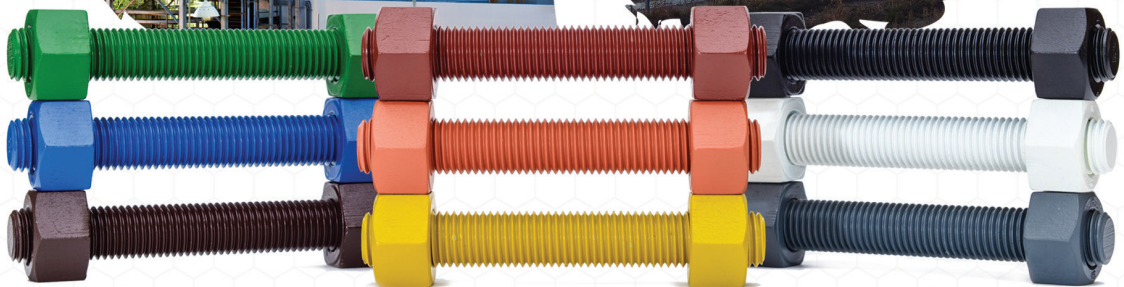




HWASUNG
FASTENERS
|주| 화성금속



Fasteners maker of the world

Challenge to the world

It will be the best in the world fasteners maker.



Contents

Company Information

Greetings
Ceo Message
History
Vision
Organization
Major Customer

Business Part

ON/OFF SHORE FACILITIES (sales record)
NUCLEAR POWER PLANT (sales record)
REFINERY & PETROCHEMICAL (sales record)
POWER PLANT & CONSTRUCTION (sales record)

Quality Management

Certification

Main Product

STUD BOLT & HEX NUT
U-BOLT/HEX NUT/INSULATION PAD
HEAVY HEX BOLT (HEXAGON BOLT) / HEX NUT
ANCHOR BOLT SET (FOUNDATION BOLT)
DOUBLE END STUD BOLT
TAP STUD BOLT / SLOTTED NUT
BOLT CAP

Technology Requirements

Available Material & Specifications
Requirements For Bolting Materials
Requirements For Nut&Washer Materials
Laboratory
Closing





CEO Message

Hwasung Fasteners is a professional fastener manufacturer that has been leading the special fastener market based on exclusive proprietary technologies since its foundation in 1988. Through continuous technology development and accumulated professional experiences and know-how, Hwasung has provided numerous projects at home and abroad with rigid qualification standards with quality products satisfying customer needs even at extreme high and low temperature or pressure.

Hwasung manufactures products that comply with diverse industrial codes such as ASME, ASTM, KEPIC, IFI, DIN, KS and JIS, while precisely understanding what a customer wants and expects from us. With flexible application of its proprietary technologies, Hwasung has differentiated its offerings with competitors and acquired enviable market competitiveness. We believe we could not have achieved the growth we have undergone in a relatively short time overcoming a short history without the supports and interests from our customers as well as our collective efforts for quality improvement and customer satisfaction. We promise to provide customers with quality products with the highest value through consistent quality management and technological development.

We will do our best and be truthful so that we can develop a relationship with any customer.

Thank you.

HWASUNG FASTENERS CO.,Ltd
IL - BONG WON

Through challenge to the world, we will become the world's best fasteners maker!

Through technological advancements and professional experiences,
we will lead the fasteners industry!



Customer Satisfaction

Providing values for customers through products and services in better quality, we offer customers with an impressing beyond satisfaction



Respect for Humans

Hwasung's respect for humns, which nurtures the growth of business, creates a value not only for the company but also for the entire society.



Endless Challenge

We create a bigger value through challenges to new possibilities through passion and creative thinking, while not being complacent in anyway.

HISTORY

Founding & Base Firming

Sep. 1988

Established HWASUNG FASTENERS Co., Ltd.

Mar. 1989

Registered as Fastener Supplier to Hyundai Heavy Industry

Jun. 1994

Got Quality Approved for the Nuclear power plant use By KEPCO [Korea Electric Power Corporation]

Jul. 1995

Earned QPC III (ASME III) Quality Approval for Wolog Nuclear Power Plant By Hyundai Eng & Construction Co., Ltd.

Expansion & Growth

Jan. 1997

Approved of Vendor by "Q" Class (ASME Section III) for Youngkwang Nuclear Power Plant

Apr. 1997

Earned A Certificate of Approval for "ISO 9001" By KPC-QA

Jan. 1998

Approved as a QAP III (ASME Section III) Vendor for KEPIC (Korea Electric Power Industry Code) By Korea Heavy Industry

Apr. 1999

Approved of "Q" class (ASME Section III) Vendor By KEPCO Accredited a "Q" class (ASME Section & KEPIC-MN/SN)

Apr. 2000

Approved of Vendor by Korea National Gas Corporation

Oct. 2000

Approved of a vendor for Nuclear Power Plant (ASME SEC III)

New Challenge & Leap

May. 2005

Had Quality System Approved By KEPIC-MN/SN by KEA

Aug. 2006

Heat Treatment line set up [at Kimhae-Si]

Jan. 2009

Approved of a Vendor By SAMREF in Saudi Arabia (SAUDI Aramco EXXON MOBIL)

Apr. 2009

Accredited Certificate of GLOBAL BRAND 2002 choice Company by KOTRA

Jul. 2010

Establishment of R&D Center

Aug.

