KOBELCO WELDING TODAY

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The KOBELCO Arc: Your Total Solution in Manual, Semi-Automatic and Automatic Welding

New ZERODE-44

A Leading Electrode for General Applications in Japan

New ZERODE-44 is a lime titania type covered electrode classified as D4303 per JIS Z 3211, which corresponds to the AWS classification of A5.1 E6013, a high titania type electrode. In comparison with conventional E6013 electrodes, New ZERODE-44 offers

- Higher crack resistance
- Superior porosity resistance
- Higher impact toughness
- Deeper penetration and flatter bead shape
- Higher deposition rates
- Easier slag removal in narrow grooves

Table 1 shows a comparison between New ZERODE-44 and the conventional E6013 electrode in terms of Charpy impact toughness. New ZERODE-44 exhibits glossy bead appearance due to improved slag detachability and sufficient penetration as shown in Figure 1. As shown in Figure 2, New ZERODE-44 offers higher deposition rates because its covering contains iron powder, unlike the conventional E6013 electrode.

Table 1: A comparison between New ZERODE-44 and conventional E6013 electrodes in terms of Charpy impact energy

Electrode	Charpy impact energy (J)	
	-20°C	0°C
New ZERODE-44	90	170
Conventional E6013	40	70

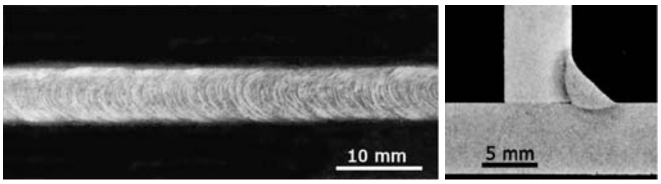

Figure 1: Bead appearance and cross sectional macrostructure of New ZERODE-44 in horizontal fillet welding

In comparison with conventional D4303 electrodes, New ZERODE-44 offers approximately 30% lower welding fume emission rates as shown in Figure 3, and its sophisticated covering picks up moisture in the atmosphere at slower rates as shown in Figure 4.

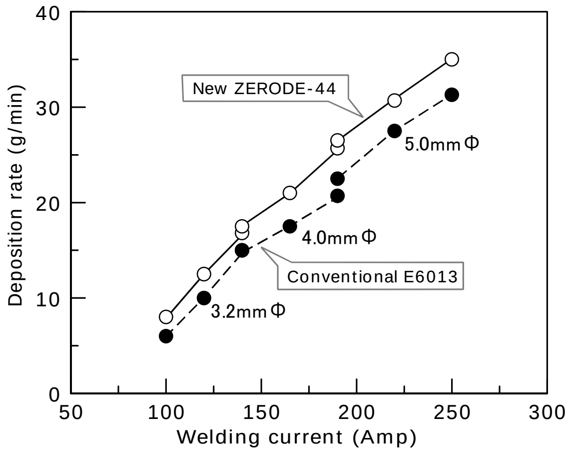

Figure 2: A comparison between New ZERODE-44 and conventional E6013 electrodes in terms of deposition rates

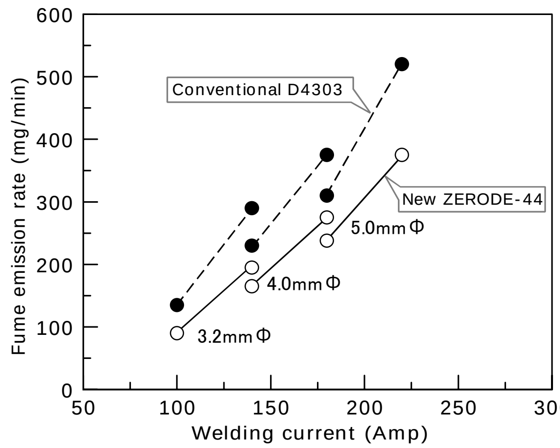

Figure 3: A comparison between New ZERODE-44 and conventional D4303 electrodes in terms of welding fume emission rates as a function of welding current

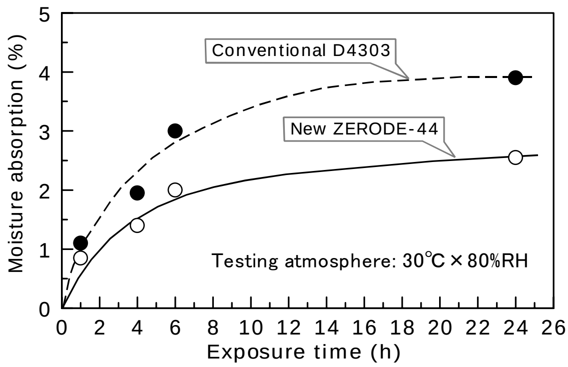

Figure 4: A comparison between New ZERODE-44 and conventional D4303 electrodes in terms of moisture absorption

A happy New Year 2006

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

We have sailed into a new era. This is the year in which we have to make up a new Three-Year Business Plan that sets our targets of achievement in sales and profits and details a strategy for executing the plan. This plan is expected to be a big step forward in realizing our dreams in which the high reputation for KOBELCO products prevails among customers and users worldwide.

