Special Solid Wire for Ar-CO_2 Mixture Shielding

MIX-50

AWS A5.18 ER70S-3

MIX-50 is a solid wire for gas metal arc welding applied to sheets of mild steel and 490-MPa class high tensile strength steel with 80%Ar-20%CO_2 mixture shielding. MIX-50 has earned a high reputation especially in auto applications due to the following unsurpassed characteristics.

(1) Low spatter — especially in pulsed arc welding (Figure 1) — provides a regular and glossy bead appearance and reduces costs associated with postweld cleaning.

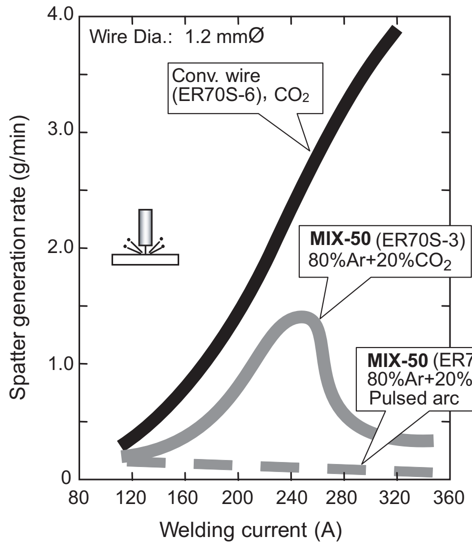


Figure 1: Spatter generation rate is lowest with MIX-50 in pulsed-arc welding.

(2) Less slag (Figure 2) prevents detachment of electrodeposition coatings on the welds.

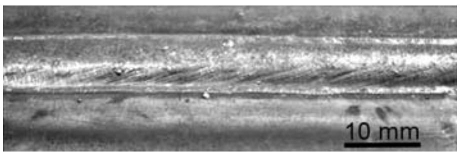


Figure 2: Less slag with MIX-50 can prevent detachment of postweld electrodeposition coatings.

(3) Consistent shallow penetration prevents excessive melt-though in sheet metal welding (Figure 3) and in turn improves variable root gap tolerance (Figure 4).

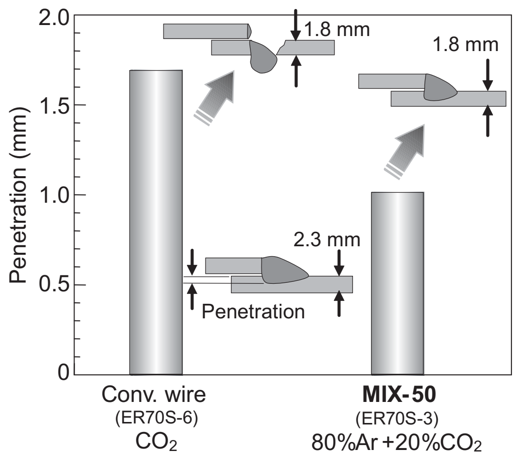


Figure 3: Shallow penetration with MIX-50 prevents excessive melt-through in sheet metal welding (Current: 220A; Welding speed: 100 cm/min.).

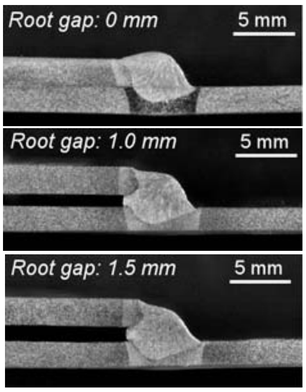


Figure 4: Excellent root gap tolerance with MIX-50 in lap fillet welding.

- Plate thickness: 2.3 mm
- Wire size: 1.2 mmØ
- Shield gas: 80%Ar+20%CO_2
- Welding current: 250A
- Arc voltage: 25V
- Welding speed: 120 cm/min.

(4) Excellent arc stability especially in pulsed arc welding can increase welding speeds and decrease welding fumes (Figure 5).

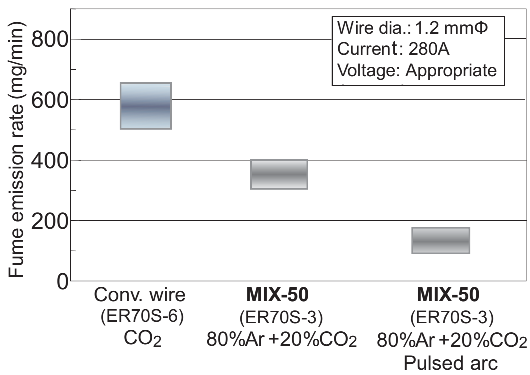


Figure 5: Lower fume emission rate with MIX-50 provides safer welding environments.

KOBELCO Will Keep Up World's Volatile Economies

Masakazu Tojo
General Manager
International Operations Dept.
Welding Company
Kobe Steel, Ltd.

