20,343	18,816	22,225	19,177	19,761	20,391	20,599	0,00254
1	8	24,968	25,349	23,114	23,287	21,570	25,400	21,971	22,606	23,338	23,561	0,00333
1 1/8	7	28,103	28,519	25,977	26,162	24,199	28,575	24,638	25,349	26,218	26,457	0,00430
1 1/4	7	31,278	31,694	29,149	29,337	27,374	31,750	27,813	28,524	29,393	29,637	0,00539
1 3/8	6	34,402	34,864	31,910	32,113	29,825	34,925	30,353	31,115	32,174	32,438	0,00661
1 1/2	6	37,577	38,039	35,082	35,288	33,000	38,100	33,528	34,290	35,349	35,616	0,00795
1 5/8	6	40,749	41,212	38,252	38,461	36,185	41,275	36,703	37,465	38,524	38,796	0,00942
1 3/4	6	43,924	44,387	41,425	41,636	39,347	44,450	39,878	40,640	41,699	41,974	0,01101
1 7/8	6	47,099	47,567	44,597	44,811	42,522	47,625	43,053	43,815	44,874	45,154	0,01272
2	4,5	50,168	50,726	46,820	47,061	44,003	50,800	44,679	45,593	47,135	47,450	0,01456
2 1/4	4,5	56,518	57,076	53,165	53,411	50,353	57,150	51,029	51,943	53,485	53,805	0,01862
2 1/2	4	62,817	63,421	59,032	59,296	55,860	63,500	56,617	57,582	59,375	59,718	0,02317
2 3/4	4	69,164	69,769	65,377	65,644	62,207	69,850	62,967	63,932	65,725	66,073	0,02822
3	4	75,514	76,119	71,722	71,994	68,557	76,200	69,317	70,282	72,075	72,428	0,03376
3 1/4	4	81,862	82,466	78,064	78,341	74,905	82,550	75,667	76,632	78,425	78,783	0,03980
3 1/2	4	88,212	88,816	84,412	84,691	81,255	88,900	82,017	82,982	84,775	85,138	0,04634
3 3/4	4	94,559	95,164	90,754	91,039	87,602	95,250	88,367	89,332	91,125	91,493	0,05338
4	4	100,909	101,514	97,102	97,389	93,952	101,600	94,717	95,682	97,475	97,848	0,06092
4 1/4	4	107,259	107,864	103,447	103,739	100,302	107,950	101,067	102,032	103,825	104,204	0,06891
4 1/2	4	113,607	114,211	109,792	110,086	106,650	114,300</					

Nominal Size	Threads	EXTERNAL mm						INTERNAL mm				Weight x 1 mm
		Major Diameter 2A		Pitch Diameter 2A		Minor	Major	Minor Diameter 2B		Pitch Diameter 2B		
		min	max	min	max	min	min	min	max	min	max	
1 1/8	8	28,141	28,522	26,284	26,459	24,742	28,575	25,146	25,781	26,513	26,741	0,00430
1 1/4	8	31,316	31,697	29,456	29,634	27,917	31,750	28,321	28,956	29,688	29,921	0,00539
1 3/8	8	34,488	34,869	32,624	32,807	31,090	34,925	31,496	32,131	32,863	33,099	0,00661
1 1/2	8	37,663	38,044	35,796	35,982	34,265	38,100	34,671	35,306	36,038	36,279	0,00795
1 5/8	8	40,838	41,219	38,969	39,157	37,551	41,275	37,846	38,481	39,213	39,459	0,00942
1 3/4	8	44,011	44,392	42,139	42,329	40,612	44,450	41,021	41,656	42,388	42,636	0,01101
1 7/8	8	47,186	47,567	45,309	45,504	43,787	47,626	44,196	44,831	45,563	45,817	0,01272
2	8	50,361	50,742	48,481	48,679	46,962	50,800	47,371	48,006	48,738	48,994	0,01456
2 1/4	8	56,708	57,089	54,823	55,027	53,310	57,150	53,721	54,356	55,088	55,352	0,01862
2 1/2	8	63,058	63,439	61,168	61,377	59,660	63,500	60,071	60,706	61,438	61,707	0,02317
2 3/4	8	69,406	69,787	67,513	67,724	66,007	69,850	66,421	67,056	67,788	68,062	0,02822
3	8	75,752	76,134	73,856	74,071	72,354	76,200	72,771	73,406	74,138	74,419	0,03376
3 1/4	8	82,103	82,484	80,201	80,421	78,704	82,550	79,121	79,756	80,448	80,775	0,03980
3 1/2	8	88,453	88,834	86,548	86,771	85,054	88,900	85,471	86,106	87,130	86,838	0,04634
3 3/4	8	94,800	95,181	92,890	93,119	91,402	95,250	91,821	92,456	93,188	93,485	0,05338
4	8	101,150	101,531	99,238	99,469	97,752	101,600	98,171	98,806	99,538	99,840	0,06092
4 1/4	8	107,498	107,879	105,580	105,816	104,099	107,950	104,521	105,156	105,888	106,195	0,06891
4 1/2	8	113,848	114,229	111,928	112,166	110,449	114,300	110,871	111,506	112,238	112,547	0,07745
4 3/4	8	120,195	120,576	118,273	118,514	116,797	120,650	117,221	117,856	118,588	118,902	0,08646
5	8	126,545	126,926	124,617	124,864	123,147	127,000	123,571	124,206	124,938	125,258	0,09590
5 1/4	8	132,895	133,276	130,965	131,214	129,497	133,350	129,291	130,556	131,288	131,610	0,10595
5 1/2	8	139,243	139,624	137,310	137,561	135,844	139,700	136,271	136,906	137,638	137,965	0,11648
5 3/4	8	145,593	145,974	143,657	143,911	142,194	146,050	142,621	143,256	143,988	144,318	0,12713
6	8	151,943	152,324	150,002	150,261	148,544	152,400	148,971	149,606	150,338	150,673	0,13860

STUDBOLT DIMENSIONS FOR ALL FLANGE TYPES

STUDBOLT LENGTHS for FLANGES to ANSI/ASME B.16.5												
Rating Nominal Size	N°	150			N°	300			N°	600		
		Dia. STUD	RF	Length RTJ		Dia. STUD	RF	Length RTJ		Dia. STUD	RF	Length RTJ
1/2	4	1/2 M14	2 1/4 65		4	1/2 M14	2 1/2 70	3 80	4	1/2 M14	3 80	3 80
3/4	4	1/2 M14	2 1/2 70		4	5/8 M16	3 80	3 1/2 95	4	5/8 M16	3 1/2 95	3 1/2 95
1	4	1/2 M14	2 1/2 70	3 80	4	5/8 M16	3 80	3 1/2 95	4	5/8 M16	3 1/2 95	3 1/2 95
1 1/4	4	1/2 M14	2 3/4 75	3 1/4 90	4	5/8 M16	3 1/4 90	3 3/4 100	4	5/8 M16	3 3/4 100	3 3/4 100
1 1/2	4	1/2 M14	2 3/4 75	3 1/4 90	4	3/4 M20	3 1/2 95	4 105	4	3/4 M20	4 1/4 115	4 1/4 115
2	4	5/8 M16	3 1/4 90	3 3/4 100	8	5/8 M16	3 1/2 95	4 105	8	5/8 M16	4 1/4 115	4 1/4 115
2 1/2	4	5/8 M16	3 1/2 95	4 105	8	3/4 M20	4 105	4 1/2 120	8	3/4 M20	4 3/4 125	4 3/4 125
3	4	5/8 M16	3 1/2 95	4 105	8	3/4 M20	4 1/4 115	4 3/4 125	8	3/4 M20	5 135	5 130
4	8	5/8 M16	3 1/2 95	4 105	8	3/4 M20	4 1/2 120	5 135	8	7/8 M22	5 3/4 150	5 3/4 150
5	8	3/4 M20	3 3/4 100	4 1/4 115	8	3/4 M20	4 3/4 125	5 1/4 140	8	1 M27	6 1/2 170	6 1/2 170
6	8	3/4 M20	4 105	4 1/2 120	12	3/4 M20	4 3/4 125	5 1/2 145	12	1 M27	6 3/4 180	6 3/4 180
8	8	3/4 M20	4 1/4 115	4 3/4 125	12	7/8 M22	5 1/2 145	6 160	12	1 1/8 M30	7 1/2 200	7 3/4 205
10	12	7/8 M22	4 1/2 120	5 135	16	1 M27	6 1/4 165	6 3/4 180	16	1 1/4 M33	8 1/2 225	8 1/2 225
12	12	7/8 M22	4 3/4 125	5 1/4 140	16	1 1/8 M30	6 3/4 180	7 1/4 190	20	1 1/4 M33	8 3/4 235	8 3/4 235
14	12	1 M27	5 1/4 140	5 3/4 155	20	1 1/8 M30	7 185	7 1/2 200	20	1 3/8 M36	9 1/4 245	9 1/4 245
16	12	1 M27	5 1/4 140	5 3/4 155	20	1 1/4 M33	7 1/2 200	8 215	20	1 1/2 M39	10 265	10 265
18	12	1 1/8 M30	5 3/4 155	6 1/4 165	24	1 1/4 M33	7 3/4 205	8 1/4 220	20	1 5/8 M42	10 3/4 285	10 3/4 285
20	12	1 1/8 M30	6 1/4 165	6 3/4 180	24	1 1/4 M33	8 215	8 3/4 235	24	1 5/8 M42	11 1/4 295	11 1/2 305
24	12	1 1/4 M33	6 3/4 180	7 1/4 190	24	1 1/2 M39	9 240	10 265	24	1 7/8 M48	13 340	13 1/4 345

Studbolt in inch sizes: length of studbolt does not include the height of the points.

Studbolt in metric sizes: length of studbolt is including the height of the points.

All information for reference purpose only. The original ANSI/ASME standard should be consulted.

STUDBOLT LENGTHS for FLANGES to ANSI/ASME B.16.5												
Rating Nominal Size	N°	900			N°	1500			N°	2500		
		Dia. STUD	Length RF	Length RTJ		Dia. STUD	Length RF	Length RTJ		Dia. STUD	Length RF	Length RTJ
1/2	4	3/4 M20	4 1/4 115	4 1/4 1154	4	3/4 M20	4 1/4 115	4 1/4 115	4	3/4 M20	43/4 125	4 3/4 125
3/4	4	3/4 M20	4 1/2 120	4 1/2 120	4	3/4 M20	4 1/2 120	4 1/2 120	4	3/4 M20	5 135	5 135
1	4	7/8 M22	5 135	5 135	4	7/8 M22	5 135	5 135	4	7/8 M22	5 1/2 145	5 1/2 145
1 1/4	4	7/8 M22	5 135	5 135	4	7/8 M22	5 135	5 135	4	1 M27	6 160	6 160
1 1/2	4	1 M27	5 1/2 145	5 1/2 145	4	1 M27	5 1/2 145	5 1/2 145	4	1 1/8 M30	5 3/4 180	5 3/4 180
2	8	7/8 M22	5 3/4 150	5 3/4 150	8	7/8 M22	5 3/4 150	5 3/4 150	8	1 M27	7 185	7 185
2 1/2	8	1 M27	6 1/4 165	6 1/4 165	8	1 M27	6 1/4 165	6 1/4 165	8	1 1/8 M30	7 3/4 205	8 215
3	8	7/8 M22	5 3/4 150	5 3/4 150	8	1 1/8 M30	7 185	7 185	8	1 1/4 M33	8 3/4 235	9 240
4	8	1 1/8 M30	6 3/4 180	6 3/4 180	8	1 1/4 M33	7 3/4 205	7 3/4 205	8	1 1/2 M39	10 265	10 1/4 270
5	8	1 1/4 M33	7 1/2 200	7 1/2 200	8	1 1/2 M39	9 3/4 260	9 3/4 260	8	1 3/4 M45	11 3/4 310	12 1/4 320
6	12	1 1/8 M30	7 1/2 200	7 3/4 205	12	1 3/8 M36	10 1/4 270	10 1/2 280	8	2 M52	13 1/2 355	14 365
8	12	1 3/8 M36	8 3/4 235	8 3/4 235	12	1 5/8 M42	11 1/2 305	12 3/4 335	12	2 M52	15 390	15 1/2 405
10	16	1 3/8 M36	9 1/4 245	9 1/4 245	12	1 7/8 M48	13 1/4 350	13 1/2 355	12	2 1/2 M64	19 1/4 500	20 520
12	20	1 3/8 M36	10 265	10 265	16	2 M52	14 3/4 385	15 1/4 400	12	2 3/4 M68	21 1/4 550	22 570
14	20	1 1/2 M39	10 3/4 285	11 290	16	2 1/4 M56	16 415	16 3/4 435				
16	20	1 5/8 M42	11 1/4 295	11 1/2 305	16	2 1/2 M64	17 1/2 455	18 1/2 480				
18	20	1 7/8 M48	12 3/4 335	13 1/4 350	16	2 3/4 M68	19 1/2 505	20 3/4 540				
20	20	2 M52	13 3/4 360	14 1/4 375	16	3 M76	21 1/4 550	22 1/4 575				
24	20	2 1/2 M64	17 1/4 450	18 470	16	3 1/2 M80	24 1/4 625	25 1/2 660				

Studbolt in inch sizes: length of studbolt does not include the height of the points.