For worldwide manufacturing and sales, KOBELCO today has seven production plants, one sales company, and one production partner outside Japan. Last year KMWT in Thailand expanded their production capacity to respond to growing demand from the automobile, motorcycle and construction machinery industries. This year KWK in South Korea is planning to increase their production capacity to solve a tight supply-demand situation. Furthermore, KWE in the Netherlands is planning to start the manufacturing of mild steel flux-cored wires, in addition to the present production of stainless steel flux-cored wires, in 2007.

It has been the case that we have not been able to supply welding robots and automatic welding equipment to overseas markets. However, under the new plan, we are now planning to export KOBELCO welding robots and automatic equipment as well as to continue supplying traditional welding consumables to provide customers and users with the total solution for arc welding in the near future.

Targeting to be a reliable company

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

A happy New Year to all the readers of Kobelco Welding Today! What plans do you have for the New Year? As I look back on last year, it was full of natural disasters with the big earthquake off the Sumatran coast that caused a great number of casualties in Indonesia and surrounding countries, the big hurricanes causing terrible floods in the US, and the abnormal climate in Japan, with a hot spell in the summer and continuous typhoons. In a way, the welding business, too, encountered difficulties last year though not in relation to any natural disasters. Triggered by rapid economic growth in China, waves of price hikes affected raw materials such as iron ores and energy sources like coal and oil. This affected our business a great deal, and we were compelled to raise prices of our products, too, in order to maintain stable supply. We thank you very much for your generous understanding about this.

This year, we are to draw up a mid-term (2006 - 2008) business plan. Though it is difficult to foresee the economic trends in markets, market positions and exchange rates in the coming three years, we are determined to pursue the activities needed in whatever business environment to maintain continuous growth and become a leading company in the world. We will make the effort to become the kind of company that will make you say "Ask Kobelco for the solution. They are reliable." We sincerely hope to continue to have your patronage.

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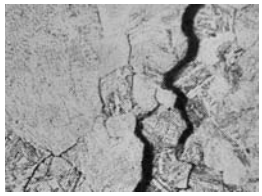


WELDING OF CRUDE OIL STORAGE TANKS

PART 1: HOW TO SELECT FILLER METALS

Oil is one of the world's major energy sources together with coal and natural gas. Oil is stored in specialized tanks prior to refining and for stockpiling. Aboveground oil storage tanks can be classified into the following three types according to the design of their roofs: floating-roof tanks, covered floating-roof tanks, and fixed-roof tanks. Large-capacity storage tanks for crude oil, the subject of this article, fall into the floating-roof type. This article discusses how to select filler metals for welding of crude oil storage tanks.

The structure of floating-roof tanks and suitable welding procedures

Figure 1 shows a three dimensional view of a floating-roof tank, which consists of a flat roof, cylindrical shell, and flat bottom. The roof floats on the surface of the liquid, and it can be lifted up or down as the liquid increases or decreases. Because there is no space between the roof and the product, loss due to evaporation can be minimized.

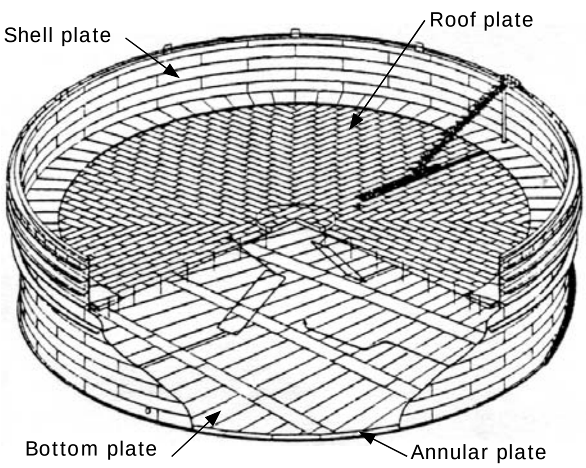


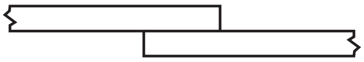
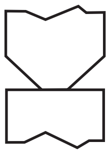
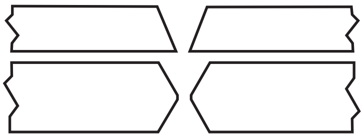
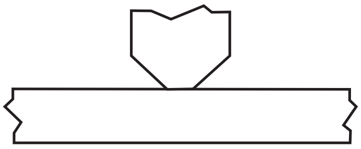
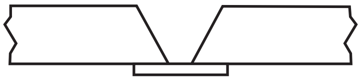
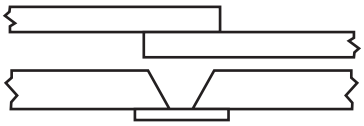
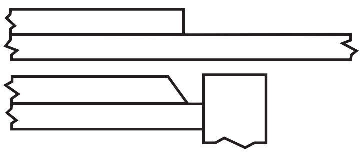
Figure 1: Schematic of floating-roof storage tank for crude oil