Here in Japan, the rainy season has started, after which the sultry, hot summer will start in the latter part of July and last through August. The climate in Japan has sometimes seemed abnormal over the past year as in some other countries. We had unseasonably warm weather during the winter season, and cool temperatures last summer, and heavy rains during the normally dry spring season. The climate is becoming less stable than before worldwide.

The world economy is much less perceivable, too — crude oil prices reached their highest point, and the demand for ship building is still increasing. Under such unforeseen circumstances, it is difficult for us to paint accurately the future picture of our business. What we can do is to prepare the modification of our technical and sales strategies as quickly as possible to accommodate any potential dramatic change in the world economy, even though it may be difficult in practice.

Meanwhile, there are a variety of projects going on in China to prepare the infrastructure for increasing energy consumption. We will support these projects by supplying quality KOBELCO welding consumables. To promote this policy, KOBELCO has opened a new office in Shanghai, China this June to take care of our customers in China who are fabricating energy-related products such as reactors, boilers, oil tanks, and LNG tanks.

Environmentally-Friendly Products and Processes: the Key to the Future

Toshiyuki Okuzumi
General Manager
International Operations Dept.
Welding Company
Kobe Steel, Ltd.

Two welding shows, the biggest events in the Asian welding industry, were held this spring in Tokyo, Japan and Beijing, China, both on a grand scale. Reflecting booming business in major industrial fields in both countries, the fairs well surpassed last year's in site area, number of exhibitors, and number of visitors.

China, especially, is now full of big projects, such as the 2008 Beijing Olympic Games, the giant Three Gorges Dam, to be completed in 2009, and the World Exposition in Shanghai in 2010. The country's economic growth is expected to maintain a rate of 8 to 9% for a few years to come, and I could feel the vigor of such high economic growth at the show in Beijing. While big demand for welding materials is expected in tandem with the rapid expansion of infrastructure and energy-related construction in China, serious environmental pollution is feared. In order to cope with the environmental problems, the Chinese government and industrial sectors should be more conscious of environmental issues, and we, the welding materials manufacturers, should increase our efforts to develop more environmentally-friendly products and processes.

We, KOBELCO, want to continue to be the company that is relied on by customers, who will say, "KOBELCO products? They are more than OK!"

CONTENTS

ATMOSPHERIC CORROSION-RESISTANT STEELS AND SUITABLE WELDING CONSUMABLES

Atmospheric corrosion-resistant (ACR) steels (also known as weathering steel) are used in highway bridges, building foundation piles, industrial machinery, and rolling stock. The bridge industry, in particular, has seen demand rise for this type of steel due to the economic advantages of saving on the initial and maintenance rust-proofing painting costs. Figure 1 illustrates annual consumption of ACR steels in bridges in relation to total steel consumption for bridges constructed in Japan. It is conspicuous that the consumption of ACR steels significantly increased during the last decade, reaching an annual consumption of nearly 90,000 metric tons, representing over 10 percent of the total.

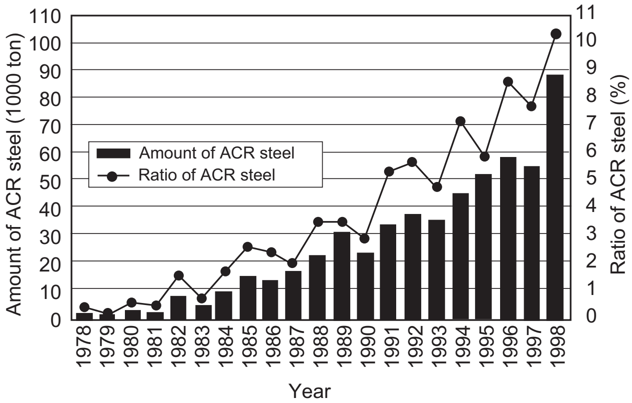


Figure 1: Amount and ratio of consumption of ACR steels in bridges in Japan.

How ACR steel can resist atmospheric corrosion

ACR steel is produced by alloying carbon steel with small amounts of P, Cu, Cr, and Ni. These alloying elements help the surface of the steel develop, as shown in Figure 2, a dense and tightly adherent protective rust layer, in which Cu and Cr are enriched, after exposure to the atmosphere. The rust layer protects the steel and prevents corrosion by serving as a barrier that prevents penetration of water and oxygen. This is in contrast to ordinary carbon steels that form a coarse, porous and flaky rust (Figure 2) that allows the atmosphere to penetrate and corrode the steel.

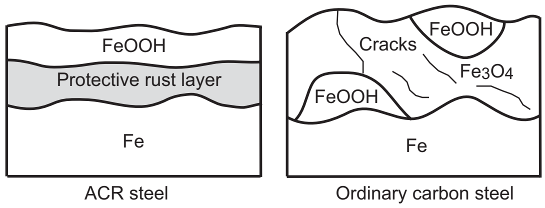


Figure 2: A comparison between schematic cross sections of weathered surface layers of ACR steel and ordinary carbon steel.