Studbolt in metric sizes: length of studbolt is including the height of the points.

All information for reference purpose only. The original ANSI/ASME standard should be consulted.

STUDBOLT DIMENSIONS FOR ALL FLANGE TYPES

STUDBOLT LENGTHS for FLANGES to ANSI/ASME B.16.47 SERIES A

Rating Nominal Size	N°	150		N°	300			N°	600			N°	900		
		Dia. STUD	Length RF		Dia. STUD	Length RF	RTJ		Dia. STUD	Length RF	RTJ		Dia. STUD	Length RF	RTJ
26	24	1 1/4 M33	8 3/4 235	28	1 5/8 M42	11 290	12 315	28	1 7/8 M48	15 1/4 400	15 1/4 410	20	2 3/4 M68	19 3/4 515	20 3/4 540
28	28	1 1/4 M33	9 240	28	1 5/8 M42	11 1/2 305	12 1/2 330	28	2 M52	16 420	16 1/2 430	20	3 M76	21 1/4 550	22 1/4 575
30	28	1 1/4 M33	9 1/4 245	28	1 3/4 M45	12 315	13 340	28	2 M52	16 1/2 430	17 445	20	3 M76	22 570	23 595
32	28	1 1/2 M39	10 1/2 280	28	1 7/8 M48	12 3/4 335	14 370	28	2 1/4 M56	17 3/4 465	18 1/2 480	20	3 1/4 M80	23 1/2 610	24 1/4 625
34	32	1 1/2 M39	10 1/2 280	28	1 7/8 M48	13 345	14 1/4 375	28	2 1/4 M56	18 1/4 475	19 495	20	3,5 M90	24 3/4 640	26 670
36	32	1 1/2 M39	11 1/4 300	32	2 M52	14 370	15 394,6	32	2 1/4 M56	19 1/2 505	20 1/4 525	20	3,5 M90	25 3/4 665	26 3/4 690
38	32	1 1/2 M39	11 290	32	1 1/2 M39	12 1/2 330		32	2 1/4 M56	18 1/2 480		20	3 1/2 M90	25 3/4 665	
40	36	1 1/2 M39	11 1/4 300	32	1 5/8 M42	13 1/4 350		32	2 1/4 M56	19 495		20	3 1/2 M90	26 1/4 680	
42	36	1 1/2 M39	11 3/4 310	32	1 5/8 M42	13 3/4 360		32	2 1/2 M64	20 1/4 525		24	3 1/2 M90	27 695	
44	40	1 1/2 M39	12 315	32	1 3/4 M45	14 1/2 380		32	2 1/2 M64	20 3/4 540		24	3 3/4 M95	28 1/4 730	
462	40	1 1/2 M39	12 1/4 325	28	1 7/8 M48	15 395		36	2 1/2 M64	21 1/4 550		24	4 M100	29 3/4 765	
48	44	1 1/2 M39	12 1/2 330	32	2 M52	15 1/4 400		28	2 3/4 M68	22 3/4 590		24	4 M100	30 1/2 785	
50	44	1 3/4 M45	13 1/2 355	32	2 M52	16 420		32	3 M72	23 3/4 615					
52	44	1 3/4 M45	13 3/4 360	32	2 1/4 M56	16 1/2 430		32	3 M72	24 1/4 625					
54	44	1 3/4 M45	14 370	28	2 1/4 M56	17 1/2 455		28	3 M72	24 3/4 640					
56	48	1 3/4 M45	14 1/2 380	28	2 1/4 M56	17 3/4 465		32	3 1/4 M80	26 670					
58	48	1 3/4 M45	14 3/4 385	32	2 1/4 M56	18 470		32	3 1/4 M80	26 1/2 685					
60	52	1 3/4 M45	15 395	32	2 1/4 M56	18 1/2 480		32	3 1/2 M90	27 3/4 715					

Studbolt in inch sizes: length of studbolt does not include the height of the points.

Studbolt in metric sizes: length of studbolt is including the height of the points.

All information for reference purpose only. The original ANSI/ASME standard should be consulted.

STUDBOLT LENGTHS for FLANGES to ANSI/ASME B.16.47 SERIES B

Rating Nominal Size	N°	150		N°	300			N°	600			N°	900		
		Dia. STUD	Length RF		Dia. STUD	Length RF	RTJ		Dia. STUD	Length RF	RTJ		Dia. STUD	Length RF	RTJ
26	36	3/4 M20	5 3/4 150	32	1 1/4 M33	10 1/2 280	11 1/2 305	28	1 5/8 M42	13 3/4 360	14 1/4 375	20	2 1/2 M64	18 3/4 485	19 3/4 515
28	40	3/4 M20	6 160	36	1 1/4 M33	10 1/2 280	11 1/2 305	28	1 3/4 M45	14 1/4 375	14 3/4 385	20	2 3/4 M68	20 1/4 525	21 1/4 550
30	44	3/4 M20	6 1/2 170	36	1 3/8 M36	11 1/4 295	12 1/4 325	28	1 7/8 M48	15 1/4 400	15 3/4 410	20	3 M76	21 1/2 560	22 1/2 585
32	48	3/4 M20	6 3/4 175	32	1 1/2 M39	12 1/4 320	13 1/4 350	28	2 M52	16 1/4 425	16 3/4 435	20	3 M76	22 1/4 575	23 1/2 610
34	40	7/8 M22	7 1/4 190	36	1 1/2 M39	12 2/5 320	13 1/4 350	24	2 1/4 M56	17 1/2 455	18 470	20	3 1/4 M80	23 1/2 610	24 3/4 640
36	44	7/8 M22	7 1/4 190	32	1 5/8 M42	12 1/2 330	13 1/2 355	28	2 1/4 M56	18 470	18 3/4 490	24	3 M76	23 3/4 615	24 3/4 640
38	40	1 M27	8 210	36	1 5/8 M42	13 1/4 350									
40	44	1 M27	8 1/4 215	40	1 5/8 M42	13 1/2 355									
42	48	1 M27	8 1/4 215	36	1 3/4 M45	14 365									
44	52	1 M27	8 1/2 220	40	1 3/4 M45	14 1/2 380									
462	40	1 1/8 M30	9 240	36	1 7/8 M48	15 390									
48	44	1 1/8 M30	9 1/2 250	40	1 7/8 M48	15 1/2 405									
50	48	1 1/8 M30	9 3/4 260	44	1 7/8 M48	15 3/4 410									
52	52	1 1/8 M30	10 265	48	1 7/8 M48	16 1/4 425									
54	56	1 1/8 M30	10 1/4 270	48	1 7/8 M48	16 3/4 435									
56	60	1 1/8 M30	10 1/2 280	36	2 1/4 M56	18 470									
58	48	1 1/4 M33	11 290	40	2 1/4 M56	18 1/2 480									
60	52	1 1/4 M33	11 1/4 295	40	2 1/4 M56	18 3/4 485									

Studbolt in inch sizes: length of studbolt does not include the height of the points.

Studbolt in metric sizes: length of studbolt is including the height of the points.

Dimensions for classes 600 and 900 NPS 38” and larger for series B flanges are the same as for series A flanges.

All information for reference purpose only. The original ANSI/ASME standard should be consulted.

STUDBOLT DIMENSIONS FOR ALL FLANGE TYPES

STUDBOLT LENGTHS for FLANGES to BS 3293															
Rating Nominal Size	N°	150		N°	300			N°	400			N°	600		
		Dia. STUD	Length RF		Dia. STUD	Length RF	RTJ		Dia. STUD	Length RF	RTJ		Dia. STUD	Length RF	RTJ
26	24	1 1/4 M33	6 3/4 180	28	1 5/8 M42	9 3/4 26	11 290	28	1 3/4 M45	11 1/4 295	12 1/2 330	28	1 7/8 M48	13 340	14 1/4 375
28	28	1 1/4 M33	7 185	28	1 5/8 M42	10 1/4 270	11 1/2 305	28	1 7/8 M48	12 315	13 1/4 350	28	2 M52	13 1/2 355	14 3/4 385
30	28	1 1/4 M33	7 185	28	1 3/4 M45	11 290	320 320	28	2 M52	12 3/4 335	14 365	28	2 M52	13 3/4 360	15 390
32	28	1 1/2 M39	7 3/4 205	28	1 7/8 M48	11 3/4 310	13 340	28	2 M52	13 1/4 350	14 3/4 385	28	2 1/4 M56	14 1/2 380	16 420
34	32	1 1/2 M39	8 215	28	1 7/8 M48	12 315	13 1/4 350	28	2 M52	13 1/2 355	15 390	28	2 1/4 M56	14 3/4 385	16 1/4 425
36	32	1 1/2 M39	8 215	32	2 M52	12 1/2 330	13 3/4 360	32	2 M52	13 3/4 360	15 1/4 400	28	2 1/2 M64	15 1/2 405	17 445
38	32	1 1/2 M39	8 215												
40	36	1 1/2 M39	8 1/4 220												
42	36	1 1/2 M39	8 1/2 225												
44	40	1 1/2 M39	8 1/2 225												
462	40	1 1/2 M39	8 3/4 235												
48	44	1 1/2 M39	8 3/4 235												

Studbolt in inch sizes: length of studbolt does not include the height of the points.
Studbolt in metric sizes: length of studbolt is including the height of the points.

All information for reference purpose only. The original BS standard should be consulted.

WEIGHT TABLES

HEAVY HEX NUTS and HEAVY HEX JAM NUTS

Weight Nuts per 1000 pieces

Nom. Size	HEAVY		REGULAR	
	HEX	HEX JAM	HEX	HEX JAM
1/4	5,40	2,80	3,30	2,30
5/16	8,20	5,90	5,00	3,50
3/8	14,90	11,00	7,20	4,70
7/16	20,00	15,60	12,90	8,50
1/2	31,40	21,80	17,00	12,00
9/16	39,30	28,10	26,40	16,80
5/8	50,30	42,70	33,20	22,50
3/4	88,00	79,70	53,90	34,80
7/8	129,00	103,00	86,10	54,50
1	184,00	162,00	128,00	79,90
1 1/8	254,00	225,00	172,00	106,10
1 1/4	330,30	264,00	241,00	160,70
1 3/8	431,30	322,00	298,00	195,80
1 1/2	550,00	417,00	401,00	260,20
1 5/8	713,40	546,00	-	-
1 3/4	858,90	675,00	-	-
1 7/8	1.052,3	639,00	-	-
2	1.290,0	989,00	-	-
2 1/4	1.818,2	1.088,0	-	-
2 1/2	2.497,0	1.575,0	-	-
2 3/4	3.175,0	2.019,0	-	-
3	3.920,0	2.570,0	-	-
3 1/4	4.860,0	3.190,0	-	-
3 1/2	6.420,0	4.005,0	-	-
3 3/4	8.175,0	4.802,0	-	-
4	10.350,0	5.722,0	-	-
4 1/4	11.320,0	-	-	-
4 1/2	13.920,0	-	-	-
4 3/4	16.370,0	-	-	-
5	18.540,0	-	-	-
5 1/4	22.363,0	-	-	-
5 1/2	26.500,0	-	-	-
5 3/4	27.920,1	-	-	-
6	31.528,0	-	-	-
-	-	-	-	-

HEX METRIC NUTS

Weight Nuts per 1000 pieces

DIA	DIN 934 H=D	DIN 934	DIN 936
M 6	2,75		
M 8	5,65	4,59	3,47
M 10	12,55	10,04	7,67
M 12	18,11	15,09	11,64
M 14	29,95	23,53	17,63
M 16	37,40	30,39	23,00
M 18	52,18	43,48	33,16
M 20	73,43	58,74	43,76
M 22	87,96	71,97	54,06
M 24	124,23	98,35	73,30
M 27	177,03	144,25	108,58
M 30	252,80	202,24	153,03
M 33	328,00	258,42	196,40
M 36	445,20	358,63	271,08
M 39	588,50	467,78	354,91
M 42	729,80	590,79	450,04
M 45	941,00	752,80	575,06
M 48	1.135,4	898,86	688,34
M 52	1.393,0	1.125,1	865,27
M 56	1.646,0	1.322,7	-
M 60	1.968,8	1.575,0	-
M 64	2.282,7	1.819,0	-
M 68	2.710,0	2.300,0	-
M 72	3.217,0	2.670,0	-
M 76	3.700,0	3.040,0	-
M 80	4.300,0	3.440,0	-
M 85	4.920,0	3.930,0	-
M 90	6.170,0	4.930,0	-
M 95	7.000,0	5.380,0	-
M 100	8.600,0	6.820,0	-
M 105	9.400,0	7.400,0	-
M 110	10.100,0	8.100,0	-
M 115	12.230,0	10.000,0	-
M 120	13.300,0	11.600,0	-
M 125	15.680,0	12.700,0	-
M 130	16.910,0	13.650,0	-
M 135	18.700,0	14.950,0	-
M 140	21.700,0	17.350,0	-
M 145	25.450,0	20.350,0	-
M 150	24.750,0	19.800,0	-