"One-KEPCO Export Business Group" Organized by KEPCO

Oct.

Earned A Certificate of Approval for ISO 9001 And ISO/TS 29001 By LRQA Korea

Earned A Certificate of Approval for ISO 14001 By LRQA Korea

Apr. 2011

Approved of a Vendor By Achilles JQS (For the Oil Industry in Norway and Denmark)

May.

Accredited a "Q" class by SHINULJIN Nuclear Power Plant.

Accredited a "Q" class by UAE BNPP Nuclear Power Plant.

July. 2012

Earned A Certificate of Approval for PED (CE) By LOQA Korea

May. 2014

Registration of approved Vendor of KNPC (Kuwait National Petroleum Co. (K.S.C))

Sep. 2015

Exclusive vendor Registration of Samsung Engineering Clean Fuel Project (KNPC)

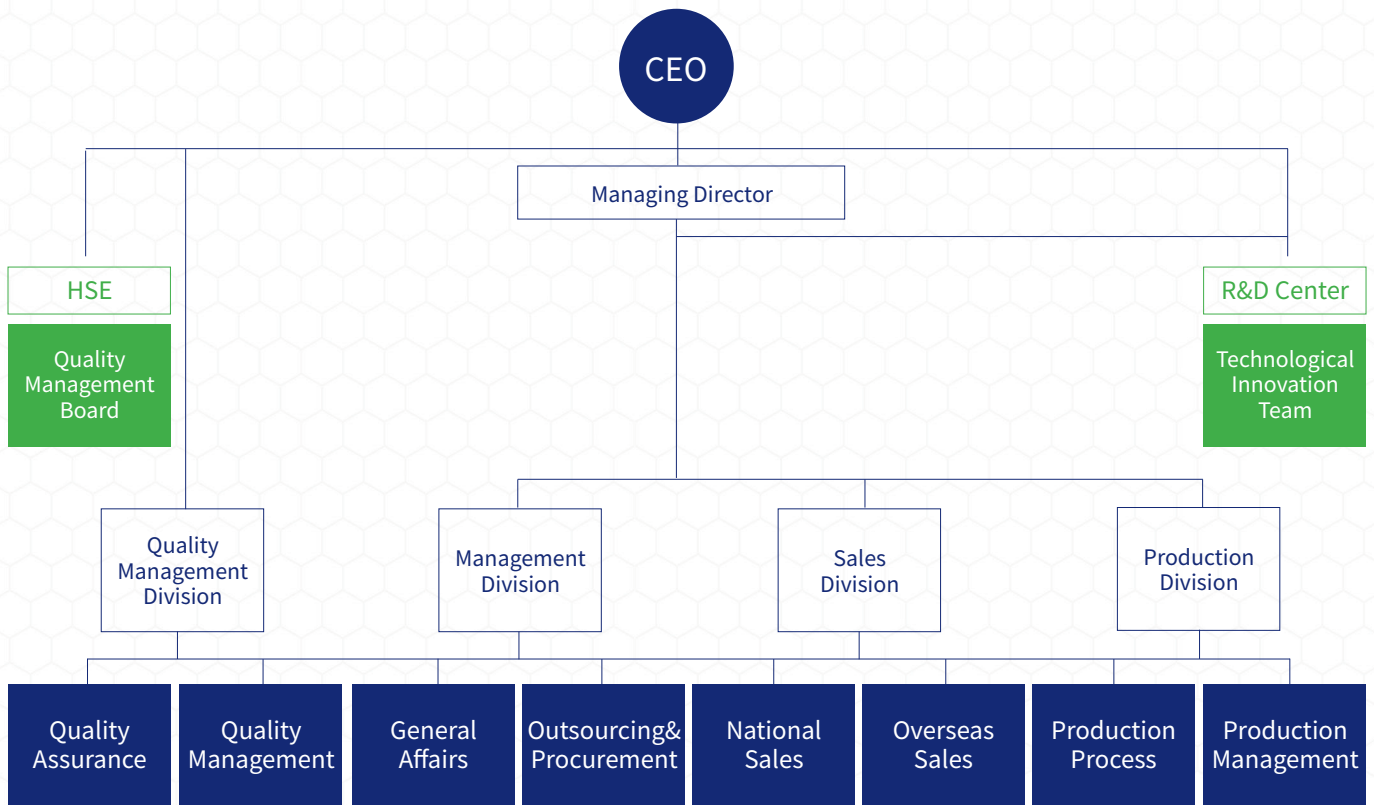
Jan. 2016

Earned A Certificate of approval for OHSAS 18000:2007 By GERMAN CERT

Feb.

