

Better Than NEEDS

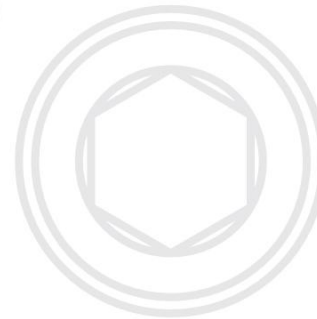


SUPPLIER CERTIFICATE



엠케이폴렉스(주)

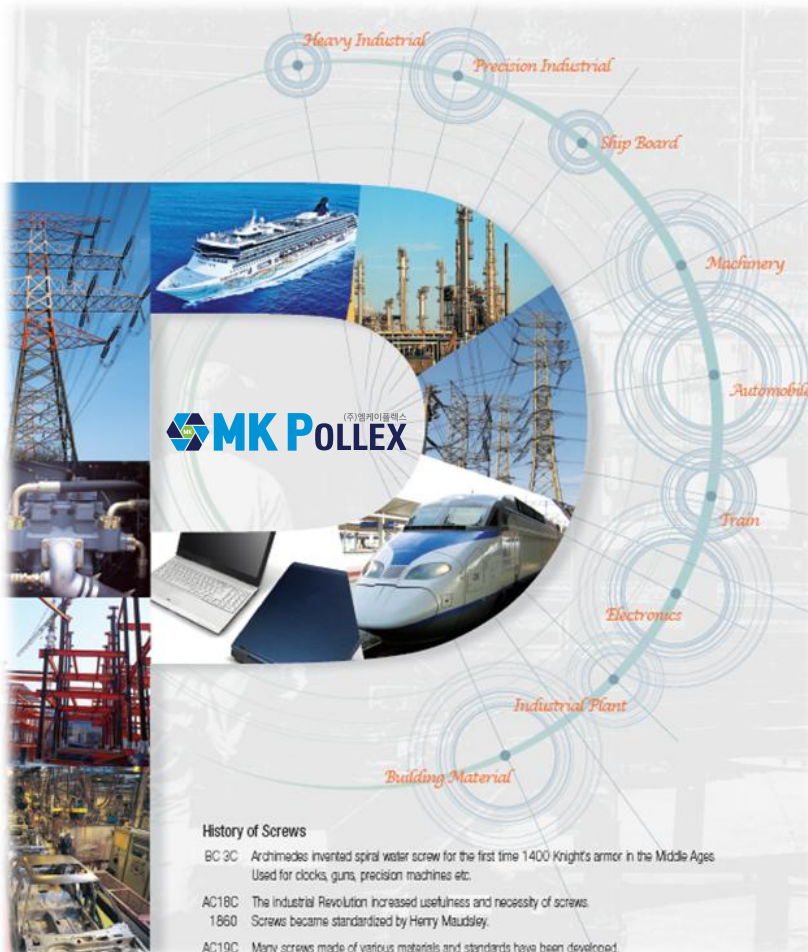
MK POLLEX





1-1. Company Introduction-[회사소개]

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1-1. Company Introduction-[회사소개]



i . General Information [일반현황]



Company Name 회사명	MK POLLEX CO.,LTD. 엠케이폴렉스(주)	establishment date 설립일	April 22, 2003 2003년 4월 22일
Address 주소	#831-22 Jugok-ri, Ujeong-eup, Hwaseong-City, Gyeonggi-do Korea 경기도 화성시 우정읍 매바위로 76(우정읍 주곡리 831-22번지)		
Phone Number	031-351-6450	Fax Number 팩스	031-351-6474
Home page	www.plx.co.kr	E-mail	master@plx.co.kr sales@plx.co.kr
Business conditions	Manufacture 제조/도매	Items	Bolt, Cold Forged part, Trade 볼트/냉간단조품



1-1-2. Company Introduction-[회사소개]

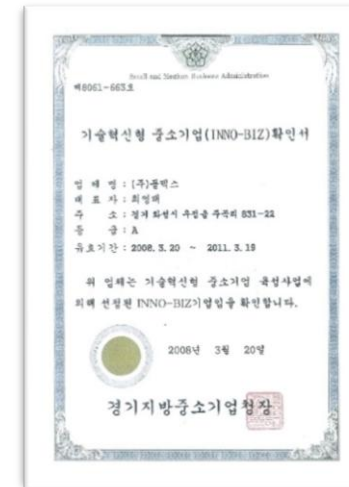
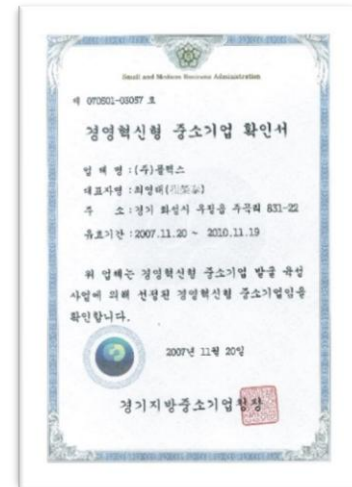
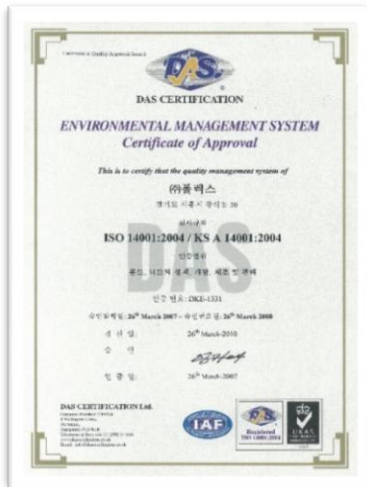
조직도 Organization chart





1-2. Company Introduction-[회사소개]

Certification and patent status





1-2. Company Introduction-[회사소개]

미국 기계학회 교육수료 인증서



The American Society of Mechanical Engineers

— Founded 1880 —

THIS CERTIFICATE IS AWARDED TO

Young Tae Choi **최영태**

FOR SUCCESSFUL COMPLETION OF

Bolted Joint Assembly Principles Per PCC-1-2013

October 11-12, 2018

Seoul, Korea

16 Hours



Thomas Costabile P.E.
Executive Director



Arin Ceglia
Director, Learning & Development





1-3-1. Company Introduction-[연혁]

ii. History of POLLEX

- 2003.04** 창업- socket bolt류 전문 제조업체
Established Pollex - [Professional manufacturer of socket bolts](#)
- 2005.05** 볼보건설기계코리아 six point screw 개발 및 양산
Volvo Construction Equipment Korea Co., Ltd. - [Six-Point Screw Development](#)
- 2005.10** 액추레이터 부품용 제품개발
Valve Actuator Parts Development - [Stainless Socket Bolt](#)
- 2005.11** (주)만도 조향사업부 금형용 볼트납품
Mando Co., Ltd. Business registration/transaction - [Delivery of consumable bolts](#)
- 2006.12** 계양전기(주) 전동공구 제품개발 및 양산공급
Developed and mass-produced socket bolts for heavy equipment (for BREAKER)
- 2006.12** [화성공장 준공](#)
Construction of Hwaseong Plant
- 2007.05** 삼성전기(주) 필리핀 세필 현지법인 ODD 광디스크 드라이브 부품 수출
Export of ODD optical disk drive parts - [Philippines SEPHIL / SAMSUNG ELCTORONICAL CO., LTD](#)
- 2008.09** 전자기기연결용 잭 터미널 제조공법 특허등록
Manufacturing method of jack terminal for connecting electronic devices - [Patent registration](#)
- 2009.11** 계양전기(주) 중국현지법인 전동공구 부품개발
Gyeyang Electric Co., Ltd. China - [Development of grinder \(100 / 125MM\) parts](#)



ii. History of POLLEX

- 2009.10** 송전탑 사업부문 진출 – 한국전력공사 송전탑 자재공급 자격획득
Entry into the steel tower business
- Registered as a qualified company for supply of steel towers of KEPCO
- 2011.03** 자동화 장비업체 니켈 도금 소켓볼트 양산체제구축
Mass production of nickel surface-treated socket bolts for FA companies
- 2011.11** 일본 히타찌 ODD 픽업용 SET SCREW 개발/납품
Japan HITACHI, SONY parts development - Set screw / M2*2.2
- 2013.09** 교통 방음벽 풀림방지용 신기술(NPT) 적용 풀림방지용 볼트 세트 개발
Development of fastening elements for traffic-related new technology sound barrier
- Anti-loosening bolt
- 2014.01** 열교환기(HRSG) / 압력용기 관련 ASTM(ANSI) 규격 제품 양산 공급
Sales of ASTM standard products for heat exchanger / pressure vessel
- ASTM A193, A194, A307, A325, A490, A563, F436, F155
- 2014.05** 일본 니산스크류 한국법인 공급협약 체결
Japan NISSAN SCREW Supply Agreement and Product Development / Mass Production Collaboration
- 2015.06** 대우건설 요르단 원자력건설 격납POOL DOOR PLATE 납품
Delivery of Daewoo E & C - Jordan Nuclear Power Construction Storage POOL DOOR Plate
- 2016.03** 삼성반도체 /하이닉스/LG디스플레이 벤더 장비 조립용 체결요소 양산 공급
Mass-production of fasteners for assembly of Samsung Semiconductor / Hynix/LG Display vendors



ii. History of POLLEX

- 2016.07** 한국수력 원자력 아톰 멘토링 사업 대상 협력업체 선정
Selection of partners for Korea Hydro & Nuclear Power Plant [ATOM mentoring project](#)
- 2016.12** 아이마켓코리아 MRO업체 등록 및 납품
Registration and delivery of iMarket Korea MRO company
- 2017.01** 회사명 MK폴렉스(주)로 개명
Name changed to company name MK POLEX CO., LTD.
- 2017.03** 양면 와셔(반도체장비 파티클 발생 방지 와셔)개발
[Development of two-sided washers \(anti-particle equipment particles\)](#)
- 2017.06** 반도체 공정장비 및 검사장비 제작업체 파인텍(주) ICD(주) 거래시작
Start of trading ICD with FineTec, a manufacturer of semiconductor process equipment and inspection equipment
- 2018.01** 축산기자재 니플 급수기 냉간단조품 3종 개발
Development of Cold-Formed Components for Nipple Water Supply System
- 2018.05** 풀림 방지용 와셔 특허등록
Patent registration for washers to prevent loosening
- 2018.09** 단 방향 보안 스크류(도난방지 및 개방방지) 제품개발
[Development of one-way security screws \(anti-disaster and anti-open\)](#)
- 2018.10** 일본 오사카 엠텍 전시회 출품 KEYENCE 업체등록 진행중
Exhibition of M- TECH Osaka, Japan (KEYENCE, IKEDA METAL COMPANY Registration ongoing)



