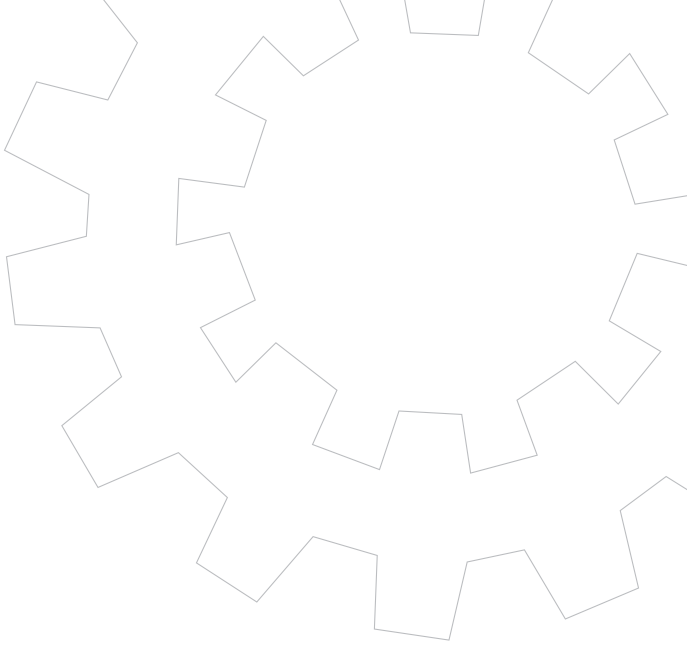
www.nbmetal.co.kr

NOBEL

Bolt, Nut & Washer




NOBEL
Precision Metal Co.,Ltd



NOBEL
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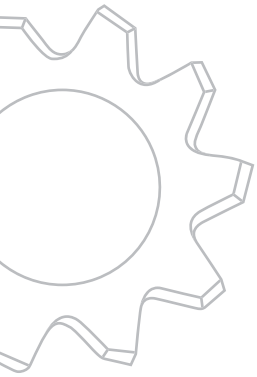

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Company View

External View of main building
본관동 외부 전경

External View of Factory
공장동 외부 전경

Clean Room Factory 1

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The 2nd Factory
부산 제2공장

The 2nd Factory
부산 제2공장

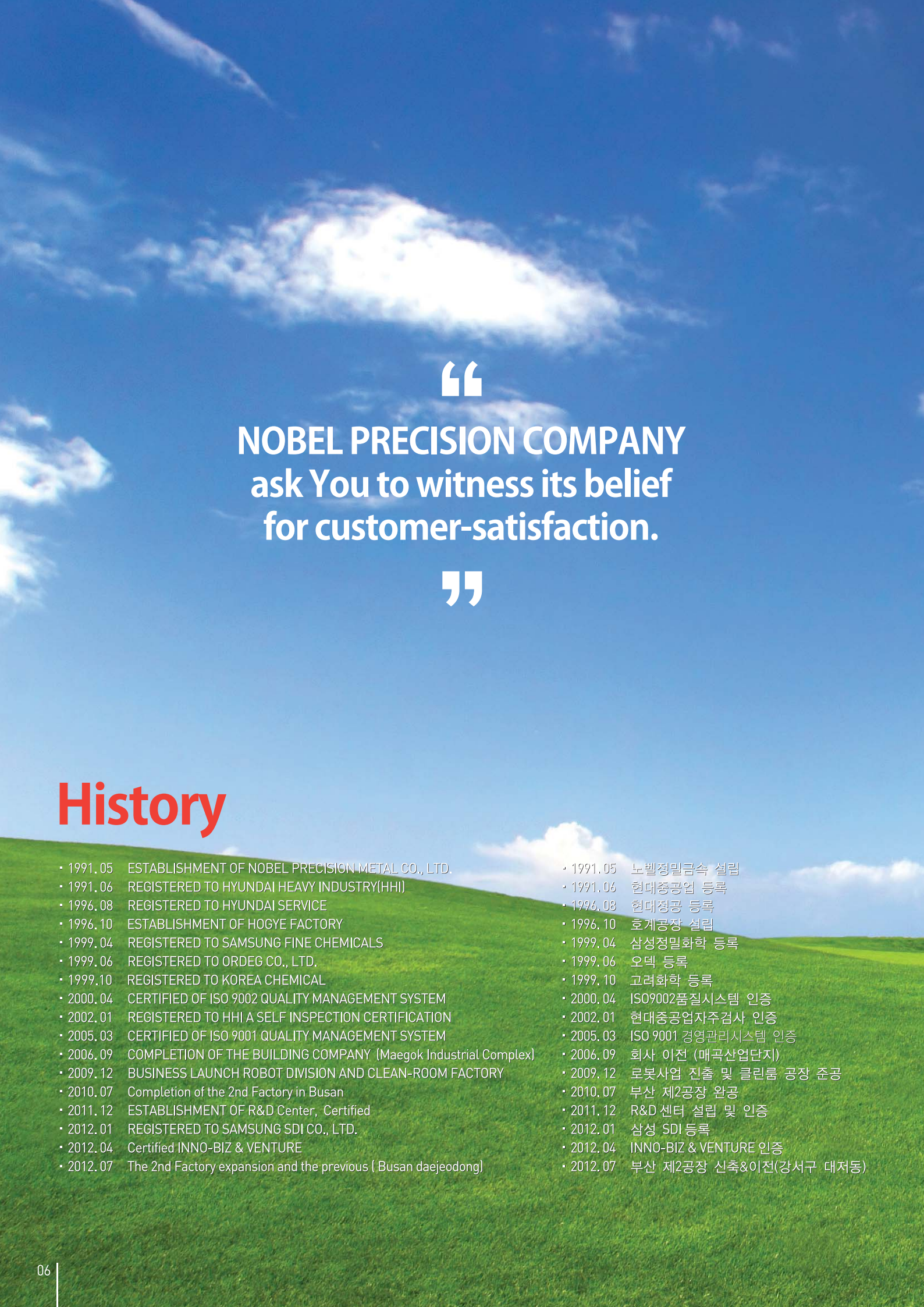
Greeting

NOBEL PRECISION METAL CO., LTD. was founded on May. 1.1991 by experts in the Fasteners field. With an external competitiveness strength and an internal operations stability we continuously grow with our customers.
NOBEL PRECISION METAL CO., LTD. developed a system that Received good reactions from industrial equipment, electrical equipment, ship building yard, land-sea structures. Big or small size plants... and compliment from customers.
These results were achieved thanks to customers belief and interest in our products.
Since 2009, The new business field of robot business in advance LCD return robots, industrial robots and FA part in as many customers obtained a good response from the day evoled out.
We will continue our drive to keep our product improvement and delivery lead-time.
Also, we will do our best and aims to keep the promise with our customers. NOBEL PRECISION METAL CO., LTD. ask You to witness its belief for customer-satisfaction.
Thank you.

President *JIN TAE, PARK*

노벨정밀금속㈜는 1991년 5월1일 FASTENERS 분야의 전문 인력들이 모여서 회사를 설립하여 밖으로는 경쟁력 강화와 안으로는 내실 있는 운영으로 고객과 함께 성장에 성장을 거듭하고 있습니다. 또한 노벨정밀금속㈜는 그동안 개발한 SYSTEM을 운용한 결과 산업설비, 발전설비, 조선소, 육·해상 구조물 등, 대·소형공사에 좋은 호응을 얻어 고객 으로부터 많은 격려를 받고 있습니다.
2009년부터는 신규사업분야인 로봇사업에 진출하여 LCD 반송로봇, 산업용 로봇 및 FA부분에서도 많은 고객들로부터 좋은 호응을 얻어 나날이 발전을 거듭해 나가고 있습니다.
이러한 결과는 저희 노벨정밀금속㈜를 믿고 맡겨주신 고객 여러분의 덕분이라 여기며 앞으로는 더욱 더 모든 제품의 품질향상과 납기준수를 위해 최선을 다할 것이며 항상 믿고 맡길 수 있는 회사가 되도록 노력 하겠습니다.
감사합니다.

박진태 배상



“

NOBEL PRECISION COMPANY ask You to witness its belief for customer-satisfaction.

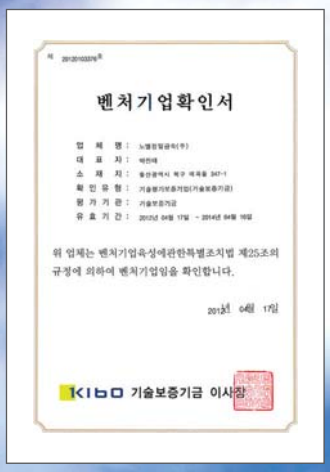
”

History

- 1991. 05 ESTABLISHMENT OF NOBEL PRECISION METAL CO., LTD.
- 1991. 06 REGISTERED TO HYUNDAI HEAVY INDUSTRY(HHI)
- 1996. 08 REGISTERED TO HYUNDAI SERVICE
- 1996. 10 ESTABLISHMENT OF HOGYE FACTORY
- 1999. 04 REGISTERED TO SAMSUNG FINE CHEMICALS
- 1999. 06 REGISTERED TO ORDEG CO., LTD.
- 1999.10 REGISTERED TO KOREA CHEMICAL
- 2000. 04 CERTIFIED OF ISO 9002 QUALITY MANAGEMENT SYSTEM
- 2002. 01 REGISTERED TO HHI A SELF INSPECTION CERTIFICATION
- 2005. 03 CERTIFIED OF ISO 9001 QUALITY MANAGEMENT SYSTEM
- 2006. 09 COMPLETION OF THE BUILDING COMPANY (Maegok Industrial Complex)
- 2009. 12 BUSINESS LAUNCH ROBOT DIVISION AND CLEAN-ROOM FACTORY
- 2010. 07 Completion of the 2nd Factory in Busan
- 2011. 12 ESTABLISHMENT OF R&D Center, Certified
- 2012. 01 REGISTERED TO SAMSUNG SDI CO., LTD.
- 2012. 04 Certified INNO-BIZ & VENTURE
- 2012. 07 The 2nd Factory expansion and the previous (Busan daejeodong)

- 1991. 05 노벨정밀금속 설립
- 1991. 06 현대중공업 등록
- 1996. 08 현대정공 등록
- 1996. 10 호계공장 설립
- 1999. 04 삼성정밀화학 등록
- 1999. 06 오덱 등록
- 1999. 10 고려화학 등록
- 2000. 04 ISO9002품질시스템 인증
- 2002. 01 현대중공업자주검사 인증
- 2005. 03 ISO 9001 경영관리시스템 인증
- 2006. 09 회사 이전 (매곡산업단지)
- 2009. 12 로봇사업 진출 및 클린룸 공장 준공
- 2010. 07 부산 제2공장 완공
- 2011. 12 R&D 센터 설립 및 인증
- 2012. 01 삼성 SDI 등록
- 2012. 04 INNO-BIZ & VENTURE 인증
- 2012. 07 부산 제2공장 신축&이전(강서구 대저동)

Certificate



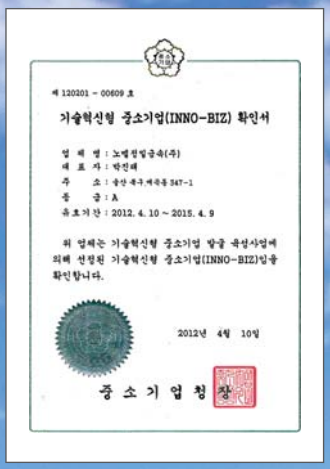
벤처기업확인서

업 체 명 : 노벨정밀금속(주)
대 표 자 : 박진태
소 재 지 : 울산광역시 북구 매곡동 347-1
확인유형 : 기술평가보증기업(기술보증기금)
평가기관 : 기술보증기금
유효기간 : 2012년 04월 17일 ~ 2014년 04월 16일

위 업체는 벤처기업육성에관한특별조치법 제25조의 규정에 의하여 벤처기업임을 확인합니다.

