COMPANY
PROFILE



KISWEL

ALWAYS WITH YOU
SINCE 1969

www.kiswel.com

COMPANY PROFILE

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READER'S GUIDE

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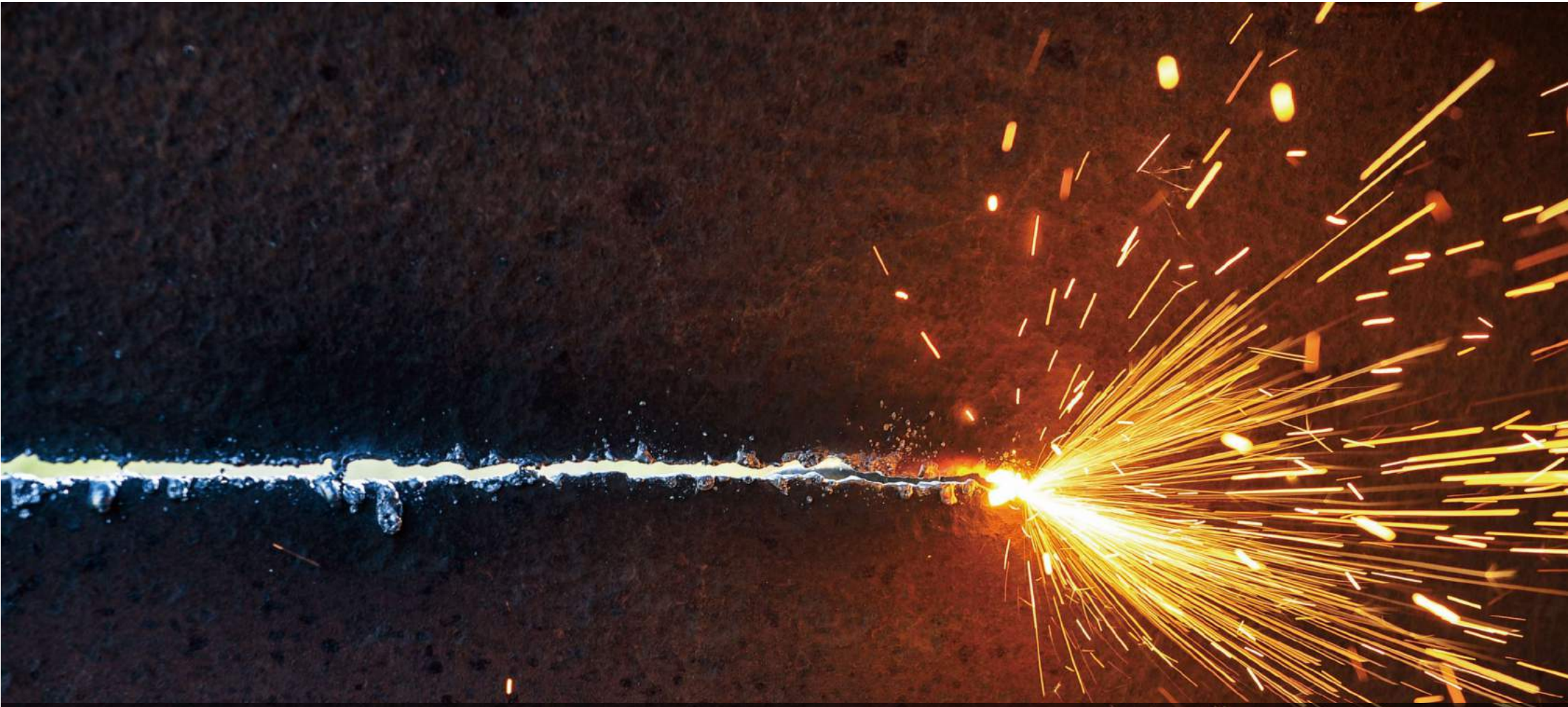
Contact Us

ALWAYS WITH YOU.
YOUR WELDING SOLUTION PARTNER, KISWEL.



Introduction

KISWEL



Introduction

OVERVIEW

KISWEL connecting the world maintains the values with added values while connecting people, products, and companies.

CEO'S GREETINGS



Taking only a single path for **more than 50 years** while holding fast to the area of welding materials.
We have devoted ourselves to the growth of the national industrial infrastructure through localizing welding materials during a time when basic industries were weak in the 1970s and 1980s. During the 90s, we have established a technology research center equipped with high-tech equipment in response to demands for advanced technologies and high quality, and have automated processes and facilities in the early stages.
And we have pursued quality first through **QS-9000, ISO/TS 16949 and ISO 14001 certification system**, and played a role in enhancing the competitiveness of the steel related industries.

In Korea, we have 2 production bases and high-tech technology research center in addition to our head office in Seoul. Befitting the global era, we have established overseas plants in China, the US, and Malaysia, as well as overseas affiliates in the US, Japan, China, Vietnam, and Malaysia, and branches in Thailand, Indonesia, Luxembourg, Mexico, Dubai, and Vietnam. And through this, **we are raising our status as a global corporation both in name and reality.**

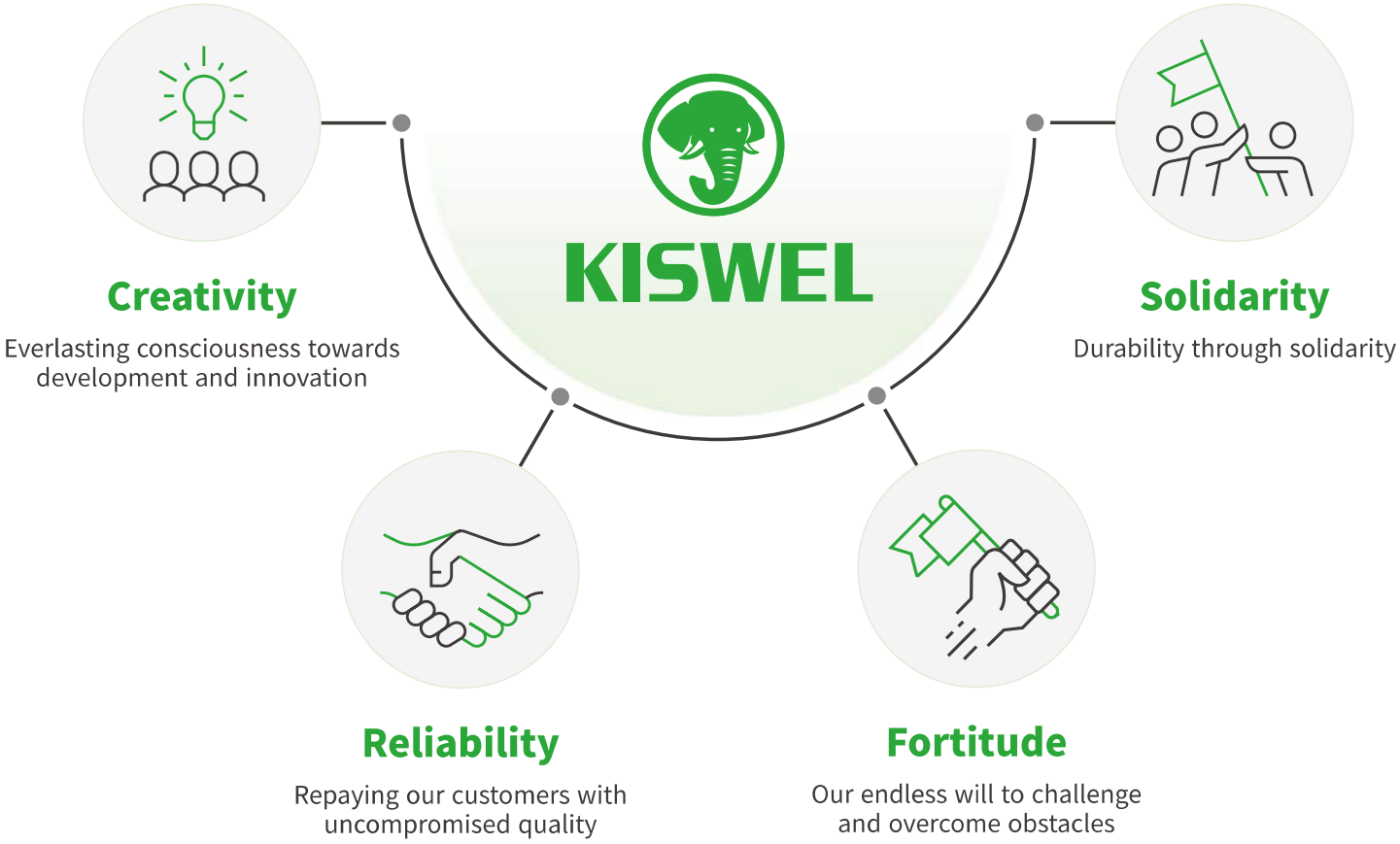
Today, everyone of you can experience our KISWEL welding materials with the trademark, "Elephant logo" in over 120 countries worldwide.
We at KISWEL are exerting our every effort to enhance the competitiveness of the nation based on the excellence and global competitiveness of our products.

Please keep an eye on KISWEL taking a leap to become the world's top company specializing in welding materials.
We express our gratitude for your unwavering trust and support.

Always with you

VISION

KISWEL has been working hard to localize welding materials and advance the basic material industry based on its management philosophy: 'Creativity,' 'Trust,' 'Perseverance,' and 'Internal Stability.' With pride that innovation of materials translates into innovation of the industry, we are connecting the world from the closest place for a more convenient world and a safer everyday life. KISWEL has been connecting the world with passion hotter than fire in a barren land of the welding industry. We will become a solution partner creating the future together with values beyond welding materials.



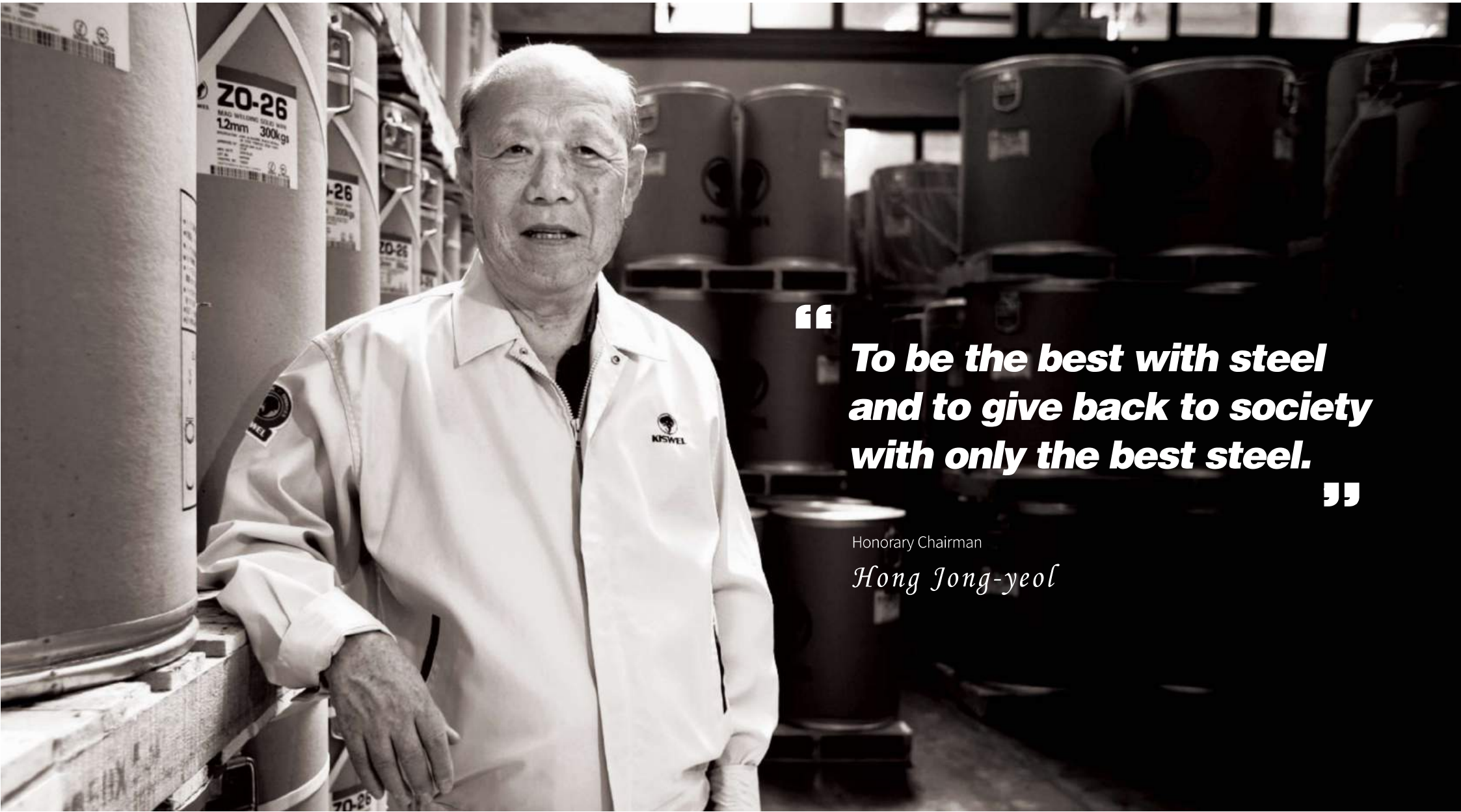


Introduction

INTRO

Let’s examine the past and present of KISWEL based on the management philosophy of ‘Creativity,’ ‘Trust,’ ‘Perseverance,’ and ‘Internal Stability.’

FOUNDER'S MESSAGE



"To be the best with steel and to give back to society with only the best steel."

Honorary Chairman

Hong Jong-yeol

KISWEL HISTORY

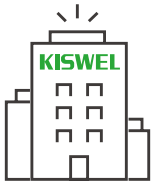
KISWEL launched as Korea Welding Rod Co., Ltd. in 1973 has been achieving records of being 'new,' 'the first,' and 'the best' for the past 50 years.
To become KISWEL standing shoulder to shoulder with global leading corporations, we will not forget that the shared growth with our customers is the source of our competitive edge, and devote ourself to add our know-how accumulated over the years to our new technologies.