The capacity of crude oil storage tanks can be as large as 181,200 kiloliters, as in one of the world's largest tanks, built in Abu Zabi in 1974. Another large storage tank is the one built on Khark Island in Iran in 1968: the cylindrical tank has a diameter of 109 m, a height of 18 m and a capacity of 160,000 kiloliters.

The construction of large-scale cylindrical storage tanks requires automatic welding processes such as submerged arc welding (SAW) and electrogas arc welding (EGW). In addition, manual shielded metal arc welding (SMAW) and semi-automatic gas metal arc welding (GMAW) may also be selected according to the accessibility and applicability of the welding position and the targeted efficiency for individual welding joints. Table 1 shows the typical welding joints for a crude oil storage tank, applicable welding positions and processes, and suitable Kobelco filler metals. The following paragraphs discuss the welding procedures for particular welding joints.

(1) SHELL PLATE HORIZONTAL BUTT JOINTS account for 90 percent of the total welding length of the shell, and the plate thickness of the joints is as large as 12-40 mm. Therefore, welding efficiency has a significant effect on the total construction cost. To achieve high welding efficiency, the SAW process carried out with special equipment for horizontal welding is generally used. Figure 2 outlines this process, in which a welding wire is fed at a certain angle into a granular flux that is sustained by conveyor tracking along the lower part of a double bevel groove. Figure 3 shows an application of this process at a construction site, in which the SAW equipment tracks along the shell plate.

Table 1: Main joints for cylindrical storage tank and suitable welding procedures

Main joint	Welding position	Joint configuration	Welding process	Type of steel (1)	Filler metal
Roof plate joint	Horizontal fillet		SMAW	Mild steel	LB-47, LB-52, LBM-52
Shell plate joint	Horizontal		SAW	Mild steel	MF-33H/US-36
				HT steel	MF-33H/US-49
			SMAW	Mild steel	LB-47, LB-52, LBM-52
				HT steel	LB-62, LB-62UL
	Vertical		EGW	Mild steel	DWS-43G
				HT steel	DWS-60G
			SMAW	Mild steel	LB-47, LB-52, LBM-52
				HT steel	LB-62, LB-62UL
Shell plate to annular plate joint	Horizontal fillet		SAW	Mild steel	MF-300/US-36
				HT steel	MF-300/US-40
			SMAW	Mild steel	LB-47, LB-52, LBM-52
				HT steel	LB-62, LB-62UL
Annular plate joint	Flat		SAW	Mild steel	MF-300/US-36
				HT steel	MF-300/US-40
			SMAW	Mild steel	LB-47, LB-52, LBM-52
				HT steel	LB-62, LB-62UL
Annular plate to bottom plate joint	Flat		SAW	Mild steel or dissimilar (2)	MF-300/US-36
			SMAW	Mild steel or dissimilar (2)	LB-47, LB-52, LBM-52
Bottom plate joint	Horizontal fillet and flat		SAW	Mild steel	MF-300/US-36
			SMAW	Mild steel	LB-47, LB-52, LBM-52
Joints at the periphery of nozzle and manhole	Horizontal fillet and flat		SMAW	Mild steel	LB-47, LB-52, LBM-52
				HT steel	LB-62, LB-62UL
			GMAW	Mild steel	MG-50
				HT steel	MG-60
			SAW	Mild steel	MF-300/US-36
				HT steel	MF-300/US-40

(1) HT steel: 550-610 MPa HT steel (2) Dissimilar: Mild steel and 550-610 MPa HT steel

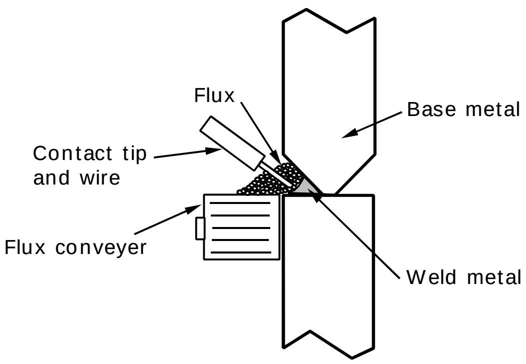


Figure 2: Outline of horizontal submerged arc welding

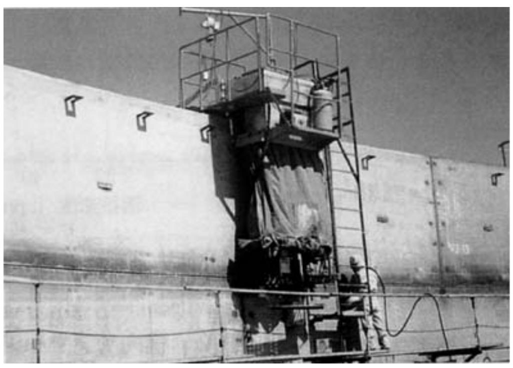


Figure 3: Application of horizontal submerged arc welding (Photo source: KHK, Safety & Tomorrow, Mar. 2000)