1-4-1. PRODUCTION EQUIPMENT-[설비현황]



1.FORGING MACHINE
FORMER(포머)



FORGING MACHINE
HEADER(헷더)



3. ROLLING MACHINE
(로링기)



4. CNC MACHINE
(가공기)



5. HEAT TREATMENT FURNACE
OUT SOURCING



6. SURFACE TREATMENT
EQUIPMENT
OUT SOURCING



1-4-2-1. EQUIPMENT LIST-[생산설비]

COLD FORGING MACHINE (FORMER, HEADER)

NO	MACHINE	MANUFACTURE	MODEL	DIA	TYPE	SPECIFICATION			OUTPUT (KW)	DATE OF PUR R	LOCATION
						RPM	P/HOUR	LENTH			
1	FORMER	GERMANY	BF4	M16	4D-4P	60	3,600	150	22	2007	F1
2	HEADER	TAEJIN	HS1-3	M12	1D-3B	30	1,800	180	15	2007	F1
3	HEADER	HAHSHIN	HS2-3	M8	2D-3B	80	4,800	120	11	2005	F1
4	HEADER	HAHSHIN	HS2-3	M6	2D-3B	90	5,400	80	3	2012	F1
5	HEADER	HAHSHIN	HS2-3	M4	2D-3B	90	5,400	50	2.2	2002	F1
6	HEADER	TAEJIN	HS1-3	M6	1D-3B	60	3,600	80	3	2005	F1
7	HEADER	TAEJIN	HS1-3	M4	1D-3B	70	4,200	50	2.2	2005	F1
8	FORMER	TAEJIN	BF4	M6	4D-4P	120	7,200	50	7.5	2008	F2
9	FORMER	TAEJIN	BF4	M8	4D-4P	120	7,200	60	7.5	2008	F2
10	FORMER	TAEJIN	BF4	M10	4D-4P	120	7,200	80	7.5	2008	F2
11	FORMER	TAEJIN	BF4	M12	4D-4P	120	7,200	60	7.5	2008	F2
12	FORMER	JYOTO	NF4	M2	4D-4P	120	7,200	10	2	2008	F2
13	FORMER	TAEJIN	NF4	M6	4D-4P	120	7,200	25	7.5	2012	F2
14	FORMER	TAEHWA	BF3	M4	3D-3P	120	7,200	40	7.5	2005	F1
15	FORMER	SAGAMURA	NF3	M6	3D-3P	120	7,200	20	7.5	2005	F1
16	HEADER	DAEWOO	HS13	M3	1D-3B	80	4,800	20	1.5	2012	F1
17	FORMER	JYOTO	NF5	M10	5D-5P	120	7,200	45	15	2012	F1
18	HEADER	HANSHIN	HS1-2	M3	1D-2B	120	7,200	30	1.5	2005	F2
19	HEADER	HWASUNG	HS1-3	M8	1D-3B	50	3,000	120	7.5	2012	F2
20	HEADER	HWASUNG	HS1-3	M6	1D-3B	60	3,600	80	3	2012	F2



1-4-2-2. EQUIPMENT LIST-[생산설비]

THREADING (ROLLING)

NO	MACHINE	MANUFACTURE	MODEL	DIA	TYPE	SPECIFICATION			OUTPUT	DATE OF PUR	LOCATION
						RPM	P/HOUR	LENTH	(KW)		
1	ROLLING MACHINE	JINSAN	RF6	M6	F	80	4,800	65	3.7	2005	B
2	ROLLING MACHINE	HEESUNG	RFE6	M6	F	150	9,000	45	5.5	2014	B
3	ROLLING MACHINE	HEESUNG	RF6	M6	F	80	4,800	75	5.5	2012	B
4	ROLLING MACHINE	NISSEI	RF12	M12	F	60	3,600	102	11	2008	B
5	ROLLING MACHINE	JINSAN	RF2	M2.5	F	160	9,600	25	0.75	2005	B
6	ROLLING MACHINE	JINSAN	RF2	M2.5	F	160	9,600	25	0.75	2012	B
7	ROLLING MACHINE	TAEJIN	RF3	M3	F	120	7,200	32	1.5	2005	B
8	ROLLING MACHINE	TAEJIN	RF3	M3	F	120	7,200	32	1.5	2005	B
9	ROLLING MACHINE	BOSUNG	RF4	M4	F	100	6,000	52	1.5	2007	B
10	ROLLING MACHINE	HEESUNG	RR2	M8	2R	60	3,600	50	5.5	2008	B
11	ROLLING MACHINE	DAITO	RF6	M6	F	80	4,800	52	3.7	2012	B
12	ROLLING MACHINE	HEESUNG	RFE8	M8	F	120	7,200	60	7.5	2014	B
13	ROLLING MACHINE	JINSAN	RF3	M3	F	120	7,200	32	0.75	2005	2F



1-4-2-3. EQUIPMENT LIST-[생산설비]

PLATE ROLL'G MACHINE

NO	MACHINE	MANUFACTURE	MODEL	DIA	TYPE	SPECCIFICATION			OUTPUT (KW)	DATE OF PUR	LOCATION
						RPM	P/HOUR	LENGTH			
1	PLATE ROLL' G MACHINE	TAEJIN	TL2	M2-3	Φ 1.72	120	7,200	12	0.75	2005	2F
2	PLATE ROLL' G MACHINE	TAEJIN	TL3	M2-3	Φ 1.72	120	7,200	12	0.75	2006	2F
3	PLATE ROLL' G MACHINE	TAEJIN	TL4	M2-4	Φ 1.72	120	7,200	12	0.75	2005	2F
4	PLATE ROLL' G MACHINE	TAEJIN	TL4	M2-4	Φ 1.72	120	7,200	12	0.75	2005	2F
5	PLATE ROLL' G MACHINE	TAEJIN	TL4	M4-5	Φ 1.72	120	7,200	12	0.75	2006	2F
6	PLATE ROLL' G MACHINE	TAEJIN	TL5	M4-5	Φ 1.72	120	7,200	12	0.75	2007	2F
7	PLATE ROLL' G MACHINE	TAEJIN	TL5	M3-5	Φ 2.60	120	7,200	12	0.75	2007	2F
8	PLATE ROLL' G MACHINE	TAEJIN	TL5	M3-5	Φ 2.60	120	7,200	12	0.75	2005	2F
9	PLATE ROLL' G MACHINE	TAEJIN	TL8	M5-8	Φ 4.60	120	7,200	12	0.75	2007	2F
10	PLATE ROLL' G MACHINE	TAEJIN	TL8	M5-8	Φ 4.60	120	7,200	12	0.75	2006	2F



1-4-3. EQUIPMENT LIST-[생산설비]

ROLLING MACHINE (SEMS)

NO	MACHINE	MANUFACTURE	MODEL	DIA	TYPE	SPECIFICATION			OUTPUT	DATE OF PUR	LOCATION
						RPM	P/HOUR	LENGTH	(KW)		
1	SEM'S ROLLING MACHINE	JINAP	CH8	M8	수직	60	3,600	45	0.75	2009	B
2	SEM'S ROLLING MACHINE	JINAP	CH6	M6	수직	80	4,800	45	0.75	2009	B
3	SEM'S ROLLING MACHINE	JINBU	CF5	M5	수평	80	4,800	45	0.75	2009	B
4	SEM'S ROLLING MACHINE	JINBU	CF4	M4	수평	80	4,800	45	0.75	2009	B
5	SEM'S ROLLING MACHINE	JINBU	CF3	M3	수평	80	4,800	45	0.75	2009	B
1	SEM'S ROLLING MACHINE	YUJIN	RF8	M8	F	80	4,800	45	7.5	2009	B
2	SEM'S ROLLING MACHINE	YUJIN	RF6	M6	F	100	6,000	52	3.7	2009	B
3	SEM'S ROLLING MACHINE	YUJIN	RF6	M6	F	100	6,000	52	3.7	2009	B
4	SEM'S ROLLING MACHINE	YUJIN	RF6	M6	F	120	7,200	52	3.7	2009	B
5	SEM'S ROLLING MACHINE	DAEHAN	RF3	M3	F	120	7,200	27	0.75	2009	B



1-4. INSPECTION EQUIPMENT-[검사 설비현황]