The path taken 1960 - Present



1969

Established welding business dept. in KISWIRE



1973

Founded KISWEL Co., Ltd.



1998

Selected as Top 50 company with superior quality competitiveness



2004

Founded R&D CENTER
Selected as the best research center in 2010



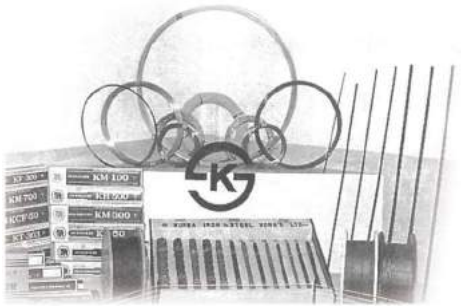
2020

Established partnership for joint development with domestic & overseas leading companies and research institutions
&
Awarded commendation from DAPA for localizing bulletproof steel welding material



2021

Localized 9% Ni steel welding material for land LNG storage tank for the first time in Korea



KISWEL product produced in 1973

1960 - 1970

Farther than others, getting ahead of others

Established foundation for localization of welding rods and industrial growth of Korea

KISWEL, born from establishing the welding business department in KISWIRE in 1969, has been working hard to develop products and control quality to cement the foundation for the industrial growth of Korea along with the localization of welding rods.

1969 Established welding rod business dept. in KISWIRE

1971 Certified by classification societies in the UK (LR), France (BV), and the US

1973 Founded KISWEL Co., Ltd. Introduced in-line equipment for the first time in East Asia

1978 Pioneered export market

1981 Acquired Japanese Industrial Standard(JIS) approval (for the first time as a foreign welding material)

1987 Awarded industrial medal of $10 million Export Tower on Trade Day
Established R&D center (Ministry of Science and Technology Reg. No. 379)

1989 Established Japanese branch (KISWEL JAPAN)

1996 Awarded industrial medal for $50 million Export Tower on Trade Day (For the first time in welding material industry)

1997 Established plant in Malaysia

1998 Selected as top 50 company with superior quality competitiveness
Established European branch

1999 Established US branch (KISWEL USA.INC)



1980 - 1990

Pushed ahead with technology independence

Establishment of quality management system and advancement in quality

KISWEL has been growing steadily as the company was awarded an industrial commendation for $50 million Export Tower on Trade Day for the first time in the welding industry and selected as the top 50 company with superior quality competitiveness due to its constant efforts to enhance quality with the belief that quality creates a safe everyday life and a convenient world.



Nov. 30, 1987 Awarded commendation for achieving $10 million in exports on Trade Day



May 2004 Opening ceremony of R&D center

2000 - 2010

As a global specialty company

Expansion of exports and global networks

KISWEL has broadened its distribution network by expanding the global networks to get closer to our customers at home and abroad. We have also opened a R&D center to concentrate more in R&D of products. Due to such efforts, we have been awarded the industrial medal of $100 million Export Tower on Trade Day and selected as the world class 300 company.

2002
Awarded 'Bronze Tower Medal of Industry' in commemoration of National Taxpayers' Day

2003
Awarded 'Export Award' from Busan city

2004
• Opened R&D CENTER
• Activated plant in China (KISWEL DALIAN LTD.)

2006
Established US manufacturing corporation (KISWEL INC.)

2007
Established Dubai branch

2008
Awarded Steel Tower Medal of '$100 Million Export'

2009
• Established Ho Chi Minh branch
• Established Bangkok branch

2016
Selected as World Class 300 (~Present)

2017
Awarded Presidential commendation for contribution to the capital goods industry

2020
Signed agreement of joint development of specialized steel welding material for each industry with POSCO
Signed agreement for joint development of total welding solution with KOMATSU (Japan)
Signed agreement for joint development of bulletproof steel welding material with Defense Agency for Technology and Quality
Localized raw material of bulletproof steel for ROK Army Cavalry Fighting Vehicle & awarded medal from DAPA

2021
Signed agreement for joint development of low slag welding material with AUTOTECH ENGINEERING (GESTAMP) of Germany
Localized 9% Ni steel welding material for LNG storage tank for the first time in Korea



May 2004 Dalian

2020 - Present

Establishment of foundation for solution partnership

Creation of future of sustainable symbiosis

KISWEL is bearing the responsibility of Korean welding materials by doing its best to establish a systematic response system with the best companies in the domestic and foreign area, and develop welding materials tailor-made to customers and provide solutions for shared growth with our customers in the diversifying industrial scene.

WORLD CLASS 300

Selected as World Class 300 (~Present)



Introduction

NETWORK

Let's take a look at the overseas affiliated companies and production facilities for drawing near to KISWEL's group company and affiliates, and domestic and overseas customers.

KISWEL IN NUMBERS

KISWEL is striving to supply the best welding materials to our customers while actively responding to changes and innovations with efficient resource management as a company specializing in welding materials representing Korea, releasing over 400 products ranging from general-purpose materials to specialized materials.

516

Output 516 KMT

7,000

Sales KRW 700 billion

450

Customers 450

92

Trading countries 92 countries

Manufacturing base
13 locations

13

1

1 Technology
R&D center

1,000

Employees
1000 persons

7 Production
bases

7

400

Products
More than 400 types

40

Production capacity
400,000 tons

KISWEL GROUP

Introduction of KISWEL affiliates.

KISWEL	KISWEL 흥국제선	Poswelding POSCO+KISWEL (Joint Venture)	SAMHWA STEEL	KORHEAT
Covered Electrodes Flux Cored Wires Solid Wires SAW Wires & Fluxes MIG Wires TIG Rods	Flux Cored Wires	Flux Cored Wires SAW Wires & Fluxes	PC Bars Spring Wires	PC Bars
640	**75**	**10**	**285**	**40**
5	**1**	**1**	**5**	**1**
(2021) USD **273** Million	USD **30** Million	USD **10** Million	USD **187** Million	USD **47** Million
210 KMT/year	**36** KMT/year	**6** KMT/year	**184** KMT/year	**80** KMT/year

KISWEL FAMILY

Introduction of KISWEL's family companies.

179 mil M/T Output

9,100 Employees

U$ 3.93 bil Sales figures

61 Production bases

KOS	KISWIRE	KISWEL	ET LAND 전자랜드
KOS Jisan Resort (Golf & Ski Resort)	KISWIRE KAT	KISWEL Samhwa Steel Korea Heat Treatment	Heungkuk Jeseon Pohang Special Welding Korea Omega	ET Land, Twin Doves Golf Club
Stainless Spring Wire, Stainless Wire Rope, Nickel Alloy Wires, PV Ribbon wire	Wire Ropes Steel Cord Wires Spring Wires	Welding Consumables PC Bars Spring Wires	Electric Devices Distribution
950	**6,500**	**1,050**	**600**
11	**37**	**13**	**120**
(2020) USD **650** Million	USD **2,0** Million	USD **525** Million	USD **750** Million
80 KMT/year	**1,200** KMT/year	**516** KMT/year	-

GLOBAL NETWORK

KISWEL is drawing closer to worldwide customers based on 7 local and overseas production bases and research center, and 19 operation points.

7 Production bases

1 Technology R&D center

5 Sales branches

19 Sales offices



DOMESTIC PRODUCTION PLANTS

We have established and are running domestic production plants in Changwon, Busan, and Pohang.





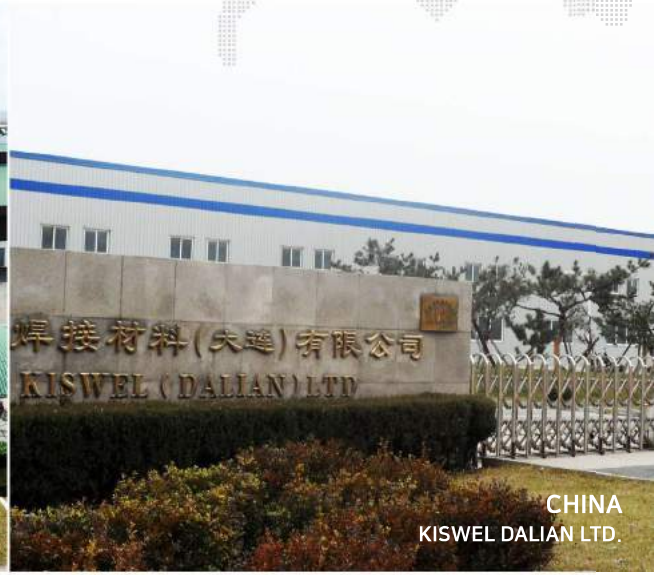
COUNTRY	ADDRESS	MAJOR PRODUCT
KOREA	**Changwon Plant** 704 (Sungju-dong), Gongdan-ro, Seongsan-gu, Changwon-si, Gyeongsangnam-do, Korea	Solid Wires / Flux Cored Wires / SAW Wires&Fluxes / MIG Wires / TIG Rods
	Busan Plant 70 (Hackjang-dong), Saebyeok-ro 63beon-gil, Sasang-gu, Busan, Korea	Electrodes
	Pohang plant 70 Jangheung-ro 39beon-gil, Nam-gu Pohang-si, Gyeongsangbuk-do, Korea	Flux Cored Wires

OVERSEAS PRODUCTION PLANTS

Our overseas production facilities include local plants in Malaysia, the US, and China. And we are responding to the demands for localization of each market in the world.



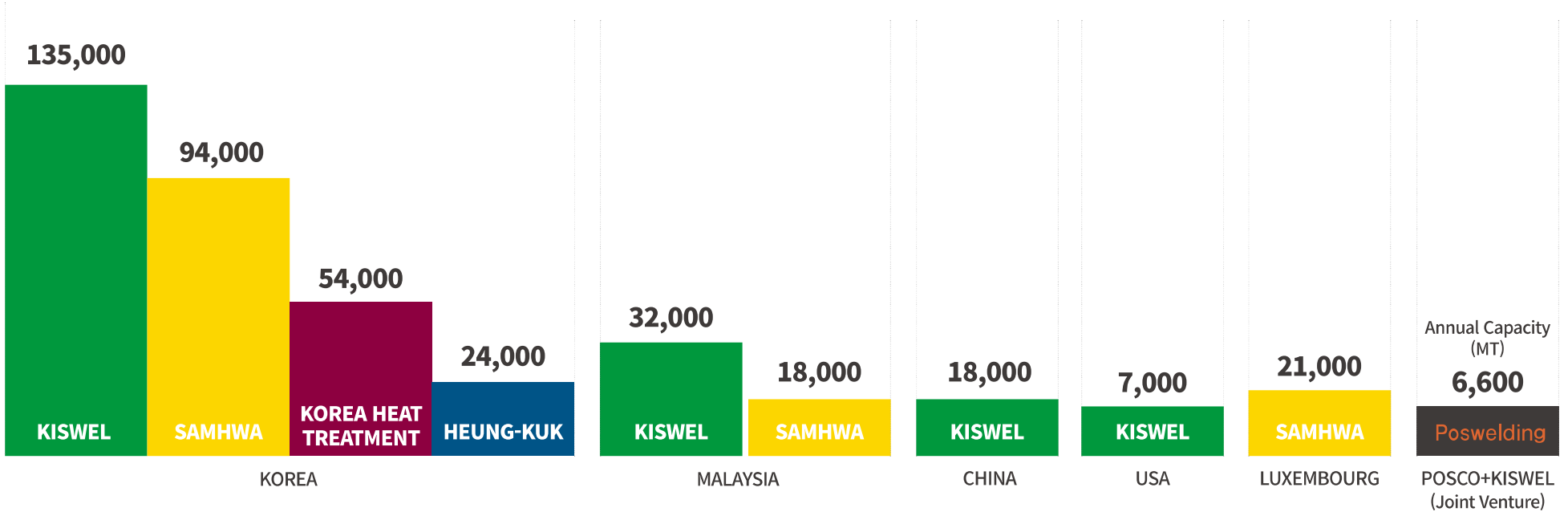




COUNTRY	ADDRESS	MAJOR PRODUCT
U.S.A	**KISWEL INC.** 7950 Dixie Hwy Florence, KY41042, U.S.A	Flux Cored Wires / MIG Wires
MALAYSIA	**KISWEL SDN BHD.** PLO 63, Jalan Keluil 2, Pasir Gudang, Malaysia	Electrodes / Solid Wires / Flux Cored Wires / MIG Wires
CHINA	**KISWEL DALIAN LTD.** #73, Zhenpeng Industrial Area, Dalian, China	Flux Cored Wires

Product production capacity

KISWEL is producing various products through operating a family company and overseas production facilities.
We are pursuing the highest quality with our know-how accumulated for half a century and constant research and development of even special welding materials suitable for the new industrial environment.



KISWEL Group	Total (MT)	Products
KISWEL	192,000	Welding Consumable (FCW / GMAW / SAW / SMAW / MIG / TIG)
SAMHWA	133,000	IHTW / ESW / PC Bar
KOREA Heat Treatment	54,000	PC Bar
HEUNG-KUK(KISWEL POHANG)	24,000	Welding Consumable (FCW)
Gross Total (MT)	**403,000**	

CERTIFICATION STATUS

We are equipped with ISO/TS 16949, ISO 14001 certifications as well as quality control system through various overseas certification system, and playing the role to enhance competitiveness in steel related businesses.

Quality Management System

1



ISO 9001

2



IAFT 16959

Environmental Management System

3



ISO 14001

Quality Management System

4



KS

5



KEPIC

6



CE

7



DB

8



TUV

Japanese Industrial Standards

9



JIS

CERTIFICATION STATUS

We are equipped with ISO/TS 16949, ISO 14001 certifications as well as quality control system through various overseas certification system, and playing the role to enhance competitiveness in steel related businesses.

Classification Societies

10

ABS

11

BV

12

DNV

13

LR

14

KR

15

NK

16

RINA

17

RS

18

CCS

19

CWB


KISWEL
Our Product & Business
CONNECTING THE WORLD!
FOR THE GREAT VALUE,
KISWEL.