This specific horizontal SAW process uses a particular flux and a thin solid wire of 3.2 mmØ. Kobe Steel recommends the flux-wire combinations of MF-33H/US-36 (AWS A5.17 F7A6-EH14) for mild steel and MF-33H/US-49 (AWS A5.23 F8A6-EG-A4) for 550-610 MPa high tensile strength (HT) steel. These flux-wire combinations offer the following features with DCEP currents:

- Unsurpassed slag removal and bead appearance
- Unmatched weld metal impact properties
- Excellent pockmark and porosity resistance
- Greater resistant against rust and dirt
- First-class X-ray soundness

While SAW is the main welding process for shell plate horizontal welding in large-capacity cylindrical tanks, SMAW is equally indispensable. Because tack welding uses low hydrogen electrodes even for mild steel base metal, cold cracks are prevented by decreasing the diffusible hydrogen in the weld metal. Kobe Steel recommends LB-47 (AWS A5.1 E7016), LB-52 (E7016) and LBM-52 (E7016) for mild steel and LB-62 (AWS A5.5 E9016-G) and LB-62UL (E9016-G) for 550-610 MPa HT steel. LB-47 weld metal contains less manganese, which lowers its carbon equivalent and so its susceptibility to cold cracking. LBM-52 is an extra-low hydrogen electrode, which offers low amounts of diffusible hydrogen in the weld metal as compared with LB-47 and LB-52. LB-62 is a moisture resistant, extra-low hydrogen electrode which picks up moisture at lower rates as shown in Figure 4. LB-62UL is a moisture resistant, ultra-low hydrogen electrode, with which the preheating temperature can be reduced by 25°C than with LB-62 as shown in Table 2.

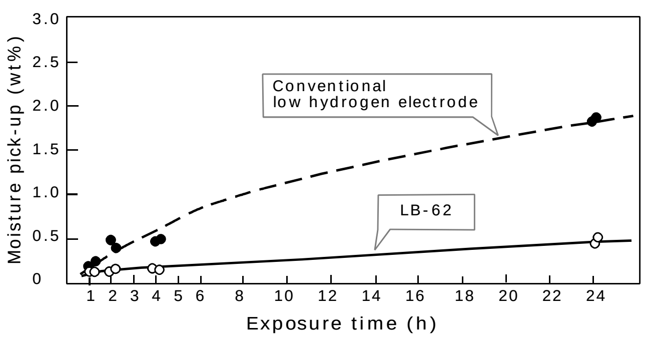


Figure 4: Moisture absorption test results of LB-62 and a conventional low hydrogen electrode under the controlled atmosphere of 30°C×80%RH

Table 2: y-groove crack test results of LB-62 and LB-62UL (1)

Electrode	Diffusible hydrogen level	Drying condition	Base metal temperature (°C) (2)		
			0	25	50
LB-62	Extra-low	Right after redrying: 350°C×1h	●●●	○○○	○○○
LB-62UL	Ultra-low		○○○	○○○	○○○
LB-62	Extra-low	Right after 4-hour exposure to atm. (3)	●●●	●●●	○○○
LB-62UL	Ultra-low		●▲○	○○○	○○○

(1) ○ : No cracking; ▲ : Half cracking; ● : Cracking through
(2) Base metal: 590MPa HT steel with 38 mm thickness, 0.35 Ceq and 0.19 Pcm, where Ceq = C + Mn/6 + Si/24 + Ni/40 + Cr/5 + Mo/4 + V/14, and Pcm = C + Si/30 + Mn/20 + Cu/20 + Ni/60 + Cr/20 + Mo/15 + V/10 + 5B
(3) 30°C×80%RH

(2) SHELL PLATE VERTICAL BUTT JOINTS are welded by EGW, using portable equipment suitable for welding short lengths of large-capacity storage tanks. For this application, Kobe Steel recommends the SEGARC process, which features easy-to-handle equipment (SEGARC-2Z) and uses 1.6-mmØ flux-cored wires, DWS-43G for mild steel and DWS-60G for 550-610 MPa HT steel. As shown in Figure 5, welding progresses while the weld pool is shielded with CO_2 gas and is dammed up by a water-cooled copper shoe on the front side and refractory backing (KL-4) or water-cooled copper backing on the backside of the welding joint. The welding head tracks during welding on a guide rail attached by a magnet on the surface of the base metal as shown in Figure 6.

