Welding Solutions for

Defense Industry



KISWEL

Defense Industry

From Ground Platforms to Naval Warships, KISWEL Welding Consumables for Armor Steel — Proven Performance through H-Plate Ballistic Testing

As geopolitical crises and localized conflicts become more frequent, the defense industry has emerged as a core sector directly linked to national security and strategy, going beyond simply developing weapons.
In particular, ground combat platforms such as main battle tanks (MBTs) and armored vehicles are critical assets that determine troop survivability and operational sustainability. For these platforms, ultra-high-hardness ballistic materials and technologies that simultaneously provide mobility, protection, and maintainability are essential.
These platforms do not use ordinary structural steel, but rather military-grade armor steels like MIL-A-12560 and MIL-A-46100. Welding consumables for these applications also must meet the same levels of hardness, toughness, and ballistic resistance as the base materials.
To ensure ballistic resistance, high-hardness, low-hydrogen consumables capable of reliably welding ultra-high-hardness steels are essential. The completed welded joints must pass performance verification under field conditions, including live-fire testing based on national defense standards.
KISWEL's welding consumables for armor steel not only meet these standards but have officially been verified of their ballistic performance by successfully passing H-plate ballistic testing based on the U.S. Army TACOM standards at the Aberdeen Test Center (ATC).
Recognized for these technological capabilities, KISWEL has been selected as a supplier of "Outstanding Defense Materials" by the Defense Acquisition Program Administration (DAPA) of South Korea. KISWEL's welding consumables are currently applied to mass-produced K-series MBTs and armored vehicles in Korea.
Building upon its land defense platform solutions, KISWEL is expanding its technological reach into naval defense platforms.
Submarines and surface warships face extreme environments involving high-pressure depths, saltwater corrosion, and cryogenic conditions. KISWEL is currently developing specialized welding consumables optimized for such harsh environments. KISWEL has been selected as a participating company in national naval defense projects in Korea and is accelerating its expansion into the naval defense sector.



K2 MBT
(Korean variant)

K2GF MBT
(Polish variant)

Manufactured by Hyundai Rotem using KISWEL welding consumables

KISWEL Product Portfolio
Specialized Products for Ballistic Steel

	Armor plate	Standard	Thickness (mm)	Main use	Function	Plate manufacturer
Tank	RHA CLASS 1	MIL-A-12560	6.0-150.5	Vehicle body, Turret structure	Protection against penetration	POSCO(Korea), etc.
	RHA CLASS 2	MIL-A-12560	12.5-38.1	Vehicle body deck	High-pressure shock(mine) protection	ArcelorMittal(USA), etc.
Armored car	ARMOX 500T (HHA)	MIL-A-46100	6.0-15.0	Vehicle body structure	Lightweight and higly resistant to impact and fatigue	SSAB (Sweden), ArcelorMittal(USA), etc.
	ARMOX 440T (RHA CLASS 2)	MIL-A-12560	6.0-10.0	Vehicle body deck	High pressure shock(mine) protection	SSAB (Sweden), ArcelorMittal(USA), etc.

	KISWEL Welding Materials				
	GMAW	GTAW	SMAW	FCAW	SAW
Tank	ZH-100D (ER100S-1/G) ZH-120 (ER120S-G)	T-100D (ER100S-1/G)	K-10018M (E10018-M)	K-100TK3 (E101T1-K3C)	EF-200V+KD-100 (F10A(P)4-EM2-G)
Armored car					