1. ROCKWELL
HARDNESS TESTER



2. UNIVERSAL TESTING
MACHINE



3. METAL MICROSCOPE



4. PLATING
THICKNESS TESTER



5. VERNIER CALIPERS



6. MICROMETER



7. RING GAUGE



8. SALT SPRAY
TESTING MACHINE



1-5. PRODUCTION INSPECTION CERTIFICATE

[공인인증기관 제품성적서]



Test report of The Official Test Facilities

BEYOND ASIAN HUB, TOWARD GLOBAL WORLD

KTR KOREA TESTING & RESEARCH INSTITUTE

TEST REPORT

우 13810 경기도 과천시 교육로 98(중양동) TEL (032)5709-700 FAX (032)575-5613

성적서번호 : TAK-2018-077337 접수 일자 : 2018년 05월 14일
대표자 : 최진재팀 시험완료일자 : 2018년 05월 25일

업체명 : 영케이폴렉스(주)
주소 : 경기 화성시 우정읍 매바위로 76

시료명 : 금속시험(SUS 산처리 유두렌치)

시험결과

시험항목	단위	시료구분	결과치	시험방법
중장영수분무시험(12h, 적독발생유무)	-	n1	이상없음	KS D 9502 : 2009
중장영수분무시험(12h, 적독발생유무)	-	n2	이상없음	KS D 9502 : 2009

-용도 : 제출용

비고 : 1. 이 성적서는 의뢰자가 제시한 시료 및 시료명으로 시험한 결과로써 전체 제품에 대한 품질을 보증하지 않으며, 성적서의 진위확인용 홈페이지(www.ktr.or.kr) 또는 QR code로 확인 가능합니다.
2. 이 성적서는 홍보, 선전, 광고 및 소송용 등으로 사용할 수 없으며, 용도 이외의 사용을 금합니다.
3. 이 성적서는 원본(재발행 포함)만 유효하며, 사본 및 전자 인쇄본/파일본은 결과치 참고용입니다.

Choo Kyunghan 작성자 : 조경환
Tel : 02-2092-3656

Kwon Seong-il 기술책임자 : 권성일
Tel : 1577-0091(AIRS ①~④)

2018년 05월 25일

KTR 한국화학융합시험연구원

위변조 확인용 QR code

Page : 1 of 1

전자문서본은 시험결과에 대한 참고용입니다. 전자문서본(Electronic Copy)

KTR KOREA TESTING & RESEARCH INSTITUTE KTR-QP-T09-F01-02(08) A4(210 X 297)

BEYOND ASIAN HUB, TOWARD GLOBAL WORLD

KTR KOREA TESTING & RESEARCH INSTITUTE

TEST REPORT

우 13810 경기도 과천시 교육로 98(중양동) TEL (032)5709-700 FAX (032)575-5613

성적서번호 : TAK-2018-077339 접수 일자 : 2018년 05월 14일
대표자 : 최진재팀 시험완료일자 : 2018년 05월 25일

업체명 : 영케이폴렉스(주)
주소 : 경기 화성시 우정읍 매바위로 76

시료명 : 금속시험(나일도금,소켓렌치 볼트)

시험결과

시험항목	단위	시료구분	결과치	시험방법
중장영수분무시험(6h, 적독발생유무)	-	n1	이상없음	KS D 9502 : 2009(*)
중장영수분무시험(6h, 적독발생유무)	-	n2	이상없음	KS D 9502 : 2009(*)

* 의뢰자제시조건 : 나사 부위는 판정 대상에서 제외.

-용도 : 제출용

비고 : 1. 이 성적서는 의뢰자가 제시한 시료 및 시료명으로 시험한 결과로써 전체 제품에 대한 품질을 보증하지 않으며, 성적서의 진위확인용 홈페이지(www.ktr.or.kr) 또는 QR code로 확인 가능합니다.
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2018년 05월 25일

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BEYOND ASIAN HUB, TOWARD GLOBAL WORLD

KTR KOREA TESTING & RESEARCH INSTITUTE

TEST REPORT

우 13810 경기도 과천시 교육로 98(중양동) TEL (032)5709-700 FAX (032)575-5613

성적서번호 : TAK-2018-077341 접수 일자 : 2018년 05월 14일
대표자 : 최진재팀 시험완료일자 : 2018년 05월 25일

업체명 : 영케이폴렉스(주)
주소 : 경기 화성시 우정읍 매바위로 76

시료명 : 금속시험(나일도금,소켓렌치 볼트)

시험결과

시험항목	단위	시료구분	결과치	시험방법
중장영수분무시험(12h, 적독발생유무)	-	n1	이상없음	KS D 9502 : 2009(*)
중장영수분무시험(12h, 적독발생유무)	-	n2	이상없음	KS D 9502 : 2009(*)

* 의뢰자제시조건 : 나사 부위는 판정 대상에서 제외.

-용도 : 제출용

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2-1. COMPANY INTRODUCTION-[회사소개]



Major Customers & Final user

H.R.S.G (Heat Recovery Steam Generator)
ENGINEERING - BASIC & DETAIL
MANUFACTURING
TEST & COMMISSIONING CONSTRUCTION
SUPERVISION
TRAINING & EDUCATION





2-1-2. COMPANY INTRODUCTION-[회사소개]

Major Customers - Final user





2-2-1. COMPANY INTRODUCTION-[회사소개]

APPLICATION-PART 1

01 Chemical Equipment Products



H.R.S.G (Heat Recovery Steam Generator)
ENGINEERING - BASIC & DETAIL
MANUFACTURING
TEST & COMMISSIONING CONSTRUCTION



02 Energy Plant Products

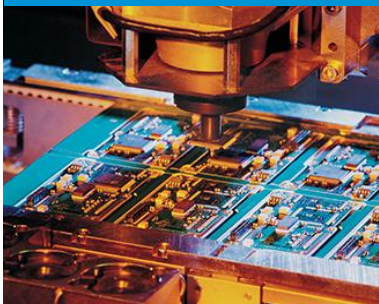




2-2-2. COMPANY INTRODUCTION-[회사소개]

APPLICATION-PART 2

SEMICONDUCTOR EQUIPMENT INDUSTRY



AUTOMOTIVE INDUSTRY



MEDICAL INDUSTRY



SOLAR POWER GENERATION INDUSTRY



OPTICS & HOME APPLIANCES



ROBOT INDUSTRY





2-3-1. Delivery Performance(Since 2016) 주요납품실적

NO	PROJECT NAME or COMPANY	DELIVERY PERIOD	DELIVERY PERFORMANCE	CUSTOMER	DESCRIPTION
1	Seoul Combined Cycle Power-MAIN STACK 서울복합화력발전소 건설프로젝트	2015.09~2016.03	\$137,570	FINE INNOVATION Corporation	H/T BOLT SETS
2	ROJANA SPP3 PROJECT 알제리 로잔나 프로젝트	2015.12~2016.06	\$96,475	DKME Corporation	ASTM A325
3	Pocheon CHP Boiler 포천화력발전	2016.03~2016.10	\$147,310	FINE INNOVATION Corporation	ASTM A325
4	BHI-//ALGERIA NAAMA CCPP 알제리 화력발전소 프로젝트	2016.04~2016.10	\$105,436	DKME Corporation	ASTM A307 Gr.A
5	WEST DAMIETTA PROJECT 이집트 웨스트 다미에타 플랜트	2016.06~2016.09	\$46,382	DKME Corporation	ASTM A325
6	DKME UPON PROJECT 대경기계기술 해외프로젝트	2016.06~2016.10	\$128,293	DKME Corporation	ASTM A490
7	KARBALA PROJECT 이라크 카르발라 프로젝트	2016.06~2016.10	\$6,494	FINE INNOVATION Corporation	F10T, S10T
8	VPI-V17498 TVA Allen PROJECT 대경기계기술 TVA프로젝트	2016.10~2016.12	\$7,885	DKME Corporation	ASTM A325
9	SAMSUNG ELECTRO-MACHANICS 삼성전기	2016.01~2016.12	\$296,846	ANI CO., LTD	SOCKET BOLT
10	SEMES CO., LTD 세메스 반도체 물류자동화	2016.01~2016.12	\$304,082	ANI CO., LTD	SOCKET BOLT
11	SAMSUNG ELECTRONICS CO., LTD (SEMICONDUCTOR) 삼성반도체 18라인공구	2016.01~2016.12	\$111,317	HANYANG ENG (TAEBONG)	SOCKET BOLT
12	KEYANG ELECTRIC 계양전기 전동	2016.01~2016.12	\$51,948	KEYANG ELECTRIC	SOCKET BOLT
13	SAMSUNG ELECTRO-MACHANICS 삼성전기 금형사업부	2016.03~2016.12	\$22,263	CHEONGWOO PRECISION	SOCKET BOLT
14	TOPTEC INC 삼성전자 반도체 검사장비	2016.03~2016.12	\$72,356	CM TECH21 Corporation	SOCKET BOLT
15	SAMSUNG ELECTRO-MACHANICS 삼성전기	2016.03~2016.12	\$46,070	HANGANG PRECISION	SOCKET BOLT