Earned A Certificate of Approval for NORSOK M-650 By DNV&HHI

ORGANIZATION



DOMESTIC PARTNERS



Fasteners maker of the world
Challenge to the world



OVERSEAS PARTNERS



adm-opco



ARMCO



BP



CHEVRON



CNPC



ENI



EXXONMIBIE



GE



GECOL



HITACHI



I-ZAK



JG SUMMIT



JGC



KOC



KUWAIT_MEW



LLOG



TOYO



LUK OIL



IRAQ



MODEC



ONGC



OOCEP



PERONAS



PEROVietnam



PTT PLC



PTTEP



GATARGAS



RASGAS



RBT



SAPCO



SAUDI
ELECTRICITY



SHELL



SIMENS



STATOIL



SUMITOMO



TAKREER



TOTAL



WOODSIDE



KNPC

Hwasung
References

PERFORMANCE



ON/OFF SHORE FACILITIES SALES RECORD

PROJECT NAME	CUSTOMER	COUNTRY
VASAI PLATFORM PJT	ONGC	INDIA
EXMAR LNG HULL PJT	EXMAR	BELGIUM
UMM SHAIK GAS INJECTION FACILITIES PJT	ADMA-OPCO	UAE
ENFIELD FPSO PJT	WOODSIDE	AUSTRALIA
BONGKOT FIELD DEVELOPMENT PJT	PTT Exploration & Production	THAILAND
DAEWOO SHWE PJT	DAEWOO INTERNATIONAL PTT	MYANMAR
IGD-DAS PJT	ADMA-OPCO	UAE
GOLGON PJT (Barrow Island LNG Plant)	CHEVRON	AUSTRALIA
GOLIAT PJT	ENI	NORWAY
PTT SPURLINE PJT	PTT PLC	THAILAND
OFON PJT	TOTAL	NIGERIA
BARZAN PJT	EXXON MOBIL	QATAR
Q204 PJT	BP	NORTH SEA
CLAIR RIDGE PJT	BP	UK
DSO PJT	SHELL	NIGERIA
STENA Drill Ship #4	STENA	SWEDEN
SEADRILL Drill Ship #4	CHEVRON	NIGERIA
WHEATSTONE PJT	CHEVRON	AUSTRALIA
Ichthys Gas Field Development PJT	TOTAL	AUSTRALIA
POINT THOMSON PJT	EXXON MOBIL	CANADA
DELTA HOUSE PJT	LLOG	AMERICA
HEBRON PJT	EXXON MOBIL	CANADA
CARIGALI PJT	B.C.P	MALAYSIA
MOHO NORD (TLP/FPU) PJT	TOTAL	CONGO
Aasta Hansteen PJT (Platform)	Statoil	NORWAY
Jangkrik Complex Project	Eni Muara Barkau B.V.	INDONESIA
Bergading CPP Project	Hess Exploration & Production Malaysia B.V.	MALAYSIA

NUCLEAR POWER PLANT SALES RECORD

PROJECT NAME	CUSTOMER	COUNTRY
Braka Nuclear Power Plant 3&4 PJT	KNHP	UAE
Braka Nuclear Power Plant 1&2 PJT	KNHP	UAE
Shinulchin Nuclear Power Plant 1&2 PJT	KEPCO	KOREA
Ulchin NPP 3&4 SGR PJT	KEPCO	KOREA
ShinGori Nuclear Power Plant 3&4 PJT	KEPCO	KOREA
ShinGori Nuclear Power Plant 1&2 PJT	KEPCO	KOREA
ShinWolsong Nuclear Power Plant 1&2 PJT	KEPCO	KOREA

REFINERY & PETROCHEMICAL SALES RECORD

PROJECT NAME	CUSTOMER	COUNTRY
RPLC Deep Conversion Project	Petroleo de Venezuela, S.A (PDVSA)	Venezuela
Boryeon LNG Terminal	Boryeon LNG Terminal	KOREA
Sadara Project	SAUDI ARAMCO & Dow Chemical	SAUDI ARABIA
THERMA VISAYAS ENERGY PROJECT 150MW X 2 UNITS	THERMA VISAYAS INC.	PHILIPPINES
Evergreen	Shoei Kisen Kaisha	TAIWAN
CATHER FPSO PJT	Cairn Energy	UK
Clean Fuel Project	KNPC	Kuwait
E-KANDYM PJT	LUOC (Lukoil)	UZBEKISTAN
Yep-V PJT	KUMHO POLYCHEM	KOREA
Dow DMC Polyol PJT	Rayong Terminal Co., Ltd	THAILAND
Indorama Fertilizer Plant Project	SAUDI ARAMCO	Nigeria
Ichthys Gas Field Development PJT	TOTAL	AUSTRALIA
RABICH-2 CP-3,4 Package PJT	ARAMCO DVERSEAS COMPANY B.V& SUMITOMO CHEMICAL CO., LTD	SAUDI ARABIA