Our Product & Business

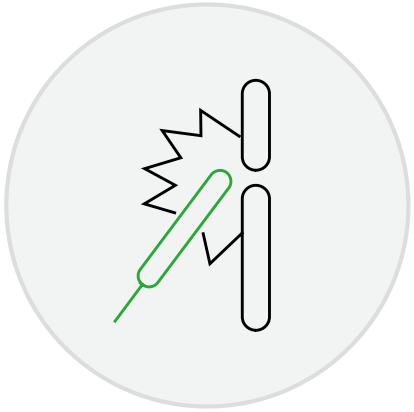
SERVICE

KISWEL is striving to create values higher than just welding materials.
We will become a total solution partner providing differentiated solutions tailored to customers through integrating products, technologies, and services.

TOTAL SOLUTION PARTNER, KISWEL

KISWEL provides 'Total Solution Marketing' to satisfy customers with values beyond just supplying welding materials.

Welding consumables



Welding technology
Technical Solution

Customer needs



- Robot automation system
- Highly efficient welding technology
- Quality certification
- Eco-friendly material development
- Future-oriented new steel customized development

Joint business/agreement signing
Commercial Solution

+

Establishment of win-win collaborative relations
Human Solution

Creation of values beyond welding materials
Creation of the Future integrating high quality welding materials with customized solutions.

TOTAL WELDING SOLUTION

KISWEL provides 'Total Solution Marketing' to satisfy customers with values beyond just supplying welding materials.

TOTAL WELDING SOLUTION

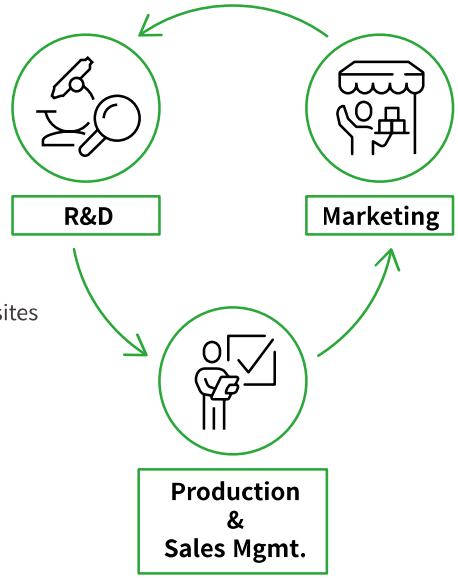
Steel material
Creation of new values actualizing business diversification by enabling innovation of steel materials

Welding technology
Grafting of optimum welding technology perfecting product innovation

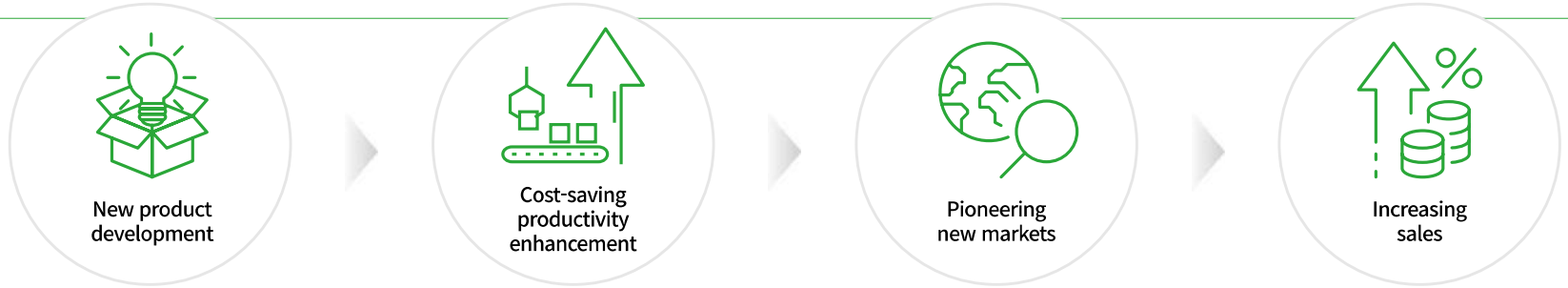
Welding system
Fusing of optimized welding system leading the creation of a safe and efficient environment in various sites

Quality certification service
Providing a variety of certification services and various business services

Human solution
Establishing win-win collaborative relations impressing customers by being close to customers

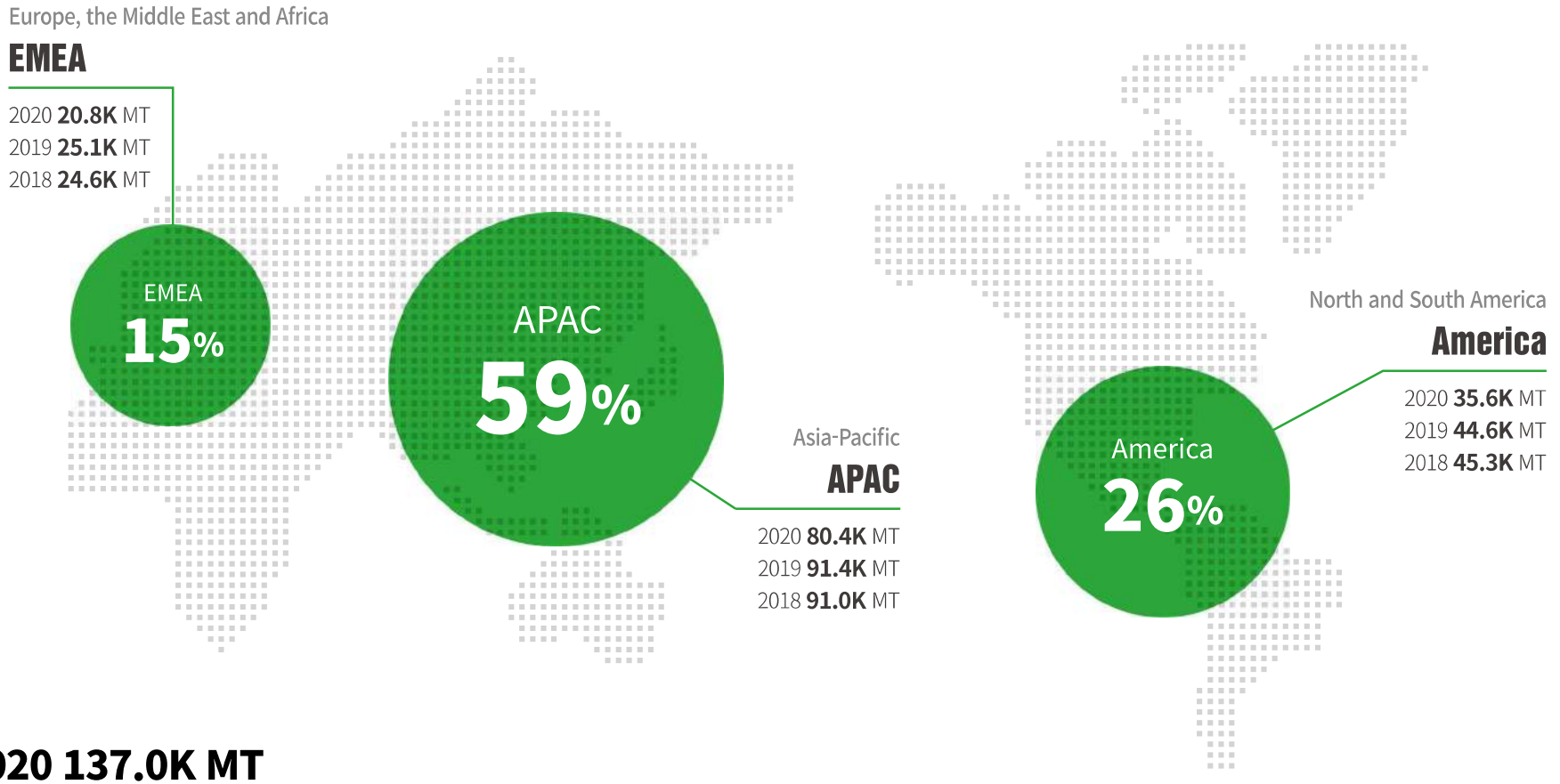


Customer's



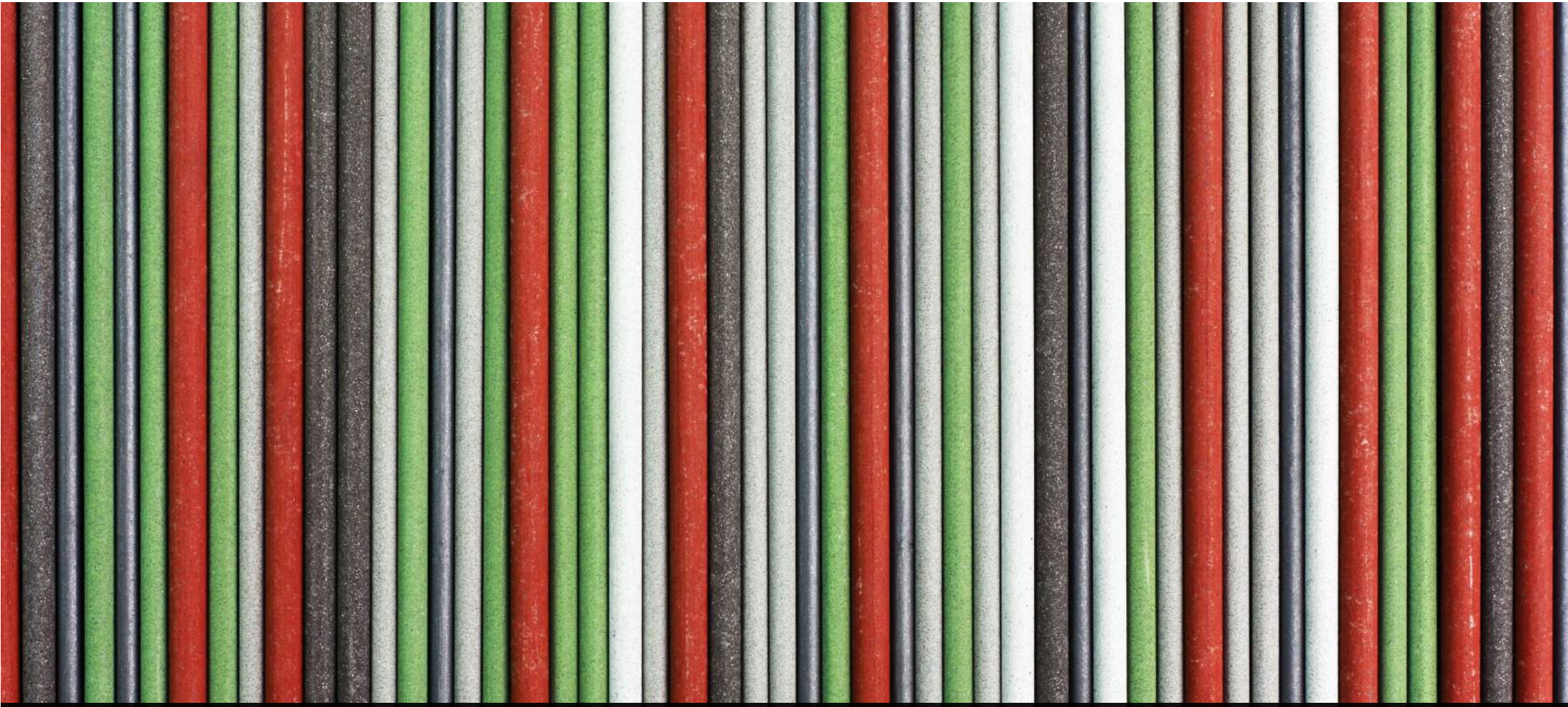
GLOBAL SALES PERFORMANCE

KISWEL is delivering values beyond just welding materials in the global welding market based on constant technology development and quality control.



2020 137.0K MT

Solid Wires	Flux Cored Wires	Electrodes	SAW	MIG/TIG
39%	38%	14%	5%	3%



Our Product & Business

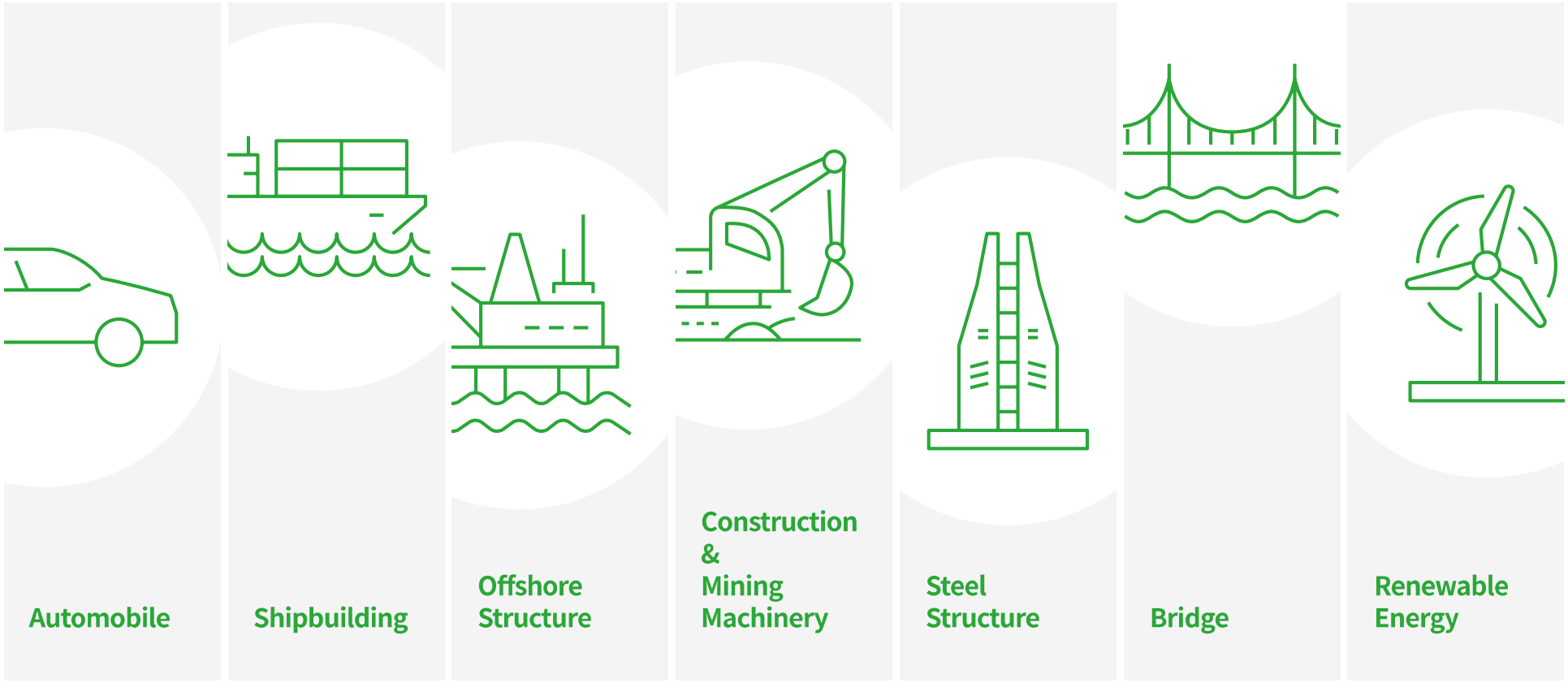
PRODUCT & PORTFOLIO

KISWEL is producing various welding materials
Let's take a look at the products group, customer segments, major products by industrial classification, and supply history.