2-3-2. Delivery Performance(Since 2016) 주요납품실적

NO	PROJECT NAME & COMPANY	DELIVERY PERIOD	DELIVERY PERFORMANCE	CUSTOMER	DESCRIPTION
16	SK HYNICS CO., LTD 하이닉스반도체	2016.03~2016.12	\$37,100	ICD Corporation	SOCKET BOLT
17	SAMSUNG SDI VN 삼성디스플레이 A4	2017.01~2017.08	\$240,200	ANI CO., LTD	SOCKET BOLT
18	TOPTEC INC VN 삼성반도체관련	2017.01~2017.04	\$163,200	CM TECH21 Corporation	SOCKET BOLT
19	BHI-//ALGERIA NAAMA CCPP 알제리 남마 정유시설	2017.01~2017.13	\$183,000	SYSCO CO., LTD	ASTM & H/T BOLT SET
20	CEMES CO., LTD 세메스(주) 물류자동화	2017.01~2017.15	\$63,080	FINE TECH Corporation	SOCKET BOLT
21	SAMSUNG ELECTRONICS CO., LTD (SEMICONDUCTOR)삼성반도체18라인	2017.01~2017.16	\$296,800	ANI CO., LTD	SOCKET BOLT
22	MYANMAR(REFINERY FACILITY) 미얀마정유시설프로젝트	2017.02~2017.07	\$66,790	TTS CORPORATION	SOCKET BOLT
23	SAMSUNG SDI VN 삼성전자 베트남	2017.03~2017.07	\$340,260	ANI CO., LTD	SOCKET BOLT
24	SAMSUNG SDI VN 삼성베트남디스플레이	2017.04~2017.08	\$140,200	ANI CO., LTD	SOCKET BOLT
25	SAMSUNG ELECTRONICS CO., LTD (SEMICONDUCTOR)삼성반도체18라인	2017.06~2017.07	\$40,260	ANI CO., LTD	SOCKET BOLT
26	TOPTEC INC 삼성반도체	2017.05~2017.12	\$163,210	FINE TECH Corporation	SOCKET BOLT
27	SAMSUNG ELECTRO-MACHANICS 삼성전기 금형사업부	2017.06~2017.06	\$43,600	CHEONGWOO PRECISION	SOCKET BOLT
20	LG DISPLAY CO., LTD 엘지디스플레이	2017.07~2017.10	\$63,080	ODI CO., LTD	SOCKET BOLT
21	SAMSUNG SDI CO.LTD 삼성디스플레이	2017.08~2018.02	\$296,846	ANI CO., LTD	SOCKET BOLT
22	MYANMAR(REFINERY FACILITY) 미얀마정유시설	2018.01~2018.02	\$66,790	TTS CORPORATION	H/T BOLT SETS
21	LG DISPLAY CO., LTD 엘지디스플레이	2018.02~2017.06	\$296,846	ODI CO., LTD	SOCKET BOLT



2-3-3. Delivery Performance(Since 2016) 주요납품실적

NO	PROJECT NAME & COMPANY	DELIVERY PERIOD	DELIVERY PERFORMANCE	CUSTOMER	DESCRIPTION
22		2019.02~2019.10	\$190,500		
23	오만 LPIC3 ProjectT	2019.05~2020.07	\$160,000		
24	UZGTL Project	2019.08~2020.07	\$290,000		
25	Ruwais Refinery West (RRW)	2019.09~2021	\$100,000		
26	First Forge Australia	2020.02~2022	\$205,700		
27	Hoang Van Thu Project	2019.09~2022	\$381,000		
28	평택고덕 P2 Project	2020.06~2020.12	\$114,300		
29	싱가폴 JTC 로지스틱스 Project	2020.04~2020.12	\$53,300		
30	TCO Project	2020.03~2021.11	\$464,800		
31	UTCC Project	2020.06~2020.12	\$137,100		
32	LG CWA(폴란드)	2020.09~2021.01	\$442,000		
33	SK하이닉스 M16 Project	2021.10~2022.04	\$74,600		
34	현대케미칼 HPC PKG-3 (3-1공구)	2021.04~2022	\$34,300		



2-3-4. Delivery Performance by Product-[납품실적]

Plant industry parts - I ASTM A325/A325M - Heavy hexagon bolts

Iron & Steel plant



Iron structure building



Power plant



Chemical plant



2-3-5. Delivery Performance by Product-[납품실적]

Plant industry parts - Ⅱ

ASTM A490/A490M - Heavy hexagon bolt set & stud bolt set

Iron & Steel plant



Offshore plant



Power plant



Chemical plant



2-3-6. Delivery Performance by Product-[납품실적]

Plant industry parts - Ⅲ ASTM A307 - Hexagon bolts

Nuclear power plant



Power plant



Iron & Steel plant



Chemical plant



2-3-7. Delivery Performance by Product-[납품실적]

Plant industry parts - IV KS B 2819 - T/S bolts

Steel structure bridge



Iron structure building



Nuclear power plant



Chemical plant



2-3-8. Delivery Performance by Product-[납품실적]

Plant industry parts - V KS B 1010 - H/T bolt set

Steel structure bridge



Iron structure building



Nuclear power plant



Chemical plant



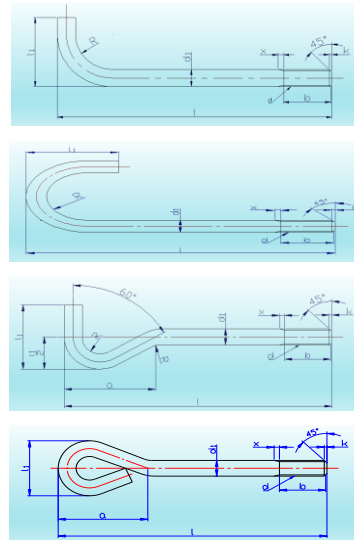
2-3-9. Delivery Performance by Product-[납품실적]

Plant industry parts - VI KS B 1016 – FOUNDATION BOLT

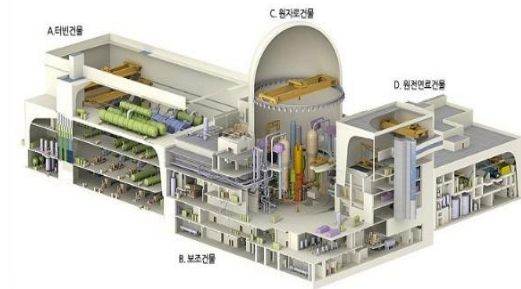
Chemical plant



Power plant



Iron structure building



Nuclear power plant



2-3-10. Delivery Performance by Product-[납품실적]

Plant industry parts - VII KS B 1062 - Headed weld'g stud

Steel structure bridge



Iron structure building



Power plant

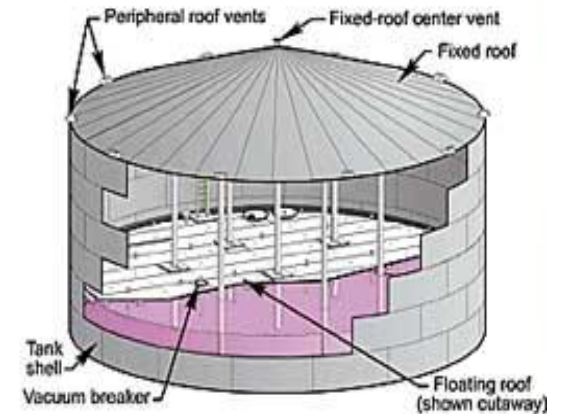
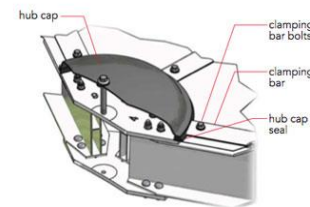
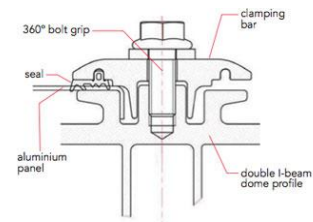


Nuclear power plant



2-3-11. Delivery Performance by Product-[납품실적]