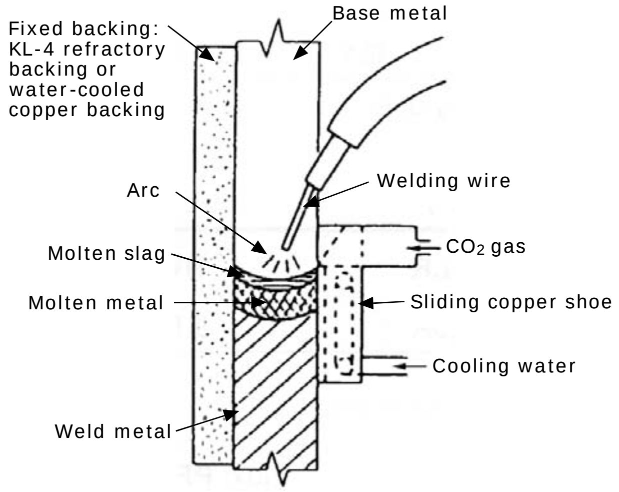


Figure 5: The SEGARC process for one-run vertical butt welding

Figure 6: SEGARC process: a portable EGW process for vertical welding

The SEGARC process is widely used in the construction of storage tanks due to the following outstanding characteristics of efficiency and operability:

- High deposition rates (e.g. 180 g/min at 380A) ensure high welding efficiency.
- Light-weight, compact equipment makes for easy set up.
- There is constant control of the wire extension in varied welding conditions.
- The welding line can be located either on the left side (Standard) or, by reassembling, the right side of the tracking rail.
- With the oscillator (Optional), one-pass completion welding can be conducted for steel plates with a thickness of 32 mm max.
- The carriage can be detached at any point on the guide rail.

(3) SHELL TO ANNULAR PLATE TEE JOINTS can be subjected repetitively to severe bending stresses over the lifetime of the storage tank because of frequent loading and unloading of the liquid and uneven settling of the foundation under the tank. In addition, the welding of this joint is likely to be affected by sand, rust, dirt, oil, rain and dew because this joint is located close to the foundation at the construction site. Welding during fabrication must be conducted carefully in order to prevent welding defects and ensure the durability of the tank. In particular, root pass welds can easily contain porosity and cracks. To prevent these defects, the SMAW process is recommended for the root passes on the backing side and final side because it resists the difficulties in such a critical welding environment. Kobe Steel recommends LB-47, LB-52 and LBM-52 for mild steel and LB-62 and LB-62UL for 550-610 MPa HT steel.

For the filling passes and the capping passes, SAW provides the highest efficiency. Due to the severe welding environment, the best flux-wire combination for this joint should emphasize porosity resistance. Kobe Steel recommends the flux-wire combinations of MF-300/US-36 for mild steel and MF-300/US-40 for 550-610 MPa HT steel. These SAW flux-wire combinations offer the following features:

- Unsurpassed slag detachability in the groove
- More resistance against rust and dirt
- Excellent porosity resistance
- Unmatched X-ray soundness
- Superior mechanical properties

With these flux-wire combinations, DCEP polarity will produce better bead appearance in single SAW than AC polarity. Figure 7 shows a typical weld pass sequence for this joint, combining SMAW for the root pass and single SAW for the filling and capping passes.

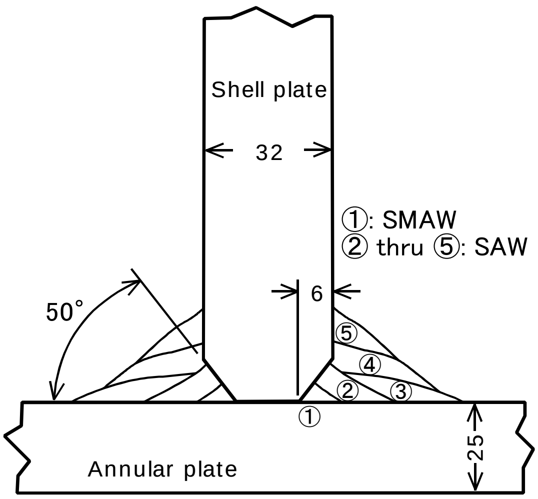


Figure 7: A typical pass sequence for shell plate to annular plate tee joint welded by using a combination of SMAW and single SAW processes

(4) BOTTOM PLATE JOINTS are made of mild steel lap joints in small-capacity storage tanks and butt joints with steel backing in 10,000 kilo-liter or larger storage tanks. As with the shell to annular plate joints, a similarly severe welding environment can lead to the inclusion of rust and dirt in the welding groove because the bottom plate rests directly upon the foundation of the tank. This is why SMAW is recommended for the root pass welds to minimize the occurrence of porosity. Because of its high efficiency, SAW is more beneficial for the filling and capping passes. Kobe Steel recommends LB-47, LB-52 and LBM-52 for SMAW and the flux-wire combination of MF-300/US-36 for single SAW with DCEP currents.