WASHERS - WEIGHT TABLE

Nom. Size		Kg. /1000 pcs.	Nom. Size		Kg. /1000 pcs.	Nom. Size		Kg. /1000 pcs.
M 6	1/4	1,1	M 27	1		42,3	M 60	458
M 7		1,4	M 30	1 1/8	53,6	M 64	2 1/2	492
M 8	5/16	2,2	M 33	1 1/4	75,3	M 68	2 3/4	586
M 10	3/8	4,1	M 36	1 3/8	92,1	M 72	3	626
M 12	7/16	6,3	M 39	1 1/2	133	M 76		749
M 14	1/2	8,6	M 42	1 5/8	183	M 80		953
M 16	9/16-5/8	11,3	M 45	1 3/4	220	M 85	3 1/4	983
M 18		14,7	M 48	1 7/8	294	M 90	3 1/2	1.250
M 20	3/4	17,2	M 52	2	330	M 95	3 3/4	1.290
M 22	7/8	18,3	M 56	2 1/4	425	M 100	4	1.710
M 24		32,3						

WEIGHT TABLES

WEIGHT TABLE - STUDBOLTS without NUTS - ANSI TYPE (Kg./Piece)

L	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2
25	0,011	0,015	-	-	-	-	-	-	-	-	-	-
30	0,013	0,018	-	-	-	-	-	-	-	-	-	-
35	0,015	0,021	-	-	-	-	-	-	-	-	-	-
40	0,018	0,024	0,032	-	-	-	-	-	-	-	-	-
45	0,020	0,027	0,036	-	-	-	-	-	-	-	-	-
50	0,022	0,030	0,040	0,051	0,063	0,092	0,127	0,166	0,215	-	-	-
55	0,024	0,033	0,044	0,056	0,069	0,101	0,139	0,183	0,236	-	-	-
60	0,026	0,036	0,048	0,061	0,076	0,111	0,152	0,199	0,258	-	-	-
65	0,029	0,039	0,052	0,066	0,082	0,120	0,165	0,216	0,279	-	-	-
70	0,031	0,042	0,056	0,071	0,088	0,129	0,177	0,233	0,301	-	-	-
75	0,033	0,045	0,060	0,076	0,094	0,138	0,190	0,249	0,322	-	-	-
80	0,035	0,048	0,063	0,081	0,101	0,147	0,203	0,266	0,343	0,431	0,529	-
85	0,037	0,051	0,067	0,086	0,107	0,157	0,215	0,283	0,365	0,458	0,562	-
90	0,040	0,054	0,071	0,092	0,113	0,166	0,228	0,299	0,386	0,485	0,595	-
95	0,042	0,057	0,075	0,097	0,120	0,175	0,241	0,316	0,408	0,512	0,628	-
100	0,044	0,060	0,079	0,102	0,126	0,184	0,253	0,332	0,429	0,539	0,661	-
105	0,046	0,063	0,083	0,107	0,132	0,194	0,266	0,349	0,451	0,566	0,694	-
110	0,048	0,066	0,087	0,112	0,139	0,203	0,279	0,366	0,472	0,592	0,727	-
115	0,051	0,069	0,091	0,117	0,145	0,212	0,291	0,382	0,494	0,619	0,760	-
120	-	0,072	0,095	0,122	0,151	0,221	0,304	0,399	0,515	0,646	0,793	0,954
125	-	0,075	0,099	0,127	0,157	0,230	0,317	0,416	0,537	0,673	0,826	0,993
130	-	0,078	0,103	0,132	0,164	0,240	0,329	0,432	0,558	0,700	0,859	1,033
135	-	-	0,107	0,137	0,170	0,249	0,342	0,449	0,580	0,727	0,892	1,073
140	-	-	0,111	0,142	0,176	0,258	0,355	0,465	0,601	0,754	0,925	1,113
145	-	-	0,115	0,147	0,183	0,267	0,367	0,482	0,623	0,781	0,958	1,152
150	-	-	0,119	0,153	0,189	0,277	0,380	0,499	0,644	0,808	0,991	1,192
155	-	-	-	-	0,195	0,286	0,393	0,515	0,665	0,835	1,024	1,232
160	-	-	-	-	0,202	0,295	0,405	0,532	0,687	0,862	1,057	1,272
165	-	-	-	-	0,208	0,304	0,418	0,548	0,708	0,889	1,090	1,311
170	-	-	-	-	0,214	0,313	0,431	0,565	0,730	0,916	1,123	1,351
175	-	-	-	-	0,220	0,323	0,443	0,582	0,751	0,943	1,156	1,391
180	-	-	-	-	0,227	0,332	0,456	0,598	0,773	0,970	1,189	1,431
185	-	-	-	-	-	-	0,469	0,615	0,794	0,996	1,222	1,470
190	-	-	-	-	-	-	0,481	0,632	0,816	1,023	1,255	1,510
195	-	-	-	-	-	-	0,494	0,648	0,837	1,050	1,288	1,550
200	-	-	-	-	-	-	0,507	0,665	0,859	1,077	1,321	1,590
205	-	-	-	-	-	-	-	0,681	0,880	1,104	1,354	1,629
210	-	-	-	-	-	-	-	0,698	0,902	1,131	1,387	1,669
215	-	-	-	-	-	-	-	0,715	0,923	1,158	1,421	1,709
220	-	-	-	-	-	-	-	0,731	0,945	1,185	1,454	1,749
225	-	-	-	-	-	-	-	0,748	0,966	1,212	1,487	1,788
230	-	-	-	-	-	-	-	0,765	0,987	1,239	1,520	1,828
235	-	-	-	-	-	-	-	0,781	1,009	1,266	1,553	1,868
240	-	-	-	-	-	-	-	0,798	1,030	1,293	1,586	1,908
245	-	-	-	-	-	-	-	-	-	1,320	1,619	1,947
250	-	-	-	-	-	-	-	-	-	1,347	1,652	1,987
255	-	-	-	-	-	-	-	-	-	1,373	1,685	2,027
260	-	-	-	-	-	-	-	-	-	1,400	1,718	2,066
265	-	-	-	-	-	-	-	-	-	1,427	1,751	2,106
270	-	-	-	-	-	-	-	-	-	1,454	1,784	2,146
275	-	-	-	-	-	-	-	-	-	-	1,817	2,186
280	-	-	-	-	-	-	-	-	-	-	1,850	2,225
285	-	-	-	-	-	-	-	-	-	-	1,883	2,265
290	-	-	-	-	-	-	-	-	-	-	-	2,305
295	-	-	-	-	-	-	-	-	-	-	-	2,345
300	-	-	-	-	-	-	-	-	-	-	-	2,384
305	-	-	-	-	-	-	-	-	-	-	-	2,424
310	-	-	-	-	-	-	-	-	-	-	-	2,464
315	-	-	-	-	-	-	-	-	-	-	-	2,504

every extra 5 mm:												
0,0004	0,0006	0,0008	0,001	0,0013	0,0018	0,0025	0,0033	0,0043	0,0054	0,0066	0,0079	

WEIGHT TABLE - STUDBOLTS without NUTS - ANSI TYPE (Kg./Piece)

L	1 5/8	1 3/4	1 7/8	2	2 1/4	2 1/2	2 3/4	3	3 1/4	3 1/2	3 3/4	4
120	1,129	1,320	1,526	1,746	2,232	-	-	-	-	-	-	-
125	1,176	1,374	1,589	1,819	2,325	-	-	-	-	-	-	-
130	1,223	1,429	1,653	1,891	2,418	-	-	-	-	-	-	-
135	1,270	1,484	1,716	1,964	2,511	3,125	3,806	4,554	-	-	-	-
140	1,317	1,539	1,780	2,037	2,604	3,241	3,947	4,723	-	-	-	-
145	1,364	1,594	1,843	2,110	2,697	3,356	4,088	4,891	-	-	-	-
150	1,411	1,649	1,907	2,182	2,790	3,472	4,229	5,060	5,967	6,946	8,000	9,129
155	1,458	1,704	1,971	2,255	2,883	3,588	4,370	5,228	6,166	7,177	8,267	9,434
160	1,505	1,759	2,034	2,328	2,976	3,704	4,511	5,397	6,365	7,409	8,534	9,738
165	1,552	1,814	2,098	2,401	3,069	3,819	4,652	5,566	6,564	7,640	8,800	10,042
170	1,599	1,869	2,161	2,473	3,162	3,935	4,793	5,734	6,763	7,872	9,067	10,347
175	1,646	1,924	2,225	2,546	3,255	4,051	4,933	5,903	6,961	8,103	9,334	10,651
180	1,693	1,979	2,288	2,619	3,348	4,167	5,074	6,072	7,160	8,335	9,600	10,955
185	1,740	2,034	2,352	2,692	3,441	4,282	5,215	6,240	7,359	8,566	9,867	11,260
190	1,787	2,089	2,416	2,764	3,534	4,398	5,356	6,409	7,558	8,798	10,134	11,564
195	1,835	2,144	2,479	2,837	3,627	4,514	5,497	6,578	7,757	9,029	10,400	11,868
200	1,882	2,199	2,543	2,910	3,720	4,629	5,638	6,746	7,956	9,261	10,667	12,173
205	1,929	2,254	2,606	2,983	3,813	4,745	5,779	6,915	8,155	9,492	10,934	12,477
210	1,976	2,309	2,670	3,055	3,906	4,861	5,920	7,084	8,354	9,724	11,200	12,781
215	2,023	2,364	2,733	3,128	3,999	4,977	6,061	7,252	8,553	9,955	11,467	13,086
220	2,070	2,419	2,797	3,201	4,092	5,092	6,202	7,421	8,752	10,187	11,734	13,390
225	2,117	2,474	2,861	3,274	4,185	5,208	6,343	7,590	8,950	10,418	12,000	13,694
230	2,164	2,529	2,924	3,346	4,278	5,324	6,484	7,758	9,149	10,650	12,267	13,998
235	2,211	2,584	2,988	3,419	4,371	5,440	6,625	7,927	9,348	10,881	12,534	14,303
240	2,258	2,639	3,051	3,492	4,464	5,555	6,766	8,096	9,547	11,113	12,800	14,607
245	2,305	2,694	3,115	3,565	4,557	5,671	6,907	8,264	9,746	11,344	13,067	14,911
250	2,352	2,749	3,178	3,637	4,650	5,787	7,048	8,433	9,945	11,576	13,334	15,216
255	2,399	2,804	3,242	3,710	4,743	5,903	7,189	8,602	10,144	11,808	13,600	15,520
260	2,446	2,859	3,306	3,783	4,836	6,018	7,330	8,770	10,343	12,039	13,867	15,824
265	2,493	2,914	3,369	3,856	4,929	6,134	7,471	8,939	10,542	12,271	14,134	16,129
270	2,540	2,969	3,433	3,928	5,022	6,250	7,612	9,108	10,740	12,502	14,400	16,433
275	2,587	3,024	3,496	4,001	5,115	6,366	7,753	9,276	10,939	12,734	14,667	16,737
280	2,634	3,079	3,560	4,074	5,208	6,481	7,894	9,445	11,138	12,965	14,934	17,042
285	2,681	3,134	3,623	4,147	5,301	6,597	8,035	9,614	11,337	13,197	15,201	17,346
290	2,728	3,189	3,687	4,219	5,394	6,713	8,175	9,782	11,536	13,428	15,467	17,650
295	2,775	3,244	3,750	4,292	5,487	6,828	8,316	9,951	11,735	13,660	15,734	17,955
300	2,822	3,299	3,814	4,365	5,580	6,944	8,457	10,120	11,934	13,891	16,001	18,259
305	2,869	3,354	3,878	4,438	5,673	7,060	8,598	10,288	12,133	14,123	16,267	18,563
310	2,916	3,409	3,941	4,510	5,766	7,176	8,739	10,457	12,332	14,354	16,534	18,868
315	2,963	3,464	4,005	4,583	5,859	7,291	8,880	10,626	12,531	14,586	16,801	19,172
320	3,011	3,519	4,068	4,656	5,952	7,407	9,021	10,794	12,729	14,817	17,067	19,476
325	3,058	3,574	4,132	4,729	6,045	7,523	9,162	10,963	12,928	15,049	17,334	19,780
330	3,105	3,629	4,195	4,801	6,138	7,639	9,303	11,132	13,127	15,280	17,601	20,085
335	3,152	3,684	4,259	4,874	6,231	7,754	9,444	11,300	13,326	15,512	17,867	20,389
340	3,199	3,739	4,323	4,947	6,324	7,870	9,585	11,469	13,525	15,743	18,134	20,693
345	3,246	3,794	4,386	5,020	6,417	7,986	9,726	11,638	13,724	15,975	18,401	20,998
350	3,293	3,849	4,450	5,092	6,510	8,102	9,867	11,806	13,923	16,206	18,667	21,302
355	3,340	3,904	4,513	5,165	6,603	8,217	10,008	11,975	14,122	16,438	18,934	21,606
360	3,387	3,959	4,577	5,238	6,696	8,333	10,149	12,144	14,321	16,669	19,201	21,911
365	3,434	4,014	4,640	5,311	6,789	8,449	10,290	12,312	14,520	16,901	19,467	22,215
370	3,481	4,069	4,704	5,383	6,882	8,565	10,431	12,481	14,718	17,132	19,734	22,519
375	3,528	4,123	4,768	5,456	6,975	8,680	10,572	12,650	14,917	17,364	20,001	22,824
380	3,575	4,178	4,831	5,529	7,068	8,796	10,713	12,818	15,116	17,596	20,267	23,128
385	3,622	4,233	4,895	5,602	7,161	8,912	10,854	12,987	15,315	17,827	20,534	23,432
390	3,669	4,288	4,958	5,674	7,254	9,027	10,995	13,156	15,514	18,059	20,801	23,737
395	3,716	4,343	5,022	5,747	7,347	9,143	11,136	13,324	15,713	18,290	21,067	24,041
400	3,763	4,398	5,085	5,820	7,440	9,259	11,277	13,493	15,912	18,522	21,334	24,345
405	3,810	4,453	5,149	5,893	7,533	9,375	11,418	13,662	16,111	18,753	21,601	24,650
410	3,857	4,508	5,213	5,965	7,626	9,490	11,558	13,830	16,310	18,985	21,867	24,954