Standards for ACR steels

Extensive research into the development of ACR steel was started in Europe and the US in the 1910s. COR-TEN steel was the first proprietary material of this kind developed and supplied by U.S. Steel. In the latter half of the 1950s, Japanese steel producers began to develop their own unique variations of ACR steels. In 1960, the P-Cu type was employed for rolling stock. Since the development of Cu-Cr type of ACR steel, which featured superior weldability, the application of ACR steels was expanded in bridges and buildings. Table 1 shows the characteristics of popular types of ACR steels specified by the JIS and ASTM.

Table 1: Chemical and mechanical properties of ACR steels specified in the JIS and ASTM standards.

Properties		JIS standard							ASTM standard (1)	
		G 3114 (2)						G 3125 (3)	A 242	A 588
		SMA 400 (A, B, C)		SMA 490 (A, B, C)		SMA 570		SPA-H SPA-C	-	Gr.B
		W	P	W	P	W	P			
Chemical composition (%)	C	0.18 max.	0.18 max.	0.18 max.	0.18 max.	0.18 max.	0.18 max.	0.12 max.	0.15 max.	0.20 max.
	Si	0.15-0.65	0.55 max.	0.15-0.65	0.55 max.	0.15-0.65	0.55 max.	0.25-0.75	-	0.15-0.50
	Mn	1.25 max.	1.25 max.	1.40 max.	1.40 max.	1.40 max.	1.40 max.	0.20-0.50	1.00 max.	0.75-1.35
	P	0.035 max.	0.035 max.	0.035 max.	0.035 max.	0.035 max.	0.035 max.	0.070-0.150	0.15 max.	0.04 max.
	S	0.035 max.	0.035 max.	0.035 max.	0.035 max.	0.035 max.	0.035 max.	0.040 max.	0.05 max.	0.05 max.
	Cu	0.30-0.50	0.20-0.35	0.30-0.50	0.20-0.35	0.30-0.50	0.20-0.35	0.25-0.60	0.20 min.	0.20-0.40
	Cr	0.45-0.75	0.30-0.55	0.45-0.75	0.30-0.55	0.45-0.75	0.30-0.55	0.30-1.25	-	0.40-0.70
	Ni	0.05-0.30	-	0.05-0.30	-	0.05-0.30	-	0.65 max.	-	0.50 max.
	V	-	-	-	-	-	-	-	-	0.01-0.10
TS (MPa)		400-540		490-610		570-720		480 min. 490 min. 450 min.	435 min. 460 min. 480 min.	435 min. 460 min. 485 min.
vE (J) (4)		B: av. 27 min. at 0°C C: av. 47 min. at 0°C		B: av. 27 min. at 0°C C: av. 47 min. at 0°C		av. 47 min. at –5°C		-	-	-

1. The minimum tensile strength (TS) varies depending on the plate thickness.
2. Mo, Nb, Ti, V, and Zr can be added, provided the total amount of these elements shall not exceed 0.15% max. The W grade is to be used in the unpainted condition or in the rust-stabilized condition. The P grade is to be used in the painted condition.
3. The minimum tensile strength (TS): 480 or 490 MPa depending on the thickness for SPA-H; 450 MPa for SPA-C.
4. Charpy impact testing is required for steels thicker than 12 mm.

Superior ACR steels, such as SPA-H and SPA-C, specified in JIS G 3125 (Superior Atmospheric Corrosion Resistant Rolled Steels) contain higher amounts of P, Cu, Cr, and Ni for better atmospheric resistance. They have been used extensively for rolling stock in Japan. However, high amounts of phosphorous, 0.070-0.15.%, can degrade weldability, causing hot cracks when inappropriate welding procedures are used. Taking into account the typical application and inferior weldability, plate thickness is limited to 16 mm for SPA-H, and 2.3 mm for SPA-C.

In contrast, ACR steels specified in JIS G 3114 (Hot-Rolled Atmospheric Corrosion Resistant Steels for Welded Structures), such as SMA 400, SMA 490, and SMA 570, are designed to offer superior weldability by restricting the P content (0.035% max.) and atmospheric corrosion resistance by alloying with modest amounts of Cu, Cr, and Ni. With these excellent properties, this series of ACR steels is extensively used in bridges in Japan.

The ASTM standards for iron and steel products include low-alloy steels that contain Cu, Cr, Ni, and other alloying elements that resist atmospheric corrosion. Many grades of steels specified in ASTM A242, A514, A517, A588, A709, A710, A736, A852, and A871 are considered “weathering” per ASTM G101 (Standard Guide for Estimating the Atmospheric Corrosion Resistance of Low-Alloy Steels).

Advanced ACR steels

Conventional ACR steels, such as those specified as per JIS G 3114, are intended for use in the unpainted condition for applications that are not subjected to a high chloride environments, such as where the amount of airborne salt exceeds 0.05 mdd (mg/dm^2/day). This is to keep the amount of material lost to corrosion to an approximate thickness of 0.3 mm after 50 years of use in Japan.

