KOBELCO WELDING TODAY

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The KOBELCO Arc: Energy that Strengthens the World

FAMILIARC™ MIX-50FS
FAMILIARC™ SE-A50FS
Advanced Solid Wires for Sheet Metal Welding

Sheet metals (thin steel sheets) are extensively used for the fabrication of autos, motorcycles, railroad cars, and white goods. Typical sheet metal parts used in such applications are press formings and are joined in many cases by arc welding. Automobile manufacturers in particular often assemble complicated, three dimensional press formings by arc welding. However, the welding joints of such press formings often contain root gaps and misalignment which can cause burn-through and bead meander requiring repair.

With **MIX-50FS** and **SE-A50FS** (AWS ER70S-G) such problems can be avoided thanks to the following benefits they bring to gas metal arc welding with a shielding gas of Ar + CO_2 mixture.

(1) WIDER BEADS with smaller height/width ratios (Fig. 1), larger flank angles and better wettability improve gap bridgeability (Fig. 2) and performance in high speed welding (Fig. 3), preventing burn-through, bead meandering, humping beads and undercut.

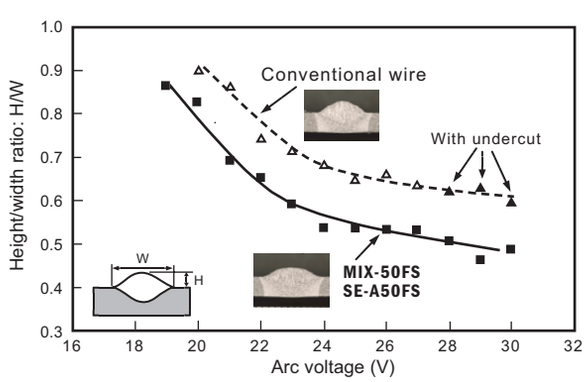

Figure 1: Height/width ratio of beads as a function of arc voltage with MIX-50FS and SE-A50FS in comparison with conventional wire (pulsed MAG; 80%Ar-20%CO_2; 200Amp; wire feed speed of 670cm/min.; travel speed of 80cm/min.; wire size of 1.2Ø mm; bead-on-plate welding)

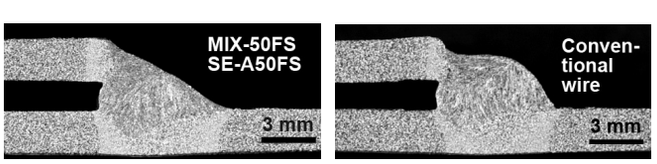

Figure 2: Comparison of 1.5-mm gap bridgeability (pulsed MAG; 80%Ar-20%CO_2; 250Amp; travel speed of 100cm/min.)

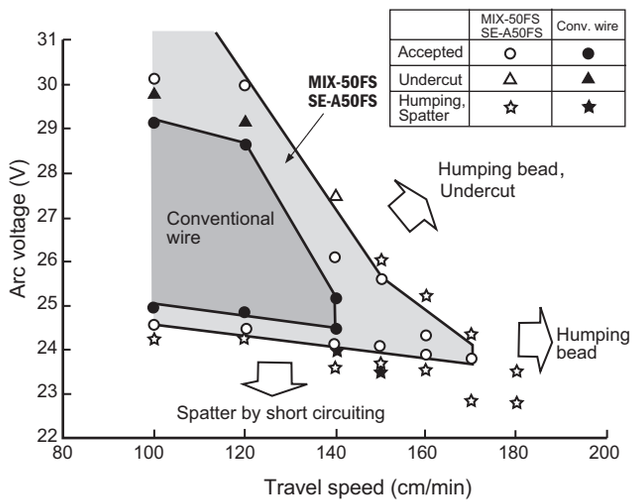

Figure 3: Comparison of parametric envelopes (arc voltage vs. travel speed) of advanced wires and conventional wire.

(2) LESS SLAG (Fig. 4) with fragile characteristics enables easier slag removal and thus prevents detachment of postweld electrodeposition coatings.

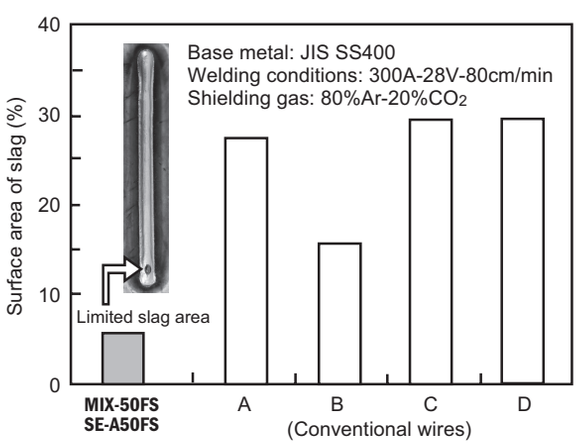

Figure 4: Comparison of the ratios of slag area to entire bead surface area.

(3) NON-COPPER coated **SE-A50FS** is less harmful to the environment because it foregoes copper and thus requires less energy to produce. The wire is treated with a special coating to prevent rust and to ensure sufficient wire feedability.