CUSTOMER SEGMENT

Various products of KISWEL are used every day in diverse business areas as the basic materials of all metal industries.

Customer segment



PRODUCT LINE-UP

Various products of KISWEL are used every day in diverse business areas as the basic materials of all metal industries.

Product

SMAW



GMAW



SAW



FCAW



MIG / TIG



Special Alloy



Offshore Structures & Shipbuilding

Base Material	IACS	A B D	AH32 DH32	AH36 DH36	AH40 DH40	E	EH32	EH36	EH40	FH32	FH36	FH40	E500	F690
	Yield Strength (MPa)	235	315	355	390	235	315	355	390	315	355	390	500	690
	Test Temp. (℃)	20 0 -20		0 -20		-40					-60		-40	-60
	Absorbed Energy (J)	27	31	34	39	27	31	34	39	31	34	39	33	46
KISWEL Welding Consumables	FCAW	K-71T				K-81TK2							K-92T	K-110TK3
		KX-200				KX-200H				K-71TNi2			K-90T	
	SAW	EF-200V X KD-50			EF-200LT X KD-50	EF-200V X KD-50			EF-200LT X KD-50		EF-200LT X KD-50		EF-200LT X KD-60	EF-200UV X KD-120

Major Supply Records



"Johan Sverdrup process platform"

Structure	Client	Field Location	Country	Year
FSO Sao Vang & Dai Nguy Turret	FSO Golden star	05-1b&c	Vietnam	2020
ANCHOR FPU HULL	CHEVRON	Gulf of Mexico	U.S.A	2021
JOHAN SVERDRUP PROCESS PLATFORM	Statoil	Norwegian North Sea	Norway	2021
GBS LNG PLANT MODULE	Noavatek	Gulf of OB	Russia	2021
BP MAD DO2 FPU	BP	INDIA	U.K	2021
RELIANCE MJ FPSO	RELIANCE	INDIA	INDIA	2021
FAST4WARD FPSO	OGC /PETROPAC	Salalah,OMAN	OMAN	2021
Salalah LPG PLANT	Petrobras	Coast of Rio de Janeiro	Brazil	2021
Self-elevating platform (SEP)	Penda-Ocean	JAPAN	Indonesia	2021

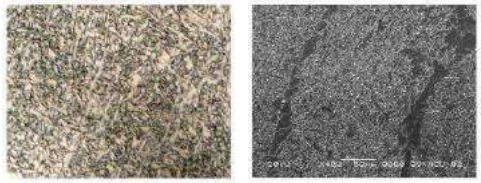
Thermal & Nuclear Power Plants

Base Material	ASTM	0.5Mo	1Cr-0.5Mo	2Cr-1Mo	2Cr-1Mo-V	5Cr-0.5Mo	9Cr-1Mo	9Cr-1Mo-Nb-V
	AISI	P/T1	P/T11	P/T22	P/T23	P/T5	P/T9	P/T91
KISWEL Welding Consumables	SMAW	K-7016A1	K-8016B2	K-9016B3		K-8016B6	K-8016B8	K-9015B9
	FCAW	K-81TA1	K-81TB2(L)	K-91TB3(L)	K-91TB3LS	K-81TB6		K-91TB9
	SAW	EF-200H X KD-60	EF-200H X KD-B2	EF-200H X KD-B3				EF-200HP X KD-B9
	GMAW		KC-80SB2	KC-90SB3				KC-90SB9
	GTAW		T-80SB2	T-90SB3				T-90SB9
PWHT		620℃×1Hr		690℃×1Hr		740℃×2Hr		760℃×2Hr

Major Supply Records

Client/EPC		Project	Country	Year
BACS	ZAMIL SSD	Riyadh metro project	SAUDI	2019
EVN (V.N electricity)	Doosan Heavy Industries & Mitsubishi Corp.	VINH TAN 4 EXPANSIOIN	VIETNAM	2020
PDO	Towell Engineering Services	DIPWP PROJECT	OMAN	2020
KOEN	POSCO & Doosan Heavy Industries	Samcheok Blue power	Korea	2022
Salalah LPG PLANT	Hyundai E&C	CIREBON COAL POWER P LANT	INDONESIA	2022
NS2PC	Doosan Heavy Industries	NGHI SON Ⅱ THERMAL	VIETNAM	2022
TAIWAN thermal power	Doosan Heavy Industries	Fuel Gas Desulfurization	TAIWAN	2022
Tongyeong eco power	Hanwha E&C	Combination THERMAL POWER	KOREA	2022

Characteristic of product (EF-200H×KD-60)



Microstructure of weld metal. From the left, PWHT OM(X500)& PWHT SEM(X400).

- PWHT : Post Weld Heat Treatment

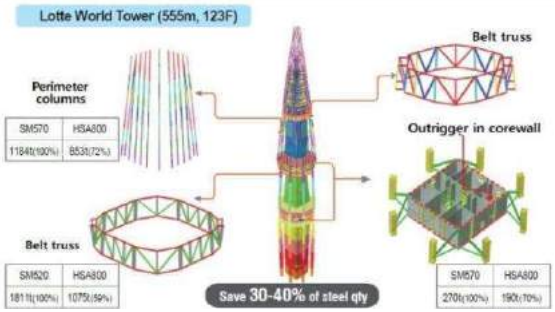
Building & Bridge Construction

	KS	SS 400	SM 400	SMA 400	SM 490	SM 490Y	SMA 490	HSB 500	SM 520	SM 570	SMA 570
Base Material	Tensile Strength (MPa)	400-510		400-540		490-610		Min.500	520-640	570-720	
	Test Temp. (℃)	-	0	0	0	0	0	-5	0	-5	-5
	Absorbed Energy (J)	-	47	47	47	27	47	47	47	47	47
KISWEL Welding Consumables	FCAW	K-71T			K-55T					K-81T	
		KX-200			KX-55					K-80ST	
	SAW	EF-100H x KD-50			EF-100H x KD-60						
	GMAW	KC-28			ZO-55					ZO-60	

	KS	HSB 600	HSA 800	HSB 800
Base Material	Tensile Strength (MPa)	Min.600	800-950	Min.800
	Test Temp. (℃)	-5	-5	-20
	Absorbed Energy (J)	47	47	47
KISWEL Welding Consumables	FCAW	K-91T	K-120TG	
		K-90T		
	SAW	EF-200UV x KD-120		
	GMAW	ZO-60	ZH-120	

Major Supply Records





Butt welded joint tensile test, different grade steel joint tensile test, welded joint bending test, Charpy impact test, microstructure test and others were conducted to evaluate the welding performance of HSA800 (Fig. 3). K-120TG and OK-Aristo79 weld electrodes were used for high strength steel. K-71T was used for the different grade steel joint tensile tests between HSA800 and SM400.

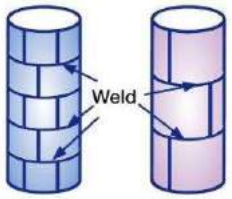
Information & Image source
: "HSA800: High Strength Steel for Bldgs."
POSCO(RIST)

Structure	City	Floors	Height to roof(m)	Year
Lotte World Tower	Seoul	123	555	2016
KL118 (Merdeka 118)	Malaysia	118	664	2021
1863 Oceanwide center	San Francisco	64	280	2021

Storage Tanks

Base Material	ASTM	A283-C	A36	A516-70	A573-70N	A537-Cl.2	A841-Cl.2
	Tensile Strength (MPa)	380 - 515	400 - 550	485 - 620	485 - 620	550 - 690	550 - 690
	Test Temp. (℃)	-	-	-46	-46	Design Temp.	Design Temp.
	Absorbed Energy (J)	-	-	27	27	48	48
KISWEL Welding Consumables	FCAW	K-71T					
		K-81T					
	SMAW	K-7018(Pipeweld)					
						K-8016C1	
						K-8018C1	
	SAW	EF-200LT x KD-50					
					EF-200LT x KD-60		
	EGW	K-EG3					

Major Supply Records



Information & Image source
: "Steel Plate for Storage Tanks"
POSCO

Client/EPC	Project	Country	Year
VOPAK Tank	HIAP SENG Engineering	Singapore	2018
Petronas	ICE Petroleum Engineering	Malaysia	2019
KET	SK & DAEWOO E&C	Korea	2021
POSCO	POSCO E&C	Korea	2021
KOGAS	Doosan Heavy Industries	Korea	2021
Tongyeong eco power	Hanwha E&C	Korea	2021

Pipe Manufacturing

Base Material	API	2W Gr.50	2H Gr.50	5L B 5L X42	5L X46	5L X52	5L X56	5L X60	5L X65
	Tensile Strength (MPa)	Min. 448	483 – 620	414 – 758	434 - 758	455 – 758	490 – 758	517 – 758	531 – 758
	Test Temp. (℃)	-40	-40	0					
	Absorbed Energy (J)	≥41	≥41	≥27					
KISWEL Welding Consumables	SAW	EF-200LT X KD-50	EF-200V X KD-42	EF-100H X KD-50					
		EF-200LT Plus X KD-50	EF-200K X KD-42	EF-100S X KD-42					
			EF-200UV X KD-EH12K	EF-200V X KD-42					

Base Material	API	5L X70	5L X80
	Tensile Strength (MPa)	565 – 758	621 - 827
	Test Temp. (℃)	0	0
	Absorbed Energy (J)	≥27	≥27
KISWEL Welding Consumables	SAW	EF-100H X KD-EA2	EF-200V X KD-100
		EF-200V X EA2	

Country	Client
Japan	NSSMC
Japan	Kubota
Malaysia	EEW
Saudi Arabia	NPC
Korea	EEW
Korea	Dongbu Steel
Korea	Dongyang Steel Pipe

Major Supply Records

Country	Client	Project
Iran	NIGC	IGAT 5
Kazakhstan	AGIP KCO	AGIP Kashagan
Iran	ICOFC	NAR Compressor
Saudi Arabia	SABIC	Saudi Kayan
UAE	ASCON	Kaddas Oilfield
UAE	GASCO	Habshan
Saudi Arabia	Saudi Aramco	Shaybah
Saudi Arabia	Saudi Aramco	Jazan
Kuwait	KNPC	Clean Fuel
Mexico	ESEASA Offshore	PEMEX Platforms
Malaysia	Hyundai Engineering	MELAKA Refinery diesel
OMAN	Arabian Industries.,	DUQM SS piping

Wind Towers

Base Material	EN 10025	S355J	S355J0	S355J2	S355K2	S355N	S355NL	S355M	S355ML
	Yield Strength (MPa)	Min. 355							
	Test Temp. (℃)	20	0	-20	-20	-20	-50	-20	-50
	Absorbed Energy (J)	≥27	≥27	≥27	≥40	≥40	≥27	≥40	≥27
KISWEL Welding Consumables	SAW	EH-200V X KD-EH12K			EF200LT Plus X KD-50				
		EF-200K X KD-42			EF-200UV X KD-EH12K				
					EF-200SF X KD-EH12K				

Base Material	EN 10025	S420N	S420NL	S420M	S420ML
	Yield Strength (MPa)	Min. 420			
	Test Temp. (℃)	-20	-50	-20	-50
	Absorbed Energy (J)	≥40	≥27	≥40	≥27
KISWEL Welding Consumables	SAW	EF-200V X KD-EA2	EF-200SF X KD-EH12K	EF-200V X KD-EA2	EF-200SF X KD-EH12K
			EF200LT Plus X KD-50		EF200LT Plus X KD-50

Major Supply Records

Country	Client
Scotland	Subsea7
Mexico	Speco
China	T.S.P
Denmark	Nordex
Germany	Siemens
Spain	Gamesa
USA	GE
Belgium	Nobel Wind
Korea	CS Wind

√ 6 Basic Steps to manufacture

1. Forming & *tack welding*
2. External & internal *longitudinal welding*
3. Flange & *support welding*
4. Shell forming & *tack welding*
5. Shell *joining welding*
6. *Sub components welding*

Defense Industry (Bullet-proof Steel)

Category	Applied armor plate	Applied Standard	Applied Thickness (mm)	Main use	Plate Manufacturer	Function
TANK	RHA CLASS 1	MIL-A-12560 KDS 9515-1018	6.0 ~ 150.5	Vehicle body, Turret structure	POSCO etc. (KOREA)	Protection against penetration
	RHA CLASS 2	MIL-A-12560	12.5 ~ 38.1	Vehicle body deck	ArcelorMittal etc. (U.S.A)	High pressure shock(mine) protection
Armored Car	ARMOX500 (HHA)	MIL-A-46100	6.0 ~ 15.0	Vehicle body Structure	SAB (SWEDEN) ArcelorMittal etc (U.S.A)	Relatively light and excellent against hitting and fatigue
	ARMOX440 (RHA CLASS 2)	MIL-A-12560	6.0 ~ 10.0	Vehicle body deck	SAB (SWEDEN) ArcelorMittal etc (U.S.A)	High pressure shock(mine) protection

The armor plate is generally either Homogeneous rolled armor steel (MIL-STD-12560) or high hardness armor steel (MIL-STD-46100). These steels have the advantage of having very high hardness and high strength and though this it protects tanks and armored vehicles from attacks.
For domestic armored vehicles, ARMOX produced by SSAB with relatively high quality is used. Small tactical vehicles(KIA Moters) are also produced using ARMOX boards.