(5) JOINTS AT THE PERIPHERY OF A NOZZLE AND MANHOLE (Figure 8) are welded in the factory in advance. They can be welded by SAW using special equipment that can track along the three-dimensional saddle-shaped welding line. In such cases, Kobe Steel recommends the flux-wire combinations of MF-300/US-36 for mild steel and MF-300/US-40 for 550-610 MPa HT steel. However, where such automatic welding equipment is not available, semi-automatic GMAW and SMAW are the second and third best processes respectively in terms of welding efficiency. These welds are postweld heat treated to remove the residual stresses; therefore, the filler metal should be selected taking into account the weld metal properties after the postweld heat treatment at the specified temperature and soaking time.

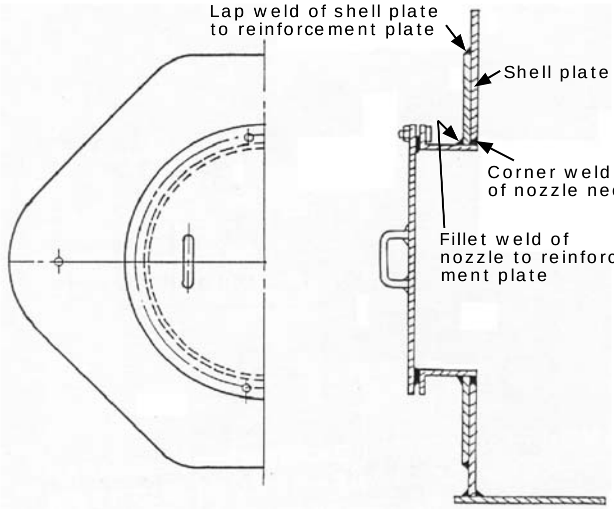


Figure 8: Welds at the periphery of a manhole equipped in a shell plate

Typical properties of filler metals

The chemical composition and mechanical properties of as-welded weld metal of the filler metals discussed in this article are shown in Tables 3, 4, and 5 for individual welding processes.

Table 3: Typical chemical composition and mechanical properties of SMAW electrodes

Properties	LB-47	LB-52	LBM-52	LB-62	LB-62UL
C (%)	0.08	0.08	0.08	0.07	0.07
Si	0.55	0.60	0.57	0.61	0.63
Mn	0.79	0.94	0.97	1.15	1.13
Ni	-	-	-	0.63	0.65
Mo	-	-	-	0.26	0.25
YS (MPa)	480	500	490	550	550
TS (MPa)	540	570	570	650	650
EL (%)	32	32	31	30	30
vE (J)	0°C:220	0°C:210	0°C:220	-18°C:150	-18°C:160

Table 4: Typical chemical composition and mechanical properties of SAW flux and wire combinations

Properties	MF-33H / US-36	MF-33H / US-49	MF-300 / US-36	MF-300 / US-40
C (%)	0.07	0.06	0.09	0.07
Si	0.20	0.21	0.23	0.32
Mn	1.55	1.31	1.62	1.64
Mo	-	0.45	-	0.50
YS (MPa)	466	575	470	604
TS (MPa)	572	645	570	682
EL (%)	28	28	30	25
vE (J)	-20°C:108	-20°C:115	-20°C:104	-20°C:88

Table 5: Typical chemical composition and mechanical properties of GMAW solid wires and EGW flux-cored wires (1)

Properties	MG-50	MG-60	DWS-43G	DWS-60G
C (%)	0.08	0.08	0.08	0.08
Si	0.51	0.51	0.35	0.32
Mn	1.10	1.39	1.63	1.67
Ni	-	-	0.02	0.71
Mo	-	0.29	0.17	0.25
Ti	-	-	0.02	0.03
YS (MPa)	490	590	470	520
TS (MPa)	570	670	600	650
EL (%)	30	28	27	26
vE (J)	0°C:120	-5°C:150	-20°C:62	-20°C:65

(1) Shielding gas: CO_2

» References «
S. Saburi. Kobe Steel Technical Guide, Nos. 241 thru 244, 1990.

SR Cracking

Postweld heat treatment (PWHT) is generally carried out to relieve residual stresses, remove diffusible hydrogen, and temper hard transformation microstructures of the weld, thereby preventing brittle fractures and obtaining the desired properties of the product. PWHT, however, can have some negative effects, such as stress relief cracking (SR cracking).