POWER PLANT & CONSTRUCTION SALES RECORD

PROJECT NAME	CUSTOMER	COUNTRY
Kirikkale Independent Power Plant Project	ACWA GUC	Turkey
SM#1 Modernization Project	SAMSUNG TOTAL PETROCHEMICALS	KOREA
Azito Phase 3	Azito Energy	Republic of Cote d'Ivoire
KUMHO YEP IV PJT	KUMHO POLYCHEM	KOREA
Ras-Djinet 1,131.1MW Combined Cycle Power Plant Project	SPE	ALGERIA
IRAQ AL FAW BREAKWATER PJT	The General Company for ports of Iraq	IRAQ
Azzour WDC II PTJ	Ministry of Electricity and Water	KUWAIT
Jorf Lasfar Fertilizer Plant	OCP	MORROCO
CG Aceto PJT	Tongsuh Petrochemical	KOREA
BAPP Ashuganj 225MW Combined Cycle Power Plant	Ashuganj Power Station Co	BANGLADECH
TAEAN IGCC POWER PLANT PJT	KEPCO	KOREA
BASF / ULTRASON-1 PJT	BASF	KOREA
ZWITINA COMBINED CYCLE ADD-ON PJT	GENERAL ELECTRIC COMPANY OF LIBYA	LIBIYA

SYSTEM AUTHENTICATION



ISO 14001



ISO 9001



ISO TS 29001



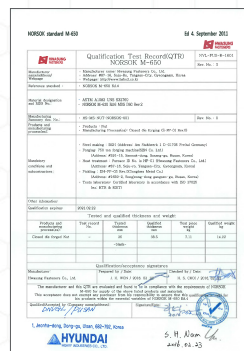
KEPIC-MN (DN247)



PED



JQS Achilles



NORSOK ACCREDITED
DNV.GL&HHI



OH SAS 18001

QUALITY MANAGEMENT



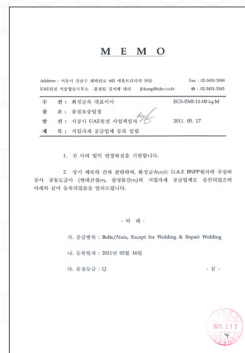
CERTIFICATES BY CUSTOMERS



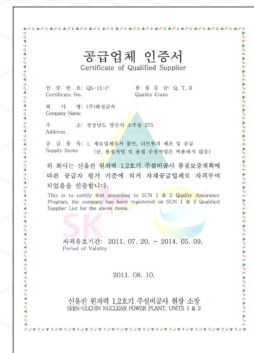
SAMREZ



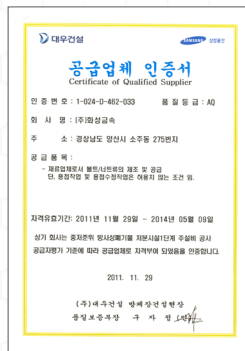
KEPCO



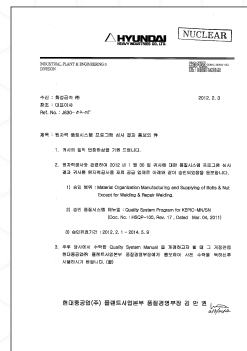
BNPP Q CLASS
CERTIFICATION



HDEC (SHINHANUL)
NPP CERTIFICATION



DAEWOO (SHINWOLSUNG)
RDP CERTIFICATION



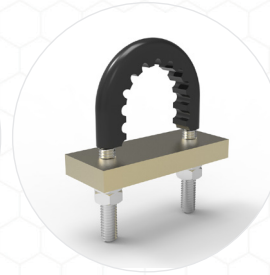
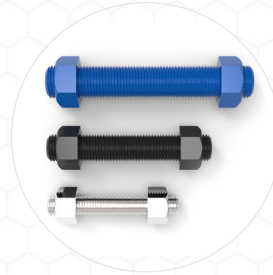
NUCLEAR POWER PLANT
CERTIFICATION BY HHI