Base Material	T.S Min (Mpa)		1200	1400	1600	2000
	Steel company	SSAB	Armox 370T Cl.1,2	Armox 440T	Armox 500T	Armox 600T
		Dillinger	DIFENDER 400	DIFENDER 450	DIFENDER 500	DIFENDER 600
		Thyssen Krupp	SECURE 400	SECURE 450	SECURE 500	SECURE 600
		Industeel (Arclor)	MARS280,380	MARS440	MARS500	MARS600,650
KISWEL welding Consumables	SMAW		K-11018M			
	GMAW		ZH-100D			
	GTAW		T-100D			

KISWEL welding consumables applicable for TANK and Armored vihicles satisfy all the requirements and standard of the ATC (U.S. Army Aberdeen Test Center).

Major Supply Records

Client (Country)	Category	KISWEL Welding consumables
HYUNDAI ROTEM (KOREA army)	MBTs and Family Vehicles Wheel Type Combat Vehicles	ZH-100D, K-11018M

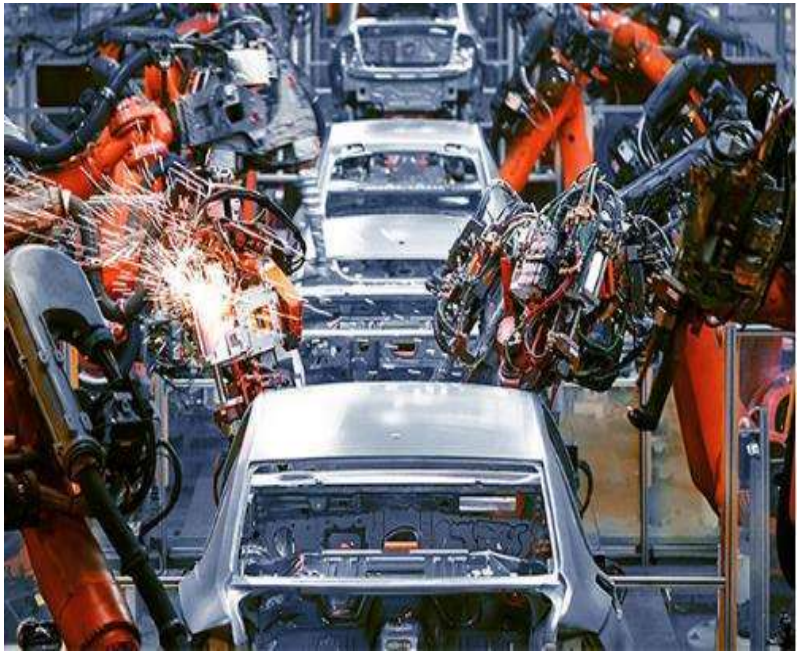


- Top/side and rear protection: ARMOX500 or HHA
- Bottom protection: ARMOX440 or RHA Class 2



- Top/side and rear protection: RHA Class 1
- Bottom protection: RHA Class 2

Automobile

PARTS NAME	TYPE/THICKNESS	SIZE (mm)	WELDING PROCESS					
			GMAW		FCW		MIG/TIG (STS and nonferrous metals)	
CAR BODY AND FRAME	LOW CARBON STEEL (2.5~4.0mm)	ø1.2 ~1.6	CO2	KC-28/ KC-28CF				
			MAG	KC-25M				
CHASSIS AND FRONT BUMPER	LOW CARBON STEEL (1.5~2.5mm)	ø1.2	CO2	KC-28/ KC-28CF				
			MAG	KC-25M				
LOW PARTS OF FRAME	LOW CARBON STEEL (1.5~2.5mm)	ø1.2	CO2	KC-28/ KC-28CF				
			MAG	KC-25M				
	STEEL COATED WITH ZINC (1.5~2.5mm)		CO2	KC-70S2				
	CORRISION RESISTANCE (1.5~2.5mm)		CO2	KC-28/KC-28CF				
SEAT AND INSIDE FRAME	LOW CARBON STEEL (1.5~2.5mm)	ø0.9 ~1.2	CO2	KC-28/ KC-28CF				
			MAG	KC-25M				
EXTERNAL CAR BODY	STEEL COATED WITH ZINC (1.5~2.5mm)	ø0.9 ~1.0	CO2	KC-28/ KC-28CF				
			MAG	KC-25M				
MUFFLER PARTS	STS (0.8~2.5mm)	ø1.0 ~1.4			Ar+ 2%O2	K-409TiT/K-409TiC	Ar+ 2%O2	M-409Cb
						K-430T/K-430LNb		M-430/M-430Ti/M-430LNb
						K-436T/K-439T		M-308L(Si)/M-309L(Si)
						K-309LMT		KW-MNF1

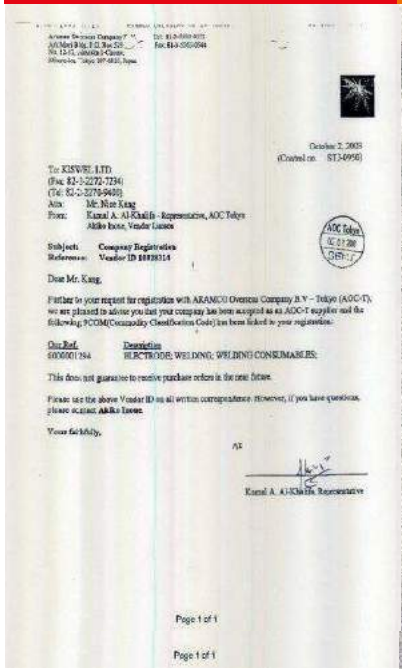


User Approval & Appreciation

Oil and gas

▶ **User Approval & Appreciation**

Saudi Aramco	National Iranian Gas Company	Petroleum Development Oman	Kuwait National Petroleum Company	Kuwait Oil Company



To: KISWEL LTD.
(Fax: 82-2-2272-7234)
(Tel: 82-2-2270-9400)
Attn: Mr. Nam Kang
From: Kamal A. Al-Khalifa - Representative, AOC Tokyo
Akiko Inoue, Vender Liaison

Subject: Company Registration
Reference: Vendor ID 10038314

Dear Mr. Kang,

Further to your request for registration with ARAMCO Overseas Company B.V – Tokyo (AOC-T), we are pleased to advise you that your company has been accepted as an AOC-T supplier and the following PCOM(Commodity Classification Code) has been linked to your registration.

Our Ref.	Description
4600001784	ELECTRODE; WELDING; WELDING CONSUMABLES;

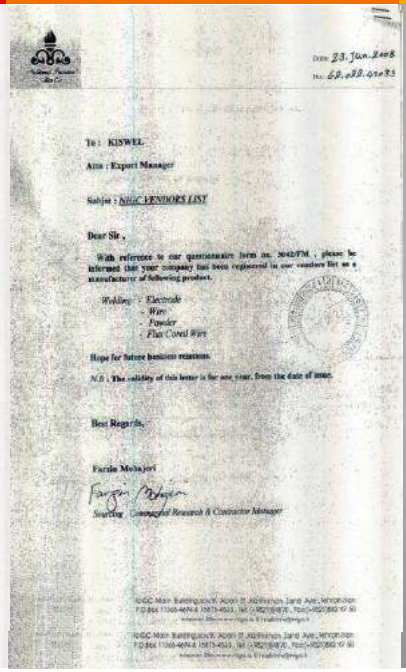
This does not guarantee to receive purchase orders in the near future.

Please use the above Vendor ID on all written correspondence. However, if you have questions, please contact Akiko Inoue.

Your faithfully,

Kamal A. Al-Khalifa Representative

Page 1 of 1



Date: 23. Jan. 2008
No: 50.022.0703

To : KISWEL

Attn : Export Manager

Subject : NIGC VENDORS LIST

Dear Sir ,

With reference to our questionnaire form no. 3042/FM , please be informed that your company has been registered in our vendors list as a manufacturer of following product.

Welding : - Electrode
- Wire
- Powder
- Flux Cored Wire

Hope for future business relations.

N.B : The validity of this letter is for one year, from the date of issue.

Best Regards,

Farshid Mohajeri

Senior Commercial Research & Contracts Manager



Petroleum Development Oman L.L.C.

WELDING CONSUMABLE

ASME NO.	PRODUCT CATEGORY	PRODUCT SUB CATEGORY
	CARBON STEEL, LOW ALLOY STEEL & STAINLESS STEEL	CARBON STEEL, LOW ALLOY STEEL & STAINLESS STEEL



شركة البترول الوطنية الكويتية
KNPC

VENDORS & CONTRACTORS EVALUATION COMMITTEE

Vendor Registration Certificate

This document certifies that the manufacturing facility of

M/s. KISWEL LIMITED, SOUTH KOREA
HEE NGKOOK B/D., 681 BANGBAE
CHUNG-GU, SEOUL,
KOREA.

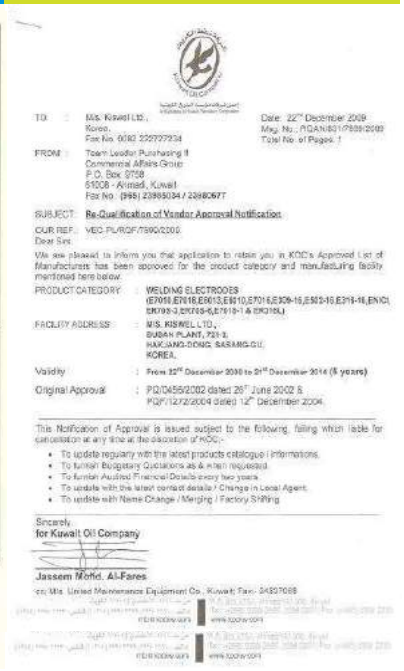
have been assessed and approved to supply of the following product(s) for KNPC refineries

Product	Description
37 10	WELDING ELECTRODES - CARBON STEEL
37 13	WELDING ELECTRODES - STAINLESS STEEL
37 16	WELDING ELECTRODES - ALLOY STEEL
37 20	FILLER WIRES - CARBON STEEL
37 22	FILLER WIRES - STAINLESS STEEL
37 24	FILLER WIRES - ALLOY STEEL

Ahmad Al- Tabtabai
Chairman V & CEC

Revalidation Approval: 02/01/2013
Approval Expiry: 30/06/2018
Code Number: 271073

PLEASE REFER OVERLEAF FOR INSTRUCTIONS TO THE VENDOR



TO : M/s. Kiswel Ltd., Korea. Fax No. 0082 2272727234
Date: 22nd December 2009
Msg. No.: PGAN/831/7899/2009
Total No. of Pages: 1

FROM : Team Leader Purchasing II
Commercial Affairs Group
P.O. Box 9758
61008 - Ahmadi, Kuwait
Fax No. : (965) 23980384 / 23980677

SUBJECT : Re-Qualification of Vendor Approval Notification

OUR REF. : VEC.PL/PGF/7899/2009

Dear Sirs,

We are pleased to inform you that application to retain you in KOC's Approved List of Manufacturers has been approved for the product category and manufacturing facility mentioned here below.

PRODUCT CATEGORY : WELDING ELECTRODES (E7018,E7018,E9013,E8010,E7015,E309-16,E312-16,E316-16,ENiCl, ER70S-3,ER70S-6,E7018-1 & ER316L)

FACILITY ADDRESS : M/S. KISWEL LTD., BUDAN PLANT, 723-3, HAKJANG-DONG, SASANG-GU, KOREA.

Validity : From 22nd December 2009 to 21st December 2014 (5 years)

Original Approval : PQ/10455/2002 dated 26th June 2002 & PQF/1272/2004 dated 12th December 2004.

This Notification of Approval is issued subject to the following, failing which liable for cancellation at any time at the discretion of KOC:-

- To update regularly with the latest products catalogue / informations.
- To furnish Budgetary Quotations as & when requested.
- To furnish Audited Financial Details every two years.
- To update with the latest contact details / Change in Local Agent.
- To update with Name Change / Merging / Factory Shifting

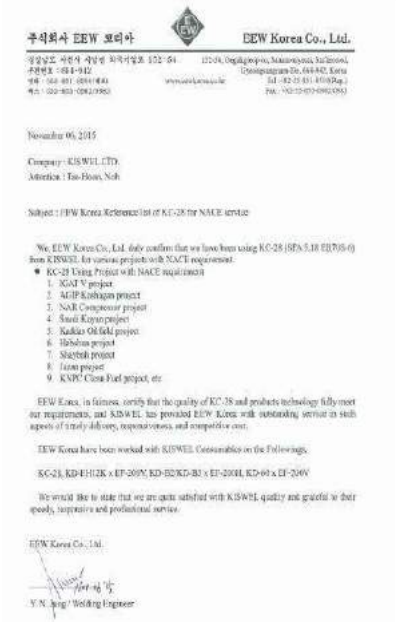
Sincerely,
for Kuwait Oil Company

Jassem Mohd. Al-Fares
c/o: M/s. United Maintenance Equipment Co., Kuwait, Fax: 24307088

Pipe mill

▶ **User Approval & Appreciation**

EEW Korea	EEW Malaysia	Dongbu Steel	Nippon Steel & Sumitomo Metal	Kubota



주식회사 EEW 코리아 EEW Korea Co., Ltd.

November 06, 2015

Company : KISWEL LTD.
Attention : Tae-Hoon, Noh

Subject : EEW Korea Reference list of KC-28 for NACE service

We, EEW Korea Co., Ltd. duly confirm that we have been using KC-28 (SFA 5.18 E70S-6) from KISWEL for various projects with NACE requirement.

- KC-28 Using Project with NACE requirement
  1. XGAT V project
  2. AGIP Kashagan project
  3. NAR Compressor project
  4. Saudi Kayan project
  5. Kashan Oil field project
  6. Habshan project
  7. Shajeah project
  8. Luzon project
  9. KNPC Clean Fuel project, etc

EEW Korea, in fairness, certify that the quality of KC-28 and products technology fully meet our requirements, and KISWEL has provided EEW Korea with outstanding service in such aspects of timely delivery, responsiveness, and competitive cost.

