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# **STUDBOLTS**

## **TIRANTI PER FLANGE**

**TECHNICAL SHEETS AND WEIGHT**  
**DATI TECNICI E PESI TEORICI**

**Member of CISQ Federation**



**CERTIFIED MANAGEMENT SYSTEM**

**ISO 9001**

# STUDBOLTS

## A. TYPE

Completely Threaded Stud-Bolts	with 2 nuts
Completely Threaded Bars	without nuts
Stud-Bolts	with 1 nut

## B. DIMENSIONS

- Stud Bolts ASME B16.5, API Spec. 6A, B.S. 4882 and UNI6610
- Nuts ASME B18.2.2 and UNI 5587 - 5588 - 5591

Thread is in accordance with:

### ANSI/ASME B1.1

- Stud-Bolts up to 1 " included UNC - 2A - over 1 " 8UN - 2A
- Nuts up to 1 " included UNC - 2B - over 1 " 8 UN - 2B

ANSI B1.13.M, UNI 5542 and UNI 5543

Meter Thread

## C. MATERIAL

ASTM A193	Gr.B5-B6-B7-B7M-B8-B8A-B8M-B8MA-B8T-B8TA-B16
ASTM A194	Gr.2H-2HM-3-4-6-7-7M-8-8A-8M-8MA-8T-8TA
ASTM A320	Gr.L7-L7M-L43-B8-B8A-B8M-B8MA-B8T-B8TA
ASTM B453	Gr.660 CL. A-B-C

# STUDBOLTS

## E. DOCUMENTS & CERTIFICATES

DIN 50049/3.1B - EN 10204/3.1B

## F. SURFACE AND PROTECTIVE TREATMENTS

Alloy stud-bolts	Oil treatment
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ARC zinc-coated	according to	ASTM B633
Hot dip Galvanizing	according to	ASTMA153-A120

## H. ORDER INSTRUCTIONS

In order to achieve a better service, customers are kindly requested to clearly indicate the following information in the order as per set below:

Parameter name	Value (examples)
Quantity	N°25
Type of product	FULLY THREADED STUD-BOLTS
Number of nuts	N°2 nuts
Dimension	1.1/2" x 450 mm
Threading normative and type	ANSI/ASME B1.1 – 8UN –2A/2B
Material type and grade	ASTM A193 - Gr. B7 – A194 –Gr.2H
Dimension normative	ASME B16.5 – ASMA B18.2.2
Normative for protective coating	ASTM A123 - Hot dip Galvanizing
Type of certification	DIN 50049 - EN 10204/3.1B
request for specific certification by external Bodies	

## I. USEFUL INFORMATION

### MAINTENANCE

- Keep supplied pieces in the IML original packing
- Do not store pieces in damp areas
- Do not store pieces in contact with water
- Handle all threaded parts with care

# STUDBOLTS

## RECOMMENDED FLANGE BOLT TORQUE

40,000 PSI Stress		52,000 PSI Stress		Bolt Size	28 Kg/mm2		37 Kg/mm2	
Bolt Tension	Make-Up Torque	Bolt Tension	Make-Up Torque		Bolt Tension	Make-Up Torque	Bolt Tension	Make-Up Torque
lbf	ft-lbs	lbf	ft-lbs		Kg/m	N-m	Kg/m	N-m
5,674	45	7,448	59		1/2"-13UNC	8,451	61	11,093
9,026	86	11,846	113	5/8"-11UNC	13,444	116	17,644	153
13,355	150	17,528	196	3/4"-10UNC	19,892	203	26,107	265
18,482	239	24,257	313	7/8"-9UNC	27,528	324	36,130	424
24,229	361	31,800	474	1"-8UN	36,089	489	47,366	642
31,617	522	41,497	686	1.1/8"-8 UN	47,093	707	61,809	930
39,987	726	52,483	953	1.1/4"-8 UN	59,560	984	78,173	1,292
49,339	976	64,757	1,281	1.3/8"-8 UN	73,490	1,323	96,455	1,736
59,672	1,277	78,320	1,676	1.1/2"-8 UN	88,881	1,731	116,657	2,272
70,988	1,635	93,171	2,146	1.5/8"-8 UN	105,736	2,216	138,778	2,909
83,284	2,054	109,311	2,695	1.3/4"-8 UN	124,051	2,784	162,818	3,653
96,563	2,538	126,739	3,331	1.7/8"-8 UN	143,830	3,441	188,777	4,516
110,824	3,093	145,456	4,060	2"-8 UN	165,072	4,193	216,656	5,504
142,290	4,435	186,755	5,821	2.1/4"-8 UN	211,940	6,012	278,171	7,892
177,683	6,116	233,209	8,028	2.1/2"-8 UN	264,658	8,292	347,364	10,884
196,852	7,097	258,368	9,314	2.5/8"-8 UN	293,211	9,622	384,839	12,627
217,003	8,176	284,817	10,731	2.3/4" - 8 UN	323,225	11,085	424,234	14,549
260,280	10,653	641,578	13,982	3"-8 UN	387,642	14,443	508,780	18,956
307,424	13,585	403,495	17,830	3.1/4"-8 UN	457,908	18,418	601,005	24,173
413,554	20,967	542,790	27,519	3.3/4"-8 UN	615,988	28,427	808,485	37,310
442,541	23,157	580,834	30,393	3.7/8"-8 UN	659,164	31,396	865,152	41,206
472,509	25,494	620,168	33,461	4"-8 UN	703,802	34,564	923,740	45,366
602,200	36,412	790,388	47,790	4.1/2"-8 UN	896,976	49,367	1,177,282	64,793
672,936	42,879	883,229	56,289	4.3/4"-8 UN	1,002,338	58,135	1,315,569	76,316

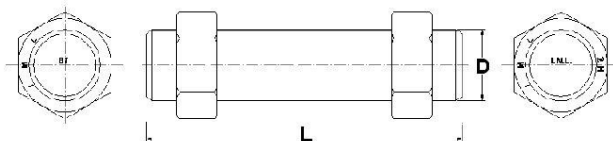
Note:

- Approximate figures have been drawn from the standard API Spec. 6A.
- 1 ft-lb = 1.3558 N-m
- 1 lb/ft = 1.4895 Kg/m
- 1 psi = 0.0703 Kg/cm2