KNPC VENDOR
REGISTRATION

Hwasung
Product

MAIN PRODUCT



STUD BOLT & HEX NUT HWASUNG PRODUCT



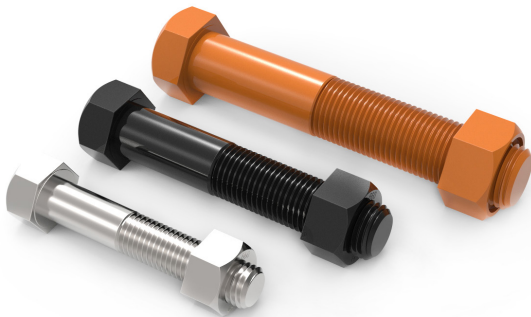
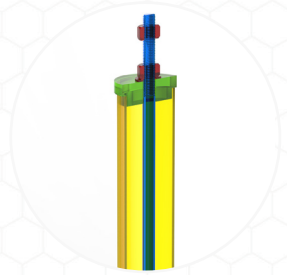
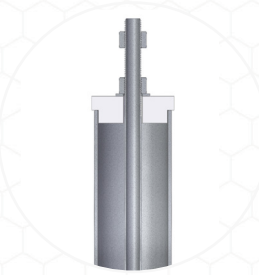
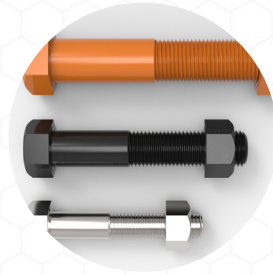
Material	Alloy Steel	B7,B7M,B16,B5,L7,L7M,L43,20CrMoVTIB4-10
	Carbon Steel	A36,A307,4.6,SS400,S45C,A325,A490
	Stainless Steel	B8 CL1&2, B8M CL1&2,B8T,B8C,B6,SS317(L)
	Nickel Alloys	A453-660,Inconel625/718,Incoloy 925,C276
	Super Duplex	UNS S32760 / S32750
	Titanium	Grade 2 / 5 / 7
	Copper Alloy	C65100, C63000, C61400

U-BOLT/HEX NUT/INSULATION PAD HWASUNG PRODUCT



Material	Alloy Steel	B7,B7M,B16,B5,L7,L7M,L43,20CrMoVTIB4-10
	Carbon Steel	A36,A307,4.6,SS400,S45C,A325,A490
	Stainless Steel	B8 CL1&2, B8M CL1&2,B8T,B8C,B6,SS317(L)
	Nickel Alloys	A453-660,Inconel625/718,Incoloy 925,C276
	Super Duplex	UNS S32760 / S32750
	Titanium	Grade 2 / 5 / 7
	Copper Alloy	C65100, C63000, C61400

Hwasung
Product



HEAVY HEX BOLT (HEXAGON BOLT) / HEX NUT HWASUNG PRODUCT

Alloy Steel	B7,B7M,B16,B5,L7,L7M,L43,20CrMoVTIB4-10
Carbon Steel	A36,A307,4.6,SS400,S45C,A325,A490
Stainless Steel	B8 CL1&2, B8M CL1&2,B8T,B8C,B6,SS317(L)
Material Nickel Alloys	A453-660,Inconel625/718,Incoloy 925,C276
Super Duplex	UNS S32760 / S32750
Titanium	Grade 2 / 5 / 7
Copper Alloy	C65100, C63000, C61400



ANCHOR BOLT SET (FOUNDATION BOLT) HWASUNG PRODUCT

-SLEEVE TYPE
-SLEEVELESS TYPE
-KS B 1016 (TYPE L / LA / J / JA)

Alloy Steel	B7,B7M,B16,B5,L7,L7M,L43,B23,A449
Material Carbon Steel	A36,A307,4, A325, F1554 Gr.36 / Gr.55.SS400
Stainless Steel	B8 CL1&2, B8M CL1&2

Hwasung
Product

MAIN PRODUCT

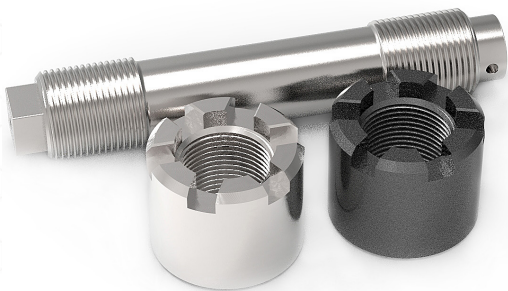


DOUBLE END STUD BOLT HWASUNG PRODUCT

Material

Alloy Steel	B7,B7M,B16,B5,L7,L7M,L43,20CrMoVTIB4-10
Carbon Steel	A36,A307,4.6,SS400,S45C,A325,A490
Stainless Steel	B8 CL1&2, B8M CL1&2,B8T,B8C,B6,SS317(L)
Nickel Alloys	A453-660,Inconel625/718,Incoloy 925,C276
Super Duplex	UNS S32760 / S32750
Titanium	Grade 2 / 5 / 7
Copper Alloy	C65100, C63000, C61400