Struggling for survival in the face of rising raw material prices

Sharp increases in the prices of iron ores, metallurgical coals, ferro-manganese alloys and other materials, which have risen far higher than we could envisage, are causing severe damage globally to the iron and steel industries that intersect with our welding business. Due to the economic forces, we have been compelled to raise welding material prices repeatedly. We would like to thank all our customers and dealers very much for their understanding of this situation and for accepting our decisions. We will devote our energies to mitigating these difficulties by ensuring the stable procurement of raw materials and stable supply of welding consumables. We hope you will continue to extend your generous understanding and support.

Prices for steel raw materials have been rising, and crude oil prices are still high. The situation was sparked by the steep rise in demand from newly emerging countries, including China, Russia and India and was fueled further by speculators quick to seize an opportunity. No matter what caused the price hikes, they are beginning to menace our daily life as petrochemical products, gasoline, and other commodities become difficult to afford. Some industries, such as the automobile industry, may stay firm on the whole, with demand growing in newly emerging countries, offsetting declining auto use and sales generated by high gas prices or (in the U.S.) recession caused by the supreme loan problem. The construction machinery industry, too, is expected to stay solid with growing demand in the field of infrastructure construction. Here in the welding industry, we will make efforts to ensure the stable supply of welding consumables so that we may assist such industries as automobile and construction machinery industries.

On the other hand, where there is crisis may lie opportunity. Saudi Arabia and other major producers are increasing production of crude oil, new exploration of deep-sea oil fields is driving demand for offshore structures, and demand for new tankers is growing, too. Hence, our customers in Japan, China, Korea and Southeast Asia that construct ships and offshore structures are enjoying a strong market. Though some fear that raw material costs may rise higher, I am convinced that their business will continue to be brisk. To respond to the demand for ships and offshore structures, we have established a new production site: Kobe Welding of Quintao, in Quintao City in Shandong Province, in China, will commence production of mild steel flux-cored wires in 2009.

Under the business slogans of “Only One and No.1” (unique design with the top quality or sales) and “QTQ” (quality products, technical support and quick delivery) and with a desire to assist our customers' welding businesses, we will keep up with worldwide trends and ensure the stable supply of welding consumables.

We must also remember that environmental awareness will remain a big concern in the 21st century. Without undertaking an environmentally-conscious management strategy, an enterprise will not be able to survive. We will try to maintain harmony with the environment and convey environmental consciousness to subsequent generations. Your everlasting patronage is most appreciated.

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

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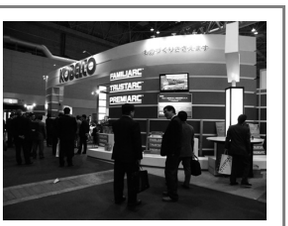
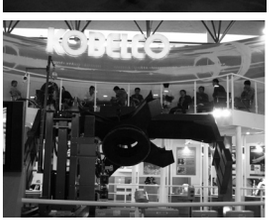




Recent International Trends in Filler Metal Standards

National standards for filler metals have often been revised in recent years in tandem with the rise of the international ISO standard. This article introduces the principles of the latest editions of AWS A5.01M/A5.01:2008 (Procurement Guidelines for Consumables — Welding and Allied Processes — Flux and Gas Shielded Electrical Welding Processes), EN ISO 2560:2005 (Welding Consumables — Covered Electrodes for Manual Metal Arc Welding of Non-Alloy and Fine Grain Steels — Classification) and JIS Z 3221:2008 (Stainless Steel Covered Electrodes). KOBELCO filler metals that are affected by these updated standards are also listed for your reference.

Standardized procurement of filler metals

Procurement of standard, commercial filler metals, such as E6013, E7016, or E308L, is usually straightforward. However, when weld metal toughness, mechanical properties after postweld heat treatment, ferrite criteria, hardness or other nonstandard requirements are of concern, understanding between the user, distributor, and manufacturer becomes critical. In this regard, AWS A5.01 (the ASME-adopted standard as SFA 5.01) can provide clarity. This standard, as well as other AWS, ISO, or other recognized filler metal standards, provides a method for preparing those specific details needed for procuring appropriate filler metals: (a) the filler metal classification, (b) the lot classification, and (c) the testing schedule.

The latest edition, AWS A5.01:2008, was developed by revising the 2003 edition to accommodate updated technologies and expanded criteria as a provisional adoption of ISO 14344:2002 (Welding and Allied Processes — Flux and Gas Shielded Electrical Welding Processes — Procurement Guidelines for Consumables) and was enacted in April this year. The AWS and ISO standards are specified in similar ways in terms of lot classification and testing schedule (refer to Tables 1 and 2 for AWS A5.01).