# STUDBOLTS

## STUD - BOLTS THREADED FULL LENGTH WITH TWO HEXAGONAL HEAVY NUTS

LENGHT-L		WEIGHTS 1,000 PCS							
INCH	MM	D	1/2"	5/8"	3/4"	7/8"	1"	1.1/8"	1.1/4"
2.3/8"	60	KG	111	186					
		LBS	245	410					
2.1/2"	65	KG	115	192					
		LBS	254	423					
2.3/4"	70	KG	119	198					
		LBS	262	437					
3"	75	KG	123	205	317				
		LBS	271	452	699				
3.1/8"	80	KG	127	211	327				
		LBS	280	465	721				
3.1/4"	85	KG	131	217	336				
		LBS	289	478	741				
3.1/2"	90	KG	135	224	345	504			
		LBS	298	494	761	1,111			
3.3/4"	95	KG	139	230	354	516			
		LBS	306	507	780	1,138			
4"	100	KG	143	236	364	529			
		LBS	315	520	802	1,166			
4.1/8"	105	KG	147	243	343	542			
		LBS	324	536	822	1,195			
4.1/4"	110	KG	151	249	382	554			
		LBS	333	549	842	1,221			
4.1/2"	115	KG	155	255	391	567	794		
		LBS	342	562	862	1,250	1,750		
4.3/4"	120	KG	159	261	400	580	811		
		LBS	351	575	882	1,279	1,788		
5"	125	KG		268	410	593	828		
		LBS		591	904	1,307	1,825		
5.1/8"	130	KG		274	419	605	844	1,129	
		LBS		604	924	1,334	1,861	2,489	
5.1/4"	135	KG		280	428	618	861	1,151	
		LBS		617	944	1,362	1,898	2,537	
5.1/2"	140	KG		287	437	631	877	1,172	1,463
		LBS		633	963	1,391	1,933	1,584	3,225
5.3/4"	145	KG		293	447	643	894	1,194	1,490
		LBS		646	985	1,418	1,971	2,632	3,285
6"	150	KG		299	456	656	911	1,215	1,517
		LBS		659	1,005	1,446	2,008	2,679	3,344
FOR EACH 10MM		KG	8	13	18	25	33	43	54
FOR EACH 10MM		LBS	18	29	40	55	73	95	119



**STUDS MATERIAL:** ALLOY STEEL ASTM A193 GRADE B7

**NUTS MATERIAL:** - CARBON STEEL ASTM A194 GRADE 2H.

**THREAD:** ASME B 1.1 – UNC UP TO 1" -8UN 1.1/8" AND OVER.

**LENGHT:** INCHES/MM

**WEIGHT:** LBS/1000 PIECES.

**DIMENSIONS:** ASME B16.5

These stud-bolts are manufactured also in steel ASTM A320 GR. L7, ASTM A193GR. B16 and stainless steel ASTM A193 GR. B8 (AISI 304), GR. 8T (AISI 321), GR. 8M (AISI 316) and any other type of alloy or stainless steel.



# STUDBOLTS

## STUD - BOLTS THREADED FULL LENGTH WITH TWO HEXAGONAL HEAVY NUTS

LENGHT-L		WEIGHTS 1000 PCS													
INCH	MM	D	5/8"	3/4"	7/8"	1"	1.1/8"	1.1/4"	1.3/8"	1.1/2"	1.5/8"	1.3/4"	1.7/8"	2"	
6.1/4"	160	KG	312	474	681	944	1,258	1,571	2,003						
		LBS	689	1,045	1,501	2,081	2,773	3,453	4,416						
6.3/4"	170	KG	324	493	707	977	1,301	1,625	2,069						
		LBS	714	1,087	1,559	2,154	2,868	3,582	4,561						
7"	180	KG	337	511	732	1,011	1,344	1,679	2,136	2,588					
		LBS	743	1,127	1,614	2,229	2,963	3,702	4,709	5,701					
7.1/2"	190	KG		530	758	1,044	1,387	1,733	2,202	2,666					
		LBS		1,168	1,671	2,302	3,058	3,821	4,855	5,877					
7.7/8"	200	KG		548	783	1,077	1,430	1,768	2,268	2,745					
		LBS		1,208	1,726	2,374	3,153	3,937	5,000	6,052					
8.1/8"	210	KG		566	808	1,111	1,473	1,840	2,334	2,825	3,472				
		LBS		1,248	1,781	2,449	3,247	4,056	5,146	6,228	7,654				
8.3/4"	220	KG			834	1,144	1,516	1,894	2,400	2,904	3,566				
		LBS			1,839	2,522	3,342	4,175	5,291	6,402	7,862				
9"	230	KG			859	1,177	1,599	1,948	2,466	2,984	3,660				
		LBS			1,894	2,595	3,525	4,295	5,437	6,578	8,069				
9.1/2"	240	KG			884	1,210	1,602	2,002	2,532	3,063	3,754	4,496			
		LBS			1,949	2,668	3,532	4,414	5,582	6,753	8,276	9,912			
9.3/4"	250	KG			910	1,244	1,645	2,056	2,588	3,143	3,848	4,606			
		LBS			2,006	2,743	3,627	4,533	5,728	6,929	8,483	10,154			
10.1/4"	260	KG			935	1,277	1,688	2,110	2,664	3,222	3,942	4,716	5,535		
		LBS			2,061	2,815	3,721	4,652	5,873	7,103	8,690	10,397	12,202		
10.5/8"	270	KG				1,310	1,731	2,164	2,730	3,302	4,036	4,826	5,662	6,615	
		LBS				2,888	3,816	4,771	6,019	7,280	8,898	10,639	12,482	14,583	
11"	280	KG				1,344	1,774	2,218	2,796	3,381	4,130	4,936	5,789	6,760	
		LBS				2,963	3,911	4,890	6,164	7,454	9,105	10,882	12,762	14,903	
11.1/2"	290	KG				1,377	1,817	2,272	2,962	3,461	4,224	5,046	5,916	6,906	
		LBS				3,036	4,006	5,009	6,530	7,630	9,312	11,124	13,042	15,225	
11.3/4"	300	KG				1,410	1,860	2,336	2,928	3,540	4,318	5,156	6,043	7,051	
		LBS				3,108	4,101	5,128	6,455	7,804	9,519	11,367	13,322	15,545	
12.3/4"	325	KG					1,968	2,461	3,094	3,739	4,553	5,431	6,361	7,415	
		LBS					4,339	5,425	6,821	8,243	10,037	11,973	14,023	16,347	
13.3/4"	350	KG					2,075	2,595	3,259	3,937	4,709	5,706	6,879	7,779	
		LBS					4,575	5,721	7,185	8,679	10,558	12,579	14,724	17,149	
14.3/4"	375	KG								4,136	5,024	5,980	6,997	8,143	
		LBS								9,118	11,076	13,183	15,425	17,952	
15.3/4"	400	KG								4,135	5,259	6,255	7,314	8,506	
		LBS								9,116	11,594	13,790	16,124	18,752	
16.3/4"	425	KG											7,632	8,870	
		LBS											16,825	19,555	
17.3/4"	450	KG											7,950	9,234	
		LBS											17,526	20,357	
18.3/4"	475	KG											8,268	9,597	
		LBS											18,228	21,157	
19.3/4"	500	KG											8,580	9,961	
		LBS											18,915	21,960	
FOR EACH 10 MM		KG	13	18	25	33	43	54	66	79	94	110	127	145	
FOR EACH 10 MM		LBS	28.66	39.68	55.11	72.75	94.8	119.05	145.5	174.16	207.23	242.5	279.98	319.66	