TAP STUD BOLT / SLOTTED NUT HWASUNG PRODUCT



Material

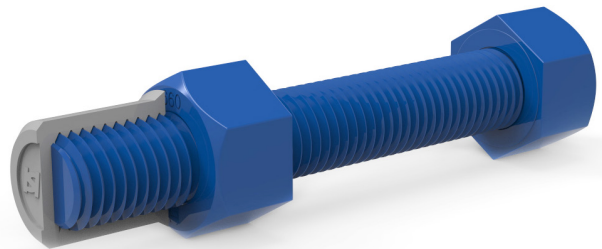
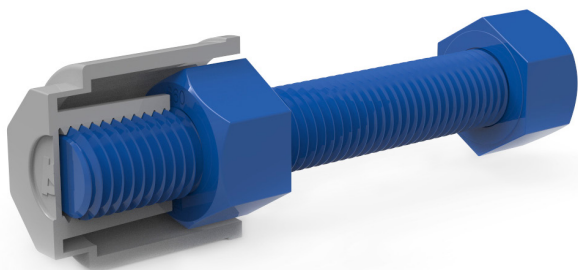
Alloy Steel	B7,B7M,B16,B5,L7,L7M,L43,20CrMoVTIB4-10
Carbon Steel	A36,A307,4.6,SS400,S45C,A325,A490
Stainless Steel	B8 CL1&2, B8M CL1&2,B8T,B8C,B6,SS317(L)
Nickel Alloys	A453-660,Inconel625/718,Incoloy 925,C276
Super Duplex	UNS S32760 / S32750
Titanium	Grade 2 / 5 / 7
Copper Alloy	C65100, C63000, C61400

Hwasung
Product



BOLT CAP
HWASUNG PRODUCT

- Thermoplastic Rubber Bolt Cap
- For Anti-Corrosion
- BOLT SIZE : 1" ~ 3.5"



Technology Requirements

Available Material & Specifications

ALLOY STEEL

ASTM A193	B7,B7M,B16,B5
ASTM A194	2H, 2HM, 3, 4, 7, 7M
ASTM A320	L7, L7M, L43
JIS B1051/BS3692	Grade 8.8, 10.9, 12.9
EN10269	20CrMoVTIB4-10

CARBON STEEL

ASTM A325 / ASTM A490 / ASTM A449	
ASTM A307	Grade A / B / C
BS3692	Grade 4.8, 8.8
ASTM	A36
ASTM F1554	Grade 36 / 55
KS	D 3752 / D 3503

NICKEL ALLOYS

ASTM A453	660 Class A / B / C / D
Incoloy	800, 800HT, A286, 925(N09925)
Inconel	600, 625, 718
Monel	400, K500
Hastelloy	C276, C22

STAINLESS STEEL

ASTM A193	B6, B8 Class 1&2, B8M Class 1&2, B8T Class 1&2, B8C
ASTM A194	8M, 8MA, 8, 8A, 8T, 8C, 6
ASTM A320	B6, B8 Class 1&2, B8M Class 1&2, B8T Class 1&2, B8C
ISO 3506	A2-70, A2-80, A4-70, A4-80
AISI	SS 304(L), SS 316(L), SS316TI, SS 317(L)