2012년 04월 17일

KIBO 기술보증기금 이사장



제 120201 - 00609 호

기술혁신형 중소기업(INNO-BIZ) 확인서

업 체 명 : 노벨정밀금속(주)
대 표 자 : 박진태
주 소 : 울산 북구 매곡동 347-1
등 급 : A
유효기간 : 2012. 4. 10 ~ 2015. 4. 9

위 업체는 기술혁신형 중소기업 발굴 육성사업에 의해 선정된 기술혁신형 중소기업(INNO-BIZ)임을 확인합니다.

2012년 4월 10일

중 소 기 업 청 장

Certificate No : 120201 - 00609

CERTIFICATE OF INNO-BIZ

Company : NOBEL PRECISION METAL CO., LTD
CEO : PARK JIN TAE
Address : 347-1, MAEGOK-DONG, , KOREA
Validity of Certificate : 2012. 04. 10 ~ 2015. 04. 09

This is to certify that the above-mentioned Company is an INNO-BIZ enterprise in accordance with Article 15 of the Act on Promotion of Technology Innovation for SMEs.

APR 10, 2012

Administrator

Small and Medium Business Administration
Republic of Korea

제 2011310621 호

기업부설연구소 인정서

1. 연 구 소 명 : 노벨정밀금속(주) 기술연구소
[소속기업명 : 노벨정밀금속(주)]
2. 소 재 지 : 울산 북구 매곡동 347-1
3. 신고 연월일 : 2011년 12월 22일

「기초연구진흥 및 기술개발지원에 관한 법률」 제14조, 같은 법 시행령 제16조제1항 및 제27조제1항에 따라 위와 같이 기업부설연구소로 인정합니다.

2011년 12월 27일

koita 한국산업기술진흥협회장

ISC

품질경영시스템인증서

노벨정밀금속(주)

KS Q ISO 9001:2009 / ISO 9001:2008

2003. 03. 31 2014. 03. 06 2011. 03. 07

IAF KAB 국제표준인증원장

ISC

Quality Management System Certificate

NOBEL PRECISION METAL CO., LTD.

2-18Block, Msegok Industrial Complex, 31-1, Maegok-dong, Buk-gu, Ulsan, Korea

This is to certify that the Quality Management System of the above company is appropriate to the standard and the scope listed below, in accordance with registration system provision of this certification body.

Certification Standard :
KS Q ISO 9001:2009 / ISO 9001:2008

Certification Scope :
The Production of Bolt, Nut, Metal Components for Heavy Machinery and Metal Accessories.

DATE OF INITIAL REGISTRATION 31 MARCH 2005 | DATE OF ISSUE 06 MARCH 2014 | DATE OF LAST ISSUE 07 MARCH 2011

IAF KAB

y. c. kwon

International Standard Certification Co., LTD
Authorized Signatory

Achilles JQS

Joint Qualification System

for suppliers to the Oil Industry in Norway and Denmark

Certificate of Qualification

Awarded to

NOBEL PRECISION METAL CO LTD

Company Reg.no: 230111-0123635

Achilles Id. 27921

Achilles Information Centre hereby confirms that NOBEL PRECISION METAL CO LTD is qualified in the Achilles Joint Qualification System for suppliers to the Oil Industry in Norway and Denmark. The qualification concerns the product and service categories listed in the appendix.

Issued Date: 14-Mar-2011

Expiry Date: 13-Jul-2011

출원번호통지서

출원일자 2011.11.16
특허청장

출원번호통지서

출원일자 2011.11.16
특허청장

디자인등록증

CERTIFICATE OF DESIGN REGISTRATION

등록 제 30-0474230 호

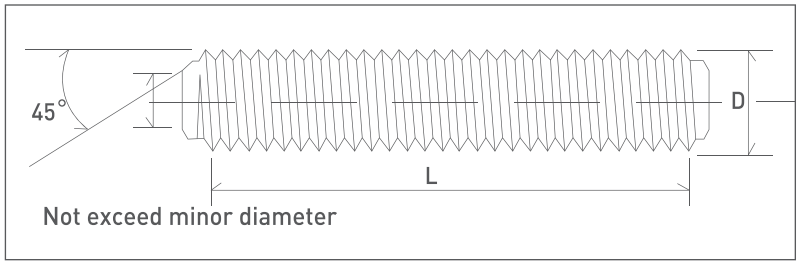
디자인보호법에 의하여 디자인등록원부에 등록되었음을 증명합니다.

2007년 12월 20일

특 허 청 장

Stud Bolts & Nuts
For Pressure-Temperature Piping (ANSI B16.5)

Stud Bolts Size & Dimension Tolerance



Unit: inch

Lengths / Diameter	Tolerance On Stud Lengths	
	L ≤ 6	L > 6
Over 5/16 to 3/4	±1/16	±1/8
Over 3/4 to 1-1/4	±1/8	±3/16
Over 1-1/4	±1/4	±1/4

Notes
1. L is the length of first thread to thread not including point of both ends.
2. Points shall be flat and chamfered.

Threads

Nominal Size or Diameter of Stud-bolt(D)		D = 1"(25mm) & Smaller	D = 1⅛"(28mm) & Larger
Thread	INCH Series	Unified Coarse Thread Series Class 2A and 2B ANSI B1.1	Unifiled 8-thread(3-pitch) Series Class 2A snd 2B ANSI B1.1
	METRIC Series	METRIC Coarse Thread Series Class 6G and 6H JIS B0209/ISO 261	METRIC 3-pitch Series Class 6G and 6H JIS B0209/ISO 261

Dimension of Nut

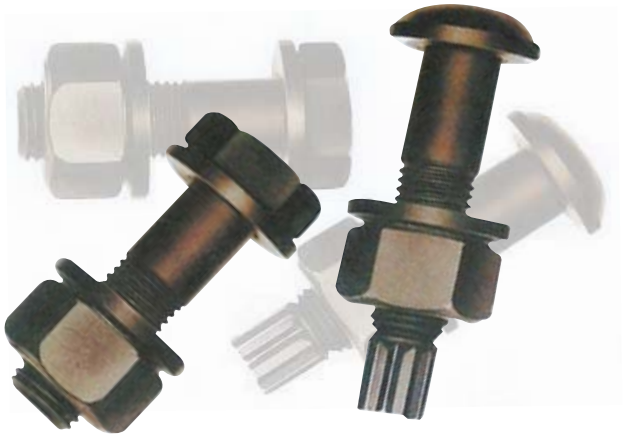
INCH Series	Comform to Heavy Hex Nuts of ANSI B 18.2.2 Double chamfered of Washer faced
METRIC Series	Comform to Heavy Hex Nuts of ANSI 18.2.2 Double chamfered of Washer faced

Materials
Conform to ASTM, ASME, JIS Specification

Marking
Identification grade Marking Shall conform
to ASTM ASME designation for steel fasteners

High Strength
Bolts, Nuts & Washers

Torque Shear Type



Weights & Range of Products

Unit: gr.

		M16	M20	M20	M24
Nut Weights		57	97	137	201
Washer Weights		20	32	52	62
Set Weights of T.S.Bolt/Nut/Washer					
Bolt Length	35	185			
	40	191	318		
	45	199	328	449	
	50	207	341	463	
	55	215	354	478	631
	60	223	367	493	649
	65	231	380	508	667
	70	239	393	523	685
	75	247	406	538	703
	80	255	419	553	721
	85	263	432	568	739
	90	271	445	583	757
	95	279	458	598	775
	100	287	471	613	793
	105	295	484	628	811
	110		497	643	829
	115		510	658	847
	120		523	673	865
	125		236	888	883
	130		549	703	901
	135			718	919
	140			733	937
	145			748	955
	150				973

(mm)

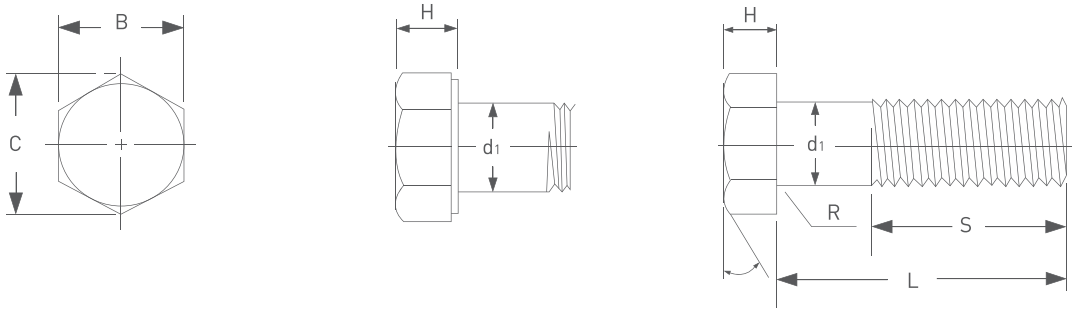
Hex Head Type

Weights & Range of Products KS B1010 JIS B 1186

Unit: gr.

Diameter \ Length		40	45	50	55	60	65	70	75	80	85	90	95	100	110	120	130	140	150	NUT	WASHER
M12	Set	107	112	116	121	125	130	134	138	143	147	152	156	-	-	-	-	-	-	30	10
	Bolt	57	62	66	71	75	80	84	88	93	97	102	106	-	-	-	-	-	-		
M16	Set	202	210	217	225	233	241	249	257	265	273	281	289	296	312	328	-	-	-	57	20
	Bolt	105	113	120	128	136	144	152	160	168	176	184	192	199	215	231	-	-	-		
M20	Set	336	348	361	373	385	398	410	422	435	447	459	472	484	509	533	558	583	608	97	32
	Bolt	175	187	200	212	224	237	249	261	274	286	298	311	323	348	374	397	422	447		
M22	Set	-	481	496	510	525	540	555	570	585	600	615	630	645	674	704	734	764	794	137	52
	Bolt	-	240	255	259	284	299	314	329	344	359	374	389	404	433	464	493	523	553		
M24	Set	-	-	648	666	683	701	719	737	754	772	790	808	825	861	896	932	967	1003	201	52
	Bolt	-	-	323	341	358	376	394	412	429	447	465	483	500	536	571	607	642	678		
M27	Set	-	-	-	-	-	954	976	999	1021	1044	1066	1088	1111	1153	1198	1253	1298	1343	263	93
	Bolt	-	-	-	-	-	505	527	550	572	595	617	639	662	704	749	796	841	883		
M30	Set	-	-	-	-	-	-	1248	1276	1304	1332	1359	1387	1409	1464	1519	1624	1679	1735	340	134
	Bolt	-	-	-	-	-	-	640	668	696	724	751	779	801	856	911	998	1053	1109		