EEW Korea have been worked with KISWEL Consumables on the Followings.

KC-28, KD-EH12K x EF-200V, KD-B2/KD-B3 x EF-200H, KD-60 x EF-200V

We would like to state that we are quite satisfied with KISWEL quality and grateful to their speedy, responsive and professional service.

EEW Korea Co., Ltd.

Y.N. Jung / Welding Engineer



EEW Malaysia Sdn Bhd

KISWEL SDN BHD
Plo 63, Jalan Kilat 2,
81750 Pasir Gudang,
Johor, Malaysia
Tel +607 2515 933
Fax +607 2515 934

24th May 2011

Attn: Mr. Paul Hyun, Sales Manager

RECOMMENDATION LETTER

We would like to confirm that we had the privilege of using KISWEL consumable products for the manufacturing of structural tubular and line pipes for various projects.

The following KISWEL products have been or are currently in use at our manufacturing plant:-

- SMAW electrode – K-70/80
- FCAW wires – K-81T, K-81T-K2, K-81TSR
- GMAW wire – KC-28
- SAW wire-flux – KD-EH12K + EF-200V

EEW Malaysia, in all fairness, confirm that the quality of the products above have fully meet our expectation and requirements, and that KISWEL has provided EEW Malaysia with outstanding services in terms of responsiveness, delivery and technical support.

We are satisfied with KISWEL professional services so far and would not hesitate to recommend the same for others.

EEW Malaysia Sdn. Bhd.

Engr. Ahmad Kamil Mohd Sallah
Welding Engineer
Dip. +Eng. (Fin), M. Eng (Mechanical)
EWE / IWE CWI



Dongbu Steel

789, Bookbeom-ro, Seo-gu, Incheon, Korea
TEL. 82-32-570-4114
FAX. 82-32-577-0158

Attn : To whom it may concern, Kiswel Ltd.

Kiswel Ltd.

I wish to compliment Kiswel Ltd. for doing excellent jobs over the past few years on the supplying for the Spiral welded steel pipes.

Especially, throughout supplying of quality products (KD-50 X EF-100) for Spiral welded steel pipes, plenty of projects were completed very efficiently and timely.

In addition, Kiswel Ltd. has provided excellent assistances in helping us assess the users' required upgrade and technical suggestions to achieve and increased manufacturing performance of the welding processes.

We are looking forward to our continued business collaboration.
Again thank you and take care.

Yours truly,

25/03/2016
Chan-hae Kim
Assistant technical manager
Steel pipe & tube production team



品質監査結果報告書



注文書

▶ **User Approval & Appreciation**

Automobile

GM



Certificate of Acceptance and Delivery
승인 및 납품 확인서

GM Korea Company certifies that the vehicles have been manufactured with the following KISWEL Ltd. welding consumables :

Applied welding consumables / 적용 용접재료

Part No. 부품번호	Specification 규격	Product name 제품명	Remarks 비고
[illegible]	[illegible]	KC-28	1.0mm
[illegible]	[illegible]	KC-28	1.2mm
[illegible]	[illegible]	KR-A500	1.0mm
[illegible]	[illegible]	KR-A500	1.2mm

위 사실을 증명함
We hereby certify this above.
2016.04.14

Authorised by GM Korea Company:

GM Korea Company
253 Bupyeong-daero
Bupyeong-gu, Incheon, Korea 403-714
T. : + 82-(0)2-3030-5000
F. : + 82-(0)2-526-4815

Daimler Chrysler



DAIMLERCHRYSLER

December 2, 2005

DaimlerChrysler Corporation

Mr. W. Kim
President
KISWEL USA, Inc.
3875 Koger Blvd., Suite 205
Duluth, GA 30096

RE: KISWEL LTD WELDING ELECTRODE KC-28C APPROVAL FOR MB-5581

This letter is to notify you that KISWEL LTD electrode KC-28C from the Busan, Korea plant has been approved and will be added to the Engineering Approved Source List (EASL) of MB-5581. There will be a note on the EASL that explains KC-28C is DCX's supplies. The note is shown below:

"Only authorized for use by suppliers. Bulk material not approved for use in DCX facilities until approved by Industrial Hygiene & Toxicology and Materials Engineering - Welding"

To reinstate the approval, Materials Engineering – Welding will update MS-5581 to reflect the addition of KISWEL LTD KC-28C in the EASL.

This letter will serve as authorization to use of the KISWEL LTD KC-28C electrode at DCX suppliers until MS-5581 is updated.

If there are any questions about this approval, please contact the writer at (248) 674-7440 or [illegible]@DCX.com.

Sincerely,

William A. Murillo

Senior Specialist
Materials Engineering - Welding

cc: J. E. Bateman
R. Branch
J. Hilton
M. Sfreddo – KISWEL
J. Tumpa

GKN



GKN

9th October 2015

Bernard Sing
Kiswel Europa Branch.

Dear Sir
I would like to take this opportunity to compliment yourself and Kiswel for the service you have provided over the years of our business relationship.

We have predominantly used KC-28 (1.00 mm and 1.2 mm) in our robotic welding processes, with great success. Over the years we have enjoyed a good supply of quality products and look forward to our continued relationship.

Because of this service we have recently increased the number of products that we purchase from Kiswel.

Keep up the good work.

Best regards

EXPECT MORE

Tower International



Tower International Supplier Scorecard

Your Rating is: Green 100.00

	Score Range	Performance Definition
Green	>= 90.00	Favorable, candidate for new business
Yellow	>= 70.00, < 90.00	Questionable, new business under review
Red	< 70.00	Unacceptable, new business held

Supplier Score

Quality

	February	March	April	May	June	July	3 Month Total
Parts Received	294,000	329,400	321,300	312,500	348,000	282,864	1,991,064
Parts Rejected	0	0	0	0	0	0	0
Rejected Issues	0	0	0	0	0	0	0
Quality Returns	0	0	0	0	0	0	0
Severity Level Score	0	0	0	0	0	0	0
PPM Score	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Rejected Issue Score	100.00	100.00	100.00	100.00	100.00	100.00	100.00
ZF Count Score	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Severity Level Score	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Monthly Quality Score	80.00	80.00	80.00	80.00	80.00	80.00	80.00

Delivery

	February	March	April	May	June	July	3 Month Total
Deliveries	15	15	14	15	15	14	88
Shutdown	0	0	0	0	0	0	0
Delivery Reports	0	0	0	0	0	0	0
Discrepancy	Count 0	Score 0.00	Count 0	Score 0.00	Count 0	Score 0.00	Count 0	Score 0.00	Count 0	Score 0.00	Count 0	Score 0.00	Count 0	Score 0.00
Labeling	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Late Early Shipment	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Overt Over Shipment	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Packaging	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Premium Freight	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Monthly Delivery Score	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Monthly Quality & Delivery Score = (Quality Score + Delivery Score) / 2 = (80.00 + 100.00) / 2 = 90.00

Period Responsiveness

	Response Type	Average Period Lateness, Days	Period Score
Period Responsiveness Total Score =	CAR Response	0.00	100.00

Period Total Score

Period Total Score = Period Quality & Delivery Score + Period Responsiveness Total Score = 90.00 + 10.00 = 100.00

ZF SACHS



ZF SACHS

119 Seongsanpaechang-ro, Seongsan-gu,
Changwon, Gyeongsangnam-do (51504)
ZF SACHS KOREA

January 13, 2016

Kiswel Ltd.

We are pleased to provide this reference letter for Kiswel Ltd.

Over the past few years, ZF SACHS KOREA has continued successful business collaboration with Kiswel Ltd.,
We, ZF SACHS KOREA, would like to take this opportunity to compliment Kiswel Ltd. for quality products and responsive services.

We have predominantly used KC-28 in our welding processes with great success. ZF SACHS KOREA, in fairness, certify that the quality of Kiswel products technology fully meet our requirements. We have enjoyed a good supply of quality products and look forward to our continued relationship.

ZF SACHS KOREA

Manufacturing Technology Team
Engineering Manager
Seung-mook Kim

Power Plant & Construction

▶ **User Approval & Appreciation**

Hitachi-GE

CERTIFICATE OF APPROVAL

This is to certify that the Quality Management System of :

KISWEL LTD.
704, Gongdan-Ro, Seongsan-Gu,
Changwon-Si, Gyeongsangnam-Do
Republic of Korea

has been approved by Hitachi, Ltd. and Hitachi-GE Nuclear Energy, Ltd

The Quality Management System is applicable to :

Manufacture of Solid Welding Wires

Approval
Certificate No. NK-0463 *: November 2 2015*

Approval Expiry : November 19, 2018

Hitachi, Ltd. Power Systems Company 兼田英明
Hitoshi Kaneta, General Manager
Quality Assurance Division

Hitachi-GE Nuclear Energy, Ltd. 三村靖
Yasushi Mimura, Vice President
Nuclear Systems Quality Assurance Division

Doosan Heavy Industries & Construction

FACSIMILE
REF NO. : Doosan S2/16-05 DATE 2010-10-05
COMPANY : KISWEL LTD. DUBAI OFFICE FAX NO. 971-88833864
ATTN. : G.Y. Lee TEL NO. 971-4-8833678
CC TOTAL PAGES 1

SUBJECT Shuweihat S2 IWPP

To whom this may concern,

We, Doosan Heavy Industries & Construction (Doosan) duly confirm that we have been using KISWEL Welding Consumables for Shuweihat S2 IWPP project in Abu Dhabi.

Doosan, in likewise, certify that the quality of KISWEL welding consumables and products technology fully meet our requirements, and KISWEL has provided Doosan with outstanding services in each aspects of timely delivery responsiveness, and competitive cost.

We would like to state that we are quite satisfied with KISWEL welding consumables quality and grateful to their speedy responses and professional service.

Doosan worked with KISWEL Welding Consumables on the following:

KST-308S (E308-16), KW-T60(E71T-1C), KW-T60(ERNiCu-7), W-TIG(ER308), T-308L/MIG(ER308LSi), T-309L/ER309(L), KST-309L(E309L-16), KST-316L(E316L-16), K-7018 (E7018) etc

We wish you all the best.

Sincerely,
Sanjung Won Lee
Senior Manager
Shuweihat S2 PPN

Hyundai E&C Samsung C&T

M E M O

Address : 서울시 강남구 테헤란로 419 기성브라운빌 3층 Fax : 02-501-2599
UAE현장 사용장소주소 : 울산광 장비에 Email@kiswel.co.kr 연 : 02-501-3561

수 신 : 고려용접봉 대표이사 KCS-DM-13-005(A-M)
참 조 : 영업K2담당
발 신 : 서공사 UAE현장 사업책임자 2013. 05. 29
제 목 : 저압차폐 무균업체 우회 협력

1. 귀 사의 발전 협력하심을 기원합니다.

2. 상기 제목과 관련 관련하여, 고려용접봉은 UAE BNPP(원자력 주설비 공사 공급도급사)협력업체로, 신규협력업체의 저압차폐 관련업체로 등록되었으며, 아래와 같이 품목확대에 따른 이에 따른 품질보증(QSM-KWE Rev.0) 변경 발생에 따 제작소 품질보증업으로 생산업체 또는 검토를 요청하여 주시고, 제반 내용에 적합성을 평가 판단하여 통보 바랍니다.

- 아 래 -

가. 공급업체 : Foreign & Nonferrous Welding Materials

나. 품목업체 : 2013년 07월 31일

다. 품목업체 : Q - 끝 -

Hyundai SK GS E&C

공급업체 인증서
Certificate of Approved Supplier

인 증 번 호: QS-02-17 품 질 등 급: Q.T.R
Certificate No. Quality Class

회 사 명: 고려용접봉㈜
Company Name

주 소: 경남 창원시 성산구 성주동 58-2
Address

공 급 품 목: 용접재료
Supply Items

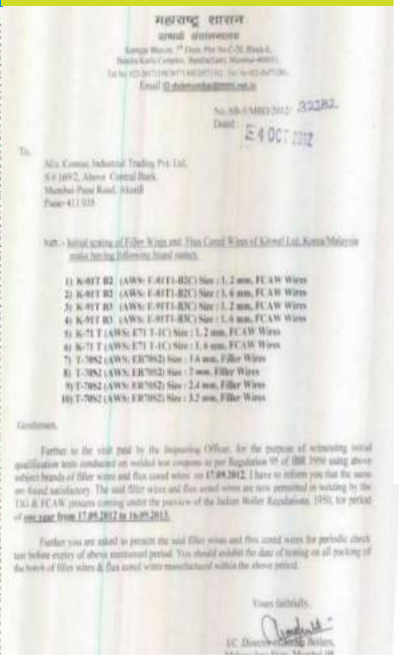
위 회사는 신울진 원자력 1,2호기 주설비공사 품질보증계획에 따른 공급자 평가 기준에 의거 자재 공급업체로 자격부여 되었음을 인증합니다.
This is to certify that according to SUN 1&2 Quality Assurance Program, the company has been registered as SUN 1&2 Qualified Supplier List for the above items.

자격유효기간: 2012.03.08 ~ 2015.03.7
Period of Validity

2013. 04. 30

신울진 원자력 1,2호기 주설비공사 현장 소장
SHIN-ULCHIN NUCLEAR POWER PLANT, UNITS 1 & 2

Indian Boiler Regulation





Our Product & Business

COLLABORATION

KISWEL proposes the optimum solution for customers through collaboration with various companies.
We are not afraid of taking a path we have not taken before for unlimited possibilities.