STUDS MATERIAL: ALLOY STEEL ASTM A193 GRADE B7

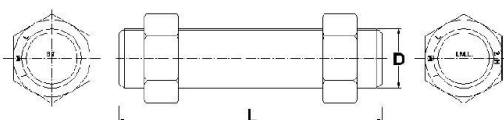
NUTS MATERIAL: - CARBON STEEL ASTM A194 GRADE 2H.

THREAD: ASME B 1.1 – UNC UP TO 1" -8UN 1.1/8" AND OVER.

LENGHT: INCHES/MM

WEIGHT: LBS/1000 PIECES.

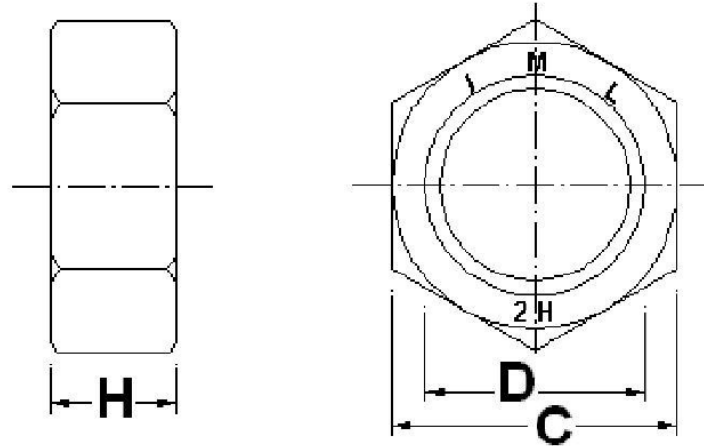
DIMENSIONS: ASME B16.5



These stud-bolts are manufactured also in steel ASTM A320 GR. L7, ASTM A193GR. B16 and stainless steel ASTM A193 GR. B8 (AISI 304),GR. 8T (AISI 321), GR. 8M (AISI 316) and any other type of alloy or stainless steel.

# STUDBOLTS

## HEAVY HEXAGONAL NUTS



D	C		H		PITCH	WEIGHTS 1000 PCS	
	MM	INCH	MM	INCH		KG	LBS
1/2"	22	0.87	12.5	0.49	13	30	66
5/8"	27	1.06	16	0.63	11	52	114
3/4"	32	1.26	19	0.75	10	85	187
7/8"	36	1.42	22	0.87	9	130	286
1"	41	1.61	25	0.98	8	194	427
1.1/8"	46	1.81	28	1.1	8	270	595
1.1/4"	50	1.97	32	1.26	8	335	738
1.3/8"	55	2.16	35	1.38	8	450	992
1.1/2"	60	2.36	38	1.5	8	550	1,212
1.5/8"	65	2.56	42	1.65	8	715	1,576
1.3/4"	70	2.76	45	1.77	8	890	1,962
1.7/8"	74	2.91	48	1.89	8	1,070	2,358
2"	79	3.11	50	1.97	8	1,285	2,832
2.1/4"	89	3.5	56	2.2	8	1,800	3,968
2.1/2"	98	3.86	62	2.44	8	2,425	5,346
2.3/4"	108	4.25	68	2.68	8	3,300	7,275
	117	4.61	75	2.95	8	4,140	9,126

**MATERIAL:** CARBON STEEL ASTM A194 GRADE 2H, ASTM A194 GR. 3-4-7 and in stainless steel GR. 8 (AISI 304), GR. 8T (AISI 321) and GR. 8M (AISI 316)

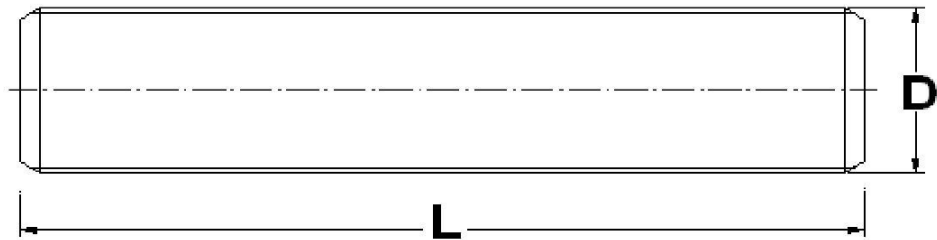
**THREAD:** ASME B 1.1 - UNC UP TO 1" - 8 UN 1.1/8" AND OVER.

**DIMENSIONS:** INCH.

**WEIGHT:** LBS/1000 PIECES

# STUDBOLTS

## SCREWED RODS FULL LENGTH



D	PITCH	WEIGHTS 1000 PCS	
		KG	LBS
1/2"	13	0.79	1.74
5/8"	11	1.26	2.78
3/4"	10	1.84	4.06
7/8"	9	2.54	5.6
1"	8	3.33	7.34
1.1/8"	8	4.3	9.48
1.1/4"	8	5.39	11.88
1.3/8"	8	6.61	14.57
1.1/2"	8	7.95	17.53
1.5/8"	8	9.41	20.74
1.3/4"	8	11	24.25
1.7/8"	8	12.72	28.04
2"	8	14.56	32.1

**MATERIAL:** ALLOY STEEL ASTM A193 GRADE B7

**THREAD:** ASME B 1.1 – UNC UP TO 1" – 8 UN 1.1/8" AND OVER.

**DIMENSIONS:** INCHES

**WEIGHT:** LBS/1 mt

On request we can supply these bars with length of 2-3 meters or commercial length.