Hex Bolts & Hex Cap Screws



Metric KS B1002 JIS 1180

Unit: mm

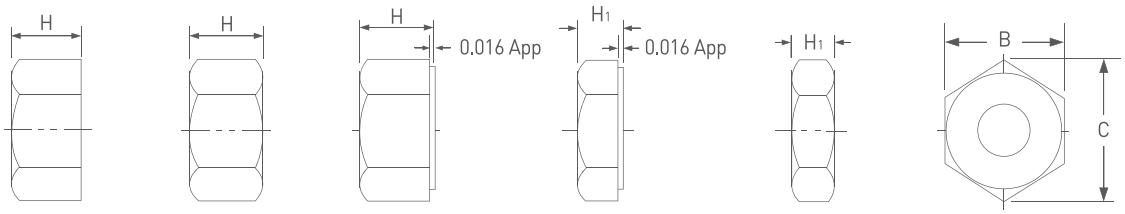
Bolt Diameter and Pitch		d1				H				B				C	R	S		
		Basic	Tolerance			Basic	Tolerance			Basic	Tolerance							
Coarse	Fine		Fin	Semi Fin	Rege		Fin	Semi Fin	Rege		Fin	Semi Fin	Rege	App	Min	L ≦ 125	125 < L ≦ 200	L > 200
M6 x 1	-	6	0 -0.1	0 -0.2	+0.6 -0.15	4	±0.15	±0.25	±0.6	10	0 -0.2	0 -0.6	0 -0.6	11.5	0.25	18	-	-
M8 x 1.25	M8 x 1	8	0 -0.15		+0.7 -0.2	5.5				13	0 -0.25	0 -0.7	0 -0.7	15	0.4	22	-	-
M10 x 1.5	M10 x 1.25	10				7	±0.2	±0.3	±0.8	17				19.6	0.4	26	-	-
M12 x 1.75	M12 x 1.25	12	0 -0.2	0 -0.25	+0.9 -0.2	8				19	0 -0.3	0 -0.8	0 -0.8	21.9	0.6	30	36	-
M14 x 2	(M14 x 1.5)	14				9				22				25.4	0.6	34	40	-
M16 x 2	M16 x 1.5	16				10				24				27.7	0.6	38	44	-
(M18 x 2.5)	(M18 x 1.5)	18				12		±0.35	±0.9	27				31.2	0.8	42	48	-
M20 x 2.5	M20 x 1.5	20		0 -0.35	+0.95 -0.35	13				30				34.6	0.8	46	52	-
(M22 x 2.5)	(M22 x 1.5)	22				14				32				37	0.8	50	56	-
M24 x 3	M24 x2	24				15				36	0 -0.4	0 -1.0	0 -1.0	41.6	1	54	60	-
(M27 x 3)	(M27 x 2)	27				17				41				47.3	1	60	66	79
M30 x 3.5	M30 x 2	30				19	±0.25	±0.4	±1.0	46				53.1	1	66	72	85
(M33 x 3.5)	(M33 x 2)	33	0 -0.25	0 -0.4	+1.2 -0.4	21				50				57.7	1	72	78	91
M36 x 4	M36 x 3	36				23				55				63.5	1	78	84	97
(M39 x 4)	(M39 x 3)	39				25				60				69.3	1.2	84	90	103
(M42 x 4.5)	-	42				26				65				75	1.2	90	96	109
(M45 x 4.5)	-	45				28				70	0 -0.45	0 -1.2	0 -1.2	80.8	1.6	96	102	115
M48 x 5	-	48				30				75				86.5	1.6	102	108	121
(M52 x 5)	-	52	0 -0.3	0 -0.45	+1.2 -0.7	33	±0.3	±0.5	±1.5	80				92.4	2	-	116	129
M56 x 5.5	-	56			-	35			-	85	0 -0.55	0 -1.4	-	98.1	2	-	124	137
(M60 x 5.5)	-	60				38				90				104	2	-	132	145
M64 x 6	-	64				40				95				110	2	-	140	153
(M68 x 6)	-	68				43				100				115	2	-	148	161
-	M72 x 6	75				45				105				121	2	-	156	169
-	(M76 x 6)	76				48				110				127	2	-	164	177
-	M80 x 6	80				50				115				133	2	-	172	185

Unified ANSI B18.2.1

Unit: inch

Nominal Size of Basic Bolt Dia		d1	B			C		H			R		S	
		Body Dia	Width Across Flats			Width Across Corners		Head Height			Radius of Fillet		Thread Length For Bolt Length	
													L ≦ 6	L > 6
		Max	Basic	Max	Min	Max	Min	Basic	Max	Min	Max	Min	Basic	Basic
1/4	0.2500	0.260	7/16	0.438	0.425	0.505	0.484	11/64	0.188	0.150	0.03	0.01	0.750	1.000
5/16	0.3125	0.324	1/2	0.500	0.484	0.577	0.552	7/32	0.235	0.195	0.03	0.01	0.875	1.125
3/8	0.3750	0.388	9/16	0.562	0.544	0.650	0.620	1/4	0.268	0.226	0.03	0.01	1.000	1.250
7/16	0.4375	0.452	5/8	0.625	0.603	0.722	0.687	19/64	0.316	0.272	0.03	0.01	1.125	1.375
1/2	0.5000	0.515	3/4	0.750	0.725	0.866	0.826	11/32	0.364	0.302	0.03	0.01	1.250	1.500
5/8	0.6250	0.642	15/16	0.938	0.906	1.083	1.033	27/64	0.444	0.378	0.06	0.02	1.500	1.750
3/4	0.7500	0.768	1 1/8	1.125	1.088	1.299	1.240	1/2	0.524	0.455	0.06	0.02	1.750	2.000
7/8	0.8750	0.895	1 5/16	1.312	1.269	1.516	1.447	37/64	0.604	0.531	0.06	0.02	2.000	2.250
1	10.000	1.022	1 1/2	1.500	1.450	1.732	1.653	43/64	0.700	0.591	0.09	0.03	2.250	2.500
1 1/8	1.1250	1.149	1 11/16	1.688	1.631	1.949	1.859	3/4	0.780	0.658	0.09	0.03	2.500	2.750
1 1/4	1.2500	1.277	1 7/8	1.875	1.812	2.165	2.066	27/32	0.876	0.749	0.09	0.03	2.750	3.000
1 3/8	1.3750	1.404	2 1/16	2.062	1.994	2.382	2.273	29/32	0.940	0.810	0.09	0.03	3.000	3.250
1 1/2	1.5000	1.531	2 1/4	2.250	2.175	2.598	2.480	1	1.036	0.902	0.09	0.03	3.250	3.500
1 3/4	1.7500	1.785	2 5/8	2.625	2.538	3.031	2.893	1 5/32	1.196	1.054	0.12	0.04	3.750	4.000
2	2.0000	2.039	3	3.000	2.900	3.464	3.306	1 11/32	1.388	1.175	0.12	0.04	4.250	4.500
2 1/4	2.2500	2.305	3 3/8	3.375	3.262	3.897	3.719	1 1/2	1.548	1.327	0.19	0.06	4.750	5.000
2 1/2	2.5000	0.559	3 3/4	3.750	3.625	4.330	4.133	1 21/32	1.708	1.479	0.19	0.06	5.250	5.500
2 3/4	2.7500	2.827	4 1/8	4.125	3.988	4.763	4.546	1 13/16	1.869	1.632	0.19	0.06	5.750	6.000
3	3.0000	3.081	4 1/2	4.500	4.330	5.196	4.959	2	2.060	1.815	0.19	0.06	6.250	6.500
3 1/4	3.2500	3.335	4 7/8	4.875	4.712	5.629	5.372	2 3/16	2.251	1.936	0.19	0.06	6.750	7.000
3 1/2	3.5000	3.589	5 1/4	5.520	5.075	6.062	5.786	2 5/16	2.380	2.057	0.19	0.06	7.250	7.500
3 3/4	3.7500	3.858	5 5/8	5.625	5.437	6.495	6.198	2 1/2	2.572	2.241	0.19	0.06	7.750	8.000
4	4.0000	4.111	6	6.000	5.800	6.928	6.612	2 11/16	5.764	2.424	0.19	0.06	8.250	8.500

Hex Nuts & Hex Jam Nuts



Metric KS B1012 JIS 1181

Unit: mm

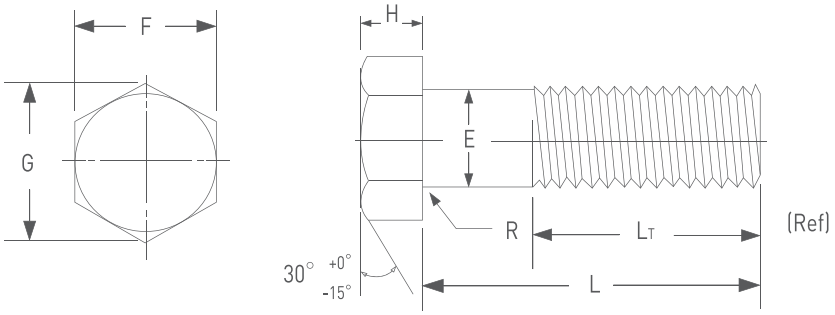
Nominal Size and Pitch		H				H1				B				C
			Tolerance				Tolerance				Tolerance			
Coarse	Fine	Basic	Finish	Semi Finish	Regu	Basic	Finish	Semi Finish	Regu	Basic	Finish	Semi Finish	Regu	App
M6 x 1	-	5	0 -0.30	0 -0.48	±0.6	3.6	0 -0.3	0 -0.48	±0.6	10	0 -0.2	0 -0.6	0 -0.6	11.5
M8 x 1.25	M8 x 1	6.5	0 -0.36	0 -0.58	±0.8	5				13	0 -0.25	0 -0.7	0 -0.7	15
M10 x 1.5	M10 x 1.25	8				6				17				19.6
M12 x 1.175	M12 x 1.25	10				7	0 -0.36	0 -0.58	±0.8	19				21.9
(M14 x 2)	(M14 x 1.5)	11	0 -0.43	0 -0.70	±0.9	8				22	0 -0.35	0 -0.8	0 -0.8	25.4
M16 x 2	M16 x 1.5	13				10				24				27.7
(M18 x 2.5)	(M18 x 1.5)	15				11	0 -0.43	0 -0.70	±0.9	27				31.2
M20 x 2.5	M20 x 1.5	16				12				30				34.6
(M22 x 2.5)	(M22 x 1.5)	18				13				32	0 -0.4	0 -1.0	0 -1.0	37
M24 x 3	M24 x 2	19	0 -0.52	0 -0.84	±1.0	14				36				41.6
(M27 x 3)	(M27 x 2)	22				16				41				47.3
M30 x 3.5	M30 x 2	24				18				46				53.1
(M33 x 3.5)	(M33 x 2)	26				20	0 -0.52	0 -0.84	±1.0	50				57.7
M36 x 4	M36 x 3	29				21				55	0 -0.45	0 -1.2	0 -1.2	63.5
(M39 x 4)	(M39 x 3)	31	0 -0.62	0 -1.0	±1.2	23				60				69.3
M42 x 4.5	-	34				25				65				75
(M45 x 4.5)	-	36				27				70				80.8
M48 x 5	-	38				29				75				86.5
(M52 x 5)	-	42				31	0 -0.62	0 -1.0	±1.2	80				92.4
M56 x 5.5	-	45				34				85	0 -0.55	0 -1.4	0 -1.4	98.1
(M60 x 5.5)	-	48				36				90				104
M64 x 6	-	51	0 -0.74	0 -1.2	±1.5	38				95				110
(M68 x 6)	-	54				40				100				115
-	-	58				42				105				121
-	-	61				46				110				127
-	-	64				48				115				133
-	-	68				50				120				139
-	-	72				54	0 -0.74	0 -1.2	±1.5	130	0 -0.65	0 -1.6	0 -1.6	150
-	-	76				57				135				156
-	-	80				60				145				167
-	-	88	0 -0.87	0 -1.4	±1.8	65				155				179
-	-	96				72				170				196

Unified ANSI B18.2.2

Unit: inch

Nominal Size or Basic Major Dia of Thread		B			C		H			H1		
		Width Across Flats			Width Across Corners		Thickness Hex Nuts			Thickness Hex Jam Nuts		
		Basic	Max	Min	Max	Min	Basic	Max	Min	Basic	Max	Min
1/4	0.2500	7/16	0.438	0.428	0.505	0.488	7/32	0.226	0.212	5/32	0.163	0.150
5/16	0.3125	1/2	0.500	0.489	0.577	0.557	17/64	0.273	0.258	3/16	0.195	0.180
3/8	0.3750	9/16	0.562	0.551	0.650	0.628	21/64	0.337	0.320	7/32	0.227	0.210
7/16	0.4375	11/16	0.688	0.675	0.794	0.768	3/8	0.385	0.365	1/4	0.260	0.240
1/2	0.5000	3/4	0.750	0.736	0.866	0.840	7/16	0.448	0.427	5/16	0.323	0.302
9/16	0.5625	7/8	0.875	0.861	1.010	0.982	31/64	0.496	0.473	5/16	0.324	0.301
5/8	0.6250	15/16	0.938	0.922	1.083	1.051	35/64	0.559	0.535	3/8	0.387	0.363
3/4	0.7500	1 1/8	1.125	1.088	1.299	1.240	41/64	0.665	0.617	27/64	0.446	0.398
7/8	0.8750	1 5/16	1.312	1.269	1.516	1.447	3/4	0.776	0.724	31/64	0.510	0.458
1	1.0000	1 1/2	0.500	1.450	1.732	1.653	55/64	0.887	0.831	35/64	0.575	0.519
1 1/8	1.1250	1 11/16	1.688	1.631	1.949	1.859	31/32	0.999	0.939	39/64	0.639	0.579
1 1/4	1.2500	1 7/8	1.875	1.812	2.165	2.066	1 1/16	1.904	1.030	23/32	0.751	0.687
1 3/8	1.3750	2 1/16	2.062	1.994	2.382	2.273	1 11/64	1.206	1.138	25/32	0.815	0.747
1 1/2	1.5000	2 1/4	2.250	2.175	2.598	2.480	1 9/32	1.317	1.245	27/32	0.880	0.808