On the other hand, the need for corrosion resistant steels to be used in high chloride environments has increased as more bridges and steel structures are built in coastal areas or cold weather districts where road antifreeze is used. In respond to this demand, various advanced ACR steels have been developed.

The chemical compositions of these steels vary according to the specifications of individual steel producers. In sum, they are low-alloy steels containing Cu, Ni, Mo, and Ti, but no Cr. Adding Cr is believed to decrease the corrosion resistance of the steel in chloride environments. The advanced ACR steels also contain higher amounts of Ni than conventional ACR steels to improve atmospheric corrosion resistance. Tables 2 and 3 show typical chemical and mechanical properties of the Cu-Ni-Ti type and Ni-Mo type advanced ACR steels, respectively.

Table 2: Typical chemical and mechanical properties of Cu-Ni-Ti type advanced ACR steel.

Properties		Steel grade (1)
		SMA490CW-mod.
Plate thickness (mm)		25
Chemical composition (%)	C	0.06
	Si	0.25
	Mn	1.09
	Cu	1.00
	Ni	1.02
	Ti	0.047
0.2%OS (MPa)		513
TS (MPa)		545
El. (%)		28
vE (J)		352 at 0°C

1. Classified per JIS G 3114 only for mechanical properties. Chemical composition is modified.

Table 3: Typical chemical and mechanical properties of Ni-Mo type advanced ACR steels.

Properties		Steel grade (1)
		CUPTEN 490A-CL
Plate thick. (mm)		15
Chemical composition (%)	C	0.08
	Si	0.31
	Mn	0.69
	Ni	1.40
	Mo	0.31
0.2%OS (MPa)		419
TS (MPa)		583
El. (%)		26
vE (J)		278 at 0°C

1. Classified per JIS G 3114 only for mechanical properties. Chemical composition is modified.

Figures 3 and 4 show how Cu-Ni-Ti type and Ni-Mo type advanced ACR steels can effectively reduce atmospheric corrosion in environments with high amounts of airborne salt as compared with ordinary carbon steel and conventional ACR steel. It is significant that the amount of loss to corrosion of one-side thickness in advanced ACR steels is less than half that of the conventional ACR steel, without causing loose flaky rust.

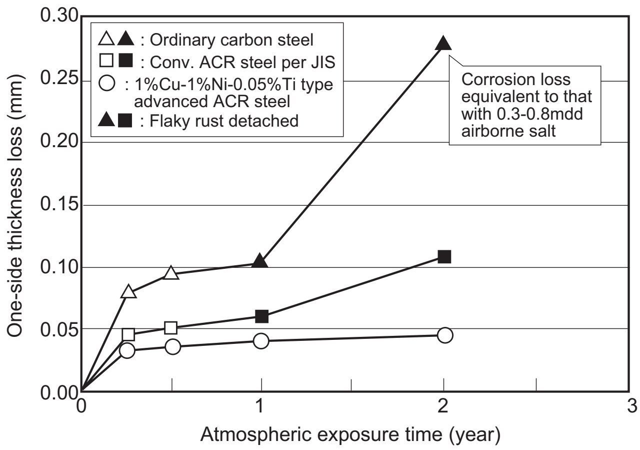


Figure 3: Results of chloride atmospheric exposure test of Cu-Ni-Ti type advanced ACR steel in comparison with ordinary carbon steel and conventional ACR steel as per JIS.

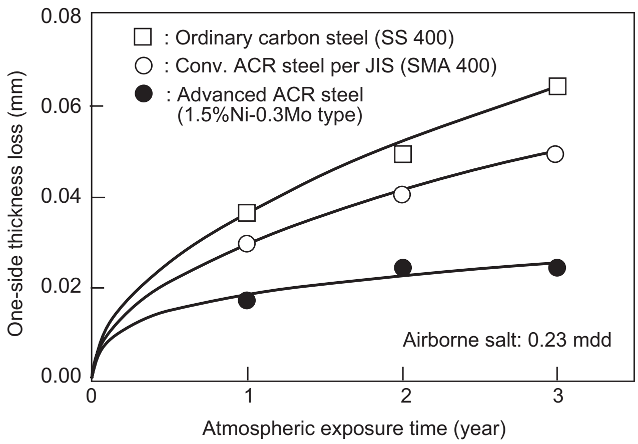


Figure 4: Results of chloride atmospheric exposure test of Ni-Mo type advanced ACR steel in comparison with ordinary carbon steel and conventional ACR steel as per JIS.

Suitable welding consumables for ACR and advanced ACR steels

For the construction of bridges and other structures made from ACR steel and advanced ACR steel, welding consumables with similar chemical compositions are used to prevent dissimilar metal galvanic corrosion in the weld.

Table 4: Quick guide to suitable welding consumables for ACR and advanced ACR steels.