# STUDBOLTS

## STUDBOLTS THREADED FULL LENGTH WITH TWO HEXAGONAL HEAVY NUTS

		Ø	M12	M14	M16	M18	M20	M22	M24	M27	M30	M33
WEIGHTS X 1000 PCS	60	KG	87	126	167	233						
		LBS	192	278	368	514						
	65	KG	90	131	173	231						
		LBS	188	289	381	509						
	70	KG	94	136	180	239						
		LBS	207	300	397	527						
	75	KG	97	141	186	247	323					
		LBS	214	311	410	545	712					
	80	KG	101	146	193	256	334					
		LBS	223	322	425	564	736					
	85	KG	105	150	200	264	344	421	544			
		LBS	232	331	441	582	758	928	1,199			
	90	KG	108	155	206	272	354	433	559			
		LBS	238	342	454	600	760	955	1,232			
	95	KG	112	160	213	280	364	446	574			
		LBS	247	353	470	617	803	983	1,285			
	100	KG	115	165	219	288	375	459	589			
		LBS	254	364	483	635	827	1,012	1,299			
	105	KG	119	170	226	296	385	472	603			
		LBS	262	375	498	653	849	1,041	1,329			
	110	KG	123	175	233	305	395	484	618			
		LBS	271	386	514	672	871	1,067	1,362			
	115	KG	126	180	239	313	406	497	633	868		
		LBS	278	397	527	690	895	1,096	1,396	1,914		
	120	KG	130	185	246	321	416	510	648	887		
		LBS	287	408	542	708	917	1,124	1,429	1,956		
	125	KG			252	329	426	522	683	906		
		LBS			556	725	939	1,151	1,462	1,997		
	130	KG			259	337	437	535	678	925	1,211	
		LBS			571	743	963	1,180	1,495	2,039	2,870	
135	KG			266	346	447	548	692	945	1,234		
	LBS			586	763	986	1,208	1,526	2,063	2,721		
140	KG			272	354	457	560	707	964	1,258	1,570	
	LBS			600	780	1,008	1,235	1,559	2,125	2,773	3,461	
145	KG			279	362	468	573	722	983	1,281	1,599	
	LBS			615	798	1,032	1,283	1,592	2,167	2,824	3,525	
150	KG			285	370	478	586	737	1,000	1,305	1,628	
	LBS			628	816	1,054	1,292	1,625	2,209	2,877	3,569	
FOR EACH 10 MM MORE		KG	7	10	13	16	21	25	30	38	47	58
FOR EACH 10 MM MORE		LBS	15	22	30	35	46	55	66	84	104	128



**STUDS MATERIAL:** ALLOY STEEL ASTM A193 GRADE B7

**NUTS MATERIAL:** - CARBON STEEL ASTM A194 GRADE 2H.

**THREAD:** UNI 5542 - 5543 - M36 -> M52M FINE PITCH.

**LENGTH:** MM

**WEIGHT:** LBS/1000 PIECES.

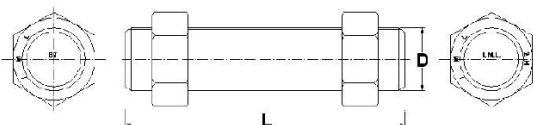
**DIMENSIONS:** UNI 6610

Studbolts are manufactured also in of alloy or stainless steel.

# STUDBOLTS

## STUDBOLTS THREADED FULL LENGTH WITH TWO HEXAGONAL HEAVY NUTS

D		M16	M18	M20	M22	M24	M27	M30	M33	M36	M39	M42	M45	M48	M52	
MM	160	KG	299	386	499	611	767	1,040	1,352	1,685	2,132					
		LBS	659	851	1,100	1,347	1,691	2,293	2,981	3,715	4,700					
MM	170	KG	312	403	519	637	796	1,079	1,399	1,743	2,203					
		LBS	688	889	1,144	1,404	1,755	2,379	3,084	3,843	4,857					
MM	180	KG		325	419	540	662	826	1,117	1,445	1,801	2,274	2,792			
		LBS		717	924	1,190	1,549	1,821	2,463	3,186	3,970	5,013	6,155			
MM	190	KG			560	687	856	1,155	1,482	1,858	2,345	2,876				
		LBS			1,235	1,515	1,887	2,546	3,289	4,096	5,101	6,340				
MM	200	KG			561	713	885	1,194	1,539	1,916	2,416	2,960				
		LBS			1,281	1,572	1,951	2,632	3,393	4,224	5,328	6,526				
MM	210	KG			602	738	915	1,232	1,586	1,974	2,487	3,044	3,680			
		LBS			1,327	1,627	2,017	2,716	3,496	4,352	5,483	6,711	8,113			
MM	220	KG				763	945	1,270	1,633	2,031	2,556	3,128	3,378			
		LBS				1,682	2,083	2,800	3,600	4,478	5,639	6,896	7,447			
MM	230	KG				789	974	1,309	1,680	2,089	2,629	3,212	3,876			
		LBS				1,739	2,147	2,886	3,704	4,805	5,796	7,081	8,545			
MM	240	KG				814	1,004	1,347	1,727	2,147	2,700	3,296	3,974	4,732		
		LBS				1,795	2,213	2,970	3,807	4,733	5,952	7,266	8,761	10,432		
MM	250	KG				840	1,034	1,385	1,774	2,204	2,771	3,380	4,072	4,846		
		LBS				1,852	2,279	3,053	3,911	4,859	6,109	7,451	9,977	10,683		
X	260	KG				865	1,063	1,424	1,821	2,262	2,841	3,463	4,170	4,959	5,825	6,954
		LBS				1,907	2,343	3,139	4,015	4,987	6,263	7,634	9,193	10,933	12,842	15,331
1	270	KG						1,462	1,868	2,320	2,912	3,547	4,268	5,072	5,955	7,107
		LBS						3,223	4,118	5,115	6,420	7,820	9,409	11,182	13,128	15,668
0	280	KG						1,501	1,915	2,377	2,983	3,631	4,367	5,186	6,085	7,260
		LBS						3,309	4,222	5,240	6,576	8,005	9,627	11,433	13,415	16,005
P	290	KG						1,539	1,982	2,435	3,054	3,715	4,485	5,289	6,214	7,413
		LBS						3,393	4,325	5,368	6,733	8,190	9,843	11,682	13,590	16,343
C	300	KG						1,577	2,009	2,493	3,125	3,799	4,563	5,412	6,344	7,585
		LBS						3,477	4,429	5,496	6,889	8,375	10,060	11,931	13,986	16,678
S	325	KG						2,126	2,637	3,302	4,009	4,808	5,696	6,889	7,947	
		LBS						4,687	5,813	7,280	8,838	10,600	12,557	14,702	17,520	
MM	350	KG						2,243	2,781	3,480	4,218	5,053	5,979	6,993	8,329	
		LBS						4,945	6,131	7,672	9,299	11,140	13,161	15,417	18,362	
MM	375	KG									4,428	5,298	6,263	7,318	8,711	
		LBS									9,762	11,680	13,807	16,133	19,204	
MM	400	KG									4,638	5,543	6,546	7,642	9,093	
		LBS									10,225	12,220	14,431	16,847	20,046	
MM	425	KG										6,830	7,966	9,475		
		LBS										15,057	17,562	20,883		
MM	450	KG										7,113	8,291	9,857		
		LBS											16,278	21,731		
MM	475	KG											8,615	10,239		
		LBS												18,993	22,573	
MM	500	KG												8,940	10,621	
		LBS													19,709	23,415
FOR EACH 10		KG	13	16	21	25	30	38	47	58	71	84	98	113	130	153
FOR EACH 10		LBS	29.68	35.27	46.3	55.11	66.14	83.77	103.6	127.9	156.5	185.2	217	249.1	286.6	337.3