WEIGHT TABLES

WEIGHT TABLE - STUDBOLTS without NUTS - METRIC TYPE (Kg./Piece)

L	M 12	M 14	M 16	M 18	M 20	M 22	M 24	M 27	M 30	M 33	M 36	M 39
25	0,018	0,024	-	-	-	-	-	-	-	-	-	-
30	0,021	0,029	-	-	-	-	-	-	-	-	-	-
35	0,025	0,034	0,046	-	-	-	-	-	-	-	-	-
40	0,029	0,039	0,053	-	-	-	-	-	-	-	-	-
45	0,032	0,044	0,059	-	-	-	-	-	-	-	-	-
50	0,036	0,049	0,066	0,082	0,103	0,127	-	-	-	-	-	-
55	0,039	0,054	0,072	0,090	0,113	0,139	0,163	0,211	0,258	-	-	-
60	0,043	0,059	0,079	0,098	0,124	0,152	0,178	0,230	0,282	-	-	-
65	0,046	0,064	0,085	0,106	0,134	0,165	0,193	0,249	0,305	-	-	-
70	0,050	0,068	0,092	0,115	0,144	0,177	0,208	0,268	0,328	-	-	-
75	0,054	0,073	0,098	0,123	0,155	0,190	0,223	0,288	0,352	-	-	-
80	0,057	0,078	0,105	0,131	0,165	0,203	0,237	0,307	0,375	0,461	0,567	-
85	0,061	0,083	0,112	0,139	0,175	0,215	0,252	0,326	0,399	0,490	0,603	-
90	0,064	0,088	0,118	0,147	0,186	0,228	0,267	0,345	0,422	0,519	0,638	-
95	0,068	0,093	0,125	0,155	0,196	0,241	0,282	0,364	0,446	0,548	0,674	-
100	0,071	0,098	0,131	0,164	0,206	0,253	0,297	0,383	0,469	0,577	0,709	-
105	0,075	0,103	0,138	0,172	0,217	0,266	0,312	0,403	0,493	0,606	0,745	-
110	0,079	0,108	0,144	0,180	0,227	0,279	0,326	0,422	0,516	0,634	0,780	-
115	0,082	0,112	0,151	0,188	0,237	0,291	0,341	0,441	0,540	0,663	0,816	-
120	0,086	0,117	0,158	0,196	0,248	0,304	0,356	0,460	0,563	0,692	0,851	1,007
125	0,089	0,122	0,164	0,205	0,258	0,317	0,371	0,479	0,587	0,721	0,886	1,048
130	-	0,127	0,171	0,213	0,268	0,329	0,386	0,499	0,610	0,750	0,922	1,090
135	-	-	0,177	0,221	0,278	0,342	0,401	0,518	0,633	0,779	0,957	1,132
140	-	-	0,184	0,229	0,289	0,355	0,416	0,537	0,657	0,808	0,993	1,174
145	-	-	-	0,237	0,299	0,367	0,430	0,556	0,680	0,836	1,028	1,216
150	-	-	-	0,245	0,309	0,380	0,445	0,575	0,704	0,865	1,064	1,258
155	-	-	-	0,254	0,320	0,393	0,460	0,594	0,727	0,894	1,099	1,300
160	-	-	-	0,262	0,330	0,405	0,475	0,614	0,751	0,923	1,135	1,342
165	-	-	-	0,270	0,340	0,418	0,490	0,633	0,774	0,952	1,170	1,384
170	-	-	-	0,278	0,351	0,431	0,505	0,652	0,798	0,981	1,206	1,426
175	-	-	-	0,286	0,361	0,443	0,519	0,671	0,821	1,009	1,241	1,468
180	-	-	-	0,295	0,371	0,456	0,534	0,690	0,845	1,038	1,277	1,510
185	-	-	-	0,303	0,382	0,469	0,549	0,709	0,868	1,067	1,312	1,552
190	-	-	-	0,311	0,392	0,481	0,564	0,729	0,892	1,096	1,347	1,594
195	-	-	-	0,319	0,402	0,494	0,579	0,748	0,915	1,125	1,383	1,636
200	-	-	-	-	0,413	0,507	0,594	0,767	0,938	1,154	1,418	1,678
205	-	-	-	-	0,423	0,519	0,608	0,786	0,962	1,182	1,454	1,719
210	-	-	-	-	-	-	-	0,805	0,985	1,211	1,489	1,761
215	-	-	-	-	-	-	-	0,824	1,009	1,240	1,525	1,803
220	-	-	-	-	-	-	-	0,844	1,032	1,269	1,560	1,845
225	-	-	-	-	-	-	-	0,863	1,056	1,298	1,596	1,887
230	-	-	-	-	-	-	-	0,882	1,079	1,327	1,631	1,929
235	-	-	-	-	-	-	-	0,901	1,103	1,355	1,667	1,971
240	-	-	-	-	-	-	-	0,920	1,126	1,384	1,702	2,013
245	-	-	-	-	-	-	-	-	1,150	1,413	1,737	2,055
250	-	-	-	-	-	-	-	-	1,173	1,442	1,773	2,097
255	-	-	-	-	-	-	-	-	1,197	1,471	1,808	2,139
260	-	-	-	-	-	-	-	-	1,220	1,500	1,844	2,181
265	-	-	-	-	-	-	-	-	1,243	1,529	1,879	2,223
270	-	-	-	-	-	-	-	-	1,267	1,557	1,915	2,265
275	-	-	-	-	-	-	-	-	1,290	1,586	1,950	2,307
280	-	-	-	-	-	-	-	-	-	1,615	1,986	2,349
285	-	-	-	-	-	-	-	-	-	1,644	2,021	2,390
290	-	-	-	-	-	-	-	-	-	1,673	2,057	2,432
295	-	-	-	-	-	-	-	-	-	1,702	2,092	2,474
300	-	-	-	-	-	-	-	-	-	1,730	2,128	2,516
305	-	-	-	-	-	-	-	-	-	1,759	2,163	2,558
310	-	-	-	-	-	-	-	-	-	1,788	2,198	2,600
315	-	-	-	-	-	-	-	-	-	1,817	2,234	2,642
every extra 5 mm:												
	0,0007	0,001	0,0013	0,0016	0,0021	0,0025	0,003	0,0038	0,0047	0,0058	0,0071	0,0084

WEIGHT TABLE - STUDBOLTS without NUTS - METRIC TYPE (Kg./Piece)

L	M 42	M 45	M 48	M 52	M 56	M 60	M 64	M 68	M 72	M 76	M 80	M 85
120	1,177	1,360	1,557	1,841	2,096	-	-	-	-	-	-	-
125	1,226	1,417	1,622	1,917	2,183	-	-	-	-	-	-	-
130	1,275	1,474	1,687	1,994	2,271	-	-	-	-	-	-	-
135	1,324	1,530	1,752	2,071	2,358	2,727	3,125	3,541	-	-	-	-
140	1,373	1,587	1,817	2,147	2,445	2,828	3,241	3,672	-	-	-	-
145	1,422	1,644	1,882	2,224	2,533	2,929	3,356	3,803	-	-	-	-
150	1,471	1,701	1,947	2,301	2,620	3,030	3,472	3,934	4,431	4,958	5,514	6,251
155	1,520	1,757	2,012	2,377	2,707	3,131	3,588	4,065	4,579	5,123	5,698	6,459
160	1,569	1,814	2,076	2,454	2,795	3,231	3,704	4,196	4,727	5,288	5,882	6,668
165	1,618	1,871	2,141	2,531	2,882	3,332	3,819	4,327	4,874	5,454	6,065	6,876
170	1,667	1,927	2,206	2,608	2,969	3,433	3,935	4,459	5,022	5,619	6,249	7,084
175	1,716	1,984	2,271	2,684	3,057	3,534	4,051	4,590	5,170	5,784	6,433	7,293
180	1,765	2,041	2,336	2,761	3,144	3,635	4,167	4,721	5,317	5,949	6,617	7,501
185	1,814	2,097	2,401	2,838	3,231	3,736	4,282	4,852	5,465	6,115	6,801	7,709
190	1,863	2,154	2,466	2,914	3,319	3,837	4,398	4,983	5,613	6,280	6,984	7,918
195	1,912	2,211	2,531	2,991	3,406	3,938	4,514	5,114	5,760	6,445	7,168	8,126
200	1,961	2,267	2,596	3,068	3,493	4,039	4,629	5,245	5,908	6,610	7,352	8,335
205	2,010	2,324	2,660	3,144	3,581	4,140	4,745	5,376	6,056	6,776	7,536	8,543
210	2,059	2,381	2,725	3,221	3,668	4,241	4,861	5,508	6,204	6,941	7,720	8,751
215	2,108	2,437	2,790	3,298	3,755	4,342	4,977	5,639	6,351	7,106	7,903	8,960
220	2,157	2,494	2,855	3,374	3,843	4,443	5,092	5,770	6,499	7,271	8,087	9,168
225	2,207	2,551	2,920	3,451	3,930	4,544	5,208	5,901	6,647	7,437	8,271	9,376
230	2,256	2,607	2,985	3,528	4,017	4,645	5,324	6,032	6,794	7,602	8,455	9,585
235	2,305	2,664	3,050	3,605	4,105	4,746	5,440	6,163	6,942	7,767	8,639	9,793
240	2,354	2,721	3,115	3,681	4,192	4,847	5,555	6,294	7,090	7,932	8,822	10,001
245	2,403	2,778	3,180	3,758	4,279	4,948	5,671	6,426	7,237	8,098	9,006	10,210
250	2,452	2,834	3,244	3,835	4,367	5,049	5,787	6,557	7,385	8,263	9,190	10,418
255	2,501	2,891	3,309	3,911	4,454	5,150	5,903	6,688	7,533	8,428	9,374	10,627
260	2,550	2,948	3,374	3,988	4,541	5,251	6,018	6,819	7,681	8,593	9,558	10,835
265	2,599	3,004	3,439	4,065	4,629	5,352	6,134	6,950	7,828	8,759	9,741	11,043
270	2,648	3,061	3,504	4,141	4,716	5,453	6,250	7,081	7,976	8,924	9,925	11,252
275	2,697	3,118	3,569	4,218	4,803	5,554	6,366	7,212	8,124	9,089	10,109	11,460
280	2,746	3,174	3,634	4,295	4,891	5,655	6,481	7,343	8,271	9,255	10,293	11,668
285	2,795	3,231	3,699	4,371	4,978	5,756	6,597	7,475	8,419	9,420	10,477	11,877
290	2,844	3,288	3,764	4,448	5,065	5,857	6,713	7,606	8,567	9,585	10,660	12,085
295	2,893	3,344	3,828	4,525	5,153	5,958	6,828	7,737	8,714	9,750	10,844	12,293
300	2,942	3,401	3,893	4,602	5,240	6,059	6,944	7,868	8,862	9,916	11,028	12,502
305	2,991	3,458	3,958	4,678	5,327	6,160	7,060	7,999	9,010	10,081	11,212	12,710
310	3,040	3,514	4,023	4,755	5,415	6,261	7,176	8,130	9,158	10,246	11,396	12,919
315	3,089	3,571	4,088	4,832	5,502	6,362	7,291	8,261	9,305	10,411	11,579	13,127
320	3,138	3,628	4,153	4,908	5,589	6,463	7,407	8,393	9,453	10,577	11,763	13,335
325	3,187	3,685	4,218	4,985	5,677	6,564	7,523	8,524	9,601	10,742	11,947	13,544
330	3,236	3,741	4,283	5,062	5,764	6,665	7,639	8,655	9,748	10,907	12,131	13,752
335	3,285	3,798	4,348	5,138	5,851	6,766	7,754	8,786	9,896	11,072	12,315	13,960
340	3,334	3,855	4,413	5,215	5,939	6,867	7,870	8,917	10,044	11,238	12,498	14,169
345	3,383	3,911	4,477	5,292	6,026	6,968	7,986	9,048	10,192	11,403	12,682	14,377
350	3,432	3,968	4,542	5,368	6,113	7,069	8,102	9,179	10,339	11,568	12,866	14,585
355	3,481	4,025	4,607	5,445	6,201	7,170	8,217	9,310	10,487	11,733	13,050	14,794
360	3,530	4,081	4,672	5,522	6,288	7,271	8,333	9,442	10,635	11,899	13,234	15,002
365	3,579	4,138	4,737	5,599	6,375	7,372	8,449	9,573	10,782	12,064	13,417	15,211
370	3,629	4,195	4,802	5,675	6,463	7,473	8,565	9,704	10,930	12,229	13,601	15,419
375	3,678	4,251	4,867	5,752	6,550	7,574	8,680	9,835	11,078	12,394	13,785	15,627
380	3,727	4,308	4,932	5,829	6,637	7,675	8,796	9,966	11,225	12,560	13,969	15,836
385	3,776	4,365	4,997	5,905	6,725	7,776	8,912	10,097	11,373	12,725	14,153	16,044
390	3,825	4,421	5,061	5,982	6,812	7,877	9,027	10,228	11,521	12,890	14,336	16,252
395	3,874	4,478	5,126	6,059	6,899	7,978	9,143	10,360	11,669	13,055	14,520	16,461
400	3,923	4,535	5,191	6,135	6,987	8,079	9,259	10,491	11,816	13,221	14,704	16,669
405	3,972	4,591	5,256	6,212	7,074	8,180	9,375	10,622	11,964	13,386	14,888	16,877
410	4,021	4,648	5,321	6,289	7,161	8,281	9,490	10,753	12,112	13,551	15,072	17,086
every extra 5 mm:												
	0,0098	0,0113	0,013	0,0153	0,0175	0,0202	0,0231	0,0262	0,0295	0,0331	0,0368	0,0417