Type of steel		Welding process (1)	Application	Brand name (2)	JIS classification	AWS classification
JIS G3125	SPA-H SPA-C	SMAW	All positions	TBW-52	Z3214 DA5003G	-
			All positions	LBW-52	Z3214 DA5016G	A5.5 E7016-G
JIS G 3114	SMA 400 (A, B, C) SMA 490 (A, B, C) W or P	SMAW	All positions	LBW-52B	Z3214 DA5016W	A5.5 E7016-G
		FCAW	All positions, CO_2	DW-50W	Z3320 YFA-50W	-
			F/H fillet, CO_2	MX-50W	Z3320 YFA-50W	-
		GMAW	High amp.,CO_2, Ar+CO_2	MGW-50B	Z3315 YGA-50W	A5.28 ER80S-G
			All position, CO_2, Ar+CO_2	MGW-50TB	Z3315 YGA-50W	A5.28 ER80S-G
		SAW	Butt/F fillet	MF-38/USW-52B	Z3183 S502-AW	A5.23 F7A2-EG-G
	SMA 570 W or P	SMAW	All positions	LBW-62G	Z3214 DA5816W	A5.5 E8018-W2
		FCAW	All positions, CO_2	DW-60W	Z3320 YFA-58W	A5.29 E81T1-W2
			F/H fillet, CO_2	MX-60W	Z3320 YFA-58W	A5.29 E80T1-W2
		GMAW	High amp.,CO_2	MGW-60B	Z3315 YGA-58W	A5.28 ER80S-G
		SAW	Butt	MF-38/USW-62B	Z3183 S582-AW	A5.23 F8A2-EG-G
			F/H fillet	MF-63/USW-63B	Z3183 S581-AW	A5.23 F8A0-EG-G
Cu-Ni-Ti type	SMA 400W-mod. SMA 490W-mod.	SMAW	All positions	LB-50WT	-	-
		FCAW	All positions, CO_2	DW-50WT	-	-
			F/H fillet, CO_2	MX-50WT	-	-
		SAW	Butt	MF-38/US-50WT	-	-
			F/H fillet	MF-53/US-50WT	-	-
Ni-Mo type	CUPLOY 400-CL CUPTEN 490-CL	SMAW	All positions	LBW-52CL	-	-
		FCAW	All positions, CO_2	DW-50WCL	-	-
			F/H fillet, CO_2	MX-50WCL	-	-
		SAW	Butt	MF-38/USW-52CL	-	-
			F/H fillet	MF-53/USW-52CL	-	-

1. SMAW: shielded metal arc welding; FCAW: flux cored arc welding; GMAW: gas metal arc welding with solid wires; SAW: submerged arc welding; GTAW: gas tungsten arc welding.
2. Refer to KOBELCO Welding Handbook for chemical and mechanical properties.

Kobe Steel recommends using Table 4 to select suitable welding consumables for ACR steels and advanced ACR steels. TBW-52 is a lime titania electrode, which offers excellent X-ray soundness, mechanical properties, and bead appearance in out-of-position welding. Brands designated with LB or LBW are low-hydrogen electrodes, which feature superior X-ray soundness, impact toughness, and crack resistance. Stable, concentrated arc, good slag removal, and smooth bead appearance are the outstanding characteristics of these low-hydrogen electrodes.

Flux-cored wires designated with DW contain a rutile type flux. They are characterized by flat and glossy bead appearance, low spatter, and self-peeling slag removal. Whereas those designated with MX contain a metal type flux, which offer higher deposition rates, excellent fillet bead shape, and low spatter in the flat and horizontal positions, both DW and MX flux-cored wires require an external shielding gas of CO_2.

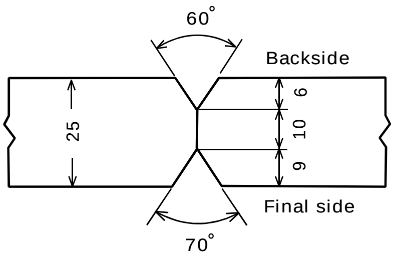
Brands designated with MGW are solid wires for GMAW, which feature a tightly adhered copper coating with a glossy surface, and properly controlled cast and helix. These outstanding features provide stable arcs in a wide range of welding currents with smooth, consistent wire feedability. Some wires use CO_2 or Ar+CO_2 but some one uses CO_2 only for the shielding gas.

As to the SAW flux-wire combinations listed in Table 4, MF-38 is a fused type flux, which produces welds characterized by excellent impact toughness, X-ray soundness, and resistance to rust and dirt on the base metal. MF-53 and MF-63 are fused type fluxes, too, whose performance shines in horizontal fillet welding, exhibiting unmatched bead appearance, excellent slag removal, and a low flux consumption ratio — thereby adding economy and value. SAW wires designated with US and USW are solid wires. All the alloying elements are added from the wire to ensure consistent quality of the weld metal.