STUDS MATERIAL: ALLOY STEEL ASTM A193 GRADE B7

NUTS MATERIAL: - CARBON STEEL ASTM A194 GRADE 2H.

THREAD: UNI 5542 - 5543 - M36 ->M52M FINE PITCH.

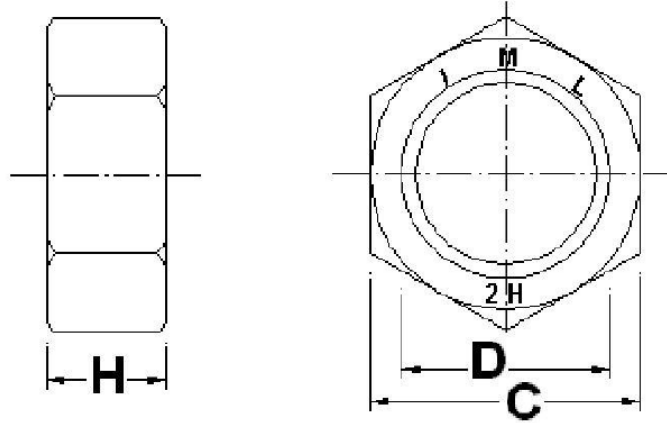
LENGTH: MM

WEIGHT: LBS/ 1000 PIECES.

DIMENSIONS: UNI 6610

# STUDBOLTS

## HEAVY HEXAGONAL NUTS H=D



D	C	H	PITCH	WEIGHTS	
	MM	MM		KG	LBS
M12	19	12	2	20	45
M14	22	14	2	32	69
M16	24	16	2	41	89
M18	27	18	3	58	128
M20	30	20	3	49	108
M22	32	22	3	95	209
M24	36	24	3	137	302
M27	41	27	3	200	441
M30	46	30	4	284	626
M33	50	33	4	361	796
M36	55	36	3	474	1,045
M39	60	39	3	612	1,349
M42	65	42	3	776	1,711
M45	70	45	3	966	2,130
M48	75	48	3	1,180	2,601
M52	80	52	3	1,430	3,153

**MATERIAL:** CARBON STEEL ASTM A194 GRADE 2H, ASTM A194 GR. 3-4-7 and in stainless steel GR. 8 (AISI 304),GR. 8T (AISI 321) and GR. 8M (AISI 316)

**THREAD:** UNI 5542 – 5543 (M12 + M33 GREAT PITCH, M36 + M52M FINE PITCH.)

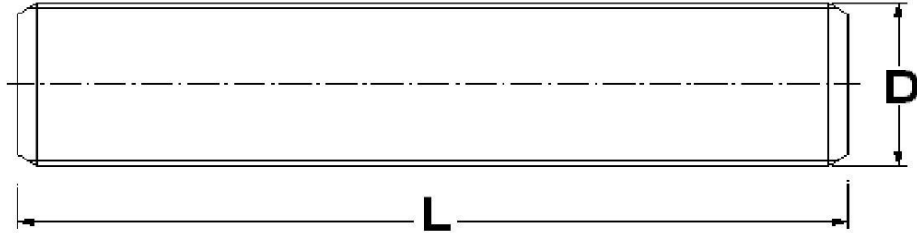
**DIMENSIONS:** MM

**WEIGHT:** KG OR LBS /1000 PIECES



# STUDBOLTS

## SCREWED RODS FULL LENGTH



D	PITCH	WEIGHTS 1000 PCS	
		KG	LBS
M12	1.75	0.72	1.59
M14	2	0.98	2.16
M16	2	1.32	2.91
M18	2.5	1.65	3.64
M20	2.5	2.07	4.56
M22	2.5	2.5	5.51
M24	3	2.98	6.57
M27	3	3.86	8.51
M30	3.5	4.72	10.41
M33	3.5	5.81	12.81
M36	3	7.15	15.76
M39	3	8.45	18.63
M42	3	4.87	10.74
M45	3	11.42	25.18
M48	3	13.07	28.81
M52	3	15.4	33.95

**MATERIAL:** ALLOY STEEL ASTM A193 GRADE B7

**THREAD:** UNI 5542 - 5543.

**DIMENSIONS:** MM

**WEIGHT:** KG/ mt - LBS/ mt

On request we can supply these bars with length of 2-3 meters or commercial length.