Table 1: Essential requirements for filler metal lot classification (Extracted from AWS A5.01:2008)

Filler metal	Lot class	Definitions for welding consumables
Covered electrode	C1	The manufacturer's standard lot defined in the manufacturer's quality assurance program
	C2	The quantity, not exceeding 45,000 kg, of any one size and classification produced in 24 h of consecutively scheduled production
	C3	In addition to the C2 definition, this class shall be produced from covering identified by wet mix or controlled chemical composition and core wire identified by heat number or controlled chemical composition.
	C4	The quantity of any one size and classification produced from one wet mix and one heat of core wire
	C5	The quantity of one size and classification produced from one dry blend of covering mixture and one heat of core wire
Solid wire	S1	The manufacturer's standard lot defined in the manufacturer's quality assurance program
	S2	The quantity, not exceeding 45,000 kg, of one classification, size, form and temper produced in 24 h of consecutively scheduled production from one heat or from material identified by controlled chemical composition
	S3	The quantity of one size produced in one production schedule from one heat
	S4	The quantity, not exceeding 45,000 kg, of one classification, size, form and temper produced under one production schedule. This class shall be produced from one heat or from material identified by controlled chemical composition.
Flux-cored wire	T1	The manufacturer's standard lot, as defined in the manufacturer's quality assurance program
	T2	The quantity, not exceeding 45,000 kg, of one classification and size produced in 24 h of consecutively scheduled production from tube or strip identified by heat number or by controlled chemical composition
	T3	The quantity produced from one heat and one dry batch or one dry blend of core materials
	T4	The quantity, not exceeding 45,000 kg, of one classification and size produced under one production schedule from tube or strip identified by heat number or controlled chemical composition
SAW flux	F1	The manufacturer's standard lot, as defined in the manufacturer's quality assurance program
	F2	The quantity produced from the same combination of raw materials under one production schedule

Table 2: Essential requirements for the testing schedule (Extracted from AWS A5.01:2008)

Schedule(1)	Requirements for welding consumables	Lot class	Scope of tests
1 or F	The manufacturer's standard testing schedule	Mfr's standard	Mfr's standard
2 or G	Tests from production runs of the product within 12 months preceding the date of the purchase order	Mfr's standard	Tests per filler metal spec.
3 or H	Chemical analysis only, for each lot shipped	Req. by purchaser	Elements per filler metal spec.
4 or I	Tests specified by Table 2 of A5.01. for each lot shipped	Req. by purchaser	Table 2 of A5.01
5 or J	Tests called for filler metal spec. for each lot shipped	Req. by purchaser	Tests per filler metal spec.
6 or K	All tests specified by the purchaser for each lot shipped	Req. by purchaser	All tests req. by purchaser

1. Either the number (identical with ISO 14344:2002) or alphabetic designations may be used.

The permissible production quantity for one lot varies depending on the lot class, and the contents of tests can alter depending on the testing schedule. Kobe Steel has adopted the lot classifications of C1, S1, T1 and F1 and the testing schedule of F for standard products. On the other hand, when requested by purchasers, Kobe Steel will accept other lot classifications and testing schedules through negotiation with the purchaser. Such special purchaser requirements may be necessary in relation to the fabrication of such heavy-duty structures as offshore rigs, reactor pressure vessels and spherical gas holders.

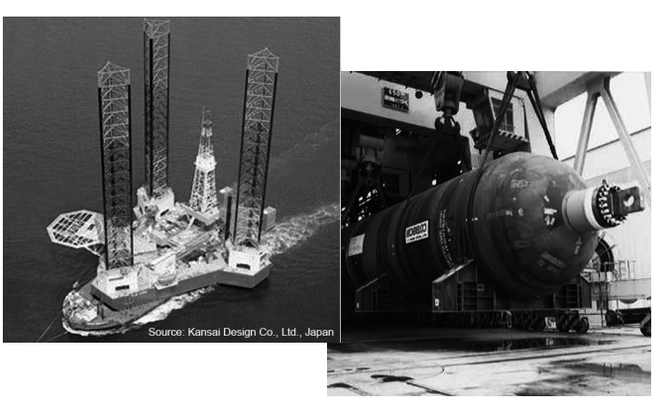


Figure 1: Offshore rigs and reactor pressure vessels typically require strict quality control to ensure sufficient weld qualities at all the stages including procurement of materials.

As to the certification of the product, the AWS A5.01 specifies the following means of quality assurance, as shown in Table 3, for individual parties concerned, which is different from those specified by the ISO 14344 shown in Table 4.

Table 3: The key points of certification of products (Extracted from AWS A5.01:2008)

Who shall certify	What shall be certified	How to certify
Manufacturer	The product meets the requirements of A5.01.	Based on mfr's quality assurance program
Purchaser	The product meets the requirements of A5.01.	By reviewing mfr's quality assurance program
Distributor(1)	The package contents are traceable to the original mfr's records.	Based on distributor's control system

1. Distributors who receive filler metals in bulk and package them for distribution, or who repackage under their own label.

Table 4: The key points of certification of products (Extracted from ISO 14344:2002)

Who shall certify	What shall be certified	How to certify
Manufacturer	The labeled product meets the requirements of the relevant filler metal standard.	Based on mfr's quality assurance program
Intermediate provider(1)	The labeled product maintains the traceability of all data required from the original manufacturer.	Based on provider's quality assurance system
Third party(2)	The labeled product meets the relevant filler metal standard.	By conducting the testing required
		By witnessing the testing conducted by the mfr or the intermediate provider

1. This is the case where an organization who is not fully integrated into the production of the product labels the product in the position of an intermediate provider in the supply chain from manufacturer to purchaser.
2. Third party is an organization not in the supply chain from manufacturer to purchaser.