KISWEL X POSCO Signed Agreement for Joint Development of Specialized Steel Welding Material

KISWEL is doing its best to become a consistent companion of customer success through providing the most competitive customized solutions to our customers in a diversifying industrial scene by establishing a systematic response system starting off with the agreement for technology cooperation of specialized steel welding materials signed with POSCO in 2016



POSCO
Agreement ceremony for joint development of specialized steel welding material

Solution

posco

Hardware

Steel

Software

Application Technology

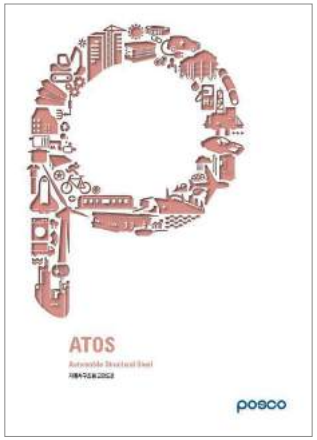
- Forming Technology
- Painting Technology
- **Welding Technology**
- Parts Evaluation

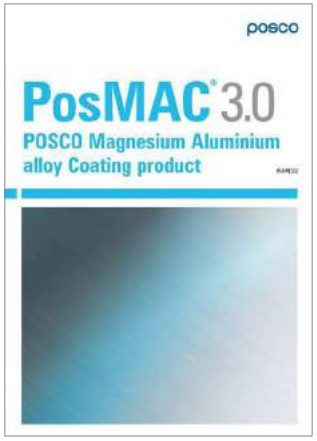
Commercial Support

- Prompt Delivery
- Cheaper Logistics Cost
- Downstream Business
- Financial Support

KISWEL X POSCO ATOS & PosMAC welding

KISWEL and POSCO develops various new steel materials and welding materials together and supplies them as packages to help customers achieve their target in the necessary area.



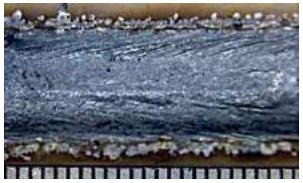


Adequate Welding Material Suggestion

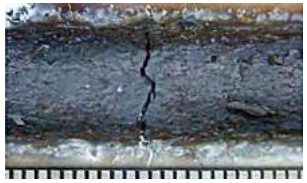
Specifi-cations	Yield strength tensile strength (MPa)	Bending ratio (R/t)	Ceq	Heat treatment	Heat input (butt joint)	Welding material	
ATOS60	YS ≥ 390 TS ≥ 590	-	0.35	Pre-heating Post-heating usually not required	-	Soild-wire	AWS A5.28-05-ER80SG (Ex. KISWEL Z0-60)
						Flux-cored	AWS A5.29-07-E81T1-Ni1 (Ex. KISWEL K81-T)
ATOS80	YS ≥ 700 TS ≥ 780	-	0.40		0.3~1.0 kJ/mm heat input amount test (in progress)	Soild-wire	AWS A5.28-05-ER120SG (Ex. KISWEL ZH-120)
						Flux-cored	AWS A5.28-07-E121T1-G (Ex. KISWEL Z0-60)
ATOS100	YS ≥ 880 TS ≥ 980	3.0	0.47			Soild-wire	AWS A5.28-05-ER130SG (Ex. KISWEL Z0-60)
						Flux-cored	AWS A5.28-07-E130T1-G (Ex. KISWEL Z0-60)

High Strength Steel for Special Vehicles ATOS, Alloy Plated Steel Sheet POSMAC & Welding Material

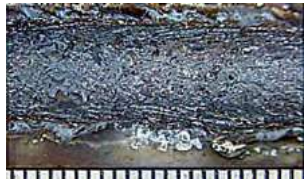
Welding material	Chemical Composition	TS	EL	NOTE
KC28(1.2Φ)	0.07C-0.86Si-1.5Mn	580MPa	28%	YGW12, ER70S-6
SM309L(1.2Φ)	22Cr-12Ni-0.02C	563MPa	43%	STS Welding material
SM310(1.2Φ)	25Cr-20Ni-0.1C	610MPa	35%	



KC28 : 150A-18V-1.0m/min



SM309L : 180A-18V-1.0m/min



SM310 : 180A-20V-1.1m/min

PosZET



Demonstration of ultra-low slag welding solution for PosZET galvanized steel sheet



LME(Liquid Metal Embrittlement) occurrence by welding material
Test information : PosMAC-C, 1.2 mmt. Coating
Weight M140 g/m², No oiled, No post treatment.

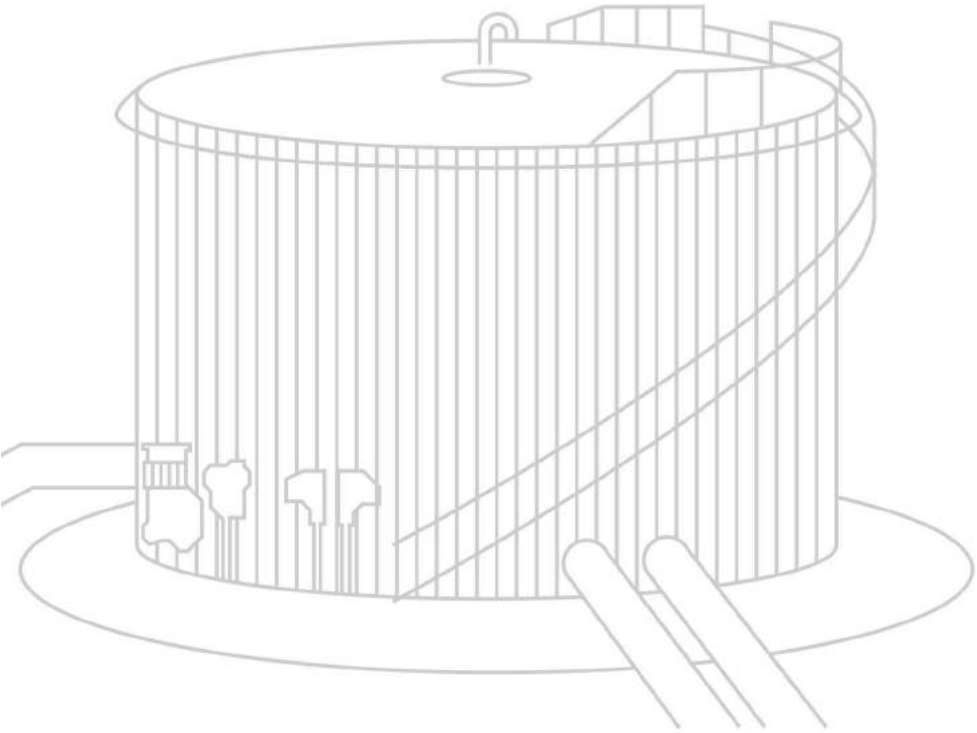
LME crack observed on welding surface
KC28(carbon steel) is good without LME,
but STS welding material is sensitive in the LME.

KISWEL X POSCO High heat input Electro-gas welding (EGW)

KISWEL developed the high heat input max40t(SA841-B-C2U) of TMCP steel for pressure vessel storage tanks and a welding material(K-EG3) through joint development with POSCO. This solution will not only provide cost-saving and construction deadline shortening effect for customers due to cost reduction for heat treatment of steel materials and welding reduction effect but will also be expanded for use as a more eco-friendly product in various future projects due to its total energy and CO2 reduction effect.

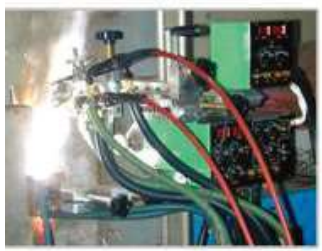
Joint development of high heat input solution of TMCP steel for pressure vessel storage tank

High heat input max 40t(SA841-B-C2U)



Process	EGW (inner pass) → ← (1 pass)	A573 70, A537 CL 2
Process steel:	EGW (outer pass) →	One pass EGW 대입열 A841 CL2

POSCO A841 CL2 + KISWEL K-EG3



EWG welding equipment



Face section



Root section



Penetration phenomenon

KISWEL X POSCO High heat input Electro-gas welding (EGW)

KISWEL developed the high heat input max40t(SA841-B-C2U) of TMCP steel for pressure vessel storage tanks and a welding material(K-EG3) through joint development with POSCO. This solution will not only provide cost-saving and construction deadline shortening effect for customers due to cost reduction for heat treatment of steel materials and welding reduction effect but will also be expanded for use as a more eco-friendly product in various future projects due to its total energy and CO2 reduction effect.



Specification by Product

Feature	Product name	Specification	
		AWS	JIS
For single	K-EG3[5Y grade]	A5.26-1997(R2003) EG82T-G	A5.26-1997(R2003) EG82T-G
	Certification authority	-	

Mechanical properties of the K-EG3

	Y.S (MPa)	T.S (MPa)	El. (%)	IV (J)
AWS Spec.	≥410	550-700	≥20	≥27 (-30℃)
K-EG3	520	660	25	80

Typical chemical composition (%)

	C	Si	Mn	P	S	Ni	Mo
AWS Spec.	Not Specified						
K-EG3	0.04	0.22	1.50	0.011	0.012	1.80	0.24



Before remove slag



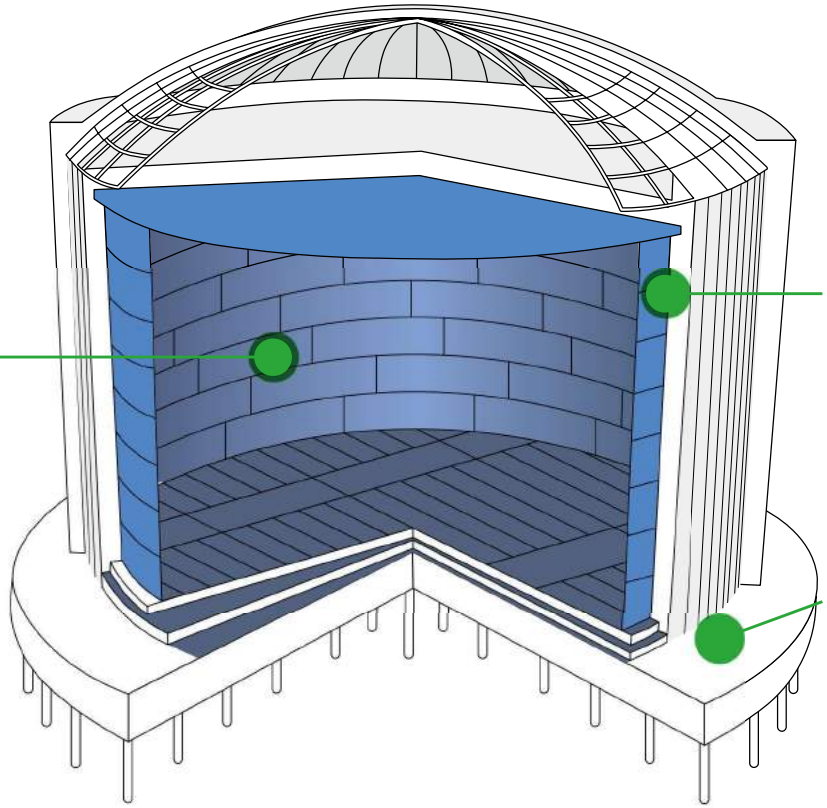
After remove slag

KISWEL X POSCO

Development and supply of package of 9% Ni steel welding material for land LNG Tank

KISWEL has successfully localized the welding material needed when producing land LNG storage tank through joint development with POSCO.
Previously, 9% Ni steel was developed and supplied for the first time in Korea in the early 90s, but the entire quantity of welding materials were dependent on imports.
Hence, both companies have developed 3 types of welding materials that can be used in all welding methods like manual, automatic, and semi-automatic through joint research. It has superior welding workability compared to imports and cost reduction effect of about over 30% can be expected.
In addition, it has passed the large breaking test of the Korea Gas Corporation and an overseas construction designer and satisfied various test item to secure reliability.

LNG Storage Tank



Inner Tank

POSCO's higher manganese (Mn) steel and 9% Ni steel is applied as an inner tank directly containing LNG with a temperature of -163°C.

Outer Tank

It is applied to POSCO low-mid operation as an outer tank for strongly supporting the inner tank

Steel Pipe Pile

It is applied to POSCO's marine steel as a pile for firmly fixing the tank on the ground.

KISWEL X HYUNDAI ROTEM Defense Industry Welding Solution

KISWEL entered into a strategic partnership MOU with HYUNDAI ROTEM, and successfully localized the welding material for armored fighting vehicles.
Due to localizing welding materials which used to be dependent on imports for the past 40 years, we have contributed to promoting national interest and was awarded a commendation from DAPA as we were recognized for taking a step closer to achieving independence in national defense.





Advantages of Bulletproof Welding Material ZH-100D Product

1. Stable Arc Welds by implementing stable spray compared to competitors



* Welding conditions: 260A/25V Ar+2%O2

2. Superior delivery

Classification	Feeding speed (cm/min)	Current deviation	Voltage deviation	Wire speed deviation
ZH-100D		27.5	3.6	8.7
Company E		29.7	4.0	9.6
Company L		32.0	3.9	24.2

KISWEL X HYUNDAI ROTEM

Defense Industry Welding Solution

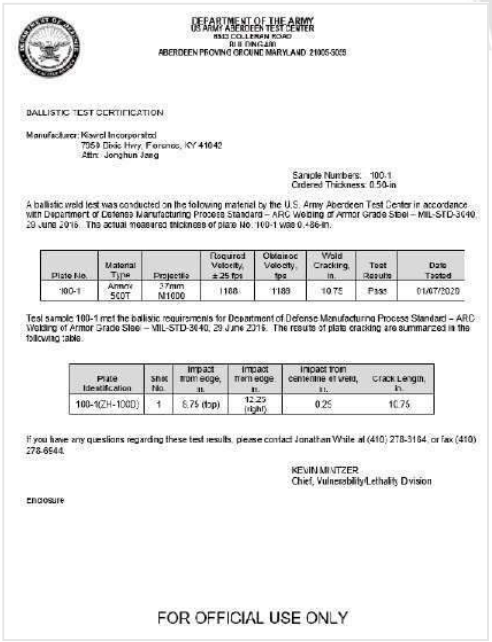
In the case of a bulletproof welding material, the performance of the weld must be satisfied according to Tacom Drawing 12479550. And H-Plate shooting test, the most important item out of weld performance was limited to ATC, a test agency certified by the US DOD, but KISWEL satisfied all requirements of the specification on armor plate material applied to tanks and armored vehicles through the test conducted by ATC.