# STUDBOLTS

## RECOMMENDED MATERIALS DEPENDING ON SERVICE CONDITIONS



Service	SERVICE CONDITIONS		RECOMMENDED MATERIAL	
	F(°C)	Stress and impact values	Stud bolt	Nut
High pressure and high temperature	32 ~1148(0~ 620)	See next sheets	ASTMA193B5	ASTMA194Gr.3
	32 ~896(0 ~480)		A 193 B 6	A 194Gr. 6
	-58 ~842 (-50 ~450)		A 193 B 7	A194Gr.2H
	-58~ 1022 (-50 ~550)		A 193 B16	A 194 Gr. 4 or 7
	~1292 (~700)		A 453 660	A194Gr.8Tor8C
High corrosive and high temperature	1104~ 1472 (540 ~800)	ditto	A 193 B 8	A 194 Gr. 8
	1104~ 1472 (540 ~800)		A193B8M	A194Gr.8M
	1104 ~1472 (540 ~800)		A193B8T	A194Gr.8T
High pressure and low temperature	-148 ~-58 (-100 ~-50)	ditto	A320L7	A 194 Gr. 4 or 7
	-148 ~-58 (-100~-50)		A 320 L43	A 194Gr. 7
Low temperature	-418~-148(-250~-100)	ditto	A 320 B 8	A 194Gr. 8
	-328~-148(-200~-100)		A 320 B 8M	A194Gr.8M
	-328~-148(-200~-100)		A 320 B 8T	A194Gr.8T



# STUDBOLTS

## ALLOY AND STAINLESS STEEL BOLTING MATERIALS FOR HIGH TEMPERATURE SERVICE ASME SA-193

ASME SECTION II AND III CODE

GRADE		B6	B7	B16	B8 Class 1	B8 Class 2	B8T Class 1	B8M Class 1	B8M Class 2	
CHEMICAL ANALYSIS	CARBON	≤ 0.15	0.37-0.49	0.36-0.47	≤ 0.08	≤ 0.08	≤ 0.08	≤ 0.08	≤ 0.08	
	MANGANESE	≤ 1.00	0.65-1.10	0.45-0.70	≤ 2.00	≤ 2.00	≤ 2.00	≤ 2.00	≤ 2.00	
	PHOSPHORUS MAX.	0.04	0.03	0.03	0.04	0.04	0.04	0.04	0.04	
	SULFUR MAX.	0.03	0.04	0.04	0.03	0.03	0.03	0.03	0.03	
	SILICON	≤ 1.00	0.15-0.35	0.15-0.35	≤ 1.00	≤ 1.00	≤ 1.00	≤ 1.00	≤ 1.00	
	NICKEL				8-10.5	8-10.5	39060	41913	41913	
	CHROMIUM	11.5-13.5	0.75-1.20	0.80-1.15	18-20	18-20	17-19	16-18	16-18	
	MOLYBDENUM		0.15-0.25	0.50-0.65				2-3	2-3	
	COLOMBIUM +TANTALUM									
	TITANIUM						Min.5xC			
VANADIUM			0.25-0.35							
Mini tensile strength N/mm <sup>2</sup>	Min. tensile strength N/mm <sup>2</sup>	180 > D > 100	690	690						
		100 > D	760		515		515	515		
		100 > D > 65		790	760					
		65 ≥ D		860	860					
		40 ≥ D > 32					690			620
		31.6 ≥ D > 25.4					720			655
		25 ≥ D > 20					790			690
		20 ≥ D					860			760
	Min. yield strength N/mm <sup>2</sup>	180 > D > 100		515	585					
		100 ≥ D	585			205		205	205	
		100 > D > 65		655	655					
		65 ≥ D		720	720					
		40 ≥ D > 32					345			345
		31.6 ≥ D > 25.4					450			450
		25 ≥ D > 20					550			550
		20 ≥ D					690			665
	Elongation in 2 inches min. per cent	180 > D > 100		18	16					
		100 ≥ D	15			30		30	30	
		100 > D > 65		16	17					
		65 ≥ D		16	18					
		40 ≥ D > 32					28			30
		31.6 ≥ D > 25.4					20			25
		25 ≥ D > 20					15			20
		20 ≥ D					12			15
	Reduction of area min. per cent	180 > D > 100		50	45					
		100 ≥ D	50			50		50	50	
		100 > D > 65		50	45					
		65 ≥ D		50	50					
40 ≥ D > 32						45			45	
31.6 ≥ D > 25.4						35			45	
25 ≥ D > 20						35			45	
20 ≥ D						35			45	

# STUDBOLTS

## CARBON AND ALLOY STEELS FOR NUTS

### ASTM Designation A194

	GRADE	2H	2HM	3	4	6	6F	7	8		8M	8F	8C
CHEMICAL ANALYSIS	CARBON	>0.40	>0.40	>0.10	0.40-0.50	≤0.15	≤0.15	0.37-0.49	≤0.08	≤0.08	≤0.08	≤0.15	≤0.08
	MANGANESE	≤1.00	≤1.00	≤1.00	0.70-0.90	≤1.00	≤1.25	0.65-1.10	≤2.00	≤2.00	≤2.00	≤2.00	≤2.00
	PHOSPHORUS MAXI	0.04	0.04	0.04	0.035	0.04	0.06	0.04	0.045	0.045	0.045	0.2	0.045
	SULFUR	≤0.05	≤0.05	≤0.03	≤0.04	≤0.03	>0.15	≤0.04	≤0.03	≤0.03	≤0.03	0.15-0.35	≤0.03
	SILICON	<0.40	<0.40	<1.00	0.15-0.35	<1.00	<1.00	0.15-0.35	<1.00	<1.00	<1.00	<1.00	<1.00
	NICKEL								8-10.5	39060	41913	38998	41518
	CHROMIUM			38972		11.5-13.5	12-14.00	0.75-1.20	18-20	17-19	16-18	17-19	17-19
	MOLYBDENUM			0.40-0.65	0.20-0.30			0.15-0.25			2-3		
	TITANIUM MINI								5xC				
	SELENIUM						>0.15						
	TANTALUM												Min.10xC
MECHANICAL PROPERTIES	BRINELL HARDNESS	248	159	248	248	228	228	248	126	126	126	126	126
		352	237	352	352	271	271	352	300	300	300	300	300
EQUIVALENTS	AISI	-	-	501		410	416	4142	304	321	316	303	347
	AFNOR	CC45	CC45	Z12CD5	45 D2	Z10Cr13	Z12CF13	42 CD 4	Z6CN 18.09	Z6CNT 18.10	Z6CND 17.11	Z10CNF 18.09	
	DIN	C45	C45	12CrMo 19.5		X10Cr13		42CrMo4	X5CrNi 18.09	X10CrNiTi 18.09	X5CrNiMo 18.10	X12CrNiS 18.08	X10CrNiNb 18.09
	BS	1506-162	1506-162	1506-625	1506-240		1506-713	1506-621 GrA	1506-301 GrB	1506-821 GrTi	1506-845	1506-801 GrAM	1506-821 Nb

Note: the above equivalents are to be heat-threaded in line with mechanical characteristics shown.