WEIGHT TABLES

WEIGHT TABLE - STUDBOLTS COMPLETE with TWO NUTS - ANSI TYPE (Kg./Set)

L	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2
25	0,041	0,055	-	-	-	-	-	-	-	-	-	-
30	0,043	0,058	-	-	-	-	-	-	-	-	-	-
35	0,045	0,061	0,090	-	-	-	-	-	-	-	-	-
40	0,048	0,064	0,094	0,119	0,151	-	-	-	-	-	-	-
45	0,050	0,067	0,098	0,124	0,157	0,259	-	-	-	-	-	-
50	0,052	0,070	0,102	0,129	0,164	0,268	0,385	0,534	0,723	-	-	-
55	0,054	0,073	0,106	0,134	0,170	0,277	0,397	0,551	0,744	-	-	-
60	0,056	0,076	0,110	0,139	0,176	0,287	0,410	0,567	0,766	-	-	-
65	0,059	0,079	0,114	0,144	0,182	0,296	0,423	0,584	0,787	-	-	-
70	0,061	0,082	0,118	0,149	0,189	0,305	0,435	0,601	0,809	-	-	-
75	0,063	0,085	0,122	0,154	0,195	0,314	0,448	0,617	0,830	-	-	-
80	0,065	0,088	0,125	0,159	0,201	0,323	0,461	0,634	0,851	1,091	-	-
85	0,067	0,091	0,129	0,164	0,208	0,333	0,473	0,651	0,873	1,118	-	-
90	0,070	0,094	0,133	0,170	0,214	0,342	0,486	0,667	0,894	1,145	-	-
95	0,072	0,097	0,137	0,175	0,220	0,351	0,499	0,684	0,916	1,172	-	-
100	0,074	0,100	0,141	0,180	0,227	0,360	0,511	0,700	0,937	1,199	1,523	-
105	0,076	0,103	0,145	0,185	0,233	0,370	0,524	0,717	0,959	1,226	1,556	-
110	0,078	0,106	0,149	0,190	0,239	0,379	0,537	0,734	0,980	1,252	1,589	1,974
115	0,081	0,109	0,153	0,195	0,245	0,388	0,549	0,750	1,002	1,279	1,622	2,014
120	-	0,112	0,157	0,200	0,252	0,397	0,562	0,767	1,023	1,306	1,655	2,054
125	-	0,115	0,161	0,205	0,258	0,406	0,575	0,784	1,045	1,333	1,688	2,093
130	-	0,118	0,165	0,210	0,264	0,416	0,587	0,800	1,066	1,360	1,721	2,133
135	-	-	0,169	0,215	0,271	0,425	0,600	0,817	1,088	1,387	1,754	2,173
140	-	-	0,173	0,220	0,277	0,434	0,613	0,833	1,109	1,414	1,787	2,213
145	-	-	-	0,225	0,283	0,443	0,625	0,850	1,131	1,441	1,820	2,252
150	-	-	-	0,231	0,290	0,453	0,638	0,867	1,152	1,468	1,853	2,292
155	-	-	-	-	0,296	0,462	0,651	0,883	1,173	1,495	1,886	2,332
160	-	-	-	-	0,302	0,471	0,663	0,900	1,195	1,522	1,919	2,372
165	-	-	-	-	-	0,480	0,676	0,916	1,216	1,549	1,952	2,411
170	-	-	-	-	-	0,489	0,689	0,933	1,238	1,576	1,985	2,451
175	-	-	-	-	-	0,499	0,701	0,950	1,259	1,603	2,018	2,491
180	-	-	-	-	-	0,508	0,714	0,966	1,281	1,630	2,051	2,531
185	-	-	-	-	-	-	0,727	0,983	1,302	1,656	2,084	2,570
190	-	-	-	-	-	-	0,739	1,000	1,324	1,683	2,117	2,610
195	-	-	-	-	-	-	0,752	1,016	1,345	1,710	2,150	2,650
200	-	-	-	-	-	-	0,765	1,033	1,367	1,737	2,183	2,690
205	-	-	-	-	-	-	0,777	1,049	1,388	1,764	2,216	2,729
210	-	-	-	-	-	-	0,790	1,066	1,410	1,791	2,249	2,769
215	-	-	-	-	-	-	0,803	1,083	1,431	1,818	2,283	2,809
220	-	-	-	-	-	-	0,815	1,099	1,453	1,845	2,316	2,849
225	-	-	-	-	-	-	0,828	1,116	1,474	1,872	2,349	2,888
230	-	-	-	-	-	-	0,841	1,133	1,495	1,899	2,382	2,928
235	-	-	-	-	-	-	0,853	1,149	1,517	1,926	2,415	2,968
240	-	-	-	-	-	-	0,866	1,166	1,538	1,953	2,448	3,008
245	-	-	-	-	-	-	0,879	1,182	1,560	1,980	2,481	3,047
250	-	-	-	-	-	-	0,891	1,199	1,581	2,007	2,514	3,087
255	-	-	-	-	-	-	0,904	1,216	1,603	2,033	2,547	3,127
260	-	-	-	-	-	-	-	1,232	1,624	2,060	2,580	3,166
265	-	-	-	-	-	-	-	1,249	1,646	2,087	2,613	3,206
270	-	-	-	-	-	-	-	1,266	1,667	2,114	2,646	3,246
275	-	-	-	-	-	-	-	-	1,689	2,141	2,679	3,286
280	-	-	-	-	-	-	-	-	1,710	2,168	2,712	3,325
285	-	-	-	-	-	-	-	-	1,732	2,195	2,745	3,365
290	-	-	-	-	-	-	-	-	1,753	2,222	2,778	3,405
295	-	-	-	-	-	-	-	-	-	2,249	2,811	3,445
300	-	-	-	-	-	-	-	-	-	2,276	2,844	3,484
305	-	-	-	-	-	-	-	-	-	2,303	2,877	3,524
310	-	-	-	-	-	-	-	-	-	2,330	2,910	3,564
315	-	-	-	-	-	-	-	-	-	-	2,943	3,604
every extra 5 mm:												
	0,0004	0,0006	0,0008	0,001	0,0013	0,0018	0,0025	0,0033	0,0043	0,0054	0,0066	0,0079

WEIGHT TABLE - STUDBOLTS COMPLETE with TWO NUTS - ANSI TYPE (Kg./Set)

L	1 5/8	1 3/4	1 7/8	2	2 1/4	2 1/2	2 3/4	3	3 1/4	3 1/2	3 3/4	4
120	2,555	3,038	3,630	4,326	5,868	-	-	-	-	-	-	-
125	2,602	3,092	3,693	4,399	5,961	-	-	-	-	-	-	-
130	2,649	3,147	3,757	4,471	6,054	-	-	-	-	-	-	-
135	2,696	3,202	3,820	4,544	6,147	8,119	10,16	12,39	-	-	-	-
140	2,743	3,257	3,884	4,617	6,240	8,235	10,30	12,56	-	-	-	-
145	2,790	3,312	3,947	4,690	6,333	8,350	10,44	12,73	-	-	-	-
150	2,837	3,367	4,011	4,762	6,426	8,466	10,58	12,90	15,69	19,79	23,62	28,67
155	2,884	3,422	4,075	4,835	6,519	8,582	10,72	13,07	15,89	20,02	23,89	28,97
160	2,931	3,477	4,138	4,908	6,612	8,698	10,86	13,24	16,08	20,25	24,15	29,28
165	2,978	3,532	4,202	4,981	6,705	8,813	11,00	13,41	16,28	20,48	24,42	29,58
170	3,025	3,587	4,265	5,053	6,798	8,929	11,14	13,57	16,48	20,71	24,69	29,89
175	3,072	3,642	4,329	5,126	6,891	9,045	11,28	13,74	16,68	20,94	24,95	30,19
180	3,119	3,697	4,392	5,199	6,984	9,161	11,42	13,91	16,88	21,17	25,22	30,50
185	3,166	3,752	4,456	5,272	7,077	9,276	11,57	14,08	17,08	21,41	25,49	30,80
190	3,213	3,807	4,520	5,344	7,170	9,392	11,71	14,25	17,28	21,64	25,75	31,10
195	3,261	3,862	4,583	5,417	7,263	9,508	11,85	14,42	17,48	21,87	26,02	31,41
200	3,308	3,917	4,647	5,490	7,356	9,623	11,99	14,59	17,68	22,10	26,29	31,71
205	3,355	3,972	4,710	5,563	7,449	9,739	12,13	14,76	17,87	22,33	26,55	32,02
210	3,402	4,027	4,774	5,635	7,542	9,855	12,27	14,92	18,07	22,56	26,82	32,32
215	3,449	4,082	4,837	5,708	7,635	9,971	12,41	15,09	18,27	22,80	27,09	32,63
220	3,496	4,137	4,901	5,781	7,728	10,09	12,55	15,26	18,47	23,03	27,35	32,93
225	3,543	4,192	4,965	5,854	7,821	10,20	12,69	15,43	18,67	23,26	27,62	33,23
230	3,590	4,247	5,028	5,926	7,914	10,32	12,83	15,60	18,87	23,49	27,89	33,54
235	3,637	4,302	5,092	5,999	8,007	10,43	12,97	15,77	19,07	23,72	28,15	33,84
240	3,684	4,357	5,155	6,072	8,100	10,55	13,12	15,94	19,27	23,95	28,42	34,15
245	3,731	4,412	5,219	6,145	8,193	10,67	13,26	16,10	19,47	24,18	28,69	34,45
250	3,778	4,467	5,282	6,217	8,286	10,78	13,40	16,27	19,66	24,42	28,95	34,76
255	3,825	4,522	5,346	6,290	8,379	10,90	13,54	16,44	19,86	24,65	29,22	35,06
260	3,872	4,577	5,410	6,363	8,472	11,01	13,68	16,61	20,06	24,88	29,49	35,36
265	3,919	4,632	5,473	6,436	8,565	11,13	13,82	16,78	20,26	25,11	29,75	35,67
270	3,966	4,687	5,537	6,508	8,658	11,24	13,96	16,95	20,46	25,34	30,02	35,97
275	4,013	4,742	5,600	6,581	8,751	11,36	14,10	17,12	20,66	25,57	30,29	36,28
280	4,060	4,797	5,664	6,654	8,844	11,48	14,24	17,29	20,86	25,81	30,55	36,58
285	4,107	4,852	5,727	6,727	8,937	11,59	14,38	17,45	21,06	26,04	30,82	36,89
290	4,154	4,907	5,791	6,799	9,030	11,71	14,53	17,62	21,26	26,27	31,09	37,19
295	4,201	4,962	5,854	6,872	9,123	11,82	14,67	17,79	21,45	26,50	31,35	37,49
300	4,248	5,017	5,918	6,945	9,216	11,94	14,81	17,96	21,65	26,73	31,62	37,80
305	4,295	5,072	5,982	7,018	9,309	12,05	14,95	18,13	21,85	26,96	31,89	38,10
310	4,342	5,127	6,045	7,090	9,402	12,17	15,09	18,30	22,05	27,19	32,15	38,41
315	4,389	5,182	6,109	7,163	9,495	12,29	15,23	18,47	22,25	27,43	32,42	38,71
320	4,437	5,237	6,172	7,236	9,588	12,40	15,37	18,63	22,45	27,66	32,69	39,02
325	4,484	5,292	6,236	7,309	9,681	12,52	15,51	18,80	22,65	27,89	32,95	39,32