DUPLEX STEEL

UNS	S32750, S32760 (Conditon A & S) S32205 / S31803 / S32550
-----	--

OTHER MATERIALS

TITANIUM	Grade 2 / 5 / 7
----------	-----------------

WASHER MATERIALS

ASTM	F436 / F844
------	-------------

KS D 3559	SWRH 62B - 72B
-----------	----------------

AISI	SS 304(L), SS 316(L), SS316TI, SS 317(L)
------	--

UNS	S32750, S32760, S31803
-----	------------------------

PLATING & GALVANISING

HOT DIP GALVANIZED	ASTM A153/A123/ ISO 10684
--------------------	---------------------------

ZINC	ASTM B633 (SC1&SC2&SC3)
------	---------------------------

CADMIUM	ASTM B766
---------	-----------

ZINC NICKEL	ASTM B841
-------------	-----------

ELECTROLESS NICKEL	ASTM B733
--------------------	-----------

ZINC FLAKE	ISO 10683
------------	-----------

PHOSPHATE	ASTM F1137 / ISO 11408
-----------	------------------------

MECHANICAL GALVANIZED	ASTM A695
-----------------------	-----------

COATING

XYLAN	XYLAR 2, 1014, 1052, 1070, 1424
-------	---------------------------------

SERMAGARD	1105, 1175, 1280, 1628
-----------	------------------------

MOLYKOTE	7409
----------	------

Requirements For Bolting Materials

Grade	Chemical Requirements [%]										
	C	Mn	si	P Max	S Max	Cr	Mo	Ni	Fe	Cu	Other Elements
ASTM A193 Gr. B6	0.08-0.15	1.00 Max	1.00 Max	0.040	0.030	11.5-13.5	...	...	...	...	...
ASTM A193Gr. B7	0.37-0.49	0.65-1.10	0.15-0.35	0.035	0.040	0.75-1.20	0.15-0.25	...	...	...	...
ASTM A193 Gr. B7M	0.37-0.49	0.65-1.10	0.15-0.35	0.035	0.040	0.75-1.20	0.15-0.25	...	...	...	...
ASTM A193 Gr. B16	0.36-0.47	0.45-0.70	0.15-0.35	0.035	0.040	0.80-1.15	0.50-0.65	...	...	...	...
ASTM A193 / A320 Gr. B8 / B8 CL.2	0.08 Max	2.00 Max	1.00 Max	0.045	0.030	18.0-20.0	...	8.0-11.0	...	...	...
ASTM A193 / A320 Gr. B8M / B8M CL.2	0.08 Max	2.00 Max	1.00 Max	0.045	0.030	16.0-18.0	2.0-3.0	10.0-14.0	...	...	...
ASTM A320 Gr. L7	0.38-0.48	0.75-1.00	0.15-0.35	0.035	0.040	0.80-1.10	0.15-0.25	...	...	...	...
ASTM A320 Gr. L7M	0.38-0.48	0.75-1.00	0.15-0.35	0.035	0.040	0.80-1.10	0.15-0.25	...	...	...	...
ASTM A325 Type 1	0.30-0.52	0.60 Min	0.15-0.30	0.040	0.050	Carbon Steel	...	...	...	...	...
ASTM A325 Type 1	0.30-0.52	0.60 Min	0.15-0.35	0.035	0.040	Alloy Steel	...	...	...	...	...
ASTM A354 Gr.BC	4)0.3-0.53	...	...	0.035	0.040	...	...	...	...	...	...
ASTM A354 Gr.BD	4)0.3-0.53	...	...	0.035	0.040	...	...	...	...	...	...
ASTM A449 Type 1	0.30-0.52	0.60 Min	...	0.040	0.050	...	...	...	...	...	...
ASTM A453 Gr. 660 A-C	0.08 Max	2.00 Max	1.00 Max	0.040	0.030	13.5-16.0	1.0-1.5	24.0-27.0	...	...	6) Ti,Al,V,B
ASTM A453 Gr. 660 D	0.08 Max	2.00 Max	1.00 Max	0.040	0.030	13.5-16.0	1.0-1.5	24.0-27.0	...	...	6) Ti,Al,V,B
ASTM A479 UNS. NO. S31803	0.030 Max	2.00 Max	1.00 Max	0.030	0.020	21.0-23.0	2.5-3.5	4.5-6.5	...	...	N 0.08-0.20
ASTM A479 UNS. NO. S32750	0.030 Max	1.20 Max	0.80 Max	0.035	0.020	24.0-26.0	3.0-5.0	6.0-8.0	...	0.50 Max	N 0.24-0.32
ASTM A479 UNS. NO. S32760	0.030 Max	1.00 Max	1.00 Max	0.030	0.010	24.0-26.0	3.0-4.0	6.0-8.0	...	0.50-1.00	N 0.20-0.30
ASTM A490 Type 1 (F1080)	5)0.30-0.48	...	...	0.040	0.040	...	...	...	...	...	...
ASTM A540 Gr. B23	0.37-0.44	0.60-0.95	0.15-0.35	0.025	0.025	0.65-0.95	0.20-0.30	1.55-2.00	...	...	...
ASTM B98 UNS. NO. C65100	...	0.7 Max	0.8-2.0	...	...	...	...	...	0.8 Max	96.0 Min	11) Pb,Zn
ASTM B150 UNS. NO. C63000	...	1.5 Max	0.25 Max	...	...	...	...	4.0-5.5	2.0-4.0	Re	12) Al,Sn,Zn
ASTM B169 UNS. NO. C61400	...	1.00 Max	0.015 Max	...	...	...	...	...	1.5-3.5	Re	13) Pb,Al,Zn
ASTM B637 UNS. NO. N07718	0.08 Max	0.35 Max	0.35 Max	0.015	0.015	17.0-21.0	2.80-3.30	50.0-55.0	...	0.30 Max	10) Co,C-b,Ti,Al,B
MONEL K-500	0.25 Max	1.5 Max	0.50 Max	...	0.010	...	...	63 Min	2.00 Max	27.0-33.0	9) Al, Ti
ISO 898-1(JIS B1051) Gr.8.8	0.25-0.55	...	...	0.035	0.035	Carbon Steel	...	...	...	...	...
ISO 898-1(JIS B1051) Gr.10.9	0.25-0.55	...	...	0.035	0.035	Alloy Steel	...	...	...	...	7) Cr,Ni,Mo
KS B1010(JIS B1186) F10T	...	...	...	...	...	...	...	...	...	...	...
KS D3752(JIS G4051) S45(N)	0.42-0.48	0.60-0.90	0.15-0.35	0.030	0.035	0.20 Max	...	0.20 Max	...	0.30 Max	...
KS D3711(JIS G4105) SCM440	0.38-0.43	0.60-0.85	0.15-0.35	0.030	0.030	0.90-1.20	0.15-0.30	0.25 Max	...	0.30 Max	...
KS d3706(JIS G4303) SUS304	0.08 Max	2.00 Max	1.00 Max	0.045	0.030	18.0-20.0	...	8.0-10.50	...	...	...
KS D3706(JIS G4303) SUS316	0.08 Max	2.00 Max	1.00 Max	0.045	0.030	16.0-18.0	2.00-3.00	10.0-14.0	...	...	...