Weld joint properties of advanced ACR steel

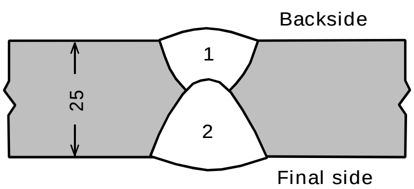
Table 5 shows welding conditions used for a weld joint test of Cu-Ni-Ti type advanced ACR steel by double-side single-pass SAW, and Table 6 shows the mechanical test results of this weld joint. Figure 5 shows an example of bridges constructed by using advanced ACR steels.

Table 5: Welding conditions for weld joint test by SAW.

<table>
<tr><td>Base metal</td><td colspan="2">25-mm thick.
SMA490CW-mod. (Cu-Ni-Ti) (1)</td></tr>
<tr><td>Filler metal</td><td colspan="2">MF-38/US-50WT (4.8Ø)</td></tr>
<tr><td>Groove prep</td><td colspan="2"></td></tr>
<tr><td>Side of layer</td><td>Backside</td><td>Final side</td></tr>
<tr><td>Amperage (A)</td><td>850</td><td>980</td></tr>
<tr><td>Voltage (V)</td><td>33</td><td>38</td></tr>
<tr><td>Speed (cpm)</td><td>32</td><td>32</td></tr>
<tr><td>Heat input (kJ/cm)</td><td colspan="2">av. 61</td></tr>
</table>

1. Refer to Table 2 for chemical and mechanical properties.

Table 6: Results of weld joint test by SAW

<table>
<tr><td>Pass sequence</td><td colspan="2"></td></tr>
<tr><td>Tensile strength (MPa)</td><td>578</td><td>580</td></tr>
<tr><td>Fracture location</td><td>Base metal</td><td>Base metal</td></tr>
<tr><td>Side bend (R = 20 mm)</td><td>Good</td><td>Good</td></tr>
<tr><td>vE at 0°C (J) (1)</td><td colspan="2">86</td></tr>
</table>

1. Specimen was removed at 1/4t from the base metal surface and notched at the weld metal center.

Figure 5: A bridge constructed by using Cu-Ni-Ti type advanced ACR steels and matching filler metals in Japan.

Tips for welding procedures

The weldability (crack resistance and mechanical properties) of ACR and advanced ACR steels can vary according to P_{CM} (crack susceptible element parameter), plate thickness, joint geometry, welding process, and welding conditions. Table 7 provides a guide to preheat and interpass temperatures for establishing the proper welding procedures for individual constructions.

Table 7: Standard preheat and interpass temperatures. (1)(2)

<table>
<tr><td rowspan="2">Steel type</td><td rowspan="2">Welding process</td><td colspan="4">Plate thickness (mm)</td></tr>
<tr><td>25 max.</td><td>Over 25, 40 max.</td><td>Over 40, 50 max.</td><td>Over 50, 100 max.</td></tr>
<tr><td rowspan="2">SMA 400W</td><td>SMAW (3)</td><td colspan="2">No preheat</td><td colspan="2">50°C</td></tr>
<tr><td>SAW, GMAW, FCAW</td><td colspan="4">No preheat</td></tr>
<tr><td rowspan="2">SMA 490W 570W</td><td>SMAW (3)</td><td>No preheat</td><td colspan="2">80°C</td><td>100</td></tr>
<tr><td>SAW, GMAW, FCAW</td><td>No preheat</td><td colspan="2">50°C</td><td>80</td></tr>
</table>

1. Extracted from Specification for Highway Bridges of Japan.
2. “No preheat” requires preheating of approx. 20°C when the ambient temperature is 5°C or lower.
3. With low hydrogen covered electrodes.

» References «
[1] Welding Technical Guide, 2002, 5, No. 385. Kobe Steel, Ltd.
[2] Welding Technical Guide, 2001, 2, No. 370. Kobe Steel, Ltd.

WELD DISTORTION

What is weld distortion?

In the fabrication of metal structures, the process of welding can often lead to fundamental dimensional changes. This is what we call "weld distortion."

What causes weld distortion?

During fusion welding, the melted metal may irregularly contracts on cooling from the solidus to room temperature, resulting in shrinkage over the weld and exerting an eccentric force on the weld cross section. The weldment strains elastically in response to the stresses caused by the contraction of the weld; hence you notice the irregular strain in macroscopic distortion.

What are the types of weld distortion?

There are a number of types of possible weld distortion as shown in Figure 1: (A) Transverse shrinkage, (B) Longitudinal shrinkage, (C) Longitudinal distortion, (D) Angular distortion, (E) Rotational distortion, and (F) Buckling distortion. The dimensional magnitude of weld distortion and/or shrinkage depends on the kind of metals being welded and the welding procedure.