# STUDBOLTS

## LOW TEMPERATURE SERVICE BOLTING ALLOY STEELS ASTM Designation A320

GRADE		L7	L43	B8 Class 1	B8 Class 2	B8T Class 1	B8M Class 1	B8M Class 2	B8C Class 1	
CHEMICAL ANALYSIS	CARBON	0.38-0.48	0.38-0.43	≤ 0.08	≤ 0.08	≤ 0.08	≤ 0.08	≤ 0.08	≤ 0.08	
	MANGANESE	0.75-1.00	0.60-0.85	≤ 2.00	≤ 2.00	≤ 2.00	≤ 2.00	≤ 2.00	≤ 2.00	
	PHOSPHORUS MAXI	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	
	SULFUR MAXI	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.03	
	SILICON	0.15-0.35	0.15-0.35	≤ 1.00	≤ 1.00	≤ 1.00	≤ 1.00	≤ 1.00	≤ 1.00	
	NICKEL		1.85-2.00	8-10.5	8-10.5	9-12	10-14	10-14	9-13	
	CHROMIUM	0.80-1.10	0.70-0.90	18-20	18-20	17-19	16-18	16-18	17-19	
	MOLYBDENUM	0.15-0.25	0.20-0.30				2-3	2-3		
	TITANIUM MINI					5 x C				
COLOMBIUM +TANTALUM									Min. 10 x C	
Min. Tensile Strength	Min. Tensile Strength N/mm <sup>2</sup>	All diameters		515	690	515	515		515	
		100 > D		860						
		65 > D	860							
		40 > D > 32				690		620		
		32 > D > 25				725		655		
		25 > D > 20				795		690		
	20 > D				860		760			
	Min. yield strength N/mm <sup>2</sup>	All diameters			205		205	205		205
		100 > D		725						
		65 > D	725							
		40 > D > 32				345		345		
		32 > D > 25				450		450		
		25 > D > 20				550		550		
	20 > D				690		655			
	Elongation in 2 inches min. %	All diameters			35		35	35		35
		100 > D		16						
		65 > D	16							
		40 > D > 32				28		30		
		32 > D > 25				20		25		
		25 > D > 20				15		20		
	20 > D				12		15			
	Reduction of area min. %	All diameters			50		50	50		50
		100 > D		50						
		65 > D	50							
40 > D > 32					45		45			
32 > D > 25					35		45			
25 > D > 20					30		45			
20 > D				35		45				
Resilience	Test temperature	-101°C	-101°C							
	KCV Joules	27	27	See note 2	See note 2	See note 1	See note 1	See note 1	See note 2	
Equivalents	AISI	4142	4340	304	304	321	316	316	347	
	AFNOR	42 CD 4	40 NCD 7.03	Z6 CN 18.09	Z6 CN 18.10	Z6 CNT 18.10	Z6 CND 17.11	Z6 CND 17.11		
	DIN	42 Cr Mo 4		X5 CrNi 18.09	X5 CrNi 18.09	X10 CrNiTi 18.09	X5 CrNiMo 18.10	X5 CrNiMo 18.10	X10 CrNiNb 18.09	
	BS	1506.62 Gr A		1506.80 GrB	1506.80 GrB	1506.82 Gr Ti	1506-845	1506-845	1506-821Nb	

Note 1 : Impact value not required for use at temperatures above -200°C.

Note 2 : above -255°C.