Heavy Hex Bolts

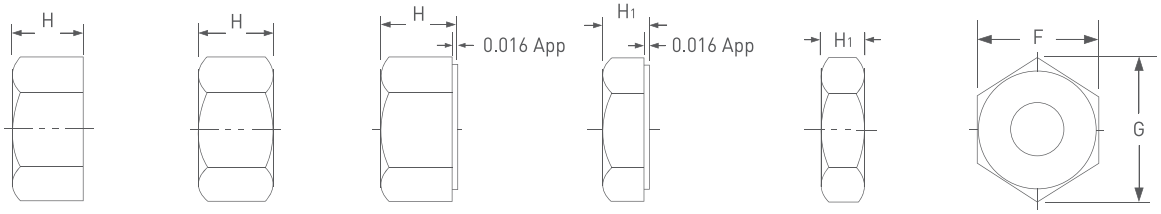


Unified ANSI B18.2.1

Unit: inch

Nominal Size or Basic Major Diameter		E	F			G		H			R		L_T	
		Body Dia	Width Across Flat			Width Across Corners		Head Height			Radius Of Fillet		Thread Length For Bolt Lengths	
													L≦6	L>6
		Max	Basic	Max	Min	Max	Min	Basic	Max	Min	Max	Min	Basic	Basic
1/2	0.500	0.515	7/8	0.875	0.850	1.010	0.969	11/32	0.364	0.302	0.03	0.01	1.25	1.50
5/8	0.625	0.642	1 1/16	1.062	1.031	1.227	1.175	27/64	0.444	0.378	0.06	0.02	1.50	1.75
3/4	0.750	0.768	1 1/4	1.250	1.212	1.443	1.383	1/2	0.524	0.455	0.06	0.02	1.75	2.00
7/8	0.875	0.895	1 7/16	1.438	1.394	1.660	1.589	37/64	0.604	0.531	0.06	0.02	2.00	2.25
1	1.000	1.022	1 5/8	1.625	1.575	1.876	1.796	43/64	0.700	0.591	0.09	0.03	2.25	2.50
1 1/8	1.125	1.149	1 13/16	1.812	1.756	2.093	2.002	3/4	0.780	0.658	0.09	0.03	2.50	2.75
1 1/4	1.250	1.277	2	2.000	1.938	2.309	2.209	27/32	0.876	0.749	0.09	0.03	2.75	3.00
1 3/8	1.375	1.404	2 3/16	2.188	2.119	2.526	2.416	29/32	0.940	0.810	0.09	0.03	30.00	3.25
1 1/2	1.500	1.531	2 3/8	2.375	2.300	2.742	2.622	1	1.036	0.902	0.09	0.03	3.25	3.50
1 3/4	1.750	1.785	2 3/4	2.750	2.662	3.174	3.035	1 5/32	1.196	1.054	0.12	0.04	3.75	4.00
2	2.000	2.039	3 1/8	3.125	3.025	3.608	3.449	1 11/32	1.388	1.175	0.12	0.04	4.25	4.50
2 1/4	2.250	2.305	3 1/2	3.500	3.388	4.041	3.862	1 1/2	1.548	1.327	0.19	0.06	4.75	5.00
2 1/2	2.500	0.559	3 7/8	3.875	3.750	4.474	4.275	1 21/32	1.708	1.479	0.19	0.06	5.25	5.50
2 3/4	2.750	2.827	4 1/4	4.250	4.112	4.907	4.688	1 13/16	1.869	1.632	0.19	0.06	5.75	6.00
3	3.000	3.081	4 5/8	4.625	4.475	5.340	5.102	2	2.060	1.815	0.19	0.06	6.25	6.50

Heavy Hex Nuts & Heavy Hex Jam Nuts



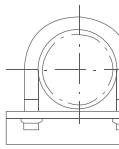
Unified ANSI B18.2.2

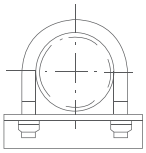
Unit: inch

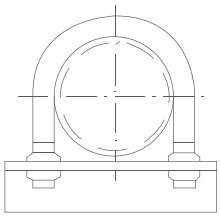
Nominal Size or Basic Major Dia of Thread		F			G		H			H_1		
		Width Across Flats			Width Across Corners		Thickness Hex Nuts			Thickness Hex Jam Nuts		
		Basic	Max	Min	Max	Min	Basic	Max	Min	Basic	Max	Min
1/2	0.500	7/8	0.875	0.850	1.010	0.969	31/64	0.504	0.464	19/64	0.317	0.277
5/8	0.625	1 1/16	1.062	1.031	1.227	1.175	39/64	0.631	0.587	23/64	0.381	0.337
3/4	0.750	1 1/4	1.250	1.212	1.443	1.382	47/64	0.758	0.710	27/64	0.446	0.398
7/8	0.875	1 7/16	1.438	1.394	1.660	1.589	55/64	0.885	0.833	31/64	0.510	0.458
1	1.000	1 5/8	1.625	1.575	1.876	1.796	63/64	1.012	0.956	35/64	0.575	0.519
1 1/8	1.125	1 13/16	1.812	1.756	2.093	2.002	1 7/64	1.139	1.079	39/64	0.639	0.579
1 1/4	1.250	2	2.000	1.938	2.309	2.209	1 7/32	1.251	1.187	23/32	0.751	0.687
1 3/8	1.375	2 3/16	2.188	2.119	2.526	2.416	1 11/32	1.378	1.310	25/32	0.815	0.747
1 1/2	1.500	2 3/8	2.375	2.300	2.742	2.622	1 15/32	1.505	1.433	27/32	0.880	0.808
1 5/8	1.625	2 9/16	2.562	2.481	2.959	2.828	1 19/32	1.632	1.556	29/32	0.944	0.868
1 3/4	1.750	2 3/4	2.750	2.662	3.175	3.305	1 23/32	1.759	1.679	31/32	1.009	0.929
1 7/8	1.875	2 15/16	2.938	2.844	3.392	3.242	1 27/32	1.886	1.802	1 1/32	1.073	0.989
2	2.000	3 1/8	3.125	3.025	3.608	3.449	1 31/32	2.013	1.925	1 3/32	1.138	1.050
2 1/4	2.250	3 1/2	3.500	3.388	4.041	3.862	2 13/64	2.251	2.155	1 13/64	1.251	1.155
2 1/2	2.500	3 7/8	3.875	3.750	4.474	4.275	2 29/64	2.505	2.401	1 29/64	1.505	1.401
2 3/4	2.750	4 1/4	4.250	4.112	4.907	4.688	2 45/64	2.759	2.647	1 37/64	1.634	1.522
3	3.000	4 5/8	4.625	4.475	5.340	5.102	2 61/64	3.013	2.893	1 45/64	1.763	1.643
3 1/4	3.250	5	5.000	4.838	5.774	5.515	3 3/16	3.252	3.124	1 13/16	1.876	1.748
3 1/2	3.500	5 3/8	5.375	5.200	6.207	5.928	3 7/16	3.506	3.370	1 15/16	2.006	1.870
3 3/4	3.750	5 3/4	5.750	5.562	6.640	6.341	3 11/16	3.760	3.616	2 1/16	2.134	1.990
4	4.000	6 1/8	6.125	5.925	7.073	6.755	3 15/16	4.014	3.862	2 3/16	2.264	2.112

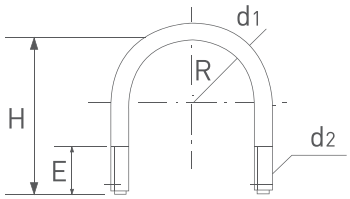
U-Bolt





Type B


Type C


Type A



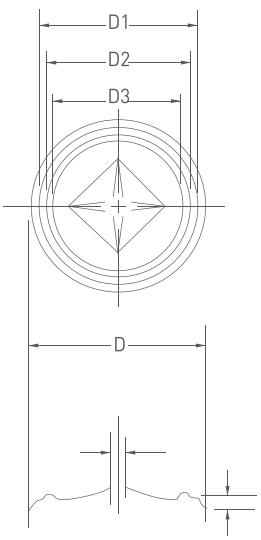
Metric /JIS F 3022

Unit: inch

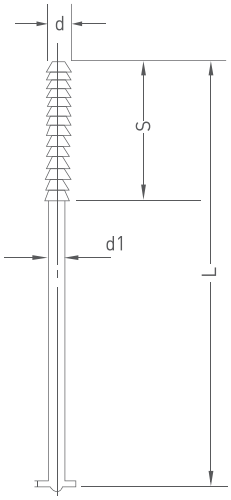
Nominal Size	Out dia of Pife	R	d1	Thread Dia (d2)	A Type		B Type		C Type	
					H	E	H	E	H	E
15	21.7	12	10	M10	-	-	39	20	47	30
20	27.2	15	10	M10	-	-	45	20	53	30
25	34.0	18	10	M10	-	-	52	20	60	30
32	42.7	23	10	M10	-	-	60	20	68	30
40	48.6	26	10	M10	-	-	66	20	74	30
50	60.5	32	10	M10	-	-	78	20	86	30
65	76.3	40	12	M12	-	-	98	25	108	35
80	89.1	46	12	M12	-	-	110	25	120	35
90	101.6	52	12	M12	-	-	123	25	133	35
100	114.3	59	16	M16	141	50	-	-	-	-
125	139.8	72	16	M16	167	50	-	-	-	-
150	165.2	85	16	M16	192	50	-	-	-	-
175	190.7	98	16	M16	218	50	-	-	-	-
200	216.3	111	20	M20	249	60	-	-	-	-
225	241.8	124	20	M20	274	60	-	-	-	-
250	267.4	137	20	M20	300	60	-	-	-	-
300	318.5	163	24	M24	357	70	-	-	-	-
350	355.6	181	24	M24	394	70	-	-	-	-
400	406.4	207	24	M24	444	70	-	-	-	-
450	457.2	233	30	M30	505	85	-	-	-	-
500	508.0	259	30	M30	556	85	-	-	-	-
550	558.8	284	30	M30	606	85	-	-	-	-
600	609.6	310	36	M36	663	100	-	-	-	-
650	660.4	335	36	M36	713	100	-	-	-	-
700	711.2	361	36	M36	764	100	-	-	-	-
750	762.0	387	36	M36	818	100	-	-	-	-
800	812.8	413	42	M42	875	115	-	-	-	-

WELDING PIN & CLIP
(INSULATION PIN & CLIP)