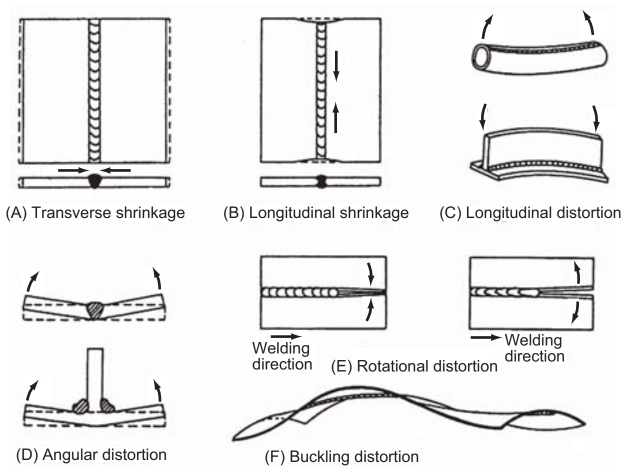


Figure 1: Variation in weld distortion.

How can weld distortion be prevented and corrected?

In fusion welding, groove preparation, sequence of deposition, and order of welding can affect the extent of weld distortion. There are several methods to prevent weld distortion by using a strongback, clamp, prestrain jig, presetting backing, and restraint bracket as illustrated in Figure 2. Several special sequences of deposition such as backward, symmetrical, stepping-stone, and forward methods, as shown in Figure 3, are also useful.

In general, a structure to be welded has a number of welding lines. Therefore, welding in the wrong order leads to weld distortion. Thorough examination of the welding method, the order of welding, and the choice of appropriate welding parameters are necessary in advance, taking into account the contractions and expansions caused by welding.

Distortion can be removed by producing adequate plastic deformation in the distorted member or section by thermal or mechanical methods: thermal or flame and/or mechanical straightening with a press or jacks. Preheating and postweld thermal treatments are also effective.

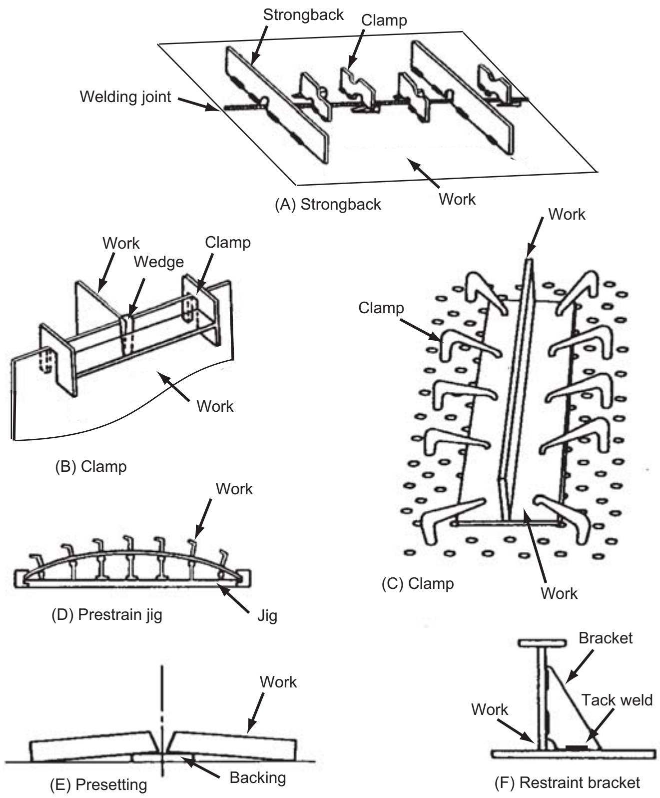


Figure 2: Some methods for preventing weld distortion.

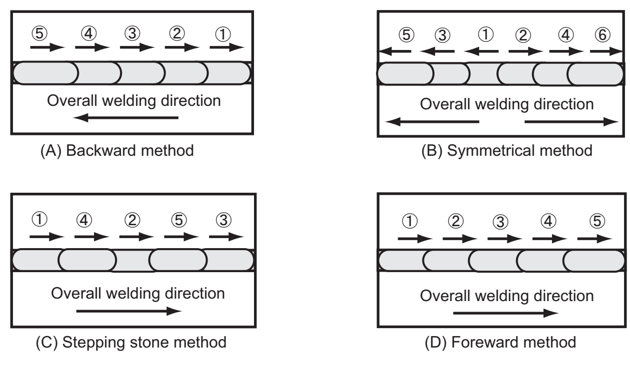


Figure 3: Variations of deposition sequences to minimize weld distortion.

» References «

[1] Yamamoto Shigeaki. The ABC's of Arc Welding and Inspection. Shinko Welding Service Co.,Ltd., Second Edition,2003, P.58-59.

[2] Welding Handbook Vol.1, AWS, 8th Edition, 1987, P.241-264.

The KOBELCO Base in Europe Will Start Production of Mild Steel FCWs

The Welding Company of Kobe Steel has recently decided to use its production and sales base in Europe, Kobelco Welding of Europe B.V. (KWE) located in Heerlen City, The Netherlands, to produce mild steel flux-core wires (FCW) from 2007. Full-scale production will begin in 2007.