Tacom Drawing 12479550

H-plate Shotting test conditions

Pass the bulletproof test requirements

KISWEL ZH-100D
secure wire bulletproof performance



DEPARTMENT OF THE ARMY
US ARMY ABERDEEN TEST CENTER
BALLISTIC TEST CERTIFICATION

Manufacturer: Kiswel Incorporated
7959 Dixie Hwy, Florence, KY 41042
Attn: Jonghun Jang

Sample Numbers: 100-1
Ordered Thickness: 0.50-in

A ballistic weld test was conducted on the following material by the U.S. Army Aberdeen Test Center in accordance with Department of Defense Manufacturing Process Standard – ARC Welding of Armor Grade Steel – MIL-STD-3640, 29 June 2016. The actual measured thickness of plate No. 100-1 was 0.484-in.

Plate No.	Material Type	Projectile	Required Velocity, ±25 fps	Obtained Velocity, fps	Weld Cracking, in.	Test Results	Date Tested
100-1	Amour 500T	27mm M1600	1168	1189	10.75	Pass	01/07/2020

Test sample 100-1 met the ballistic requirements for Department of Defense Manufacturing Process Standard – ARC Welding of Armor Grade Steel – MIL-STD-3640, 29 June 2016. The results of plate cracking are summarized in the following table.

Plate Identification	Shot No.	Impact from edge, in.	Impact from edge, in.	Impact from centerline of weld, in.	Crack Length, in.
100-1(ZH-100D)	1	6.75 (top)	12.25 (right)	0.25	10.75

If you have any questions regarding these test results, please contact Jonathan White at (410) 278-3184, or fax (410) 278-8644.

KEVIN MINTZER
Chief, Vulnerability/Lethality Division

Enclosure

FOR OFFICIAL USE ONLY

Design Activity		
U.S.Army Tank-Automotive and Armaments Command Warren, Michigan 48397-6000		
Ground Combat Vehicle Welding Code - Steel		
Size	Cage Code	12479550
A	19207	

Bulletproof test result

H-Plate Shooting test result



Figura 1.
(U) Strke face (lop) and back side (bottom) of plate
NO. 100-1 pricr to testing

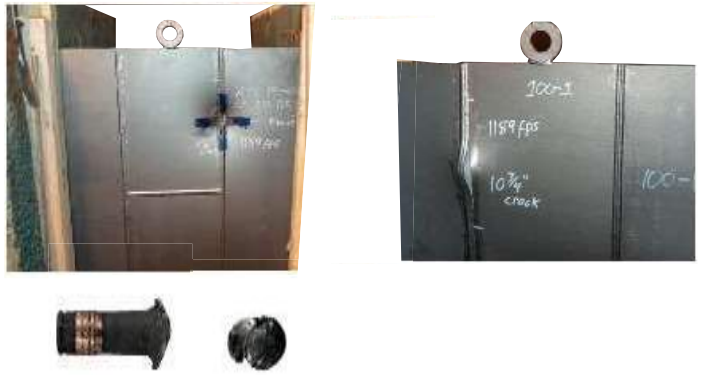


Figura 2.
(U) Strke face (lop) and back side (bottom) of plate
NO. 100-1 Cracks

KISWEL X MINISTRY OF TRADE INDUSTRY AND ENERGY

Selected as World Class 300 Company (2016~Present)

KISWEL is striving to expand its competitive advantage and global market dominance through activities for strengthening capacity up to the present by being selected for the '2016 World Class 300 Project' support project sponsored by the SMBA.
'World Class 300 Project' is a project where the Korean government selects a small-medium business or company of middle-standing having the will to grow and equipped with potential and provides concentrated support to foster 300 global companies. The selected company is assessed as the Korean hidden champion making large investments in R&D and achieving high annual average growth and actual exports.

WORLD CLASS 300



기업명	웹사이트	업종	주력상품
고려용접봉㈜	http://kiswel.com/	금속제품	SOLID(연강)

KISWEL X KOTRA

Selected as a company for World Champ Fostering Business Project (2016~Present)

KISWEL is cementing its status as a global company by setting up various joint overseas marketing strategy for social contribution activities(CSR) as KOTRA recognized the company for its future growth potential.



월드챔프 CSR 서약서

「KOTRA 월드챔프 육성사업」 참가기업 고려용접봉(주)는 KOTRA와 함께 사회적 공헌 활동에 적극 참여하기 위하여 다음과 같이 결의한다.

하나. 우리는 일자리 창출, CSR 활동 등 사회적 책임을 다하기 위하여 노력한다.

하나. 우리는 사회적 책임경영의 일환으로 국가유공자 자활용사촌 생산품, 사회적 협동조합 생산품, 녹색제품, 이상기업 제품, 중증장애인 생산품 등의 사회적 기업 제품 구매를 확대하기 위하여 노력한다.

하나. 우리는 월드챔프 육성사업 참가기업으로서 국가 경제 발전에 기여하며 지속가능한 성장을 위해 노력한다.

2016년 12월 5일

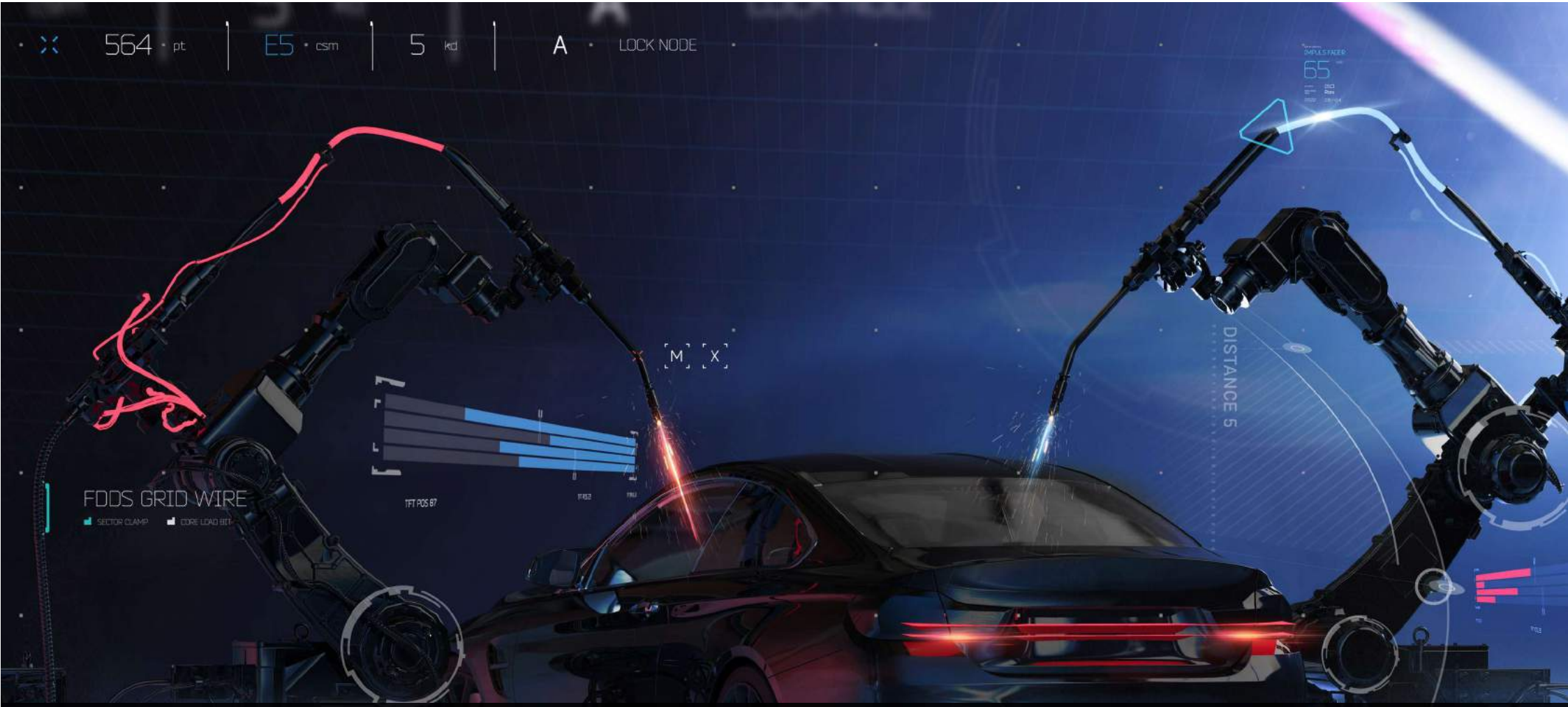
kotra 고려용접봉(주)



2016 World Champ Workshop



2019 Meeting for Companies participating in the Project for fostering World Champ Exporting Businesses of Middle Standing



Sustainable Future of KISWEL

FUTURE OF KISWEL

We introduce the efforts to lead research & development of welding materials and the welding material market.

R&D

In 1987, KISWEL established the Central Technology R&D Center, a research center specializing in welding materials as a corporate affiliated research center for the first time in the welding material industry to realize knowledge management for customer satisfaction.
Researchers specializing in each field is striving to conduct joint development in industry-university-institute collaboration and R&D for general purpose/special/eco-friendly/high value added welding materials such as MAG/FCW/SMAW/MIG/TIG/SAW.

The R&D center is conducting research on special welding related to the energy industry and maritime being recently spotlighted, contributing to the development of the Korean welding society by participating in the academic conference of the International Institute of Welding as a sponsor. The center is working hard to lead the global welding material market.

R&D

01. First time in the industry
Operation of corporate affiliated R&D center of the Ministry of Science and Technology(KISWEL R&D center specializing in welding materials 1987-Present)

02. For thermal power plant boiler
Development of hyperthermic 12% chrome alloy steel welding material

03. Exclusively for robot welding system
Development of Slag-free SOLID WIRE

04. 3D printing layered manufacturing (WAAM)
Development of smart welding technology

05. For LNG storage tank
Development of Ultra-low temperature 9% nickel steel welding material package

R&D

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Expansion of the base

Sponsored International Institute of Welding(IIW) academic conference for 8 consecutive years (2014-Present)

Sponsored welding function competition for 21 consecutive years (2000-Present)

Participated in domestic & overseas exhibitions for 21 consecutive years (2000-Present)



R&D

In 1987, KISWEL established the Central Technology R&D Center, a research center specializing in welding materials as a corporate affiliated research center for the first time in the welding material industry to realize knowledge management for customer satisfaction.
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Companies collaborating with KISWEL

Technical cooperation

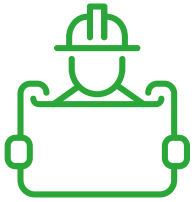
Daewoo Shipbuilding & Marine Engineering
Samsung Heavy Industries
Doosan Heavy Industries
POSCO
KOMATSU
Hyundai Rotem
CS WIND
FRONIUS
YASKAWA
OTC

National project & industry-university collaboration

FKIST
Busan National University
Dong-A University
EWI
ATC

RESEARCH AREA

Research on Welding Metallurgy & Eco-friendly Materials



Welding metallurgy research

Cryogenic toughness and CTOD characteristics

Welding technology and optimized materials for LNG tanks

-196°C cryogenic STS metallurgical properties

Welding material for high-alloy power generation boiler

Research on high/low temperature crack generation factors

Defect and fracture damage study



Eco-friendly welding material development

Fume generation factor analysis and low fume welding material

Slag-free high efficiency MCW materials

Welding technology for low spatter generation

Welding material for nuclear waste CASK container

Welding material for non-preheating high strength-high toughness welding material

Minimum generation of SAW Flux fine powder and improved recovery rate



Industry-university-institute joint research

Porosity-free galvanized steel welding material

Welding material for corrosion-resistant sulfuric acid complex corrosion steel

Welding material for bulletproof and wear resistant steel

Fitting A860-70 SAW welding material

RESEARCH AREA

Research on welding technique, production technology & new material



Development of high efficiency-high performance welding material

- High-strength EGW and ESW welding technology
- Super TIG "C-type" filler development and welding automation
- Welding material for super-strength automotive steel plate
- High-alloy surface hardening welding material
- Study of High strength & toughness on Self-shield FCAW
- Hybrid welding material for high speed welding



Research on production technology and product surface control

- Study of Wire surface properties (Chemical / electroplating, oxide coating, electrical conductivity etc)
- Bright annealed heat treatment, surface roughness and residue control technology
- Development of surface coating control technology and coating additives
- Kink-free high-capacity packaging technology and eco-friendly Pack research
- Research on raw material properties such as flux, strip, wire rod and so on
- New material and wire processing technology



New material - new technology development

- 3D WAAM welding material and build-up technology
- Processing Lab. Optimization welding parameter research
- High-strength aluminum and non-ferrous metals
- Development of high purity Ti, Ti-6Al-4V alloy powder

RESEARCH EQUIPMENT

Welding test equipment

Measurement/test equipment capable of evaluation of various welding characteristic

- Manual electrode welding
- MIG/MAG Welding
- Cored wire welding
- Tig welding
- Submerged-arc welding
- Submerged-arc Multi-wire welding
- Automated Robot welding
- Welding fume measurement system
- High-speed camera
- Arc monitoring system

Chemical analysis equipment

Various analysis equipment needed for chemical component analysis and structure test

- CP-OES
(Inductively coupled plasma optical emission system)
- ICP-MS
Inductively coupled plasma mass spectrometry)
- Spark E/S (Spark optical emission spectrometer)
- XRF-WDX (X-Ray Fluorescence Spectrometer)
- N/O (Nitrogen/Oxygen Analyzer)
- FE-SEM&EDS
(Field Emission Scanning Electron Microscope)
- SEM&EDS (Scanning Electron Microscope)
- Nitrogen & oxygen determinator
- RC-612 (Multiphase C, H, H2O Determinator)
- Oil Contents Analyzer
- Sieve Shaker
- Particle Size Analyzer
- Constant temperature and humidity and Water bath
- Portable XRF (X-Ray Fluorescence Spectrometer)

Material test equipment

Test equipment specialized for research on mechanical properties of deposited metal and welding metallurgical structure analysis

- PVR (Programmable Deformation Cracking Test)
- Creep (Creep & Stress Rupture Tester)
- CTOD (Crack-Tip Opening Displacement)
- Universal Testing Machine + High Temp. Furnace System
- Rotate welding machine (GMAW) & Arc monitoring System


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