As shown in Tables 3 and 4, the AWS standard includes purchaser's responsibility in addition to that of the manufacturer and the distributor for certifying the conformity of the product to the relevant standard. In the case of the ISO standard, the responsibilities of the manufacturer and intermediate provider conform with those of the manufacturer and distributor of the AWS standard, respectively. However, whereas it includes certification by a third party, there is no purchaser's responsibility for this activity. The ISO standard also recommends that the certifying organization be certified to ISO 9001 (Quality Management Systems) or other applicable standard.

International covered electrode standard for mild steel and high strength steel

ISO 2560:2002 (Welding Consumables — Covered Electrodes for Manual Metal Arc Welding of Non-alloy and Fine Grain Steels — Classification) was adopted as the European Standard EN ISO 2560:2005 that superseded EN 499:1995. The EN ISO standard provides two classification systems making it easier for many countries in the world to adopt. System A is based (e.g. EN 499) on the yield strength and the average impact energy of 47 J of all-weld metal. System B (as in standards used in the Pacific Rim) is based on the tensile strength and the average impact energy of 27 J of all-weld metal.

KOBELCO filler metals are not produced to the ISO standard; however, when required, Kobe Steel can issue a quality assurance document of "Guarantee of Quality" to System A of the ISO standard. Tables 5 thru 11 summarize the system-A classification symbols and requirements.

Table 5: All-weld metal yield strength and related requirements in the as-welded condition

Symbol	Min. yield strength(1) (N/mm^2)	Tensile strength (N/mm^2)	Min. elongation(2) (%)
35	355	440-570	22
38	380	470-600	20
42	420	500-640	20
46	460	530-680	20
50	500	560-720	18

1. For yield strength, the lower yield shall be used when yielding occurs, otherwise the 0.2% proof strength shall be used.
2. Gauge length is equal to five times the specimen diameter.

Table 6: All-weld metal impact toughness in the as-welded condition

Symbol	Testing temperature (°C)	Impact absorbed energy (J)
Z	No requirement	Average 47 min.
A	+20	
0	0	
2	–20	
3	–30	
4	–40	
5	–50	
6	–60	

Table 7: All-weld metal chemical composition

Symbol	Chemical composition (%)(1)		
	Mn	Mo	Ni
No symbol	2.0 max.	—	—
Mo	1.4 max.	0.-0.6	—
MnMo	1.4-2.0	0.3-0.6	—
1Ni	1.4 max.	—	0.6-1.2
2Ni	1.4 max.	—	1.8-2.6
3Ni	1.4 max.	—	2.6-3.8
Mn1Ni	1.4-2.0	—	0.6-1.2
1NiMo	1.4 max.	0.3-0.6	0.6-1.2
Z	Other elements as agreed		

1. If not specified, Mo<0.2; Ni<0.3; Cr<0.2; V<0.05; Nb<0.05; Cu<0.3.

Table 8: Type of electrode covering

Symbol	Type of electrode covering
A	Acid covering
C	Cellulosic covering
R	Rutile covering
RR	Rutile thick covering
RC	Rutile-cellulosic covering
RA	Rutile-acid covering
RB	Rutile-basic covering
B	Basic covering

Table 9: Electrode efficiency and type of current (Option)

Symbol	Nominal electrode efficiency	Type of current
1	105 max.	AC and DC
2	105 max.	DC
3	Over 105, 125 max.	AC and DC
4	Over 105, 125 max.	DC
5	Over 125, 160 max.	AC and DC
6	Over 125, 160 max.	DC
7	Lower than 160	AC and DC
8	Lower than 160	DC

Table 10: Welding position (Option)

Symbol	Welding positions
1	All positions
2	All positions except vertical-down
3	Flat, Horizontal fillet
4	Flat
5	Flat, Horizontal fillet, Vertical-down

Table 11: Diffusible hydrogen in deposited metal (Option)

Symbol	Hydrogen content of deposited metal (ml/100g)
H5	5 max.
H10	10 max.
H15	15 max.

The classification system for covered electrodes for non-alloy and fine grain steels based on System A is shown in Figure 2.

a. The combination of these designators constitutes the covered electrode classification.
b. These designators are optional and do not constitute part of the covered electrode classification.

Figure 2: ISO 2560-A designation of electrodes classified by yield strength and 47 J impact energy.

Table 12 shows the classifications per EN ISO 2560:2005 of typical KOBELCO covered electrodes for mild steel and high strength steel.

The JIS standard for stainless steel covered electrodes harmonized with the ISO standard

The JIS standard is the basic filler metal standard to which Kobe Steel produces commodity-type filler metals. JIS Z 3221 for stainless steel covered electrodes was revised this year to harmonize it with ISO 3581:2003 (Welding Consumables — Covered Electrodes for Manual Metal Arc Welding of Stainless and Heat-resisting Steels — Classification). Kobe Steel began producing stainless steel covered electrodes in accordance with this internationally-compatible JIS Z 3221:2008 from October this year.