Since 1995 when KWE was established, the subsidiary has been producing stainless steel FCWs but no mild steel FCWs. KOBELCO mild steel FCWs have been produced only in Japan and Korea and are used mainly in ship building and offshore structures. However, demand for these FCWs is increasing worldwide. In order to meet increasing demand in Europe, the wires will now be produced there. As a result, the number of employees at KWE will likely double.

In order to fulfill the promise of our production slogan, "The Same Quality for the Same Brand Worldwide," we will make every effort to support the KWE staff to supply KOBELCO quality products to customers. We hope you will continue to extend your patronage.

Reported by Yu Agatsuma, KSL

Kobe Steel Obtains Russian NACKS Certification

Following the certification and approval of NACKS, the Russian National Association of Inspection and Welding, for LB-52U in August last year, LB-62D, LB-62U and LB-106 have become the latest products certified and approved by NACKS on the 1st of February, 2006.

The certification means that the three new brands in addition to LB-52U are now officially approved and certified for welding in the manufacturing, repairing, and rehabilitating of oil and gas production equipment as well as pipelines in the Russian Federation.

We are confident that this will open up new opportunities for Kobe Steel to further expand its share of stick electrodes in the Russian market

НАКС

НАЦИОНАЛЬНАЯ АССОЦИАЦИЯ КОНТРОЛЯ И СВАРКИ

СВИДЕТЕЛЬСТВО

№ АЦСМ-15-00034
об аттестации сварочных материалов
в соответствии с требованиями РД 03-613-03

Организация: "Kobe Steel, Ltd" (Япония)
(производитель СМ)
(9-12, Kita-Shinagawa 5-chome, Shinagawa-ku, Tokyo, 141-8688, Japan)

Вид аттестации: Первичная
Вид СМ: Эп
Тип электродов: E9018-G по AWS A5.5 (Э60 по ГОСТ 9467-75)
Марка: LB-62D
Диаметр, мм: 3,2; 4,0.
ТУ, ГОСТ на изготовление: ТУ 1272-023-2005; AWS A5.5
Способ сварки: РД
Группы основных материалов: 2 (М03)*.
* - В том числе для сварки труб из сталей прочностных классов от К55 до К60 включительно (нормативный предел прочности от 539 до 588 Н/мм^2 включительно) - сварка заполняющих и облицовочного слоев шва.

Группы технических устройств: НГДО**
**- Конкретные условия применения СМ определяются требованиями НД и результатами производственной аттестации технологии сварки.

Основание: Протокол об аттестации АЦСМ-15 № 031 от 16.12.2005 г.
АЦСМ-15 № 032 от 16.12.2005 г.

Дата выдачи 01.02.2006 г.
Свидетельство действительно до 01.02.2009 г.

Примечание: Обозначения видов сварочных материалов, способов сварки, групп технических устройств и основных материалов приведены на обороте.

Президент НАКС Н.П. Алёшин

An example of the NACKS certificate for LB-62D.

The 2006 Japan International Welding Show in Tokyo

Following the show in Osaka in 2004, The Japan International Welding Show 2006 was held at Tokyo Big Site in Tokyo from April 12 through 15 this year. Despite a derailment accident that interrupted service on the Yurika-mome line, the main transportation system to the site, for hours on one day during the period, the show saw many visitors, and the site bustled with excitement throughout, reflecting the recent buoyant economy. This year, the total number of visitors amounted to as many as 101,029 including 3,132 from abroad. This figure exceeded that of the 2002 show held in Tokyo by about 3,500. There were 226 exhibitors this year (191 domestic and 35 overseas companies). KOBELCO's booth received as many as 2,500 visitors, who were attracted by our products.

The theme of the show this year was “A new stage that commences from here and from now; solutions to welding, cutting, surface modification and inspection.” Under our business slogan “KOBELCO supports your manufacturing,” the same as for the last Show in 2004, we divided our booth mainly into 4 corners for exhibition and demonstration. At the welding demonstration corner, visitors could try out welding with the DW-T series flux-cored wires for stainless steel thin sheets and with solid wires that have received a high reputation among automobile manufacturers. The booth also featured a car exhaust system welded with MXA-430M flux-cored wire for stainless steel, a welding demonstration using sophisticated power sources, a demonstration of robotic welding, and a first-time exhibition of a computer system designed to solve welding problems that could be operated by visitors themselves. All these exhibits and demonstrations received favorable notices from visitors. With many people visiting our booth from both domestic and overseas markets, it was really a valuable exhibition.

From the top, demonstration of welding robots, visitor’s trial of welding, solution of welding problems by the KOBELCO PC program, and business talk corner exhibited with a car exhaust system.

An overall impression was that the show was dominated by displays and demonstrations of welding robots together with the many welding materials used for enhanced automation and environmentally-conscious products.

The next Japan International Welding Show will be held in 2008 in Osaka. We will make great effort from now to show you newer and better products at that time. We look forward to seeing as many of you as possible.

Reported by Yu Agatsuma, KSL

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