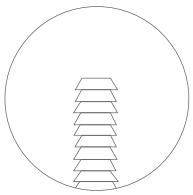
ARC TYPE



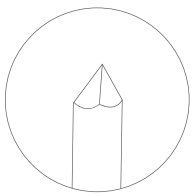
INSULATION CLIP



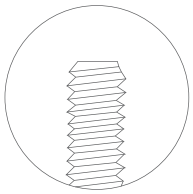
INSULATION PIN



STANDARD

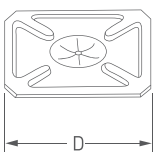


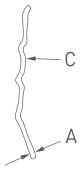
NAIL TYPE

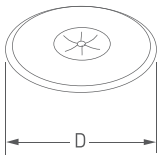


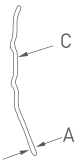
THREAD FLAT TYPE

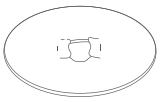
THREAD CONE TYPE

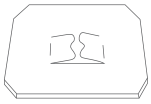




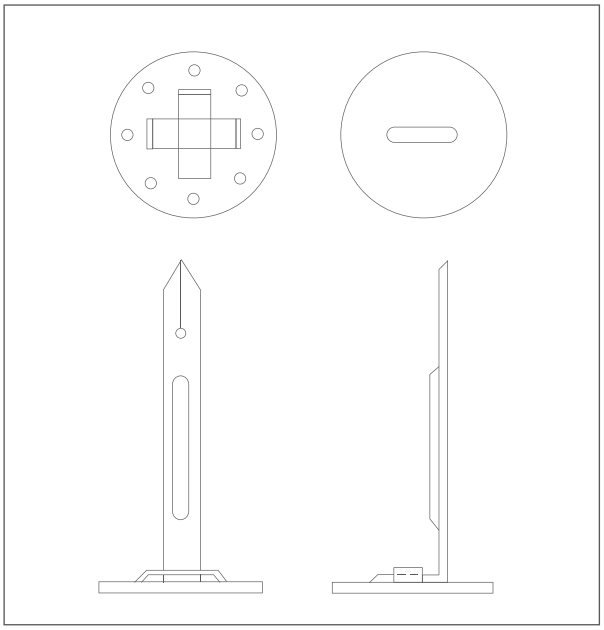




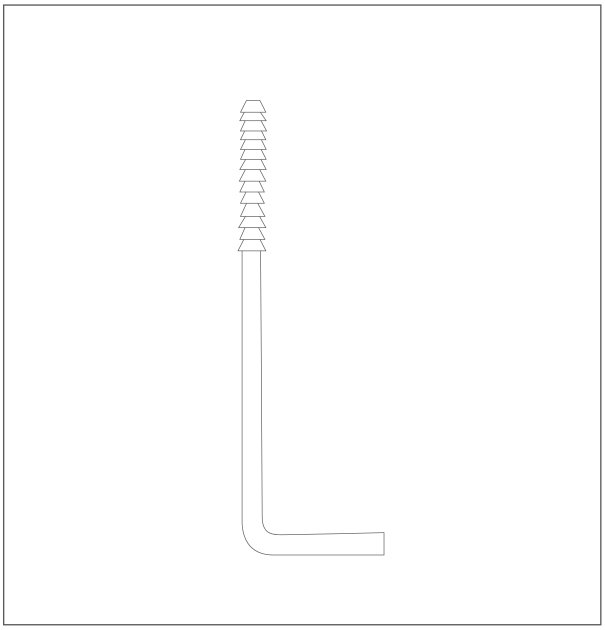




BOND TYPE

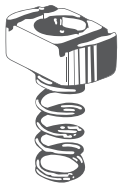


WELDING TYPE



CHANNEL NUTS

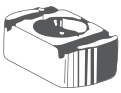
WITH SPRING



Part No.	SIZE	THREAD
SH 1006-0832	#8	32
SH 1006-1024	#10	24
SH 1006-1420	1/4"	20
SH 1007	5/16"	18
SH 1008	3/8"	16
SH 1009	7/16"	14
SH 1010	1/2"	13
SH 1012S	5/8"	11
SH 1023S	3/4"	10
SH 1024S	7/8"	9

WITHOUT SPRING

Part No.	SIZE	THREAD
SH 3016-0632	#6	32
SH 3016-0832	#8	32
SH 3016-1024	#10	24
SH 3016-1420	M6	20
SH 3006-0832	#8	32
SH 3006-1024	#10	24
SH 3006-1420	1/4"	20
SH 3007	5/16"	18
SH 3008	3/8"	16
SH 3009	7/16"	14
SH 3010	1/2"	13
SH 1012	5/8"	11
SH 1023	3/4"	10
SH 1024	7/8"	9



CHANNEL NUTS for SH 1000, SH 1100, SH 2000 and SH 3000 channels

WITH SPRING

Part No.	SIZE	THREAD
SH 4006-0832	#8	32
SH 4006-1024	#10	24
SH 4006-1420	1/4"	20
SH 4007	5/16"	18
SH 4008	3/8"	16
SH 4009	7/16"	14
SH 4010	1/2"	13
SH 4012S	5/8"	11
SH 4023S	3/4"	10

WITHOUT SPRING

Part No.	SIZE	THREAD
SH 3016-0632	#6	32
SH 3016-0832	#8	32
SH 3016-1024	#10	24
SH 3016-1420	M6	20
SH 3006-0832	#8	32
SH 3006-1024	#10	24
SH 3006-1420	1/4"	20
SH 3007	5/16"	18
SH 3008	3/8"	16
SH 3009	7/16"	14
SH 3013	1/2"	13
SH 4012	5/8"	11
SH 4023	3/4"	10

CHANNEL NUTS for SH 3300, SH 4000 and SN 4100 channels

SELF DRILLING SCREWS

SedeX STAINLESS STEEL

SedeX의 3大 MERIT

Excellent working
탁월한 작업성

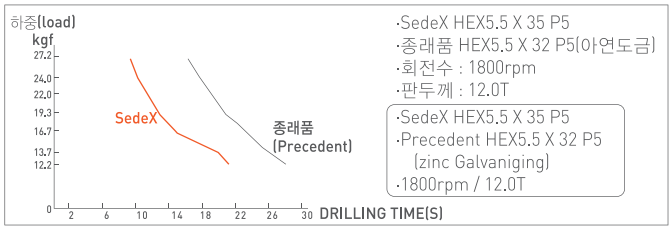
Superb durability
우수한 내식성

Outstanding bearing power
뛰어난 지지력

1. Excellent working

최적의 경도와 충분한 인성을 보유한 획기적 스텐레스 신소재 채택으로 절삭능력이 탁월합니다. 두께 12mm 철판에 드릴링시험에서 종래품과 비교해 체결시간 약 40% 단축하여 작업의 성력화, 공기단축에 크게 기여합니다. 쾌적한 작업, 성력화 이룩!

With stainless creative raw materials keeping an optimized solidity and enough nature, it has an excellent cutting ability. During a 12mm width steel board drilling test, compared with the precedent products, piercing time was reduced by 40%, So it reduces significantly the working excellence and construction time.



2. Superb durability

지금까지의 상식을 뛰어넘는 고내식성 실현, 해풍에도 산성비에도 발군의 내식성 보유, 일본 독일 규격의 염수분무시험 아황산가스시험결과에도 그 내식성이 증명되었습니다. 「SedeX」는보다 안전하고, 강력하고 오랜 기간동안 건축물을 지지합니다.

The highest durability achievement was never realized before. Regardless of a sea wind or an acid rain, excellent durability retention. The durability was proved during Japanese and German salt water spray, sulfurous gas standard test. Sedex is more safe, stronger, and supports construction structures for a long time.

염수분무시험 (JIS Z 2371·500HR)
Salt water spray test

아황산가스시험 (DIN 50018, SFW2.0S·20CYCLE)
Sulfur dioxide test

3. Outstanding bearing power

신소재가 가지는 최적의 경도, 인성으로 터프한 특성보유 종래품은 경도부족으로 인해 체결시 나사부가 50% 이상 변형이 발생하지만 「SedeX」는 최적의 경도, 인성을 보유하여 정확한 탭형성이 가능합니다. 이 때문에 모재에 대한 지지력이 약 2배 향상되어 건축물, 구조물의 안전도, 신뢰성이 크게 향상됩니다.

With new raw materials keeping optimized solidity and nature, tough character retention. Because of the insufficient solidity more than 50% the precedent products screw part was deformed. However, thanks to its optimized solidity and nature, Sedex is able to make precise molding. Owing to this point it had double improvement on the original subject. So its safety, reliability are improved on the construction structures and structure things.

지지력 Bearing Power	kgf	N
Sedex	1,428	13,494
타사제품 The Others	687	6,732

TEST SAMPLE Φ5.5 X 25 X 3.6T

SELF DRILLING SCREWS

BUGLE HEAD S.D.S TYPE BH-나팔머리 직결나사

번호 No.	호칭경 X 길이(인치) NOMINAL SIZE X L(Inch)	철판두께 STEEL THICKNESS
#6	3.5 X 25(1")	0.8 – 1.8
#6	3.5 X 32(1 1/4")	0.8 – 1.8
#6	3.5 X 38(1 1/2")	0.8 – 1.8
#6	3.5 X 41(1 5/8")	0.8 – 1.8
#6	3.5 X 47(1 7/8")	0.8 – 1.8
#7	3.8 X 50(2")	1.0 – 2.0
#7	3.8 X 60(2 3/8")	1.0 – 2.0
#7	3.8 X 65(2 5/8")	1.0 – 2.0
#7	3.8 X 75(3")	1.0 – 2.0

· 2PT▶두께 2.6T 미만 · 3PT▶두께 2.6T ~ 3.2T까지
· 2PT▶less than 2.6T · 3PT▶from 2.6T to 3.2T

용도 : 건축용으로 석고보드, 칩보드, 나무판 등을 0.8-2 두께의 철판(경량철 골조)에 부착하는데 사용하며 소재(석고보드 등)의 두께에 따라 길이를 선택합니다.
use : is used to adhere the gypsum board, chip board, wooden board to 0.8-2T steel plate and choose the length according to the material.

FLAT HEAD S.D.S TYPE FH-접시머리 직결나사

번호 No.	호칭경 X 길이(인치) NOMINAL SIZE X L(Inch)	철판두께 STEEL THICKNESS
	M3 X 13(1/2")	0.8 – 1.8
#8	4.2 X 16(5/8")부터	1.0 – 2.3
#8	4.2 X 50(2")부터	1.0 – 2.3

· 2PT▶두께 2.6T 미만 · 3PT▶두께 2.6T ~ 3.2T까지
· 2PT▶less than 2.6T · 3PT▶from 2.6T to 3.2T

용도 : 석고보드, 합판, 알미늄샤시 등의 부착.
use : to adhere to gypsum board, joint board, and aluminium chassis.

PAN HEAD S.D.S TYPE PH-팬머리 직결나사

번호 No.	호칭경 X 길이(인치) NOMINAL SIZE X L(Inch)	철판두께 STEEL THICKNESS
#8	4.2 X 13(1/2")	1.0 – 2.3
#8	4.2 X 16(5/8")	1.0 – 2.3
#8	4.2 X 25(1")	1.0 – 2.3
#8	4.2 X 32(1 1/4" 이상 2"까지)	1.0 – 2.3
#10	4.8 X 25(1")	1.0 – 3.0
#10	4.8 X 32(11/4" 이상 2"까지)	1.0 – 3.0

· 2PT▶두께 2.6T 미만 · 3PT▶두께 2.6T ~ 3.2T까지
· 2PT▶less than 2.6T · 3PT▶from 2.6T to 3.2T

용도 : 보일러, 콘테이너, 냉난방기구의 철판 외장조립
use : for assembling the outside-steel of boiler, container, cooling-heating equipment

PAN WASHER HEAD S.D.S TYPE PW-와퍼머리 직결나사

번호 No.	호칭경 X 길이(인치) NOMINAL SIZE X L(Inch)	철판두께 STEEL THICKNESS
#8	4.2 X 13(1/2")	1.0 – 2.3
#8	4.2 X 16(5/8")	1.0 – 2.3
#8	4.2 X 19(3/4")	1.0 – 2.3
#8	4.2 X 25(1")	1.0 – 2.3
#8	4.2 X 32(1 1/4")	1.0 – 2.3
#8	4.8 X 38(1 1/2")	1.0 – 2.3
#8	4.8 X 50(2")	1.0 – 2.3

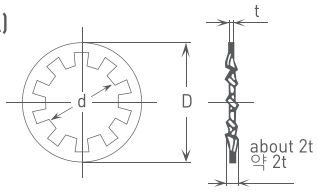
· 2PT▶두께 2.6T 미만 · 3PT▶두께 2.6T ~ 3.2T까지
· 2PT▶less than 2.6T · 3PT▶from 2.6T to 3.2T

용도 : 보일러외장 자동차 송풍기 닥트공사등 사용.
use : for the outside of boiler, air blower of car, DUCT

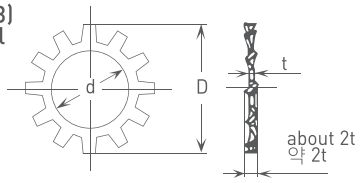
이붙이 WASHER

∘이붙이 WASHER
(KS B 1325, JIS B 1255)