1) When Copper is Specified 2) A320 Gr.B8.B8M 30min 3) A320 Gr.B8.B8M 95min 4) 1/2 C0.35-0.53 5) 1-3/8 over 1-1/2 C0.35-0.53 6) Ti 1.9-2.35,Al 0.35max,V0.1- 0.5,B0.001- 0.010
7) Alloy Steel Shall Contain one or more Alloying elements Cr, Ni, Mo, Or V 8) Proof Stress 9) Al 2.3-3.15, Ti 0.35-0.85 10) Co 1.0max, Cb 4.75-5.50, Ti 0.65-1.15, Al 0.20-0.80, B0.006max
11) Pb 0.05 Max, Zn 1.5 Max 12) Al 9.0-11.0, Sn 0.20 Max Zn 0.30 Max 13) Pb 0.01, Al 6.0-8.0, Zn 0.20 Max

Requirements For Nut Materials

Grade	Chemical Requirements [%]									
	C	Mn	si	P Max	S Max	Cr	Mo	Ni	Cu	Other Elements
ASTM A194 Gr. 2	0.40 Min	1.00 Max	0.40 Max	0.040	0.050	...	...	...	...	...
ASTM A194 Gr. 2H	0.40 Min	1.00 Max	0.40 Max	0.040	0.050	...	...	...	...	...
ASTM A194 Gr. 2HM	0.40 Min	1.00 Max	0.40 Max	0.040	0.050	...	...	...	...	...
ASTM A194 Gr. 4	0.40-0.50	0.70-0.90	0.15-0.35	0.035	0.040	...	0.20-0.30	...	...	...
ASTM A194 Gr. 6	0.15 Max	1.00 Max	1.00 Max	0.040	0.030	11.5-13.5	...	...	...	...
ASTM A194 Gr. 7	0.37-0.49	0.65-1.10	0.15-0.35	0.035	0.040	0.75-1.20	0.15-0.25	...	...	...
ASTM A194 Gr. 7M	0.37-0.49	0.65-1.10	0.15-0.35	0.035	0.040	0.75-1.20	0.15-0.25	...	...	...
ASTM A194 Gr. 8	0.08 Max	2.00 Max	1.00 Max	0.045	0.030	18.0-20.0	...	8.0-11.0	...	...
ASTM A194 Gr. 8M	0.08 Max	2.00 Max	1.00 Max	0.045	0.030	16.0-18.0	2.0-3.0	10.0-14.00	...	...
ASTM A182 F51	0.030 Max	2.00 Max	1.00 Max	0.030	0.020	21.0-23.0	2.5-3.5	4.5-6.5	...	N 0.08-0.20
ASTM A182 F53	0.030 Max	1.20 Max	0.80 Max	0.035	0.020	24.0-26.0	3.0-5.0	6.0-8.0	0.50 Max	N 0.24-0.32
ASTM A182 F55	0.030 Max	1.00 Max	1.00 Max	0.030	0.010	24.0-26.0	3.0-4.0	6.0-8.0	0.50-1.00	N 0.20-0.30
ISO 898-2(JIS B1052) Gr. 8	0.58 Max	0.25 Min	...	0.060	0.150	...	...	...	...	...
ISO 898-2(JIS B1052) Gr. 10	0.58 Max	0.30 Min	...	0.048	0.058	...	...	...	...	...
KS B1010(JIS B1186) F10	...	...	...	...	...	...	...	...	...	...

Requirements For Washer Mechanical

Grade	Dia ni[mm]	Washer Type	Hardness		
			HB	HRB	HRC
F436	All	Plain Washer / Square	...	...	38-45
F844	All	Plain Washer	...	...	...
F35	All	Plain Washer	...	...	35-45
14H	All	Plain Washer / Square	...	75-95	...
22H	All	Plain Washer / Square	...	95 Min	29 Min
SWRH	All	Spring (Lock) Washer	...	...	42-50



HWASUNG 1 FACTORY

(주) 화성금속

(株) 和星金屬

We believe we could not have achieved the growth we have undergone in a relatively short time overcoming a short history without the supports and interests from our customers as well as our collective efforts for quality improvement and customer satisfaction. We promise to provide customers with quality products with the highest value through consistent quality management and technological development. We will do our best and be truthful so that we can develop a relationship with any customer.

(주) 화성금속 2공장

(株) 和星金屬
R&D Center

HWASUNG 2 FACTORY



|주| 화성금속

HQ & the 1st Plant : 87-16, Soju-ro, Yangsan-si,
Gyeongsangnam-do, Korea
TEL : 055-366-3456 FAX : 055-366-3459
the 2nd Plant : 33, Dulleom-gil, Yangsan-si,
Gyeongsangnam-do, Korea
E-Mail : hsbolt@hsbolt.co.kr
Home Page : www.hsbolt.co.kr