Stainless steel covered electrodes can be classified with four designators as shown in Figure 3 as per JIS Z 3221:2008. In Table 13, the JIS, ISO and AWS classifications of KOBELCO covered electrodes for typical stainless steels are cross-referenced.

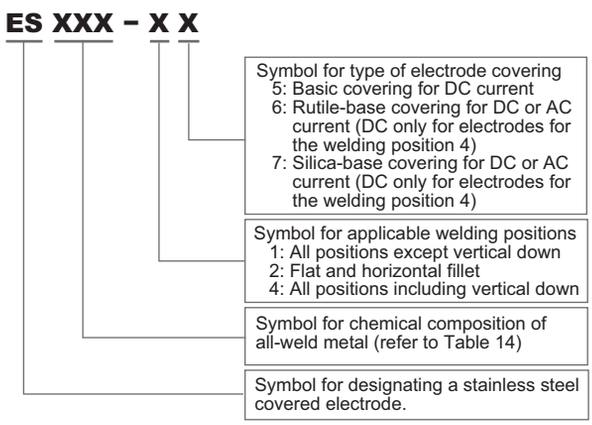


Figure 3: The classification system of JIS Z 3221:2008 for stainless steel covered electrodes.

Table 12: The EN ISO classifications of typical KOBELCO covered electrodes for mild steel and high strength steel

Brand name	EN ISO 2560-A	AWS	Notes
FAMILIARC™ RB-26	E 35 0 R	A5.1 E6013	High titanium oxide type electrode
FAMILIARC™ B-14	E 35 2 RA	A5.1 E6019	Ilmenite type electrode
FAMILIARC™ LB-52	E 42 3 B	A5.1 E7016	Low hydrogen type electrode
FAMILIARC™ LB-52-18	E 42 3 B	A5.1 E7018	Iron power low hydrogen type electrode
FAMILIARC™ LB-52U	E 42 2 B	A5.1 E7016	Low hydrogen type electrode
TRUSTARC™ LB-52NS	E 42 6 ZB	A5.5 E7016-G	Low hydrogen type electrode (0.5%Ni-T-B) for low temperature
TRUSTARC™ LB-62	E 50 3 ZB	A5.5 E9016-G	Low hydrogen type electrode for 550-610MPa high strength steel
TRUSTARC™ LB-62UL	E 50 3 ZB	A5.5 E9016-G	Extra-low hydrogen type electrode for 550-610MPa high strength steel
TRUSTARC™ LB-62L	E 50 4 ZB	A5.5 E8016-C1	Extra-low H_2 electrode (2%Ni-Ti-B) for 550-610MPa HT steel for low temp.

Table 14 shows the main chemical compositions of all-weld metal for the stainless steel covered electrodes available from Kobe Steel.

Table 13: JIS, ISO and AWS classifications cross-referenced with KOBELCO covered electrodes for typical stainless steels

Brand name	JIS Z 3221:2008 (equivalent to ISO 3581)	JIS Z 3221:2003 (withdrawn)	AWS A5.4
PREMIARC™ NC-38	ES308-16	D308-16	E308-16
PREMIARC™ NC-38L	ES308L-16	D308L-16	E308L-16
PREMIARC™ NC-39	ES309-16	D309-16	E309-16
PREMIARC™ NC-39L	ES309L-16	D309L-16	E309L-16
PREMIARC™ NC-39MoL	ES309LMo-16	D309MoL-16	E309MoL-16
PREMIARC™ NC-36	ES316-16	D316-16	E316-16
PREMIARC™ NC-36L	ES316L-16	D316L-16	E316L-16
PREMIARC™ NC-37	ES347-16	D347-16	E347-16
PREMIARC™ NC-38H	ES308H-16	D308-16	E308H-16

Filler metal standards globalized

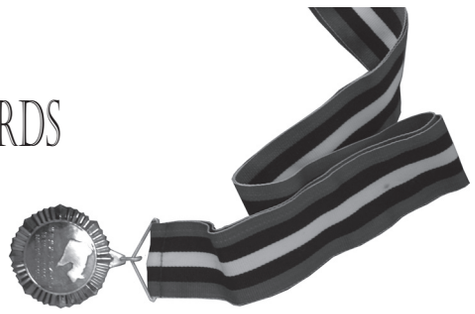
In 1995 the Agreement on Technical Barriers to Trade went into effect with the establishment of the Word Trade Organization to ensure that regulations, standards, testing and certification procedures do not create unnecessary obstacles to global free trade. Based on this international scheme the welding industries worldwide have been promoting the globalization of filler metal standards as shown with some examples in this article. Almost all filler metal standards are reviewed globally to achieve greater consistency between individual nations' standards. The European Committee for Standardization (CEN), the American Welding Society (AWS) and the Japan Welding Engineering Society (JWES) are the leading players. Kobe Steel is also actively engaged in the global collaboration.