WEIGHT TABLES

WEIGHT TABLE - STUDBOLTS COMPLETE with TWO NUTS - METRIC TYPE (Kg./Set)

L	M 12	M 14	M 16	M 18	M 20	M 22	M 24	M 27	M 30	M 33	M 36	M 39
25	0,054	0,084	-	-	-	-	-	-	-	-	-	-
30	0,058	0,089	-	-	-	-	-	-	-	-	-	-
35	0,061	0,094	0,121	-	-	-	-	-	-	-	-	-
40	0,065	0,099	0,127	-	-	-	-	-	-	-	-	-
45	0,068	0,104	0,134	-	-	-	-	-	-	-	-	-
50	0,072	0,109	0,140	0,186	0,250	0,303	-	-	-	-	-	-
55	0,076	0,114	0,147	0,194	0,260	0,315	0,412	0,565	-	-	-	-
60	0,079	0,119	0,154	0,203	0,271	0,328	0,427	0,584	-	-	-	-
65	0,083	0,124	0,160	0,211	0,281	0,341	0,441	0,603	-	-	-	-
70	0,086	0,128	0,167	0,219	0,291	0,353	0,456	0,622	0,834	-	-	-
75	0,090	0,133	0,173	0,227	0,302	0,366	0,471	0,642	0,858	-	-	-
80	0,093	0,138	0,180	0,235	0,312	0,379	0,486	0,661	0,881	1,117	-	-
85	0,097	0,143	0,186	0,243	0,322	0,391	0,501	0,680	0,904	1,146	-	-
90	0,101	0,148	0,193	0,252	0,333	0,404	0,516	0,699	0,928	1,175	-	-
95	0,104	0,153	0,200	0,260	0,343	0,417	0,530	0,718	0,951	1,204	-	-
100	0,108	0,158	0,206	0,268	0,353	0,429	0,545	0,738	0,975	1,233	-	-
105	0,111	0,163	0,213	0,276	0,363	0,442	0,560	0,757	0,998	1,262	-	-
110	0,115	0,168	0,219	0,284	0,374	0,455	0,575	0,776	1,022	1,290	1,670	2,100
115	0,118	0,172	0,226	0,293	0,384	0,467	0,590	0,795	1,045	1,319	1,706	2,142
120	-	0,177	0,232	0,301	0,394	0,480	0,605	0,814	1,069	1,348	1,741	2,184
125	-	0,182	0,239	0,309	0,405	0,493	0,619	0,833	1,092	1,377	1,777	2,225
130	-	0,187	0,245	0,317	0,415	0,505	0,634	0,853	1,116	1,406	1,812	2,267
135	-	-	0,252	0,325	0,425	0,518	0,649	0,872	1,139	1,435	1,848	2,309
140	-	-	0,259	0,333	0,436	0,531	0,664	0,891	1,163	1,464	1,883	2,351
145	-	-	-	0,342	0,446	0,543	0,679	0,910	1,186	1,492	1,919	2,393
150	-	-	-	0,350	0,456	0,556	0,694	0,929	1,209	1,521	1,954	2,435
155	-	-	-	0,358	0,467	0,569	0,708	0,948	1,233	1,550	1,990	2,477
160	-	-	-	0,366	0,477	0,581	0,723	0,968	1,256	1,579	2,025	2,519
165	-	-	-	0,374	0,487	0,594	0,738	0,987	1,280	1,608	2,061	2,561
170	-	-	-	0,383	0,498	0,607	0,753	1,006	1,303	1,637	2,096	2,603
175	-	-	-	0,391	0,508	0,619	0,768	1,025	1,327	1,665	2,131	2,645
180	-	-	-	0,399	0,518	0,632	0,783	1,044	1,350	1,694	2,167	2,687
185	-	-	-	0,407	0,529	0,645	0,798	1,063	1,374	1,723	2,202	2,729
190	-	-	-	0,415	0,539	0,657	0,812	1,083	1,397	1,752	2,238	2,771
195	-	-	-	0,424	0,549	0,670	0,827	1,102	1,421	1,781	2,273	2,813
200	-	-	-	-	-	-	0,842	1,121	1,444	1,810	2,309	2,855
205	-	-	-	-	-	-	-	1,140	1,468	1,838	2,344	2,896
210	-	-	-	-	-	-	-	1,159	1,491	1,867	2,380	2,938
215	-	-	-	-	-	-	-	1,179	1,514	1,896	2,415	2,980
220	-	-	-	-	-	-	-	1,198	1,538	1,925	2,451	3,022
225	-	-	-	-	-	-	-	1,217	1,561	1,954	2,486	3,064
230	-	-	-	-	-	-	-	1,236	1,585	1,983	2,521	3,106
235	-	-	-	-	-	-	-	1,255	1,608	2,011	2,557	3,148
240	-	-	-	-	-	-	-	1,274	1,632	2,040	2,592	3,190
245	-	-	-	-	-	-	-	-	1,655	2,069	2,628	3,232
250	-	-	-	-	-	-	-	-	1,679	2,098	2,663	3,274
255	-	-	-	-	-	-	-	-	1,702	2,127	2,699	3,316
260	-	-	-	-	-	-	-	-	1,726	2,156	2,734	3,358
265	-	-	-	-	-	-	-	-	1,749	2,185	2,770	3,400
270	-	-	-	-	-	-	-	-	1,773	2,213	2,805	3,442
275	-	-	-	-	-	-	-	-	1,796	2,242	2,841	3,484
280	-	-	-	-	-	-	-	-	-	2,271	2,876	3,526
285	-	-	-	-	-	-	-	-	-	2,300	2,912	3,567
290	-	-	-	-	-	-	-	-	-	2,329	2,947	3,609
295	-	-	-	-	-	-	-	-	-	2,358	2,982	3,651
300	-	-	-	-	-	-	-	-	-	2,386	3,018	3,693
305	-	-	-	-	-	-	-	-	-	2,415	3,053	3,735
310	-	-	-	-	-	-	-	-	-	2,444	3,089	3,777
315	-	-	-	-	-	-	-	-	-	2,473	3,124v	3,819
every extra 5 mm:												
	0,0007	0,001	0,0013	0,0016	0,0021	0,0025	0,003	0,0038	0,0047	0,0058	0,0071	0,0084

WEIGHT TABLE - STUDBOLTS COMPLETE with TWO NUTS - METRIC TYPE (Kg./Set)

L	M 42	M 45	M 48	M 52	M 56	M 60	M 64	M 68	M 72	M 76	M 80	M 85
120	2,636	3,242	3,828	4,627	5,388	-	-	-	-	-	-	-
125	2,685	3,299	3,893	4,703	5,475	-	-	-	-	-	-	-
130	2,734	3,356	3,958	4,780	5,563	-	-	-	-	-	-	-
135	2,784	3,412	4,023	4,857	5,650	6,664	7,690	8,961	-	-	-	-
140	2,833	3,469	4,088	4,933	5,737	6,765	7,806	9,092	-	-	-	-
145	2,882	3,526	4,153	5,010	5,825	6,866	7,922	9,223	-	-	-	-
150	2,931	3,583	4,217	5,087	5,912	6,967	8,038	9,354	10,87	12,36	13,57	15,33
155	2,980	3,639	4,282	5,163	5,999	7,068	8,153	9,485	11,01	12,52	13,75	15,53
160	3,029	3,696	4,347	5,240	6,087	7,169	8,269	9,616	11,16	12,69	13,94	15,74
165	3,078	3,753	4,412	5,317	6,174	7,270	8,385	9,747	11,31	12,85	14,12	15,95
170	3,127	3,809	4,477	5,394	6,261	7,371	8,500	9,879	11,46	13,02	14,31	16,16
175	3,176	3,866	4,542	5,470	6,349	7,472	8,616	10,01	11,60	13,18	14,49	16,37
180	3,225	3,923	4,607	5,547	6,436	7,573	8,732	10,14	11,75	13,35	14,67	16,58
185	3,274	3,979	4,672	5,624	6,523	7,674	8,848	10,27	11,90	13,51	14,86	16,78
190	3,323	4,036	4,737	5,700	6,611	7,775	8,963	10,40	12,50	13,68	15,04	16,99
195	3,372	4,093	4,802	5,777	6,698	7,876	9,079	10,53	12,19	13,85	15,22	17,20
200	3,421	4,149	4,866	5,854	6,785	7,977	9,195	10,67	12,34	14,01	15,41	17,41
205	3,470	4,206	4,931	5,930	6,873	8,078	9,311	10,80	12,49	14,18	15,59	17,62
210	3,519	4,263	4,996	6,007	6,960	8,179	9,426	10,93	12,64	14,34	15,78	17,83
215	3,568	4,319	5,061	6,084	7,047	8,280	9,542	11,06	12,79	14,51	15,96	18,03
220	3,617	4,376	5,126	6,160	7,135	8,381	9,658	11,19	12,93	14,67	16,14	18,24
225	3,666	4,433	5,191	6,237	7,222	8,482	9,774	11,32	13,08	14,84	16,33	18,45
230	3,715	4,489	5,256	6,314	7,309	8,583	9,889	11,45	13,23	15,00	16,51	18,66
235	3,764	4,546	5,321	6,391	7,397	8,684	10,01	11,58	13,38	15,17	16,69	18,87
240	3,813	4,603	5,386	6,467	7,484	8,785	10,12	11,71	13,52	15,33	16,88	19,08
245	3,862	4,660	5,450	6,544	7,571	8,886	10,24	11,85	13,67	15,50	17,06	19,28
250	3,911	4,716	5,515	6,621	7,659	8,987	10,35	11,98	13,82	15,66	17,25	19,49
255	3,960	4,773	5,580	6,697	7,746	9,088	10,47	12,11	13,97	15,83	17,43	19,70
260	4,009	4,830	5,645	6,774	7,833	9,189	10,58	12,24	14,11	15,99	17,61	19,91
265	4,058	4,886	5,710	6,851	7,921	9,290	10,70	12,37	14,26	16,16	17,80	20,12
270	4,107	4,943	5,775	6,927	8,008	9,391	10,82	12,50	14,41	16,32	17,98	20,33
275	4,156	5,000	5,840	7,004	8,095	9,492	10,93	12,63	14,56	16,49	18,17	20,53
280	4,205	5,056	5,905	7,081	8,183	9,593	11,05	12,76	14,71	16,65	18,35	20,74
285	4,255	5,113	5,970	7,157	8,270	9,694	11,16	12,89	14,85	16,82	18,53	20,95
290	4,304	5,170	6,034	7,234	8,357	9,795	11,28	13,03	15,00	16,99	18,72	21,16
295	4,353	5,226	6,099	7,311	8,445	9,896	11,39	13,16	15,15	17,15	18,90	21,37
300	4,402	5,283	6,164	7,388	8,532	9,997	11,51	13,29	15,30	17,32	19,08	21,58
305	4,451	5,340	6,229	7,464	8,619	10,10	11,63	13,42	15,44	17,48	19,27	21,78
310	4,500	5,396	6,294	7,541	8,707	10,20	11,74	13,55	15,59	17,65	19,45	21,99
315	4,549	5,453	6,359	7,618	8,794	10,30	11,86	13,68	15,74	17,81	19,64	22,20
320	4,598	5,510	6,424	7,694	8,881	10,40	11,97	13,81	15,89	17,98	19,82	22,41
325	4,647	5,567	6,489	7,771	8,969	10,50	12,09	13,94	16,03	18,14	20,00	22,62
330	4,696	5,623	6,554	7,848	9,056	10,60	12,20	14,07	16,18	18,31	20,19	22,83
335	4,745	5,680	6,618	7,924	9,143	10,70	12,32	14,21	16,33	18,47	20,37	23,03
340	4,794	5,737	6,683	8,001	9,231	10,80	12,44	14,34	16,48	18,64	20,55	23,24
345	4,843	5,793	6,748	8,078	9,318	10,91	12,55	14,47	16,63	18,80	20,74	23,45
350	4,892	5,850	6,813	8,154	9,405	11,01	12,67	14,60	16,77	18,97	20,92	23,66
355	4,941	5,907	6,878	8,231	9,493	11,11	12,78	14,73	16,92	19,13	21,11	23,87
360	4,990	5,963	6,943	8,308	9,580	11,21	12,90	14,86	17,07	19,30	21,29	24,08
365	5,039	6,020	7,008	8,385	9,667	11,31	13,01	14,99	17,22	19,46	21,47	24,29
370	5,088	6,077	7,073	8,461	9,755	11,41	13,13	15,12	17,36	19,63	21,66	24,49
375	5,137	6,133	7,138	8,538	9,842	11,51	13,25	15,25	17,51	19,79	21,84	24,70
380	5,186	6,190	7,202	8,615	9,929	11,61	13,36	15,39	17,66	19,96	22,02	24,91
385	5,235	6,247	7,267	8,691	10,02	11,71	13,48	15,52	17,81	20,12	22,21	25,12
390	5,284	6,303	7,332	8,768	10,10	11,81	13,59	15,65	17,95	20,29	22,39	25,33
395	5,333	6,360	7,397	8,845	10,19	11,92	13,71	15,78	18,10	20,46	22,58	25,54
400	5,382	6,417	7,462	8,921	10,28	12,02	13,82	15,91	18,25	20,62	22,76	25,74
405	5,431	6,473	7,527	8,998	10,37	12,12	13,94	16,04	18,40	20,79	22,94	25,95
410	5,480	6,530	7,592	9,075	10,45	12,22	14,06	16,17	18,55	20,95	23,13	26,16
every extra 5 mm:												
	0,0098	0,0113	0,013	0,0153	0,0175	0,0202	0,0231	0,0262	0,0295	0,0331	0,0368	0,0417