Top/Side/Rear Protection: RHA Class 1



Top/Side/Rear Protection: ARMOX 500 or HHA



Bottom Protection (Bottom Plate): RHA Class 2

Bottom Protection (Bottom Plate): AMOX 440 or RHA Class 2

ZH-100D



Ground Forces

Key Products

Soild wire

ZH-100D

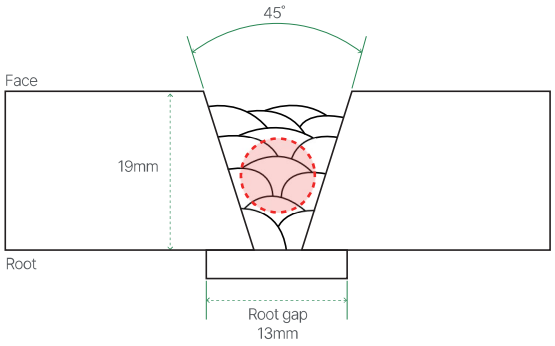
• AWS A5.28-2005	ER100S-1/G
• JIS Z 3312-2009	G 69 A 2 M N4CM21T
• EN ISO 16834-A	G 62 2 M21 Z Mn3Ni1.5Mo G 62 2 M13 Z Mn3Ni1.5Mo
• EN ISO 16834-B	G 69A 2U M21 N4CM21T G 69A 2U M13 N4CM21T

- ATC Ballistic Test "All Pass" (ZH-100D RHA Class1, Class2 / 6 items)
  Validated through U.S. Army ATC testing for defense-grade performance
- Certified as an "Excellent Defense Product" by Korea's DAPA
- Applied to armored combat vehicles and military-grade equipment
- Designed for 690 MPa-class steels in butt and fillet welding
- Stable arc performance at high current with excellent weld integrity
- Low spatter and clean bead appearance with mixed gas

Chemical Composition of Wire (wt.%)

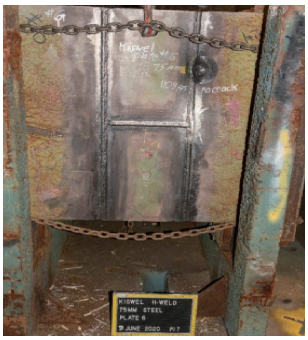
Process	Spec.	C	Si	Mn	P	S	Ni	Mo
AWS A5.28	ER100S-1/G	≤0.09	0.2-0.55	1.25-1.8	≤0.01	≤0.01	1.4-2.1	0.25-0.55
GMAW	ZH-100D	0.05	0.26	1.54	0.008	0.006	2.00	0.35

Mechanical Properties of All Weld Metal



	T.S (MPa)	Y.S (MPa)	E.L (%)	I.V (Joule @ Temp.)	Shielding Gas
ZH-100D	741	705	27	130 @ -50°C	98%Ar-2%O2





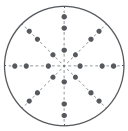


KISWEL Product Portfolio
Products by Base Metal

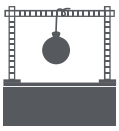
- Selected as a key supplier for Korea's national defense technology program
- Designed for ultra-high-strength, corrosion-resistant steels in naval applications
- Engineered to meet global certification standards including the Explosive Bulge Test (EBT)

Process	Grade	Product Name	Specification
SAW	HY-80	EF-280 X KD-100	EN26304 S62 6 FB SZ H4
	HY-100	EF-280 X KD-120	EN26304 S69 6 FB SZ H4
	HY-130	EF-280 X KD-140	EN26304 S89 3 FB SZ H4
MCW	HY-80	KX-90T	EN18276 T55 6 Mn2.5Ni M M21 1 H5
	HY-100	KX-110T	EN18276 T69 6 Mn2NiMo M M21 1 H5
	HY-130	KX-140T	EN18276 T89 3 Z M M21 3 H5
FCW	HY-80	K-91HY	EN18276 T55 5 Z P C1 2 H5
GMAW	HY-130	ZH-140HY	EN16834 G89 5 M21 Z

EBT TEST



Specimen preparation



Fixture setup & explosive configuration



Underwater suspension



Underwater explosive test execution



Deformation assessment post-blast



For defense and submarine applications, detailed product information is classified.
For further technical consultation or project-specific inquiries, please contact our R&D Center directly.

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