Table 14: Main chemical compositions of all-weld metal for stainless steel covered electrodes available from Kobe Steel (Extracted from JIS Z 3221:2008 harmonized with ISO 3581:2003 for chemical requirements)

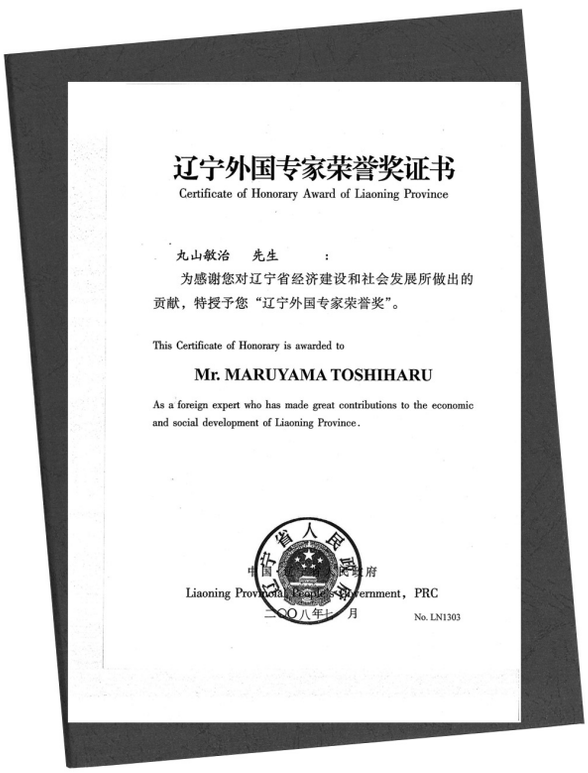
Symbol for chemical composition	Chemical composition of all-weld metal (%)[1]								KOBELCO brand[(2)]
	C	Si	Mn	Ni	Cr	Mo	Cu	Others	
308	0.08	1.00	0.5-2.5	9.0-11.0	18.0-21.0	0.75	0.75	—	NC-38
308L	0.04	1.00	0.5-2.5	9.0-12.0	18.0-21.0	0.75	0.75	—	NC-38L,NC-38LT, NC-38EL,NC-38ULC
308H	0.04-0.08	1.00	0.5-2.5	9.0-11.0	18.0-21.0	0.75	0.75	—	NC-38H
309	0.15	1.00	0.5-2.5	12.0-14.0	22.0-25.0	0.75	0.75	—	NC-39
309L	0.04	1.00	0.5-2.5	12.0-14.0	22.0-25.0	0.75	0.75	—	NC-39L
309LMo	0.04	1.00	0.5-2.5	12.0-14.0	22.0-25.0	2.0-3.0	0.75	—	NC-39MoL
310	0.08-0.20	0.75	1.0-2.5	20.0-22.5	25.0-28.0	0.75	0.75	—	NC-30
312	0.15	1.00	0.5-2.5	8.0-10.5	28.0-32.0	0.75	0.75	—	NC-32
316	0.08	1.00	0.5-2.5	11.0-14.0	17.0-20.0	2.0-3.0	0.75	—	NC-36
316L	0.04	1.00	0.5-2.5	11.0-14.0	17.0-20.0	2.0-3.0	0.75	—	NC-36L,NC-36LT, NC-36EL,NC-36ULC
316LCu	0.04	1.00	0.5-2.5	11.0-16.0	17.0-20.0	1.20-2.75	1.00-2.50	—	NC-36CuL
317L	0.04	1.00	0.5-2.5	12.0-14.0	18.0-21.0	3.0-4.0	0.75	—	NC-317L
318	0.08	1.00	0.5-2.5	11.0-14.0	17.0-20.0	2.0-3.0	0.75	Nb:6×C-1.00	NC-318
347	0.08	1.00	0.5-2.5	9.0-11.0	18.0-21.0	0.75	0.75	Nb:8×C-1.00	NC-37
347L	0.04	1.00	0.5-2.5	9.0-11.0	18.0-21.0	0.75	0.75	Nb:8×C-1.00	NC-37L
409Nb	0.12	1.00	1.00	0.60	11.0-14.0	0.75	0.75	Nb:0.50-1.50	CR-40Cb
410	0.12	0.90	1.0	0.60	11.0-14.0	0.75	0.75	—	CR-40
410NiMo	0.06	0.90	1.0	4.0-5.0	11.0-12.5	0.40-0.70	0.75	—	CR-410NM
430	0.10	0.90	1.0	0.6	15.0-18.0	0.75	0.75	—	CR-43
430Nb	0.10	1.00	1.00	0.60	15.0-18.0	0.75	0.75	—	CR-43Cb
630	0.05	0.75	0.25-0.75	4.5-5.0	16.00-16.75	0.75	3.25-4.00	Nb:0.15-0.30	NC-630
16-8-2	0.10	0.60	0.5-2.5	7.5-9.5	14.5-16.5	1.0-2.0	0.75	—	NC-16H

1. Single values are maximum values. P and S are also specified.
2. Trade designation of PREMIARC™

WINNER OF THE FOREIGN EXPERT HONORARY AWARDS OF LIAONING PROVINCIAL GOVERNMENT



Mr. Toshiharu Maruyama, the head of the Shanghai Office of the Welding Company of Kobe Steel, has won the Foreign Expert Honorary Award of the People's Government of Liaoning Province on the 22nd of July. Since he took up his new post at the Shanghai Office in November in 2006, he has engaged in technical support and service in the field of welding consumables. Nominated by a mechanical equipment manufacturer in Liaoning Province, Mr. Maruyama's work is thus acknowledged by the Liaoning Provincial Government to be a great contribution to Liaoning's technical development in the welding field.