내치형(A) Internal



외치형(B) Exrernal



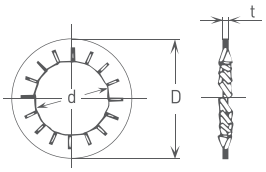
Unit: mm

Size No.		적용하는 나사지름 applicable serewΦ		d		D		t		잇수 No. of Tooth	
내치형 Internal	외치형 External	미터 Miter	인치 Inch	기준치수 Criteria figure	허용차 Allowable error	기준치수 Criteria figure	허용차 Allowable error	기준치수 Criteria figure	허용차 Allowable error	내치형 Internal	외치형 External
AW - 2	BW - 2	2	-	2.2	+0.2 0	4.8	0 -0.3	0.3	±0.025	7	8
2.3	2.3	2.3	-	2.5		5.3		0.3		7	8
2.5	2.5	2.5(2.6)	-	2.7		5.7		0.3		7	8
3	3	3	-	3.2		6.5	0 -0.4	0.45	±0.035	7	8
3.5	3.5	3.5	-	3.7		7.5		0.45		8	8
4	4	4	-	4.3		8.5		0.45		8	8
4.5	4.5	4.5	-	4.8		9.5		0.5		8	8
5	5	5	-	5.3		10		0.6	±0.04	8	10
6	6	6	-	6.4	+0.3 0	11	0 -0.5	0.6		9	12
7	-	7	-	7.4		13		0.8	±0.05	10	-
8	8	8	-	8.4		15		0.9		9	12
3/8	3/8	-	3/8	9.8		17.5		0.9		9	12
10	10	10	-	10.5	+0.4 0	18		0.9		9	12
7/16	7/16	-	7/16	11.4		19.5	0 -0.6	0.9		10	12
12	12	12	-	12.5		21		1	±0.055	10	12
1/2	1/2	-	1/2	13		22.5		1		10	12
14	14	14	-	14.5		23		1		10	12
16	16	16	5/8	16.5		26		1.2	±0.065	12	14
18	18	18	-	19	+0.5 0	29		1.2		12	14
3/4	3/4	-	3/4	19.6		32	0 -0.8	1.2		12	14
20	20	20	-	21		32		1.4	±0.07	12	14
22	22	22	7/8	23		35		1.4		14	16
24	24	24	-	25		38		1.6	±0.08	14	16
1"	1"	-	1"	26		41		1.6		14	16

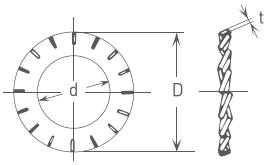
·재질 : 스프링강 또는 SPCC, 스텐레스강 ·경도 : HRC40~50 ·표면처리 : Zn도금(천연색 또는 백색 도금) ·주 1. t은 소재 두께입니다. 2. 잇수는 표준을 표시한 것이므로 다소의 증감이 있을 수 있음.
·Material : SPRING STEEL or SPCC, STAINLESS STEEL ·Hardness : HRC40~50 ·Surface-Treatment : ZINC GALVANIZING(Colored or White)
·Note 1. "t" is thickness. 2. The No. of tooth is a standard figure. Therefore there are able to be a little variation.

∘연치형 이붙이 WASHER

내치형(A) Internal



외치형(B) Exrernal



Unit: mm

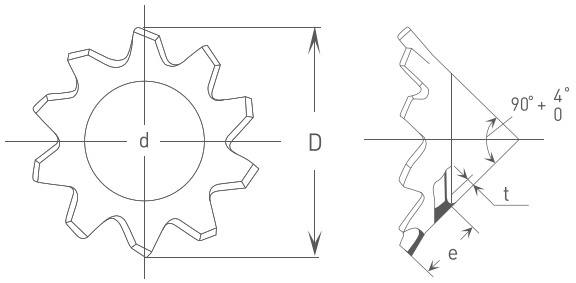
Size No.		적용하는 나사지름 applicable serewΦ		d		D		t		잇수 No. of Tooth	
내치형 Internal	외치형 External	미터 Miter	인치 Inch	기준치수 Criteria figure	허용차 Allowable error	기준치수 Criteria figure	허용차 Allowable error	기준치수 Criteria figure	허용차 Allowable error	내치형 Internal	외치형 External
JZ - 3	AZ - 3	3		3.05	+0.3 0	6	±0.24	0.4	±0.03	8	10
4	4	4	5/32	4.1		8	±0.29	0.5		8	12
5	5	5		5.1		9.2		0.6		8	12
6	6	6		6.1	+0.36 0	11	±0.35	0.7		10	12
8	8	8	5/16	8.2		14		0.8		12	14
10	10	10		10.2	+0.43 0	18		0.9		12	16
12	12	12		12.3		20	±0.42	1	±0.04	14	18
14	14	14		14.3		24		1.1		16	20
16	16	16	5/8	16.3		26		1.2		16	20
18	18	18		18.5	+0.52 0	30		1.4		16	20
20	20	20		20.5		32.5	±0.5	1.4		16	22
22	22	22	7/8	22.5		35		1.5	±0.05	18	22
24	24	24		24.5		38		1.5		20	24

·재질 : 스프링강 ·경도 : HRC40~50 ·표면처리 : 인산염피막(A.C.P), Zn도금(천연색 또는 백색 도금)
·Material : SPRING STEEL ·Hardness : HRC40~50 ·Surface-Treatment : A.C.P, ZN(Colored or White)

이붙이 WASHER

∘이붙이 WASHER
(JIS B 1255)

접시형(C) FLAT TYPE

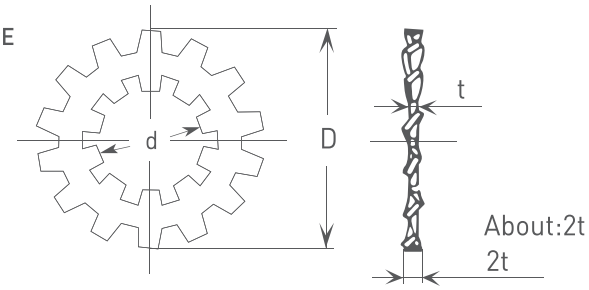


Unit: mm

Size No.	적용하는 나사지름 applicable serew Φ	d		D	e	t		잇수 No. of Tooth
		기준치수 Criteria figure	허용차 Allowable error	기준치수 Criteria figure	허용차 Allowable error	기준치수 Criteria figure	허용차 Allowable error	
CW - 3	3	3.2	+0.2 0	6	1.8	0.4	±0.03	8
3.5	3.5	3.7		7	2.1	0.4		8
4	4	4.3		8	2.5	0.4		8
4.5	4.5	4.8		9	1.7	0.5	±0.035	9
5	5	5.3		10	3.1	0.5		9
6	6	6.4	+0.3 0	12	3.8	0.5		10
8	8	8.4		16	5.1	0.6	±0.04	12

·재질 : 스프링강 또는 SPCC, 스텐레스강 ·경도 : HRC40~50 ·표면처리 : Zn도금(천연색 또는 백색 도금) ·주 1. t은 소재 두께입니다. 2. 잇수는 표준을 표시한 것이므로 다소의 증감이 있을 수 있음.
·Material : SPRING STEEL or SPCC, STAINLESS STEEL ·Hardness : HRC40~50 ·Surface-Treatment : ZINC GALVANIZING(Colored or White)
·Note 1. "t" is thickness. 2. The No. of tooth is a standard figure. Therefore there are able to be a little variation.

내외치형(AB)
INTERNAL/EXTERNAL TYPE



Unit: mm

Size No.	적용하는 나사지름 applicable serew Φ		d		D		t		잇수 No. of Tooth	
	미터 Miter	인치 Inch	기준치수 Criteria figure	허용차 Allowable error	기준치수 Criteria figure	허용차 Allowable error	기준치수 Criteria figure	허용차 Allowable error	내치형 Internal	외치형 External
ABW - 4	4	-	4.3	+0.2 0	15	0 -0.5	0.6	±0.04	8	12
4.5	4.5	-	4.8		15		0.6		8	12
5	5	-	5.3		15		0.6		8	12
5.5	5.5	-	5.8		17.5		0.8	±0.05	9	12
6	6	-	6.4	+0.3 0	17.5		0.8		9	12
8	8	-	8.4		22.5	0 -0.6	0.9		9	12
3/8	-	3/8	9.8		26		1	±0.055	9	14
10	10	-	10.5	+0.4 0	26		1		9	14
7/16	-	7/16	11.4		29		1		10	14
12	12	-	12.5		29		1		10	14
1/2	-	1/2	13		32	0 -0.8	1.2	±0.065	10	14
14	14	-	14.5		32		1.2		10	14
16	16	5/8	16.5		35		1.4	±0.07	12	16

·재질 : 스프링강 ·경도 : HRC40~50 ·표면처리 : 인산염피막(A.C.P), Zn도금(천연색 또는 백색 도금)
·Material : SPRING STEEL ·Hardness : HRC40~50 ·Surface-Treatment : A.C.P, ZN(Colored or White)

Chemical Requirements
화학적 요구사항

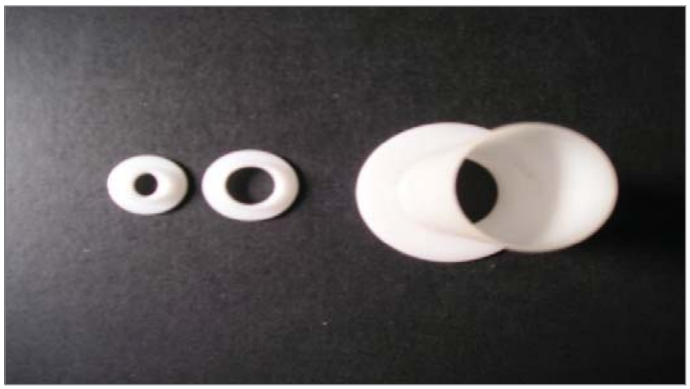
Specification Grade	C	Si	Mn	P Max	S Max	Ni	Cr	Mo	Vanadium
ASTM A193 Gr B7	0.37-0.49	0.15-0.35	0.65-1.10	0.035	0.04		0.75-1.20	0.15-0.25	
ASTM A193 Gr B7M	0.37-0.49	0.15-0.35	0.65-1.10	0.035	0.04		0.75-1.20	0.15-0.25	
ASTM A193 Gr B16	0.36-0.47	0.15-0.35	0.45-0.70	0.035	0.04		0.80-1.15	0.50-0.65	0.25-0.35
ASTM A193 Gr B8	Max 0.08	Max 1.00	Max 2.00	0.045	0.03	8.00-10.5	18.0-20.0		
ASTM A193 Gr B8M	Max 0.08	Max 1.00	Max 2.00	0.045	0.03	10.0-14.0	16.0-18.0	2.0-3.0	
ASTM A193 Gr B6	Max 0.15	Max 1.00	Max 1.00	0.045	0.03			11.5-13.5	
ASTM A320 Gr L7	0.38-0.48	0.15-0.35	0.75-1.00	0.035	0.04		0.80-1.10	0.15-0.25	
ASTM A320 GR L7M	0.38-0.48	0.15-0.35	0.75-1.00	0.035	0.04		0.80-1.10	0.15-0.25	
ASTM A320 Gr B8	Max 0.08	Max 1.00	Max 2.00	0.045	0.03	8.00-10.5	18.0-20.0		
ASTM A320 Gr B8M	Max 0.08	Max 1.00	Max 2.00	0.045	0.03	10.0-14.0	16.0-18.0	2.0-3.0	
ASTM A325 TYPE 1	0.28-0.55		Min 0.60	0.040	0.05		Boron Min 0.0005		
ASTM A325 TYPE 2	0.15-0.34		Min 0.70	0.040	0.05				
ASTM A354 Gr BC	0.30-0.53			0.035	0.04				
ASTM A354 Gr BD	0.30-0.53			0.035	0.04				
ASTM A449 TYPE 1	0.28-0.55		Min 0.60	0.040	0.05		Boron Min 0.0005		
ASTM A449 TYPE 2	0.15-0.38		Min 0.70	0.040	0.05				
ASTM A490 TYPE 1	0.30-0.48			0.040	0.04				
JIS G4303 SUS310S	Max 0.08	Max 1.50	Max 2.00	0.045	0.03	19.0-22.0	24.0-26.0		
JIS G4105 SCM 435	0.33-0.38	0.15-0.35	0.60-0.85	0.030	0.03		0.90-1.20	0.15-0.30	
JIS G4105 SCM 440	0.38-0.43	0.15-0.35	0.60-0.85	0.030	0.03		0.90-1.20	0.15-0.30	
JIS G4107 SNB 5	Min 0.10	Max 1.00	Max 1.00	0.040	0.03		4.00-6.00	0.40-0.65	
JIS G4107 SNB 7	0.38-0.48	0.20-0.35	0.75-1.00	0.040	0.04		0.80-1.10	0.15-0.25	
JIS G4107 SNB 16	0.36-0.44	0.20-0.35	0.45-0.70	0.040	0.04		0.80-1.15	0.50-0.65	0.25-0.35
JIS G4051 S45C	0.42-0.48	0.15-0.35	0.60-0.90	0.040	0.035				
ASTM A194 Gr 2H	Min 0.40	Max 0.40	Max 1.00	0.040	0.05				
ASTM A194 Gr 2HM	Min 0.40	Max 0.40	Max 1.00	0.040	0.05				
ASTM A194 Gr 7M	0.37-0.49	0.15-0.35	0.65-1.10	0.040	0.04		0.75-1.20	0.15-0.25	
ASTM A194 Gr 4	0.40-0.50	0.15-0.35	0.70-0.90	0.035	0.04			0.20-0.30	
ASTM A194 Gr 7	0.37-0.49	0.15-0.35	0.65-1.10	0.040	0.04		0.75-1.20	0.15-0.25	
ASTM A194 Gr 8	Max 0.06	Max 1.00	Max 2.00	0.045	0.03	8.00-10.5	18.0-20.0		
ASTM A194 Gr 8M	Max 0.08	Max 1.00	Max 2.00	0.045	0.03	10.0-14.0	16.0-18.0	2.00-3.00	
ASTM A563 Gr A.B.C	Max 0.55			0.012	0.15				
ASTM A563 Gr Gr D	Max 0.55		Min 0.30	0.040	0.05				
ASTM A563 Gr Gr DH	0.20-0.55		Min 0.60	0.040	0.05				