WEIGHT TABLES

DENSITY (kg/dm3)											
A20	A200	A276	A400	A500	A600	A625	A686	A718	A725	AX750	80A
N08020	N02200	N10276	N04400	N05500	N06600	N06625	N06686	N07718	N07725	N07750	N07080
8,08	8,89	8,89	8,83	8,47	8,43	8,44	8,73	8,22	8,31	8,38	8,19
A800 HT	A825	A904L	A925	B2	C22	C61400	C63000	C65500	HX	TI 2	TI 5
N08811	N08825	N08904	N09925	N10665	N06022	C61400	C63000	C65500	N06002	R50400	R56400
8,10	8,14	8,00	8,05	9,22	8,81	7,46	7,50	8,53	8,22	4,53	4,45

Carbon Steel-Inox-Duplex-Superduplex-660: 7,85

WEIGHT TABLE for ROUND and HEXAGON BARS Kg./meter											
Dim.	●	⬡	Dim.	●	⬡	Dim.	●	⬡	Dim.	●	⬡
3	0,06	0,06	45	12,47	13,77	88	47,70	52,65	131	105,71	116,67
3,5	0,08	0,08	46	13,03	14,39	89	48,79	53,85	132	107,33	118,46
4	0,10	0,11	47	13,61	15,02	90	49,90	55,07	132	107,33	118,46
5	0,15	0,17	48	14,19	15,66	91	51,01	56,30	133	108,96	120,26
6	0,22	0,25	49	14,79	16,32	92	52,14	57,54	134	110,61	122,07
7	0,30	0,33	50	15,40	17,00	93	53,28	58,80	135	112,27	123,90
8	0,40	0,44	51	16,02	17,68	94	54,43	60,07	136	113,94	125,75
9	0,50	0,55	52	16,66	18,38	95	55,59	61,36	137	115,62	127,60
10	0,62	0,68	53	17,30	19,10	96	56,77	62,65	138	117,31	129,47
11	0,75	0,82	54	17,96	19,82	97	57,96	63,97	139	119,02	131,35
12	0,89	0,98	55	18,63	20,57	98	59,16	65,29	140	120,74	133,25
13	1,04	1,15	56	19,32	21,32	99	60,37	66,63	141	122,47	135,16
14	1,21	1,33	57	20,01	22,09	100	61,60	67,98	142	124,21	137,08
15	1,39	1,53	58	20,72	22,87	101	62,84	69,35	143	125,97	139,02
16	1,58	1,74	59	21,44	23,67	102	64,09	70,73	144	127,73	140,97
17	1,78	1,96	60	22,18	24,47	103	65,35	72,13	145	129,51	142,94
18	2,00	2,20	61	22,92	25,30	104	66,63	73,53	146	131,31	144,92
19	2,22	2,45	62	23,68	26,13	105	67,91	74,95	147	133,11	146,91
20	2,46	2,72	63	24,45	26,98	106	69,21	76,39	148	134,93	148,91
21	2,72	3,00	64	25,23	27,85	107	70,53	77,84	149	136,76	150,93
22	2,98	3,29	65	26,03	28,72	108	71,85	79,30	150	138,60	152,97
23	3,26	3,60	66	26,83	29,61	109	73,19	80,77	155	147,99	163,33
24	3,55	3,92	67	27,65	30,52	110	74,54	82,26	160	157,70	174,04
25	3,85	4,25	68	28,48	31,44	111	75,90	83,76	165	167,71	185,09
26	4,16	4,60	69	29,33	32,37	112	77,27	85,28	170	178,02	196,48
27	4,49	4,96	70	30,18	33,31	113	78,66	86,81	175	188,65	208,20
28	4,83	5,33	71	31,05	34,27	114	80,06	88,35	180	199,58	220,27
29	5,18	5,72	72	31,93	35,24	115	81,47	89,91	185	210,83	232,68
30	5,54	6,12	73	32,83	36,23	116	82,89	91,48	190	222,38	245,43
31	5,92	6,53	74	33,73	37,23	117	84,32	93,06	195	234,23	258,51
32	6,31	6,96	75	34,65	38,24	118	85,77	94,66	200	246,40	271,94
33	6,71	7,40	76	35,58	39,27	119	87,23	96,27	205	258,87	285,71
34	7,12	7,86	77	36,52	40,31	120	88,70	97,90	210	271,66	299,81
35	7,55	8,33	78	37,48	41,36	121	90,19	99,54	215	284,75	314,26
36	7,98	8,81	79	38,44	42,43	122	91,69	101,19	220	298,14	329,05
37	8,43	9,31	80	39,42	43,51	123	93,19	102,85	225	311,85	344,17
38	8,90	9,82	81	40,42	44,60	124	94,72	104,53	230	325,86	359,64
39	9,37	10,34	82	41,42	45,71	125	96,25	106,23	235	340,19	375,45
40	9,86	10,88	83	42,44	46,83	126	97,80	107,93	240	354,82	391,59
41	10,35	11,43	84	43,46	47,97	127	99,35	109,65	245	369,75	408,08
42	10,87	11,99	85	44,51	49,12	128	100,93	111,39	250	385,00	424,91
43	11,39	12,57	86	45,56	50,28	129	102,51	113,13	255	400,55	442,07
44	11,93	13,16	87	46,63	51,46	130	104,10	114,89	260	416,42	459,58

OTHER TABLES

COMPARISON TABLES					
To transform	in	multiply by	To transform	in	multiply by
PRESSURE					
tons/sq foot	kgf/cm²	1,0937	LENGTH		
pounds/sq.inch (psi)	kgf/cm²	0,0703	micro inches	pm	0,0254
pounds/sq.inch (psi)	fisiche atm.	0,068	inches	mm	25,4
newton/m² (N/m²)	kgf/cm²	1,0197.10-5	feet	m	0,3048
pascal (Pa)	kgf/cm²	1,0197.10-5	yard	m	0,9144
bar	Nm-²	10 5	miles	km	1,6093
bar	kgf/ccm²	1,0197	nautical miles	km	1,8522
STRENGTH UNIT VALUES					
newton/m² (N/m²)	kgf/mm²	1,0197,10 -7	SURFACE		
meganeuton/m² (MNm-²)	kgf/mm²	0,10197	square inches	mm²	645,16
etto bar	kgf/mm²	1,0197	square feet	m²	0,0929
etto bar	MNm-²	10	square yards	m²	0,8361
longtons/sq inch (tn/sq in)	kgf/mm²	1,5749	VOLUME		
pounds/sq inch (psi)	kgf/mm²	0,000703	cubic inches	cm³	16,387
kilo lb/sq inch (1000psi)	kgf/mm²	0,7032	cubic feet	m³	0,0283
kgf/mm	N/mm²	9,8066	pints	dm³	0,568
ENERGY					
foot-pounds (ft lb)	Joule (J)	1,356	cubic yards	m³	0,7646
foot-pounds (ft lb)	kgfm	0,1383	gallon imperial	litri	4,546
joule (J)	kgfm	0,10197	gallon U.S.	lt	3,785
decajoule (da J)	Joule (J)	1055	bushels	lt	36,328
Btu	kgfm	107,56	quarters	litri	290,6
Btu	kcal	0,252	WEIGHT		
watt-hour (wt)	Joule (J)	3600	grains	mg	64,8
IMPACT STRENGTH					
decajoule al cm² (da J cm-²)	kgfm/cm²	1,0197	ounces	gr	28,349
			pounds	kg	0,4536
			centiweights	kg	50,802
			longtons	kg	1016,047
			shorttons (U.S.)	kg	907,185
FORCE					
newton			kgf		0,102
pounds			kgf		4,448

CONVERSION TABLE IMPACT TEST VALUES									
KCU CHARPY		K2 MESNAGER		K2,5 VSM		K3 DVM		KV ASTM	
kgfm/cm	Joule	kgfm/cm	Joule	kgfm/cm	Joule	kgfm/cm	Joule	kgfm/cm	Joule
13,0	64	19,4	152	17,2	129	17,0	117	71,9	97
13,5	66	20,2	158	18,2	134	17,6	121	73,4	100
14,0	69	21,2	166	19,1	140	18,4	126	78,2	106
14,5	71	22,2	174	19,9	146	19,1	131	81,3	110
15,0	74	23,1	181	20,7	152	19,9	137	84,5	115
15,5	76	24,0	188	21,5	158	20,6	141	87,6	119
16,0	78	25,0	196	22,3	164	21,4	147	90,8	123
16,5	81	26,0	204	23,1	170	22,1	152	93,9	127
17,0	83	27,0	211	23,9	176	22,8	157	97,1	132
17,5	86	28,0	220	24,6	181	23,5	161	100,2	136
18,0	88	29,0	228	25,4	187	24,2	166	103,4	140
18,5	91	30,0	235	26,1	192	24,8	170	106,5	144
19,0	93	31,0	243	26,9	198	25,5	175	109,7	149
19,5	96	32,0	251	27,6	203	26,1	179	112,8	153
20,0	98	32,9	258	28,3	208	26,7	183	116,0	157
20,5	101	33,8	265	29,0	213	27,3	187	119,1	161
21,0	103	34,8	273	29,7	218	27,9	191	122,3	166
21,5	106	35,6	279	30,4	224	28,5	196	125,4	170
22,0	108	36,5	286	31,1	229	29,1	200	128,6	174
22,5	110	37,3	293	31,7	233	29,6	203	131,7	179
23,0	113	38,1	299	32,4	238	30,2	207	134,9	183
23,5	115	38,8	304	33,1	243	30,8	211	138,0	187
24,0	118	39,8	311	33,8	249	31,3	215	141,2	191
24,5	120	40,3	316	34,4	253	31,8	218	-	-
25,0	123	41,0	321	35,1	258	32,3	222	-	-