辽宁外国专家荣誉奖证书

Certificate of Honorary Award of Liaoning Province

丸山敏治 先生 :

为感谢您对辽宁省经济建设和社会发展所做出的贡献，特授予您"辽宁外国专家荣誉奖"。

This Certificate of Honorary is awarded to

Mr. MARUYAMA TOSHIHARU

As a foreign expert who has made great contributions to the economic and social development of Liaoning Province.

Liaoning Provincial People's Government, PRC

No. LN1303

The Foreign Expert Honorary Award of Liaoning Provincial Government provided to Mr. Maruyama for his contributions to the welding technical advancement of the Liaoning province.

On 22nd July, the Ceremony of Friendship Award and Honorary Award for Foreign Experts was held at Liaoning People's Assembly Hall. Foreign experts who have made great contributions to the economic and social development of Liaoning Province were presented with the medals and certificates. The Liaoning Friendship Award was established in 2002 as the highest award to foreign experts who contribute to Liaoning's development. 32 foreign experts from many countries including Germany, Japan, UK, USA, and Russia were given the award this year. 29 winners (including 5 Japanese experts) were granted the Foreign Expert Honorary Award.

Mr. Toshiharu Maruyama (top and middle) and all the winners in delight with the medals and certificates of contribution by foreign expert.

The Japan International Welding Show 2008 Atracts Visitors

The Japan International Welding Show, the 20th since the first in 1969, was held at Intex Osaka from April 9 through 12, 2008. The organizers of the event set forth "Renaissance in Production Technologies" as the main theme and "Total Welding Solutions" as the sub-theme. Kobe Steel participated with the slogan "KOBELCO Supports Welding Production" to highlight the many ways we support our customers with welding consumables, welding systems, technical services, and product development.

Our unique and attractive, two-story booth, which was located along the main street of the exhibition hall, caught the eyes of many visitors. Kobe Steel's exhibit featured four welding demonstrations and drew large crowds with newly-developed robotic systems and robotic welding with advanced welding consumables.

(1) A dedicated welding robotic system for structural steel beams:
Structural steel columns comprise about 40% of the total amount of steel used in the construction of steel buildings and have enjoyed sufficiently automated welding processes; by contrast, structural steel beams, which account for the remaining 60%, have fallen behind in terms of the welding automation. The robotic welding system developed by Kobe Steel is dedicated to improving productivity and cutting costs in the welding of structural steel beams.

(2) An advanced tandem robotic welding system:
The newly-developed "Dual-Arc Sensor" was exhibited by demonstration and video display. The innovative dual-arc system senses changes in the welding currents not only for the leading electrode but also for the trailing electrode to have the dual arcs correctly trace the welding line, thereby improving the quality of tandem arc weldments.

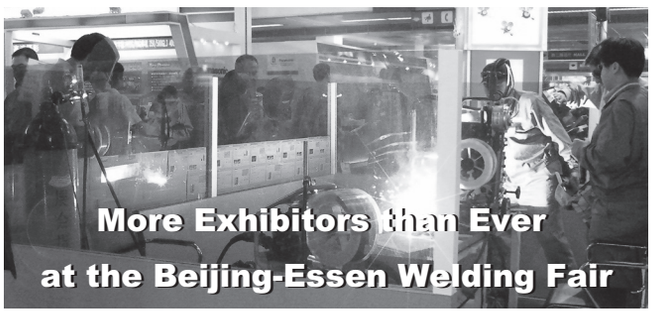
(3) FAMILIARC™ MIX-50FS MAG solid welding wire for steel sheets:
FAMILIARC™ MIX-50FS was demonstrated with a shielding gas of Ar-CO_2 mixture, which impressed visitors with its outstanding characteristics: wide, regular bead appearance, high welding speeds, less slag volume, excellent slag detachability, and improved wire-tracking accuracy.

(4) An innovative welding process:
Kobe Steel's innovative gas metal arc welding process reduces spatter and fumes in CO_2 welding even with a solid wire by precisely controlling the molten droplet transfer. Many visitors appeared interested in this process.

Many visitors enjoyed the diversified functions of advanced robotic welding systems.

Right: Business talk tables were crowded with customers day in and day out.

At a separate presentation corner, welding consumables for a variety of industrial fields, such as steel structure construction, shipbuilding, and car manufacturing, were displayed in six large panels that were of 200cm wide and 120cm high. Furthermore, every visitor could enjoy Kobe Steel's welding technologies and products by the field of industry on large liquid crystal monitors. At another separate corner, new design packages employed since this April were dynamically exhibited to notify customers and users of the new KOBELCO trademarks for the global markets.