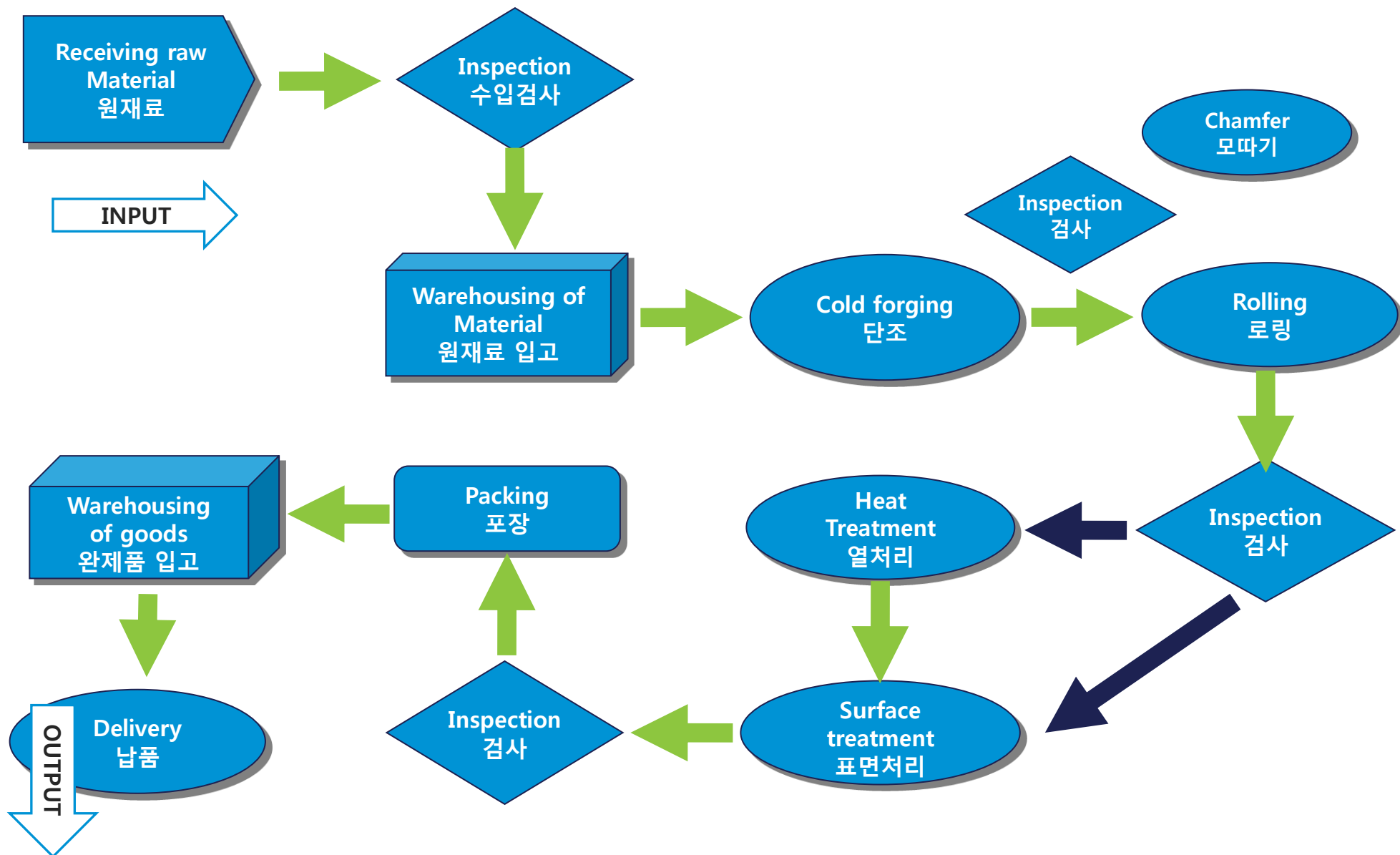
Plant industry parts - VIII Waterproof bolt set





3. PROCESS FLOW CHART-[생산공정흐름도]

- Cold forging parts





4. DESCRIPTION & SPECIFICATION-[국가별 표준 비교]

Description	Specification		
Hex Bolt Heavy Hex Bolt	4.6, 6.8, 8.8, 10.9, 12.9	GOST R ISO 898-1, KS B 0233	GOST 7798, KS B 1002
	4T, 5T, 6T, 7T	JIS B 1051	JIS B 1180
	A, B	ASTM A307	ANSI/ASME B 18.2.1
	B7, B7M, B8, B8M, B16	ASTM A193	
High Strength Hex Bolt	1, 2, 3	ASTM A325, ASTM A490	ANSI/ASME B 18.2.1
Stud Bolt	B5, B6, B7, B7M,	ASTM A193, ASTM A320	ANSI/ASME B 16.5
	L7, B8, B8M, B16		
	4.8, 8.8, 10.9, 4T	GOST R ISO 898-1, KS B 0233, JIS B 1051	KS B 1037, JIS B 1173
Foundation Bolt(Anchor Bolt)	Type J, JA, L, LA,	GOST 24379.1, KS B1016, JIS B1178	
U-Bolt	Type A, B, C	KS V3032, JIS F3022	
Hex Nut Heavy Hex Nut High Strength Hex Nut	4, 5, 6, 8, 10, 12	GOST R ISO 898-2, KS B0234	KS B1012
	4T, 5T, 6T, 8T, 10T, 12T	GOST R 52645, JIS B1052	JIS B1181
	F8, F10	KS B 1010, JIS B 1186	
	A, B, C, 8S, 10S	ASTM A563/563M	ANSI/ASME B 18.2.
	2H, 2HM, 4, 6, 8, 8M	ASTM A194	
Plain Washer	F35	KS B 1010, JIS B 1186	
	TYPE1, TYPE3	GOST R 52646, ASTM F436	
Heavy Square Nut	A, B, C, 8S, 10S	ASTM A563/563M	ANSI/ASME B 18.2.2
Socket Head Cap Screw	8.8, 10.9, 12.9	GOST R ISO 898-1, KS B 0233, JIS B 1051	KS B 1003, JIS B 1176
		ASTM A574	ANSI/ASME B 18.3
Hex Cap Screw Heavy Hex Screw	4.6, 6.8, 8.8, 10.9, 12.9,	GOST R ISO 898-1, KS B 0233, JIS B 1051	GOST 7798, KS B 1002, JIS B 1180
	4T, 5T, 6T, 7T		
	BC, BD	ASTM A354	ANSI/ASME B 18, 2.1
	TYPE 1, 2	ASTM A449	
Heavy Hex Structural Bolt	F8T, F10T, F12T	KS B 1010, JIS B 1186	
Square Bolt	4.6, 4.8, 4T	GOST R ISO 898-1, KS B 0233, JIS B 1051	KS B 1004, JIS B 1182
Heavy Square Bolt	A, B	ASTM A307	ANSI/ASME B 18.2.1



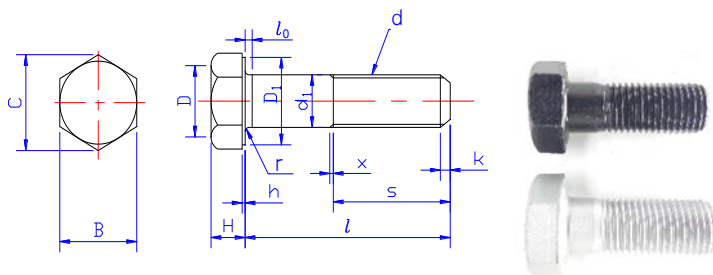
5. INTRODUCTION OF PRODUCT-[생산품목]

Alloy Steel	Grade 12.9T/ 109T/ 8.8T	Surface Treatment Black Zinc / Ni	Stainless Steel	Grade 304(A-70) 316L(A2-80)	Surface Treatment Wash'G / Black
1. Hexagon Socket Head Cap Screws [육각렌치볼트] 2. Hexagon Low Head Cap Screws [낮은머리육각렌치볼트] 3. Hexagon Socket Ultra Low Head Cap Screws [극저두렌치볼트] 4. Hexagon Socket Button Head Cap Screws [둥근머리렌치볼트] 5. Hexagon Socket Countersunk Head Cap Screw [접시머리렌치볼트] 6. Hexagon Socket Set Screws - Type(Cup/Flat/Cone/Dog) [육각렌치멈춤나사] 7. Hexagon Washer Assemblies Socket/Sems Screws[육각렌치샘스볼트] 8. 6 Lobe Button Head Cap Screws [6 Lobe 렌치버튼볼트] 9. Torx Socket Head Cap Screws [Torx 소켓렌지] 10. Torx Socket Button Head Cap Screws [Torx 둥근머리렌지볼트] 11. Torx Socket Countersunk Head Cap Screws [Torx 접시머리렌지볼트] 12. Pin Torx Socket Button Head Cap Screws [Pin Torx 둥근머리렌지볼트] 13. Pin Torx Socket Countersunk Head Cap Screws [Pin Torx 접시머리렌지] 14. Socket Head Cap Screws with Hole [가스배출볼트] 15. Hexagon Socket Tapered Pipe Plugs [육각렌치테이퍼플러그] PT/NPT/NPTF 16. Hexagon Socket Drt-seal Tapered Pipe Plugs [육각렌치드라이셀플러그]PT/NPT/NPTF 17. Square Head Tapered Pipe Plugs [사각머리테이퍼플러그]-Carbon steel 18. Profile Accesery Nut -Spong/Spring/Ball/ T [프로파일 액세서리 너트류] 19. Machine screw / Tapping screw/ Taptite screw[전자부품용 소형스크류] 20.Cold Forging Product [냉간단조품] 21.Hexagon bolt / Nut [육각볼트&너트]			        		



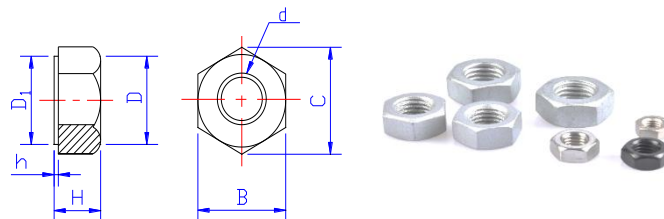
6-1. INTRODUCTION OF PRODUCT-[제품소개]

HIGH STRENGTH BOLT, NUT, WASHER



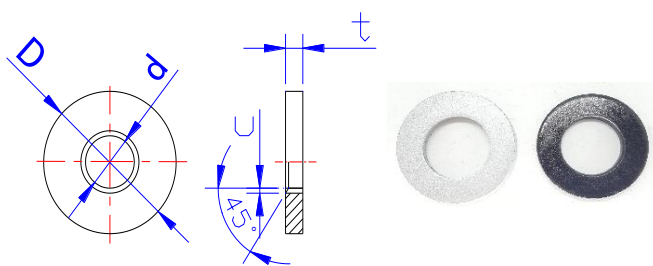
Unit : mm

Nominal Diameter (d)	d1		H		B		C	D	D1	r	K	a - b	E	F	h	s	
	Basic	Tolerance	Basic	Tolerance	Basic	Tolerance	App.	App.	min.		App.	max.	max.	max.		Basic	Tolerance
M 12	12	+0.7	8	±0.8	22	0	25.4	20	20	0.8~1.6	2	0.7				25	+5
M 16	16	-0.2	10		27	-0.8	31.2	25	25			0.8				30	0
M 20	20		13		32		37	30	29	1.2~2.0	2.5	0.9	1°	2°		35	
M 22	22	+0.8	14	±0.9	36	0	41.6	34	33			1.1			0.4	40	+6
M 24	24	-0.4	15		41	-1	47.3	39	38	1.6~2.4	3	1.2			~0.8	45	0
M 27	27		17		46		53.1	44	43			1.3				50	
M 30	30		19	±1.0	50		57.7	48	47	2.0~2.8	3.5	1.5				55	