# STUDBOLTS

## STUDBOLTS DIMENSIONS FOR ASA-RF FLANGES

Nominal Diameter of Flange	125-150 LBS			250-300 LBS			600 BS			900 BS			1500 LBS			
	Quantity	Ø of rod	length	Quantity	Ø of rod	Length	Quantity	Ø of rod	length	Quantity	Ø of rod	Length	Quantity	Ø of rod	length	
	Pieces	Inches mm	Inches mm	Pieces	Inches mm	Inches mm	Pieces	Inches mm	Inches mm	Pieces	Inches mm	Inches mm	Pieces	Inches mm	Inches mm	
1/2"	4	1/2	2.1/2	4	1/2	2.3/4	4	1/2	14	3.1/4	4	3/4	4*1/2	4	3/4	4.1/2
		14	65		14	70		16	85	20		115	20		115	
3/4"	4	1/2	2.3/4	4	5/8	3.1/4	4	5/8	16	3.3/4	4	3/4	4.3/4	4	3/4	4.3/4
		14	70		16	85		16	95	20		120	20		120	
1"	4	1/2	2.3/4	4	5/8	3.1/4	4	5/8	16	3.3/4	4	7/8	5.1/4	4	7/8	5.1/4
		14	70		16	85		16	95	22		135	22		135	
1.1/4"	4	1/2	3	4	5/8	3.1/2	4	5/8	16	4	4	7/8	5.1/4	4	7/8	5.1/4
		14	75		16	90		16	100	22		135	22		135	
1.1/2"	4	1/2	3	4	3/4	3.3/4	4	3/4	20	4.1/2	4	1	6	4	1	6
		14	75		20	95		20	145	27		150	27		150	
2"	8	5/8	3.1/2	8	5/8	3.3/4	8	5/8	16	4.1/2	8	7/8	6	8	7/8	6
		16	90		16	95		16	115	22		150	22		150	
2.1/2"	8	5/8	3.3/4	8	3/4	4.1/4	8	3/4	20	5	8	1	6.3/4	8	1	6.3/4
		16	95		20	110		20	125	27		170	27		170	
3"	8	5/8	3.3/4	8	3/4	4.1/2	8	3/4	20	5.1/4	8	7/8	6	8	1.1/8	7.1/2
		16	95		20	115		20	135	22		150	22		150	
3.1/2"	8	5/8	3.3/4	8	3/4	4.1/2	8	7/8	20	5.3/4	8			8		
		16	95		20	115		22	145							
4"	8	5/8	3.3/4	8	3/4	4.3/4	8	7/8	20	6	8	1.1/8	7.1/4	8	1.1/4	8.1/4
		16	95		20	120		22	150	30		185	30		185	
5"	8	3/4	4	8	3/4	5	8	1	20	7	8	1.1/4	8	8	1.1/2	10.1/4
		20	100		20	125		27	180	33		205	33		205	
6"	12	3/4	4.1/4	12	3/4	5	12	1	27	7.1/4	12	1.1/8	8	12	1.3/8	10.3/4
		20	110		20	125		27	185	30		205	30		205	
8"	12	3/4	4.1/2	12	7/8	5.3/4	12	1.1/8	30	8	12	1.3/8	9.1/4	12	1.5/8	12
		20	115		22	145		30	205	36		235	36		235	
10"	16	7/8	5	16	1	6.3/4	16	1.1/4	33	9	16	1.3/8	9.3/4	16	1.7/8	14
		22	125		27	170		33	230	36		250	36		250	
12"	12	7/8	5	12	1.1/8	7.1/4	12	1.1/4	30	9.1/4	12	1.3/8	10.1/2	12	2	15.1/2
		22	125		30	185		33	235	36		265	36		265	
14"	20	1	5.3/4	20	1.1/8	7.1/2	20	1.3/8	36	9.3/4	20	1.1/2	11.1/4	20	2.1/4	16.3/4
		27	145		30	190		36	250	39		285	39		285	
16"	16	1	5.3/4	16	1.1/4	8	16	1.1/2	39	10.1/2	16	1.5/8	11.3/4	16	2.1/2	18.1/2
		27	145		33	205		39	265	42		300	42		300	
18"	20	1.1/8	6.1/4	20	1.1/4	8.1/4	20	1.5/8	42	11.1/4	20	1.7/8	13.1/2	20	2.3/4	20.1/4
		30	160		33	210		42	285	48		345	48		345	
20"	24	1.1/8	6.3/4	24	1.1/4	8.3/4	24	1.5/8	42	12	24	2	14.1/2	24	3	22.1/4
		30	170		33	220		42	305	52		370	52		370	
22"	20	1.1/4	7.1/4	20	1.1/2	9.1/2	20	1.3/4	39	12.3/4	20			20		
		33	185		39	240		45	325							
24"	36	1.1/4	7.1/2	36	1.1/2	9.3/4	36	1.7/8	48	13.1/2	36	2.1/2	18	36	3.1/2	25.1/4
		33	190		39	250		48	345	64		455	64		455	
26"	28	1.1/4	7.3/4	28	1.5/8	10.3/4	28	1.7/8	48	14	28			28		
		33	195		42	275		48	355							
30"	32	1.1/4	8	32	1.3/4	12	32	2	52	15	32			32		
		33	205		45	305		52	380							
34"	32	1.1/2	8.3/4	32	1.7/8	13	32	2.1/4	56	16	32			32		
		39	220		48	330		56	405							
36"	36	1.1/2	9	36	2	13.3/4	36	2.1/2	64	16.3/4	36			36		
		39	230		52	350		64	425							
42"	36	1.1/2	9.1/2	36	2	14.3/4	36	2.3/4	68	18.1/2	36			36		
		39	240		52	375		68	470							

NB. The above lengths are total lengths, including bevels



# STUDBOLTS

## CONVERSION TABLE INCHES/MM FOR STUDBOLTS

inch	mm	inch	mm	inch	mm	inch	mm
2	50	9.1/4	235	16.1/4	415	23.1/2	595
2.1/4	55	9.1/2	240	16.1/2	420	23.5/8	600
2.3/8	60	9.5/8	245	16.3/4	415	23.3/4	605
2.1/2	65	9.3/4	250	17	430	24	610
2.3/4	70	10	255	17.1/8	435	24.1/4	615
3	75	10.1/4	260	17.1/4	440	24.1/2	620
3.1/8	80	10.1/2	265	17.1/2	445	24.5/8	625
3.1/4	85	10.5/8	270	17.3/4	450	24.3/4	630
3.1/2	90	10.3/4	275	17.7/8	455	25	635
3.3/4	95	11	280	18	455	25.1/4	640
4	100	11.1/4	285	18.1/8	460	25.3/8	645
4.1/8	105	11.1/2	290	18.1/4	465	25.1/2	650
4.1/4	110	11.5/8	295	18.1/2	470	25.3/4	655
4.1/2	115	11.3/4	300	18.3/4	475	26	660
4.3/4	120	12	305	18.7/8	480	26.1/4	665
5	125	12.1/4	310	19	485	26.3/8	670
5.1/8	130	12.3/8	315	19.1/4	490	26.1/2	675
5.1/4	135	12.1/2	320	19.1/2	495	26.3/4	680
5.1/2	140	12.3/4	325	19.3/4	500		
5.3/4	145	12.7/8	325	19.7/8	505		
6	150	13	330	20	510		
6.1/8	155	13.1/4	335	20.1/4	515		
6.1/4	160	13.5/8	340	20.1/2	520		
6.1/2	165	13.1/2	345	20.3/4	525		
6.3/4	170	13.3/4	350	20.7/8	530		
6.7/8	175	14	355	21	535		
7	180	14.1/4	360	21.1/4	540		
7.1/4	185	14.3/8	365	21.1/2	545		
7.1/2	190	14.1/2	370	21.3/4	550		
7.3/4	195	14.3/4	375	21.7/8	555		
7.7/8	200	15	380	22	560		
8	205	15.1/4	385	22.1/4	565		
8.1/4	210	15.3/8	390	22.1/2	570		
8.1/2	215	15.1/2	395	22.5/8	575		
8.3/4	220	15.3/4	400	22.3/4	580		
8.7/8	225	16	405	23	585		
9	230	16.1/8	410	23.1/4	590		