More Exhibitors than Ever at the Beijing-Essen Welding Fair

The 13th Beijing-Essen Welding Fair was held from May 14 through 17 at the China International Exhibition Center in Beijing. 21 years have passed since the first fair in 1987, and the number of exhibitors has increased to 863 companies, more than five times the 157 companies in the first exhibition. Since 2002 Beijing and Shanghai have taken turns each year holding the fair.

Kobe Welding of Tangshan Co., Ltd. and Kobe Steel, Ltd. exhibited jointly in the third hall together with Panasonic Welding System (Tangshan) Co., Ltd., Koike Engineering (Tangshan) Co., Ltd., Tangshan KaiYuan Autowelding System Co., Ltd., and Tangshan KaiYuan Robot System Co., Ltd., highlighting Tangshan as a base for welding and cutting.

The Kobe Steel booth, located at the center of the shared exhibit, featured a robotic welding system for construction equipment, whose advanced tandem welding process reduces welding cycle time by more than 40% compared with the conventional single welding process. The functional system was described in a PowerPoint presentation that attracted many visitors. At the welding demonstration corner four kinds of welding consumables with excellent usability were demonstrated: PREMIARC™ DW-309L for FCAW of stainless steels, FAMILIARC™ LB-52U for SMAW of pipelines, FAMILIARC™ LB-52T for SMAW for tack welding, and FAMILIARC™ Z-44 for SMAW of steel structures. At the corner for welding consumables, large panels demonstrated how these products are used in shipbuilding, chemical plants, and storage tanks with a display of bead samples and macro sections.

On the 2nd and 3rd days of the fair, Kobe Steel held two technical seminars, entitled “How the Welding Technology for Stainless Steels will Change” and “Future Aspects of Robot Welding Systems for Construction Machinery and Railway Trains,” respectively. These presentations were effective in publicizing Kobe Steel's customer-oriented technical and sales activities.

Left: KOBELCO robotic welding system attracts many visitors at the Tangshan KaiYuan Group exhibition booths.

Right: Many participants listening to the presenter with keen interest at the welding technical seminar.

Tangshan KaiYuan Robot System Co., Ltd., which was established in Tangshan city on January 1 this year as Kobe Steel's local producer of welding systems, demonstrated a welding system mounted on a KOBELCO ARCMAN robot to project the business attitude based on “Total Welding Solutions” in China.

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URL: http/www.kobelco.co.jp
E-mail: iod@melts.kobelco.co.jp

GLOBAL MANUFACTURING AND SALES BASES

KOBELCO
THE WORLDWIDE MANUFACTURER

ASIA

JAPAN:
KOBE STEEL, LTD., Welding Company
International Operations Dept.
9-12 Kita-Shinagawa 5-chome,
Shinagawa-ku, Tokyo, 141-8688 Japan
Tel. (81) 3 5739 6331Fax. (81) 3 5739 6960

KOREA:
KOBE WELDING OF KOREA CO., LTD.
21-14 Pairyong-Dong, Changwon,
Kyongnam Republic of Korea
Tel. (82) 55 292 6886 Fax. (82) 55 292 7786

CHINA:
KOBE WELDING OF TANGSHAN CO., LTD.
196 Huoju Road, Tangshan, New & High-Tech
Development Zone, Tangshan, Hebei
063020 People's Republic of China
Tel. (86) 315 385 2806 Fax. (86) 315 385 2829

SINGAPORE:
KOBE WELDING (SINGAPORE) PTE. LTD.
20 Pandan Avenue, Jurong, Singapore
609387 Republic of Singapore
Tel. (65) 6268 2711 Fax. (65) 6264 1761

THAILAND:
THAI-KOBE WELDING CO., LTD.
500 Moo 4 Soi 1, Bangpoo Industrial Estate
Sukhumvit Rd., Praeksa, Muang Samutprakarn
10280 Thailand
Tel. (66) 2 324 0588 to 0591 Fax. (66) 2 324 0797

KOBE MIG WIRE (THAILAND) CO., LTD.
491 Moo 4 Soi 1, Bangpoo Industrial Estate
Sukhumvit Rd., Praeksa, Muang Samutprakarn
10280 Thailand
Tel. (66) 2 324 0588 to 0591 Fax. (66) 2 324 0797

MALAYSIA:
KOBE WELDING (MALAYSIA) SDN. BHD.
Plot 502, Jalan Perusahaan Baru, Kawasan
Perusahaan Prai, 13600 Prai, Malaysia
Tel. (60) 4 3905792 Fax. (60) 4 3905827

INDONESIA:
P.T. INTAN PERTIWI INDUSTRI
(Technical Collaborated Company)
Jalan P Jayakarta 45, Block A/27, Jakarta
11110 Indonesia
Tel. (62) 21 639 2608 Fax. (62) 21 649 6081

EUROPE

KOBELCO WELDING OF EUROPE B.V.
Eisterweg 8, 6422 PN Heerlen, The Netherlands
Tel. (31) 45 547 1111 Fax. (31) 45 547 1100

USA

KOBELCO WELDING OF AMERICA INC.
Houston Head Office
4755 Alpine, Suite 250, Stafford, Texas
77477 USA
Tel. (1) 281 240 5600 Fax. (1) 281 240 5625

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