SR cracking can become a problem particularly in the PWHT of high tensile strength steel, heat-resistant low alloy steel and stainless steel weldments. Figure 1 shows a typical example of SR cracking that occurred in a 780-MPa high tensile strength steel weld that was heat treated at 600°C for 2 hours after welding. It is believed that this microscopic crack was initiated by the creep of the metal during relaxation of the residual stress at high temperatures particularly at the coarse grain area in the heat-affected zone (HAZ) at the toe of the weld. This is where the residual stresses are concentrated. And this crack propagates along the former austenite grain boundaries of the HAZ.

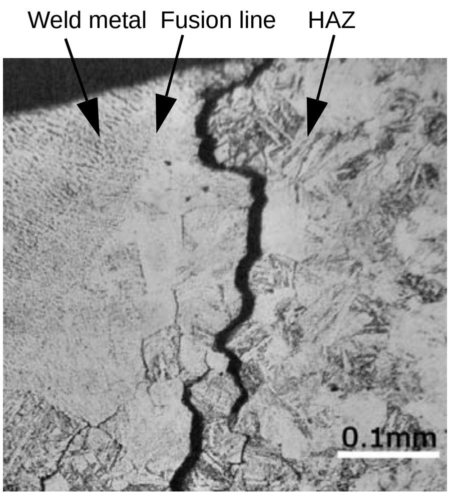


Figure 1: Typical SR cracks occurring in a 780-MPa high tensile strength steel weld (PWHT: 600°C × 2 h) [Ref.1]

The SR-crack susceptibility of particular types of steel is governed by PWHT temperature and the alloying element. Figure 2 shows how SR crack susceptibility is affected by particular alloying elements contained in the testing steels and PWHT temperature. It clearly shows that the crack susceptibility becomes highest at 600°C. This is believed to be caused by the alloying-element's carbide precipitation hardening of the crystal grains, thereby decreasing relatively the strength of the grain boundaries.

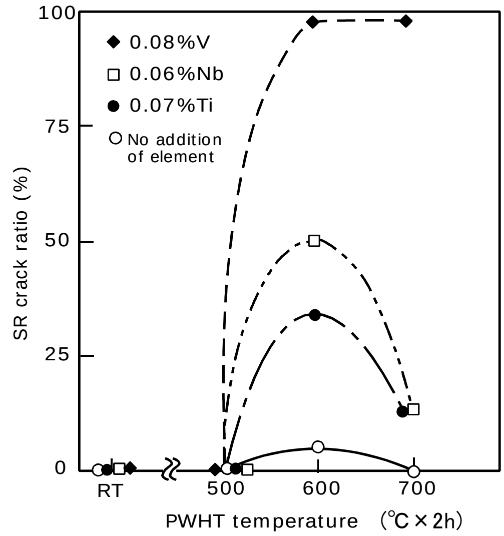


Figure 2: SR crack susceptibility of Cr-Mo steel (0.16%C, 0.30%Si, 0.60%Mn, 0.99%Cr, 0.46%Mo) as a function of PWHT temperature and additional alloying elements in y-groove restraint cracking test [Ref.2]

Ito and Nakanishi [Ref.1] suggest an SR cracking susceptibility index, P_{SR} (%) = Cr + Cu + 2Mo + 10V + 7Nb + 5Ti – 2, where the applicable ranges of alloying elements are 1.5%Cr max, 0.10-0.25%C, 1.0%Cu max, 2.0%Mo max, 0.15%V max, 0.15%Nb max, and 0.15%Ti max. It is believed that where P_{SR} is larger than zero SR crack can occur.

To avoid SR cracking, the following measures may be taken:

(1) Select a less susceptible steel taking into account, for instance, the SR cracking susceptibility index (P_{SR}).

(2) Refine the coarse grain HAZ at the toe of the weld by applying the temper bead technique.

(3) Dress the weld metal to smoothen the transition to the surface of the base metal, or remove the reinforcement of the weld metal to be flush against the surface of the base metal to minimize or remove the site of stress concentration.

(4) Avoid lapping a fillet weld onto a butt joint weld to prevent excessive residual stresses and stress concentration.

(5) Avoid joining components of excessively dissimilar thicknesses to prevent the high concentration of stress.

» References «
[1] H. Suzuki, et al. Welding Metallurgy, Sanpo Pub. Inc.
[2] H. Ikawa, et al. Welding of Heat-Resistant Steel, Sanpo Pub. Inc.

KOBELCO at the Essen Welding Fair 2005

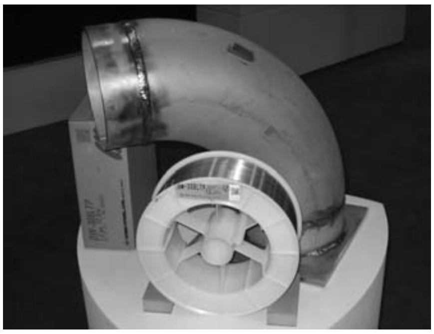
Hello from the Kobelco booth attendants!