OTHER TABLES

HARDNESS CONVERSION TABLE HB - HV - HRC - HRB - Rm									
HB*	HV	HRC	HRB	Rm	HB*	HV	HRC	HRB	Rm
124	-	-	71,00	420	232	244,8	21,10	100	765
126	-	-	72,00	430	236	249,0	21,90	-	770
128	-	-	73,00	-	240	253,2	22,60	101	780
130	-	-	-	440	244	257,4	23,40	102	800
132	-	-	74,00	450	248	261,6	24,00	-	810
134	-	-	75,00	-	252	265,9	24,70	103	820
136	-	-	76,00	460	256	270,1	25,40	-	830
138	-	-	-	-	260	274,3	26,10	104	850
140	-	-	77,00	470	264	278,5	26,80	-	860
142	-	-	78,00	480	268	282,7	27,40	105	880
144	-	-	-	-	272	287,0	27,90	-	890
146	-	-	79,00	490	276	291,2	28,60	106	900
148	-	-	80,00	500	280	295,4	29,10	-	910
150	-	-	81,00	-	284	299,6	29,60	107	930
152	-	-	-	510	288	303,8	30,20	-	940
154	-	-	82,00	520	292	308,1	30,70	-	950
156	-	-	-	-	296	312,3	31,30	108	970
158	-	-	83,00	530	300	316,5	31,80	-	980
160	-	-	-	540	304	320,7	32,30	-	990
162	-	-	84,00	-	308	324,9	32,80	109	1010
164	-	-	-	550	312	329,2	33,30	-	1020
166	-	-	85,00	560	316	333,4	33,80	-	1030
168	-	-	-	-	320	337,6	34,30	110	1050
170	-	-	86,00	570	324	341,8	34,70	-	1060
172	-	-	-	-	328	346,0	35,10	-	1070
174	-	-	87,00	580	332	350,3	35,60	-	1090
176	185,7	-	-	590	336	354,5	36,10	-	1100
178	187,8	-	88,00	-	340	358,7	36,50	-	1120
180	189,9	-	-	600	344	362,9	36,90	-	1130
182	192,0	-	89,00	610	348	367,1	37,30	-	1140
184	194,1	-	-	-	352	371,4	37,70	-	1160
186	196,2	-	90,00	620	356	375,6	38,10	-	1170
188	198,3	-	-	630	360	379,8	38,50	-	1190
190	200,5	-	91,00	-	364	384,0	38,90	-	1200
192	202,6	-	-	640	368	388,2	39,20	-	1210
194	204,7	-	92,00	650	372	392,5	39,60	-	1230
196	206,8	-	-	-	376	396,7	39,90	-	1240
198	208,9	-	93,00	660	380	400,9	40,40	-	1260
200	211,0	-	-	-	384	405,1	40,70	-	1270
202	213,1	-	94,00	670	388	409,3	41,10	-	1280
204	215,2	-	-	680	392	413,6	41,40	-	1290
206	217,3	15,00	-	-	396	417,8	41,80	-	1310
208	219,4	15,40	95,00	690	400	422,0	42,10	-	1320
210	221,6	15,90	-	700	404	426,2	42,50	-	1330
212	223,7	16,40	96,00	-	408	430,4	42,80	-	1350
214	225,8	16,90	-	710	412	434,7	43,20	-	1370
216	227,9	17,60	-	720	416	438,9	43,60	-	1380
218	230,0	18,10	97,00	-	420	443,1	43,90	-	1390
220	232,1	18,50	-	730	424	447,3	44,20	-	1410
222	234,2	19,00	98,00	-	428	451,5	44,50	-	1430
224	236,3	19,40	-	740	432	455,8	44,90	-	1440
226	238,4	19,80	-	750	436	460,0	45,20	-	1460
228	240,5	20,30	99,00	-	440	464,2	45,50	-	1470
230	242,7	20,70	-	760	444	468,4	45,80	-	1490

OTHER TABLES

INCH to MILLIMETER FRACTION COMPARISON													
		1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	
		mm.											
1/64		25,40	50,80	76,20	101,60	127,00	152,40	177,80	203,20	228,60	254,00	279,40	
	0,40	25,80	51,20	76,60	102,00	127,40	152,80	178,20	203,60	229,00	254,40	279,80	
	1/32	0,79	26,19	51,59	76,99	102,39	127,79	153,19	178,59	203,99	229,39	254,79	
	3/64	1,19	26,59	51,99	77,39	102,79	128,19	153,59	178,99	204,39	229,79	255,19	
	1/16	1,59	26,99	52,39	77,79	103,19	128,59	153,99	179,39	204,79	230,19	255,59	
	5/64	1,98	27,38	52,78	78,18	103,58	128,98	154,38	179,78	205,18	230,58	255,98	
	3/32	2,38	27,78	53,18	78,58	103,98	129,38	154,78	180,18	205,58	230,98	256,38	
7/64	2,78	28,18	53,58	78,98	104,38	129,78	155,18	180,58	205,98	231,38	256,78	282,18	
1/8	3,18	28,58	53,98	79,38	104,78	130,18	155,58	180,98	206,38	231,78	257,18	282,58	
	9/64	3,57	28,97	54,37	79,77	105,17	130,57	155,97	181,37	206,77	232,17	282,97	
	5/32	3,97	29,37	54,77	80,17	105,57	130,97	156,37	181,77	207,17	232,57	283,37	
	11/64	4,37	29,77	55,17	80,57	105,97	131,37	156,77	182,17	207,57	232,97	283,77	
	3/16	4,76	30,16	55,56	80,96	106,36	131,76	157,16	182,56	207,96	233,36	284,16	
	13/64	5,16	30,56	55,96	81,36	106,76	132,16	157,56	182,96	208,36	233,76	284,56	
	7/32	5,56	30,96	56,36	81,76	107,16	132,56	157,96	183,36	208,76	234,16	284,96	
	15/64	5,95	31,35	56,75	82,15	107,55	132,95	158,35	183,75	209,15	234,55	285,35	
	1/4	6,35	31,75	57,15	82,55	107,95	133,35	158,75	184,15	209,55	234,95	260,35	285,75
		17/64	6,75	32,15	57,55	82,95	108,35	133,75	159,15	184,55	209,95	235,35	286,15
9/32		7,14	32,54	57,94	83,34	108,74	134,14	159,54	184,94	210,34	235,74	286,54	
19/64		7,54	32,94	58,34	83,74	109,14	134,54	159,94	185,34	210,74	236,14	286,94	
5/16		7,94	33,34	58,74	84,14	109,54	134,94	160,34	185,74	211,14	236,54	287,34	
21/64		8,33	33,73	59,13	84,53	109,93	135,33	160,73	186,13	211,53	236,93	287,73	
11/32		8,73	34,13	59,53	84,93	110,33	135,73	161,13	186,53	211,93	237,33	288,13	
23/64		9,13	34,53	59,93	85,33	110,73	136,13	161,53	186,93	212,33	237,73	288,53	
3/8		9,53	34,93	60,33	85,73	111,13	136,53	161,93	187,33	212,73	238,13	263,53	288,93
		25/64	9,92	35,32	60,72	86,12	111,52	136,92	162,32	187,72	213,12	238,52	289,32
	13/32	10,32	35,72	61,12	86,52	111,92	137,32	162,72	188,12	213,52	238,92	289,72	
	27/64	10,72	36,12	61,52	86,92	112,32	137,72	163,12	188,52	213,92	239,32	290,12	
	7/16	11,11	36,51	61,91	87,31	112,71	138,11	163,51	188,91	214,31	239,71	290,51	
	13/64	5,16	30,56	55,96	81,36	106,76	132,16	157,56	182,96	208,36	233,76	259,16	
	15/32	11,91	37,31	62,71	88,11	113,51	138,91	164,31	189,71	215,11	240,51	291,31	
	31/64	12,30	37,70	63,10	88,50	113,90	139,30	164,70	190,10	215,50	240,90	291,70	
	1/2	12,70	38,10	63,50	88,90	114,30	139,70	165,10	190,50	215,90	241,30	266,70	292,10
		33/64	13,10	38,50	63,90	89,30	114,70	140,10	165,50	190,90	216,30	241,70	292,50
17/32		13,49	38,89	64,29	89,69	115,09	140,49	165,89	191,29	216,69	242,09	292,89	
36/64		14,29	39,69	65,09	90,49	115,89	141,29	166,69	192,09	217,49	242,89	293,69	
9/16		14,29	39,69	65,09	90,49	115,89	141,29	166,69	192,09	217,49	242,89	293,69	
37/64		14,68	40,08	65,48	90,88	116,28	141,68	167,08	192,48	217,88	243,28	294,08	
19/32		15,08	40,48	65,88	91,28	116,68	142,08	167,48	192,88	218,28	243,68	294,48	
39/64		15,48	40,88	66,28	91,68	117,08	142,48	167,88	193,28	218,68	244,08	294,88	
5/8		15,88	41,28	66,68	92,08	117,48	142,88	168,28	193,68	219,08	244,48	269,88	295,28
		41/64	16,27	41,67	67,07	92,47	117,87	143,27	168,67	194,07	219,47	244,87	295,67
	21/32	16,67	42,07	67,47	92,87	118,27	143,67	169,07	194,47	219,87	245,27	296,07	
	43/64	17,07	42,47	67,87	93,27	118,67	144,07	169,47	194,87	220,27	245,67	296,47	
	11/16	17,46	42,86	68,26	93,66	119,06	144,46	169,86	195,26	220,66	246,06	296,86	
	45/64	17,86	43,26	68,66	94,06	119,46	144,86	170,26	195,66	221,06	246,46	297,26	
	23/32	18,26	43,66	69,06	94,46	119,86	145,26	170,66	196,06	221,46	246,86	297,66	
	47/64	18,65	44,05	69,45	94,85	120,25	145,65	171,05	196,45	221,85	247,25	298,05	
3/4	19,05	44,45	69,85	95,25	120,65	146,05	171,45	196,85	222,25	247,65	273,05	298,45	
	49/64	19,45	44,85	70,25	95,65	121,05	146,45	171,85	197,25	222,65	248,05	298,85	
	25/32	19,84	45,24	70,64	96,04	121,44	146,84	172,24	197,64	223,04	248,44	299,24	
	51/64	20,24	45,64	71,04	96,44	121,84	147,24	172,64	198,04	223,44	248,84	299,64	
	13/16	20,64	46,04	71,44	96,84	122,24	147,64	173,04	198,44	223,84	249,24	300,04	
	53/64	21,03	46,43	71,83	97,23	122,63	148,03	173,43	198,83	224,23	249,63	300,43	
	27/32	21,43	46,83	72,23	97,63	123,03	148,43	173,83	199,23	224,63	250,03	300,83	
	55/64	21,83	47,23	72,63	98,03	123,43	148,83	174,23	199,63	225,03	250,43	301,23	
	7/8	22,23	47,63	73,03	98,43	123,83	149,23	174,63	200,03	225,43	250,83	276,23	301,63
		57/64	22,62	48,02	73,42	98,82	124,22	149,62	175,02	200,42	225,82	251,22	302,02
29/32		23,02	48,42	73,82	99,22	124,62	150,02	175,42	200,82	226,22	251,62	302,42	
59/64		23,42	48,82	74,22	99,62	125,02	150,42	175,82	201,22	226,62	252,02	302,82	
15/16		23,81	49,21	74,61	100,01	125,41	150,81	176,21	201,61	227,01	252,41	303,21	
61/64		24,21	49,61	75,01	100,41	125,81	151,21	176,61	202,01	227,41	252,81	303,61	
31/32		24,61	50,01	75,41	100,81	126,21	151,61	177,01	202,41	227,81	253,21	304,01	
63/64		25,00	50,40	75,80	101,20	126,60	152,00	177,40	202,80	228,20	253,60	304,40	

CERTIFICATIONS

Sensitive to the aspects of constant product quality, Bea has been working for decades according to the principles and prescriptions provided for by **international certification** regulations and was among the first in Europe, about 30 years ago, to obtain the ISO 9001 certification, to which over time other prestigious qualifications have been added such as the Norsok / TR2000.

BEA QUALIFICATIONS

ISO 9001 - Certified Quality System

PED 2014/68/EU - (pressure equipment bolting)

NORSOK M-650/ISO 17782 - Superduplex bolting (norwegian specifications)

IOGP S-563 - Superduplex bolting

PETROBRAS - CRC - Qualified Producer

ARAMCO - Qualified producer

EQUINOR TR2000 - Qualified producer (superduplex), accepted producer (A.625)

IN PROGRESS

API 20E (BSL3) – Bolting in carbon and alloy

API 20F (BSL3) – Bolting in corrosion resistant alloys

Bureau Veritas Certification



BEA S.r.l

Via dei Ronchi, n° 91 - 21058 SOLBIATE OLONA (VA) - Italy

Certified site:
Via dei Ronchi, n° 91 - 21058 SOLBIATE OLONA (VA) - Italy

Bureau Veritas Italia S.p.A. certifies that the Management System of the above organisation has been audited and found to be in accordance with the requirements of the management system standards detailed below

ISO 9001:2015

Scope of certification

Production of stud bolts, nuts, bolts, special fasteners, washers, special items to the customer's drawing in low alloy steel, stainless steel, titanium, duplex, super-duplex and nickel alloys applied to the energy, chemical and oil and gas industries.

IAF sector: 17

Original cycle start date: 13-April-2012

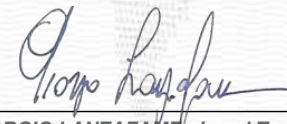
Expiry date of previous cycle: 11-April-2021

Certification / Recertification Audit date: 10-March-2021

Certification / Recertification cycle start date: 25-March-2021

Subject to the continued satisfactory operation of the organization's Management System, this certificate expires on: 11-April-2024

Certificate No.: **IT305202** Version: **1** Issue Date: **25-March-2021**



GIORGIO LANZAFAME - Local Technical Manager



SGQ N° 009A
Membro degli Accordi di Mutuo Riconoscimento EA, IAF e ILAC
Signatory of EA, IAF and ILAC mutual Recognition Agreements

Certification body address:
Bureau Veritas Italia S.p.A., Viale Monza, 347 - 20126 Milano, Italia

Further clarifications regarding the scope of this certificate and the applicability of the management system requirements may be obtained by consulting the organisation.
To check this certificate validity please refer to the website www.bureauveritas.it





Bea s.r.l.

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Quality System to:

ISO 9001: 2008 Bureau Veritas Certificate IT243284

PED Assessment Certification Bureau Veritas IT243284/PED 4.3

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