Mechanical Requirements
기계적 요구사항

Specification Grade	Diameter inch (mm)	Tensile Strength Min	Yiled Strength Min	E.L % Min	R.A % Min	Hardness			Tempering Temp"F ("C) Min
						HB	H.B	H.C	
A193 Gr B7	2½ and under	125,000 psi	100,000 psi	16	50				1,100 (593)
	Over 2½ to 4	115,000 psi	95,000 psi	16	50				1,100 (593)
A193 Gr B7M	2½ and under	105,000 psi	80,000 psi	18	50	200-235	93-99		1,150 (620)
A193 Gr B16	2½ and under	125,000 psi	105,000 psi	18	50	253-319		25-34	1,200 (650)
	Over 2½ to 4	110,000 psi	95,000 psi	17	45	353-319		25-34	1,200 (650)
A193GrB8. B8M	All diameters	75,000 psi	30,000 psi	30	50	Max 223	Max 96		
A193 Gr B6	Up to 4	110,000 psi	85,000 psi	15	50				1,100 (593)
A320 Gr L7	2½ and under	125,000 psi	105,000 psi	16	50				
A320 Gr L7M	2½ and under	100,000 psi	80,000 psi	18	50	Max 235	Max 99		1,150 (620)
A320GrB8. B8M	All diameters	75,000 psi	30,000 psi	35	50	Max 223	Max 96		
A325	½ to 1	120,000 psi	92,000 psi			248-331		24-35	800 (427)
	1⅛ to 1½	105,000 psi	81,000 psi	14	35	223-293		19-31	800 (427)
A354 Gr BC	¼ to 2½	125,000 psi	109,000 psi	16	50	255-331		26-36	800 (427)
	Over 2½	115,000 psi	99,000 psi	16	45	235-311		22-33	800 (427)
A354 Gr BD	¼ to 2½	150,000 psi	130,000 psi	14	40	311-363		33-39	800 (427)
	Over 2½	140,000 psi	115,000 psi	14	40	293-363		31-39	800 (427)
A449	¼ to 1	120,000 psi	92,000 psi	14	35	255-321		25-34	800 (427)
	Over 1 to 1½	105,000 psi	81,000 psi	14	35	223-285		19-30	800 (427)
	Over 1½ to 3	90,000 psi	58,000 psi	14	35	183-235			800 (427)
A490	½ to 1½	150-170 ksi	130,000 psi	14	40	311-352		33-38	800 (427)
JIS SUS 310S		53 kgf/mm²	21 kgf/mm²	40	50	Max 187	Max 90		
JIS SCM 435		95 kgf/mm²	80 kgf/mm²	15	50	269-331		29-35	(530-630)
JIS SCM 440		100 kgf/mm²	85 kgf/mm²	12	45	285-352		29-39	(530-630)
JIS SNB 5		70 kgf/mm²	56 kgf/mm²	16	50				(595)
JIS SNB 7	Up to 63(mm)	88 kgf/mm²	74 kgf/mm²	16	50				(595)
	Over(63)to(100)	82 kgf/mm²	67 kgf/mm²	16	50				(595)
JIS SNB 16	Up to 63(mm)	88 kgf/mm²	74 kgf/mm²	18	50				(650)
	Over(63)to(100)	77 kgf/mm²	67 kgf/mm²	17	50				(650)
JIS S45C		70 kgf/mm²	50 kgf/mm²	17	45	201-269		14.5-27	(550-650)
A194 Gr 2						159-352	Min 84		1,000 (538)
A194 Gr 2H	To 1½					248-352		24-38	850 (455)
	Over 1½					212-352	Min 95	Max 38	850 (455)
A194 Gr 2HM						159-237		Max 22	1,150 (620)
A194 Gr 6						228-271		20-28	1,100 (595)
A194 Gr 7M						159-237		Max 22	1,100 (595)
A194 Gr 4.7						248-352		24-38	1,100 (595)
A194 Gr 8.8M						126-300	60-105		
A563 Gr A	¼ to 4					116-302	Min 68	Max 32	
A563 Gr B	¼ to 1 ½					121-302	Min 69	Max 32	
A563 Gr C	¼ to 4					143-352	Min 78	Max 38	800 (427)
A563 Gr D	¼ to 4					159-352	Min 84	Max 38	800 (427)
A563 Gr DH	¼ to 4					248-352		24-38	800 (427)

LNG CARRIERS
PUMP TOWER CABLE MOUNTED

Insulation KIT

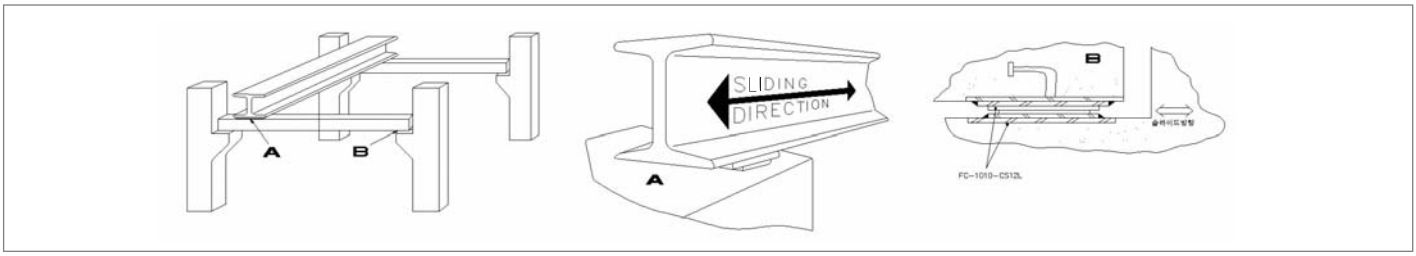


Ball Valve Seat

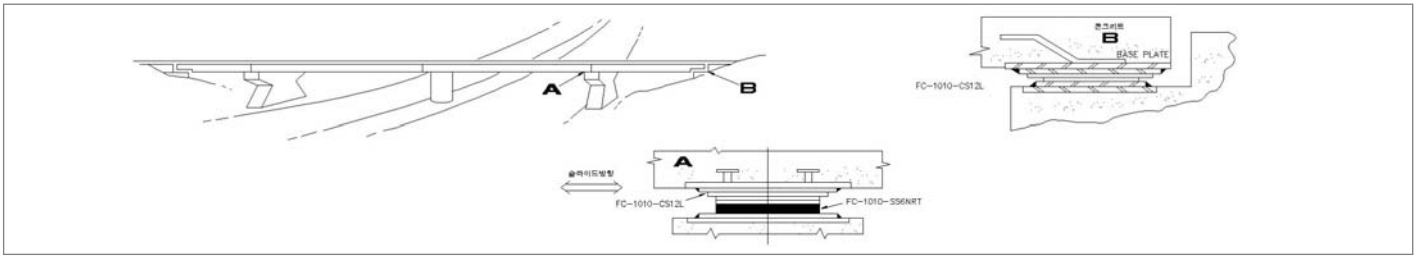
U-Bolt Coating

SLIDING PAD
일반배관용(절연U-BOLT, PAD)

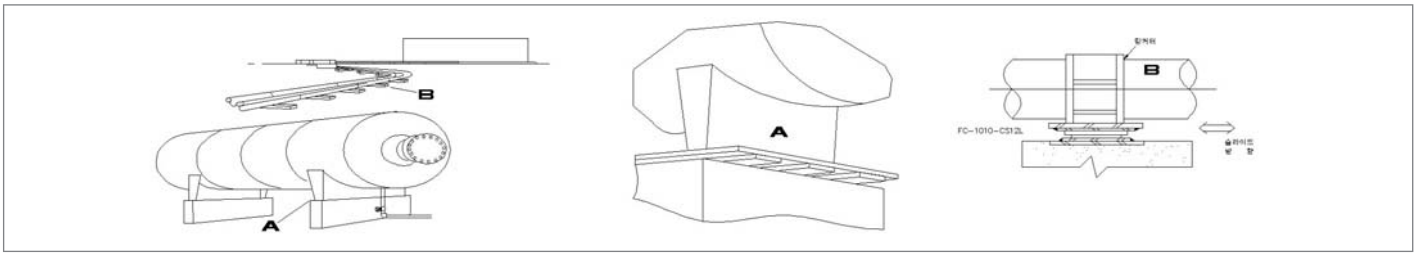
○건축, 구조물에의 응용



○교량관계에의 응용

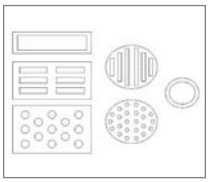


○석유화학에의 응용

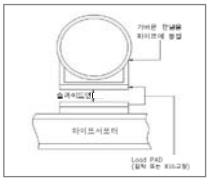


○사용 예

Load-PAD

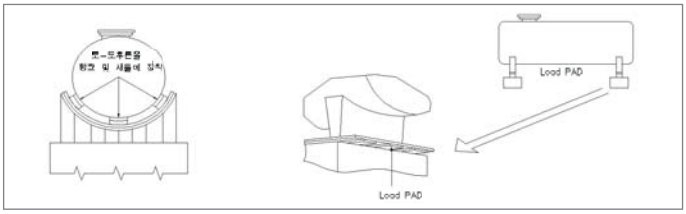


파이프슬라이드

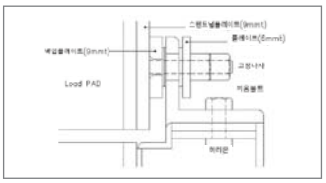


철골구조물

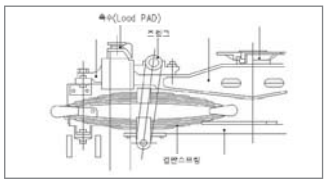
탱크 예



카팅홀



P.T.F.E사용 예



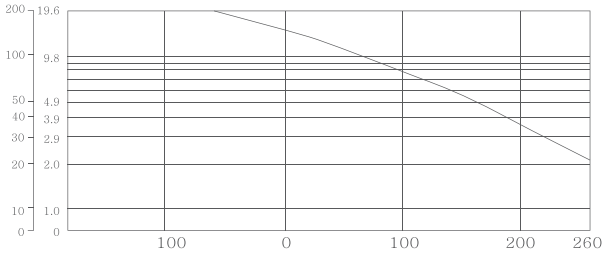
○사용 예

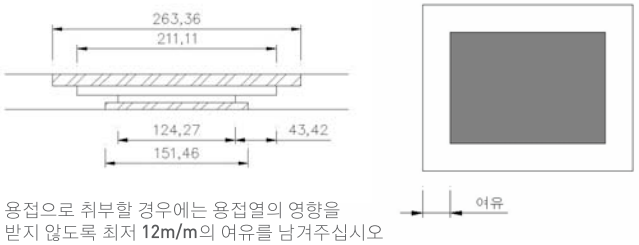
Insulation GASKET .KIT
인슐레이션 GASKET · KIT

설계순서

① 베아링 플레이트에 걸리는 하중, 온도 이동량을 산출해 주십시오.
② 베아링 플레이트에 가해지는 특별한 영향(휨, 굴곡)의 유무에 의해 SUPER GOLD의 형식을 정해주십시오.
③ 베아링 플레이트의 취부방법을 정해주십시오.
④ 온도와 하중의 관계로부터 하측의 베아링 플레이트의 면적(촌법)을 결정해 주십시오.
전체면에 일정한 접촉을 기대하기 힘든 경우에는 안전율을 2이상으로 해주십시오.
⑤ 이동량에 따라 위쪽 베아링 플레이트의 면적(촌법)을 결정해 주십시오.