The coming and going of visitors at the Kobelco booth

The Essen Fair, the biggest quadrennial welding show in the world was held from September 12 through 17, 2005 at the exhibition center in Essen in Germany. The exhibition resembled a festival with many exhibitors equipped with bars and serving beer and other beverages. All kinds of products related to welding, such as filler metals, power sources, robots and automatic equipment, were exhibited. The Fair was gigantic and worthy of being called as “the biggest in the world” with 1,052 exhibitors from 49 countries, packing 12 exhibition halls covering 110,000 square meters and drawing 61,100 visitors in total.

Bigger companies in Europe and the USA seemed especially vigorous as they exhibited their products in a grand style in wide booths that were always crowded with visitors. In contrast, Asian companies seemed somewhat passive, perhaps because of “playing away from home” so to speak. Among the exhibitors, there was one company that used almost half the total space of an exhibition hall for demonstrations of large structural welding, while another company put on performances of Samba dancers and soccer ball lifting by professional football players. Really, all the participants seemed to pour a huge amount of energy into trying to draw as many visitors as possible to their booths.

This time, we exhibited our products in our booth of 200 square meters jointly with KWE (Kobelco Welding of Europe B.V), our subsidiary in the Netherlands. In our exhibits we emphasized flux-cored wires for stainless steel, the main products of KWE, and we also exhibited flux-cored wires for mild steel.



A pipe to fitting joint of stainless steel out-of-position welded with a flux-cored wire of DW-308LTP

In particular, a pipe to fitting joint of stainless steel out-of-position welded with DW-308LTP and an automotive exhaust system assembly welded with MXA-430M grabbed favorable attention from the visitors.

For the first time in the history of our participation in the Essen Fair we performed a welding demonstration.

An automotive exhaust system flux-cored arc welded with MXA-430M

Our booth attendants were happy to be busy giving explanations on our exhibits to our users and dealers who visited our booth from all over the world. We would like to express our gratitude to all those who visited our booth during the Fair. Kobelco Welding Today, our quarterly periodical, was also distributed at the Fair, and ran out in a short time.

The next Essen Fair will be held in 2009. We will try to realize even more excellence in our exhibition. Please look forward to what you can see in our booth in 2009.

Reported by Yu Agatsuma, KSL

Coming back to the IOD

Takeo Kunitomo
Manager
International Operations Dept.
Kobe Steel, Ltd.

My name is Takeo Kunitomo. I rejoined the International Operations Department of the Welding Company in November last year, after being transferred from the Saijo Plant in Hiroshima prefecture in the western part of Japan. My main responsibility in this new assignment is to develop the Chinese market in which demand for welding consumables has been increasing consistently. The Chinese market is expected to expand at the highest rate in the world. To keep up with this rapid economic growth, Kobe Steel is determined to continue developing its presence as a powerful company in a market where there is heavy competition from many indigenous companies. My first mission is to diffuse the welding technologies that Kobe Steel has developed throughout the market and thereby contribute to the development of Chinese welding technologies.

By the way my hobby is cooking. As a “business bachelor” during my time in Saijo, I learned to cook by myself. My favorite dish is fried bean sprouts, “moyashi itame” in Japanese. You may say, “That’s easy!” I, too, had thought it an easy dish to cook, but I found out that the temperature of the frying pan and the quantity of salt, pepper, and oil are critical to cooking it well. It took one year for me to master the art of cooking tasty fried bean sprouts after many tries and errors. My second culinary mission is to cook nice Chinese paoz, “gyoza” in Japanese.

Old familiar faces in the IOD

Shinichi Tanaka
Manager
International Operations Dept.
Kobe Steel, Ltd.

Hearty greetings to dear readers of Kobelco Welding Today! My name is Shinichi Tanaka. I came back to the International Operations Department from the Hokkaido Sales Section of the Domestic Sales Department of the Welding Company as of the 1st of December last year. I am in charge of the American, European, and Russian markets.

For the past 19 years, since I joined the Welding Company of Kobe Steel in 1986, I have worked for three different departments of the Technical Development Department, the International Operations Department, the Domestic Sales Department, and two overseas subsidiaries of Kobelco Welding of America (KWAI) and Kobelco Welding of Europe (KWE). The knowledge I acquired through my experiences in these places, especially that related to domestic sales through the Shinyokai distributor network in Hokkaido, I believe, will prove useful for executing my new tasks in the International Operations Department.

As a hobby, I play golf, which I managed to improve somewhat during my stay in Hokkaido. Three years ago, my typical score was about 120, but now I can score under 100 around three times out of ten rounds. My motto is, “Work hard, play hard.” I like to put all my energy into my work on weekdays and into my hobbies on the weekends.

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