Unit : mm

Nominal Diameter (d)	d1	H		B		C	D	D1	a-b	E	F	h
		Basic	Tolerance	Basic	Tolerance	App.	App.	min.	max.	max.	max.	
M 12	12	12	±0.35	22	0	25.4	20	20	0.7			
M 16	16	16		27	-0.8	31.2	25	25	0.8			
M 20	20	20		32		37	30	29	0.9	1°	2°	0.4~0.8
M 22	22	22	±0.4	36	0	41.6	34	33	1.1			
M 24	24	24		41	-1	47.3	39	38	1.2			
M 27	27	27		46		53.1	44	43	1.3			
M 30	30	30		50		57.7	48	47	1.5			

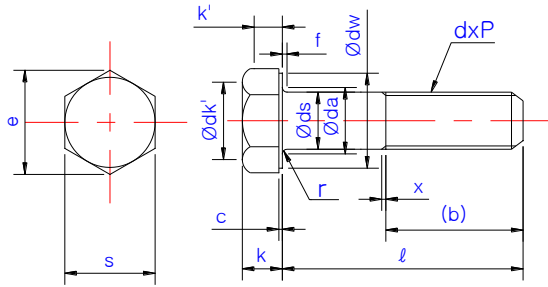


Unit : mm

Nominal Size	d		D		t		c or r
	Basic	Tolerance	Basic	Tolerance	Basic	Tolerance	App.
12	13		26	0 / -0.8	3.2	±0.4	1.5
16	17	+0.7 / 0	32		4.5	±0.5	
20	21		40	0 / -1			2
22	23	±0.8 / 0	44		6	±0.7	
24	25		48				2.4
27	28		56	0 / -1.2			
30	31	+1.0 / 0	60		8		2.8



6-2. INTRODUCTION OF PRODUCT-[제품소개]



HEX BOLT



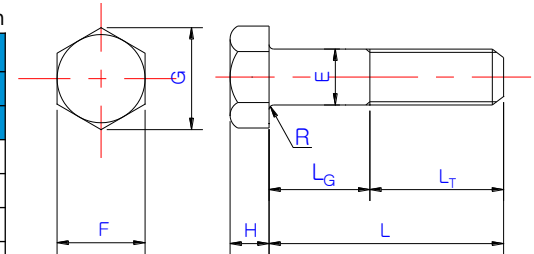
KS B 1002 / JIS B 1180

Unit : mm

Diameter (d)	Pitch		d _s		k		s		e	d _k ¹	r	d _a	z
	Coarse	Fine	Basic	Tolerance	Basic	Tolerance	Basic	Tolerance	App.	App.	min	max	App.
M 12	1.75	1.25	12	0 - 0.25	8	±0.3	19	0 - 0.8	21.9	18	0.6	13.7	2
(M 14)	2	1.5	14		9		22		25.4	21	0.6	15.7	2
M 16	2	1.5	16		10		24		27.7	23	0.6	17.7	2
(M 18)	2.5	1.5	18	0 - 0.35	12	±0.35	27	0 - 1.3	31.2	26	0.6	20.2	2.5
M 20	2.5	1.5	20		13		30		34.6	29	0.6	22.4	2.5
(M 22)	2.5	1.5	22		14		32		37	31	0.6	24.4	2.5
M 24	3	2	24		15		36		41.6	34	0.6	26.4	3
(M 27)	3	2	27	0 - 0.4	17	±0.4	41	0 - 1.2	47.3	39	1	30.4	3
M 30	3.5	2	30		19		46		53.1	44	1	33.4	3.5
(M 33)	3.5	2	33		21		50		57.7	48	1	36.4	3.5
M 36	4	3	36		23		55		63.5	53	1	39.4	4
(M 39)	4	3	39		25		60		69.3	57	1	42.4	4
M 42	4.5	—	42		26		65		75	62	1.2	45.6	4.5
(M 45)	4.5	—	45		28		70		80.8	67	1.2	48.6	4.5
M 48	5	—	48		30		75		86.5	72	1.6	52.6	5

ANSI/ASME B 18.2.1

Nominal Size or Basic Product Dia		E	F				G		H			R		L _T	
														6"≥L	6" < L
		Max	Basic	Max	Min	Max	Min	Basic	Max	Min	Max	Min	Basic	Basic	
1/2	0.5000	0.515	7/8	0.875	0.850	1.010	0.969	11/32	0.364	0.302	0.03	0.01	1.250	1.500	
5/8	0.6250	0.642	1-1/16	1.062	1.001	1.227	1.175	27/64	0.444	0.378	0.06	0.02	1.500	1.750	
3/4	0.7500	0.768	1-1/4	1.250	1.212	1.440	1.383	1/2	0.524	0.455	0.06	0.02	1.750	2.000	
7/8	0.8750	0.895	1-3/16	1.438	1.384	1.660	1.589	37/64	0.604	0.531	0.06	0.02	2.000	2.250	
1	1.0000	1.022	1-5/8	1.625	1.575	1.875	1.796	43/64	0.700	0.591	0.09	0.03	2.250	2.500	
1-1/8	1.0250	1.145	1-13/16	1.812	1.758	2.093	2.002	3/4	0.780	0.658	0.09	0.03	2.500	2.750	
1-1/4	1.2500	1.277	2	2.000	1.938	2.309	2.209	27/32	0.875	0.749	0.09	0.03	2.750	3.000	
1-3/8	1.3750	1.484	2-3/16	2.188	2.119	2.525	2.416	29/32	0.940	0.81	0.09	0.03	3.000	3.250	
1-1/2	1.5000	1.531	2-3/8	2.375	2.300	2.742	2.622	1	1.036	0.902	0.09	0.03	3.250	3.500	
1-3/4	1.7500	1.785	2-3/4	2.750	2.662	3.175	3.065	1-5/32	1.196	1.054	0.12	0.04	3.750	4.000	
2	2.0000	2.000	3-1/8	3.125	3.025	3.608	3.449	1-11/32	1.388	1.175	0.12	0.04	4.250	4.500	



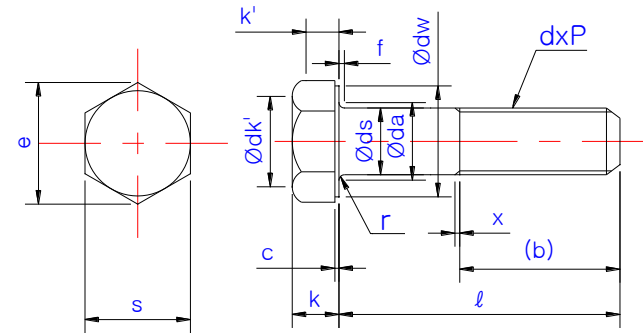
HEAVY HEX BOLT





6-3. INTRODUCTION OF PRODUCT-[제품소개]

HEXAGON HEAD BOLT

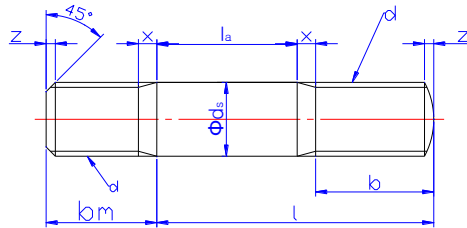


Unit : mm

Diameter (d)	Pitch		d_s		k		s		e	d_k^1	r	d_a	z
	Coarse	Fine	Basic	Tolerance	Basic	Tolerance	Basic	Tolerance	App	App	min	max	App
M 12	1.75	1.25	12	0 0.25	8	± 0.3	19	0 - 0.8	21.9	18	0.6	13.7	2
(M 14)	2	1.5	14		9		22		25.4	21	0.6	15.7	2
M 16	2	1.5	16		10		24		27.7	23	0.6	17.7	2
(M 18)	2.5	1.5	18		12		27		31.2	26	0.6	20.2	2.5
M 20	2.5	1.5	20	0 0.35	13	± 0.35	30	0 - 1.3	34.6	29	0.6	22.4	2.5
(M 22)	2.5	1.5	22		14		32		37	31	0.6	24.4	2.5
M 24	3	2	24		15		36		41.6	34	0.6	26.4	3
(M 27)	3	2	27		17		41		47.3	39	1	30.4	3
M 30	3.5	2	30	0 - 0.4	19	± 0.4	46	0 - 1.2	53.1	44	1	33.4	3.5
(M 33)	3.5	2	33		21		50		57.7	48	1	36.4	3.5
M 36	4	3	36		23		55		63.5	53	1	39.4	4
(M 39)	4	3	39		25		60		69.3	57	1	42.4	4
M 42	4.5	—	42		26		65		75	62	1.2	45.6	4.5
(M 45)	4.5	—	45		28		70		80.8	67	1.2	48.6	4.5
M 48	5	—	48		30		75		86.5	72	1.6	52.6	5



6-4. INTRODUCTION OF PRODUCT-[제품소개]