SUPER GOLD의 온도와 허용 면압의 관계





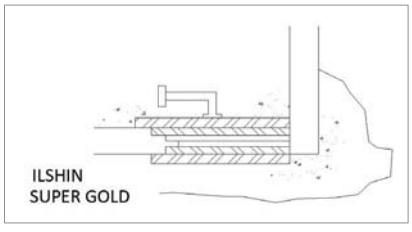
용접으로 취부할 경우에는 용접열의 영향을
받지 않도록 최저 12m/m의 여유를 남겨주십시오

취부상의 주의

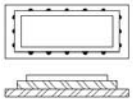
SUPER GOLD 공장에서 금속판과 견고하게 접합되어 있기 때문에 취부는 간단합니다.

- **절단:** 정해진 촌법으로부터 적당한 치수의 절단은 콘타머신 또는 기계톱으로 절단해 주십시오. 가스절단 또는 샤링머신은 피해주십시오.
(하중 및 용접상의 문제 때문에 폭 치수는 50mm이상으로 해주십시오)

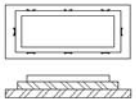
- **용접:** 1. 용접 법은 3.2mm이하의 것을 사용해 주십시오.
2. 용접 시에는 후로로골드에 겹쳐서 포장되어 있어 소프트 페이퍼를 가볍게 물에 적셔, 후로로골드면을 보호해가며 용접해 주십시오. (적신 천으로도 충분합니다.)
3. 가스용접은 피해 주십시오.
4. 용접방법의 종류



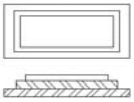
(1) 소프트 용접



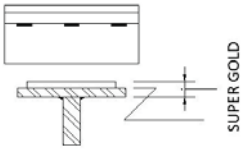
(2) 태그 용접



(3) 풀(전체) 용접



(4) 배면 용접

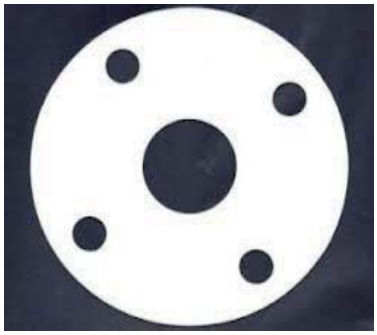


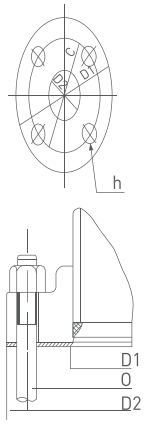
주 1) 배면용접의 경우에는 금속두께 16mm이상의 깃을 사용해 주십시오.
2) 용접 후에는 방식도장을 충분히 시공해 주십시오.

피스고정, 볼트고정
나사머리가 습동면에 돌출되지 않도록 주의해 주십시오.

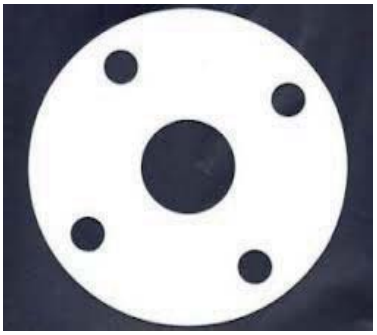
Gasket

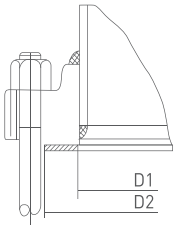
PTFE Ring Gasket (RF)



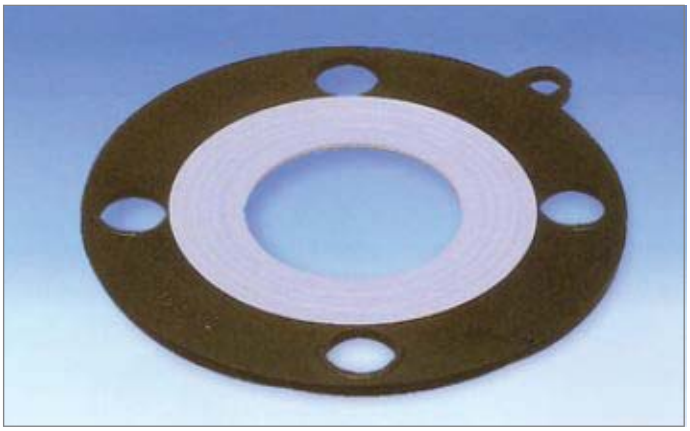


PTFE Ring Gasket (FF)



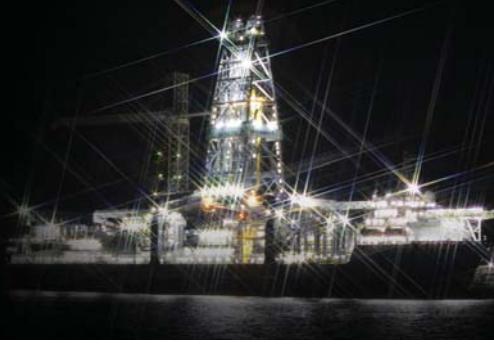


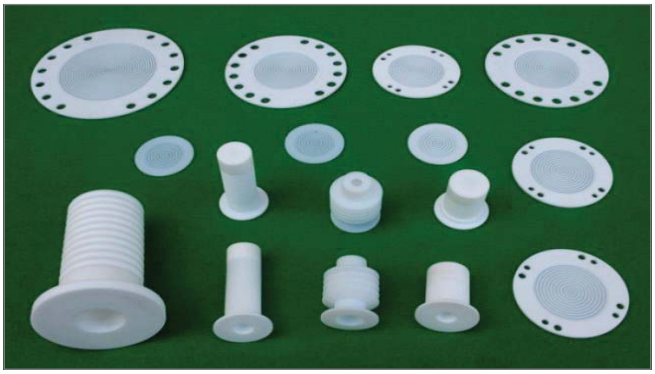
PTFE CUSHION Gasket

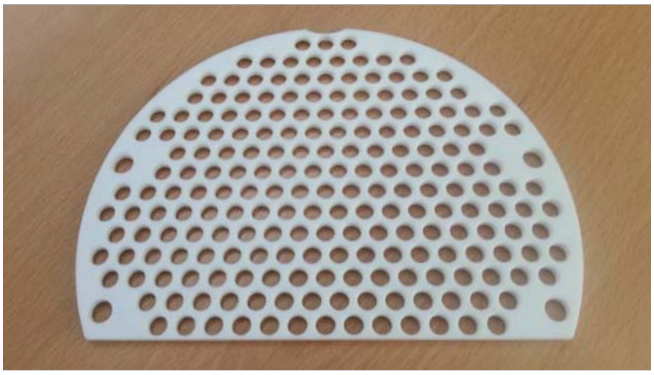


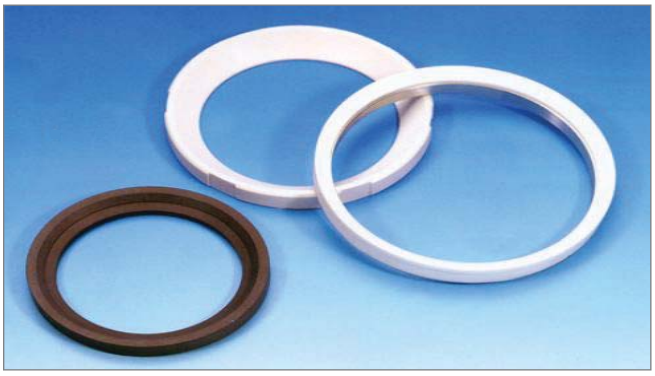
Plastic Flange Fasket (RF, FF)

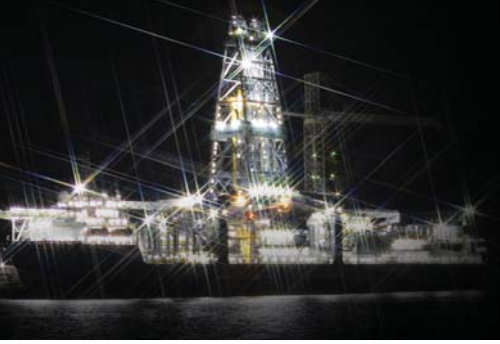
PTFE Processing Products
PTFE 가공제품







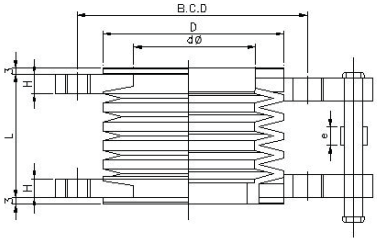


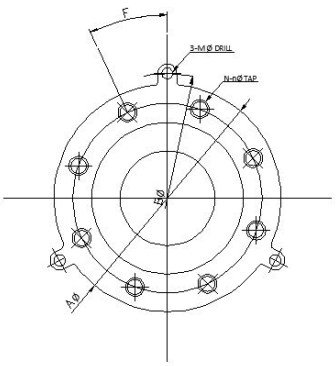


PTFE Processing Products

PTFE BELLOWS

ILLUSTRATION NAME ISB NO. CONSTRUCTION SPECIFICATION





I.S.T.B M3301 Machined Bellows	DESCRIPTION	Bellows machined from I.S.T.B sleeve.
	APPLICATIONS	Bellows for valve and measuring instrument. For expansion joint having special mouth piece.
	SIZE	Reference. Standards.

unit : mm

	dΦ	DΦ	L		AΦ	BΦ	BCD	H	F°	l		MΦ	N-nΦ
			3山	7山						3山	7山		TAP
20A(3/4B)	19	39	36~41	47~58	100	130	75	14	45	2	14	11	4-M12
25(1)	28	51	36~44	50~65	125	155	90	14	45	2	16	11	4-M16
40(1 1/2)	42	69	40~50	54~74	140	170	105	16	45	2	16	11	4-M16
50(2)	54	83	40~51	54~77	155	185	120	16	45	2	16	11	4-M16
80(3)	82	115	44~57	58~86	185	220	150	18	22.5	2	16	14	8-M16
100(4)	101	140	47~60	59~96	210	250	175	18	22.5	5	17	14	8-M16
125(5)	127	167	52~66	70~106	250	290	210	20	22.5	5	24	18	8-M20
150(6)	156	197	52~69	70~106	280	320	240	22	22.5	2	20	18	8-M20
200(8)	200	247	52~72	70~116	330	370	290	22	15	2	20	18	12-M20
250(10)	255	305	52~77	76~124	400	450	355	24	15	2	22	21	12-M22
300(12)	303	354	56~84	80~130	445	490	400	24	11.25	10	26	21	16-M22
350(14)	340	395	64~90	84~136	490	535	455	26	11.25	10	26	2	16-M22
400(16)	393	453	68~101	87~150	560	605	510	28	11.25	11	25	21	6-M24

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Designed by seesunplus 2012.10