STUD BOLT



KS B 1037

Unit : mm

Diameter(d)		M4	M5	M6	M8	M10	M12	(M14)	M16	(M18)	M20	
P	Coarse	0.7	0.8	1	1.25	1.5	1.75	2	2	2.5	2.5	
	Fine	-	-	-	-	1.25	1.25	1.5	1.5	1.5	1.5	
ds	Basic	4	5	6	8	10	12	14	16	18	20	
	Tolerance	0/-0.12			0/-0.15		0/-0.18				0/-0.21	
b	Basic	10	12	14	18	20	22	25	28	30	32	
	Tolerance	+1.1/0	+1.4/0	+1.5/0	+1.9/0	+2.2/0	+2.6/0	+3/0	+3/0	+3/0	+5/0	
bm	TYPE1	Basic	-	-	-	-	12	15	18	20	22	25
		Tolerance	-	-	-	-	+1.1/ 0			+1.3/0		
	TYPE2	Basic	6	7	8	11	15	18	21	24	27	30
		Tolerance	+0.75/0	+0.9/0		+1.1/0			+1.3/0			+1.6/0
	TYPE3	Basic	8	10	12	16	20	24	28	32	36	40
		Tolerance	+0.9/0		+1.1/0		+1.3/0			+1.6/0		
z(App.)		0.8	0.8	1	1.2	1.5	2	2	2	2.5	2.5	

ANSI C-85

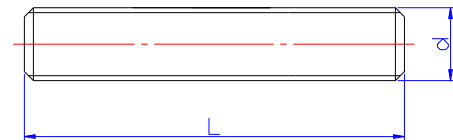
Unit : inch

Length Diameter	Tolerance on Length - inch	
	L ≤ 6 inch	L > 6 inch
over 5/16" to 3/4"	±0.06	±0.12
over 3/4" to 1-1/4"	±0.12	±0.19
over 1-1/4"	±0.25	±0.25

ANSI C-86

Unit :mm

Length Diameter	Tolerance on Stud Length
to M12	±1.5
over M12 to M18	±3.1
over M18	±6.3

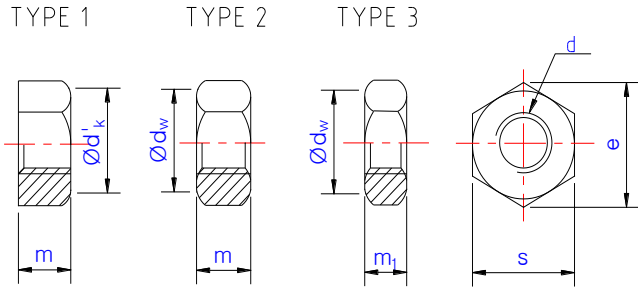


FULLY THREADED STUD BOLT





6-5. INTRODUCTION OF PRODUCT-[제품소개]



HEX NUT



KS B 1012 / JIS B 1181

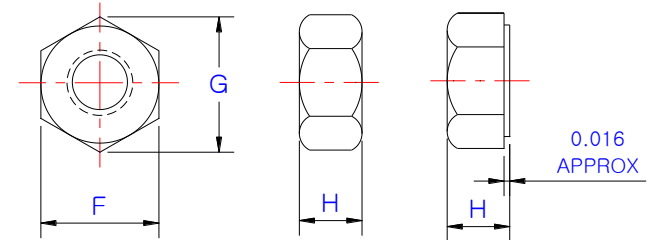
Unit : mm

Diameter (d)	m		m ₁		s		e	d _k ¹ & d _w
	Basic	Tolerance	Basic	Tolerance	Basic	Tolerance	App.	App.
M 12	10	±0.8	7	±0.8	19	0 - 0.8	21.9	18
(M 14)	11	±0.9	8		22		25.4	21
M 16	13		10		24		27.7	23
(M 18)	15		11	±0.9	27	0 - 1.0	31.2	26
M 20	16	±1.0	12		30		34.6	29
(M 22)	18		13		32		37	31
M 24	19	±1.0	14	±1.0	36	0 - 1.2	41.6	34
(M 27)	22		16		41		47.3	39
M 30	24		18		46		53.1	44
(M 33)	26	±1.2	20	±1.0	50	0 - 1.2	57.7	48
M 36	29		21		55		63.5	53
(M 39)	31		23		60		69.3	57
M 42	34	±1.2	25		65		75	62
(M 45)	36		27		70		80.8	67
M 48	38		29		75		86.5	72

ANSI / ASME B 18.2.2

Unit : inch

Nominal Size	F		G		H	
	Max	Min	Max	Min	Max	Min
1/2	0.875	0.850	1.010	0.969	0.504	0.464
9/16	0.938	0.909	1.083	1.037	0.568	0.526
5/8	1.062	1.031	1.227	1.175	0.631	0.587
3/4	1.250	1.212	1.443	1.382	0.758	0.710
7/8	1.438	1.394	1.660	1.589	0.885	0.833
1	1.625	1.575	1.876	1.796	1.012	0.956
1 1/8	1.812	1.756	2.093	2.002	1.139	1.079
1 1/4	2.000	1.938	2.309	2.209	1.251	1.187
1 3/8	2.188	2.119	2.526	2.416	1.378	1.310
1 1/2	2.375	2.300	2.742	2.622	1.505	1.433
1 5/8	2.562	2.481	2.959	2.828	1.632	1.556
1 3/4	2.750	2.662	3.175	3.035	1.759	1.679
1 7/8	2.938	2.844	3.392	3.242	1.886	1.802
2	3.125	3.025	3.608	3.449	2.013	1.925



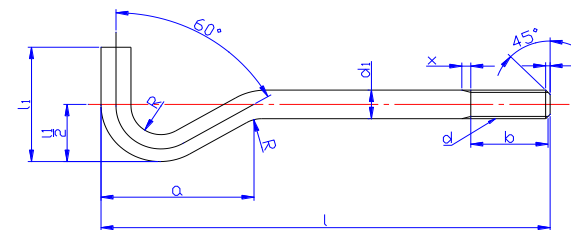
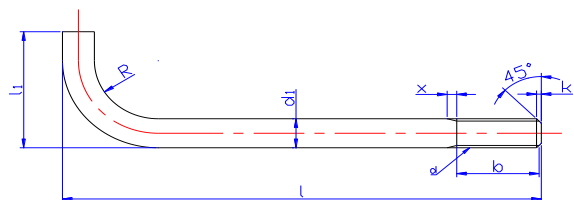
HEAVY HEX NUT





6-6. INTRODUCTION OF PRODUCT-[제품소개]

FOUNDATION BOLTS (ANCHOR BOLTS) – KS B 1016 , JIS B 1178



KS B 1016 : L-TYPE

Unit : mm

Nominal Diameter(d)	d ₁		b		l ₁	R	k
	Basic	Tolerance	Basic	Tolerance			
M10	10	±0.4	25	+6.3 / 0	40	20	1.5
M12	12		32	+8 / 0	50	25	2
M16	16	±0.5	40		63	32	2
M20	20		50		80	40	2.5

KS B 1016 : LA-TYPE

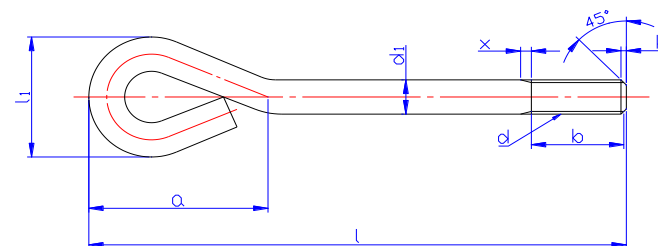
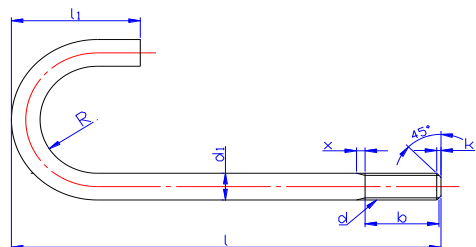
Unit : mm

Nominal Diameter(d)	d ₁		b		L ₁	a	R	K
	Basic	Tolerance	Basic	Tolerance				
M8	8	±0.4	20	+6.3 / 0	32	41	8	1.2
M10	10		30		40	51	10	1.5
M12	12		35		50	64	12	2
M16	16	±0.5	40	+8 / 0	63	81	16	2
M20	20		50		80	102	20	2.5
M24	24		80		100	127	24	3
M30	30	±0.6	90	+10 / 0	125	158	30	3.5
M36	36	±0.7	110		140	181	36	4
M42	42	±0.8	125		180	226	42	4.5
M48	48	±0.9	150	+12.5 / 0	200	252	48	5



6-7. INTRODUCTION OF PRODUCT-[제품소개]

FOUNDATION BOLTS (ANCHOR BOLTS) – KS B 1016 , JIS B 1178



KS B 1016 : J-TYPE

Unit : mm

Nominal Diameter(d)	d ₁		b		l ₁	R		K
	Basic	Tolerance	Basic	Tolerance		App.	App.	
M10	10	±0.4	25	+6.3 / 0	45	20	1.5	2
M12	12		32		56	25	2	
M16	16	±0.5	40	+8 / 0	71	32	2	2.5
M20	20		50		90	40	3	
M24	24		63		112	50	3	
M30	30	±0.6	80	+10 / 0	140	63	3.5	4
M36	36	±0.7	90		160	71	4	
M42	42	±0.8	112		200	90	4.5	
M48	48	±0.9	125	+12.5 / 0	224	100	5	

KS B 1016 : JA-TYPE

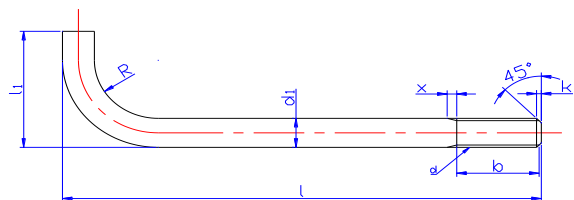
Unit : mm

Nominal Diameter(d)	D ₁		b		l ₁	a		K
	Basic	Tolerance	Basic	Tolerance		App.	App.	
M10	10	±0.4	30	+6.3 / 0	35	50	1.5	2
M12	12		35		40	65	2	
M16	16	±0.5	40	+8 / 0	55	85	2	2.5
M20	20		50		70	105	3	
M24	24		80		80	125	3	
M30	30	±0.6	90	+10 / 0	100	155	3.5	4
M36	36	±0.7	110		120	190	4	
M42	42	±0.8	125		140	220	4.5	
M48	48	±0.9	150	+12.5 / 0	160	250	5	



6-8. INTRODUCTION OF PRODUCT-[제품소개]

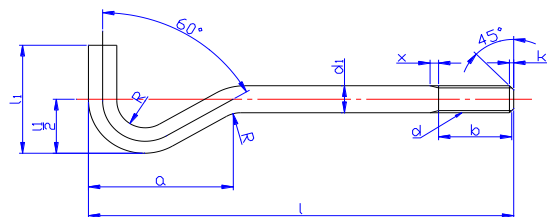
FOUNDATION BOLTS (ANCHOR BOLTS) – KS B 1016 , JIS B 1178



KS B 1016 : L-TYPE

Unit : mm

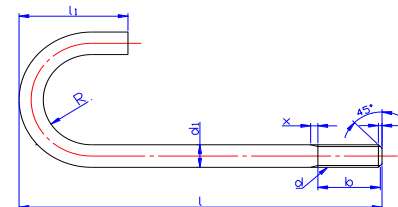
Nominal Diameter(d)	d ₁		b		L ₁	R	k
	Basic	Tolerance	Basic	Tolerance	App.	App.	App.
M10	10	±0.4	25	+6.3 / 0	40	20	1.5
M12	12		32		50	25	2
M16	16	±0.5	40	+8 / 0	63	32	2
M20	20		50		80	40	2.5



KS B 1016 : LA-TYPE

Unit : mm

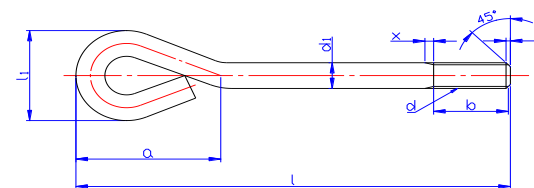
Nominal Diameter(d)	d ₁		b		L ₁	a	R	K
	Basic	Tolerance	Basic	Tolerance	App.	App.	App.	App.
M8	8	±0.4	20	+6.3 / 0	32	41	8	1.2
M10	10		30		40	51	10	1.5
M12	12		35		50	64	12	2
M16	16	±0.5	40	+8 / 0	63	81	16	2
M20	20		50		80	102	20	2.5
M24	24		80		100	127	24	3
M30	30	±0.6	90	+10 / 0	125	158	30	3.5
M36	36		110		140	181	36	4
M42	42		125		180	226	42	4.5
M48	48	±0.9	150	+12.5 / 0	200	252	48	5



KS B 1016 : J-TYPE

Unit : mm

Nominal Diameter(d)	d ₁		b		L ₁	R	K
	Basic	Tolerance	Basic	Tolerance	App.	App.	App.
M10	10	±0.4	25	+6.3 / 0	45	20	1.5
M12	12		32		56	25	2
M16	16	±0.5	40	+8 / 0	71	32	2
M20	20		50		90	40	2.5
M24	24	±0.6	63	+10 / 0	112	50	3
M30	30		80		140	63	3.5
M36	36		90		160	71	4
M42	42	±0.8	112	+12.5 / 0	200	90	4.5
M48	48	±0.9	125		224	100	5



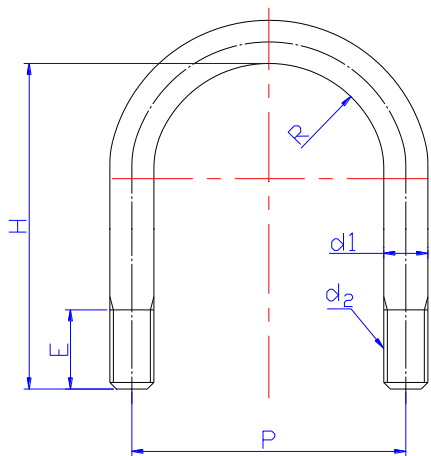
KS B 1016 : JA-TYPE

Unit : mm

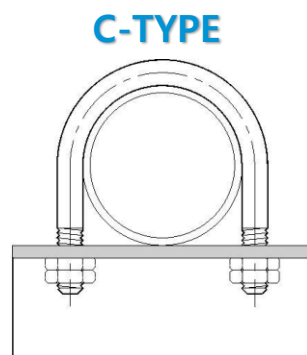
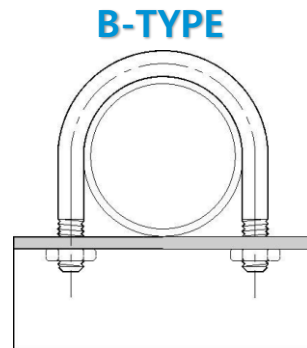
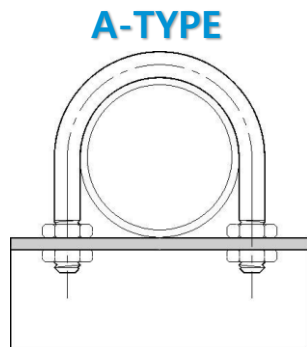
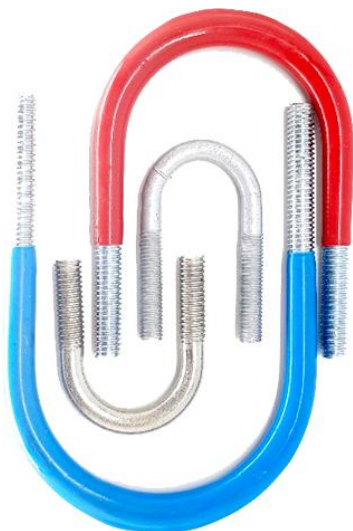
Nominal Diameter(d)	D ₁		b		L ₁	a	K
	Basic	Tolerance	Basic	Tolerance	App.	App.	App.
M10	10	±0.4	30	+6.3 / 0	35	50	1.5
M12	12		35		40	65	2
M16	16	±0.5	40	+8 / 0	55	85	2
M20	20		50		70	105	2.5
M24	24	±0.6	80	+10 / 0	80	125	3
M30	30		90		100	155	3.5
M36	36		110		120	190	4
M42	42	±0.8	125	+12.5 / 0	140	220	4.5
M48	48	±0.9	150		160	250	5



6-9. INTRODUCTION OF PRODUCT-[제품소개]



U - BOLT



KS V 3032, JIS F3022

Unit : mm

Nominal Size	Outer diameter of Pipe	p	R	d1	d2	A-TYPE		B-TYPE		C-TYPE	
						H	E	H	E	H	E
15	21.7	34	12	10	M10	-	-	39	20	47	30
20	27.2	40	15	10	M10	-	-	45	20	53	30
25	34.0	46	18	10	M10	-	-	52	20	60	30
32	42.7	56	23	10	M10	-	-	60	20	68	30
40	48.6	62	26	10	M10	-	-	66	20	74	30
50	60.5	74	32	10	M10	-	-	78	20	86	30
65	76.3	92	40	12	M12	-	-	98	25	108	35
80	89.1	104	46	12	M12	-	-	110	25	120	35
90	101.6	116	52	12	M12	-	-	123	25	133	35
100	114.3	134	59	16	M16	141	50	-	-	-	-
125	139.8	160	72	16	M16	167	50	-	-	-	-
150	165.2	186	85	16	M16	192	50	-	-	-	-
175	190.7	212	98	16	M16	218	50	-	-	-	-
200	216.3	242	111	20	M20	249	60	-	-	-	-
225	241.8	268	124	20	M20	274	60	-	-	-	-
250	267.4	294	137	20	M20	300	60	-	-	-	-
300	318.5	350	163	24	M24	357	70	-	-	-	-
350	355.6	386	181	24	M24	394	70	-	-	-	-
400	406.4	438	207	24	M24	444	70	-	-	-	-
450	457.2	496	233	30	M30	505	85	-	-	-	-
500	508.0	548	259	30	M30	556	85	-	-	-	-
550	558.8	598	284	30	M30	606	85	-	-	-	-
600	609.6	656	310	36	M36	663	100	-	-	-	-
650	660.4	706	335	36	M36	713	100	-	-	-	-
700	711.2	758	361	36	M36	764	100	-	-	-	-
750	762.0	810	387	36	M36	818	100	-	-	-	-
800	812.8	868	413	42	M42	875	115	-	-	-	-
850	863.6	920	439	42	M42	926	115	-	-	-	-
900	914.4	970	464	42	M42	977	115	-	-	-	-



7. GREETING-[맺음말]

Thank you very much
for spending time with us.



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