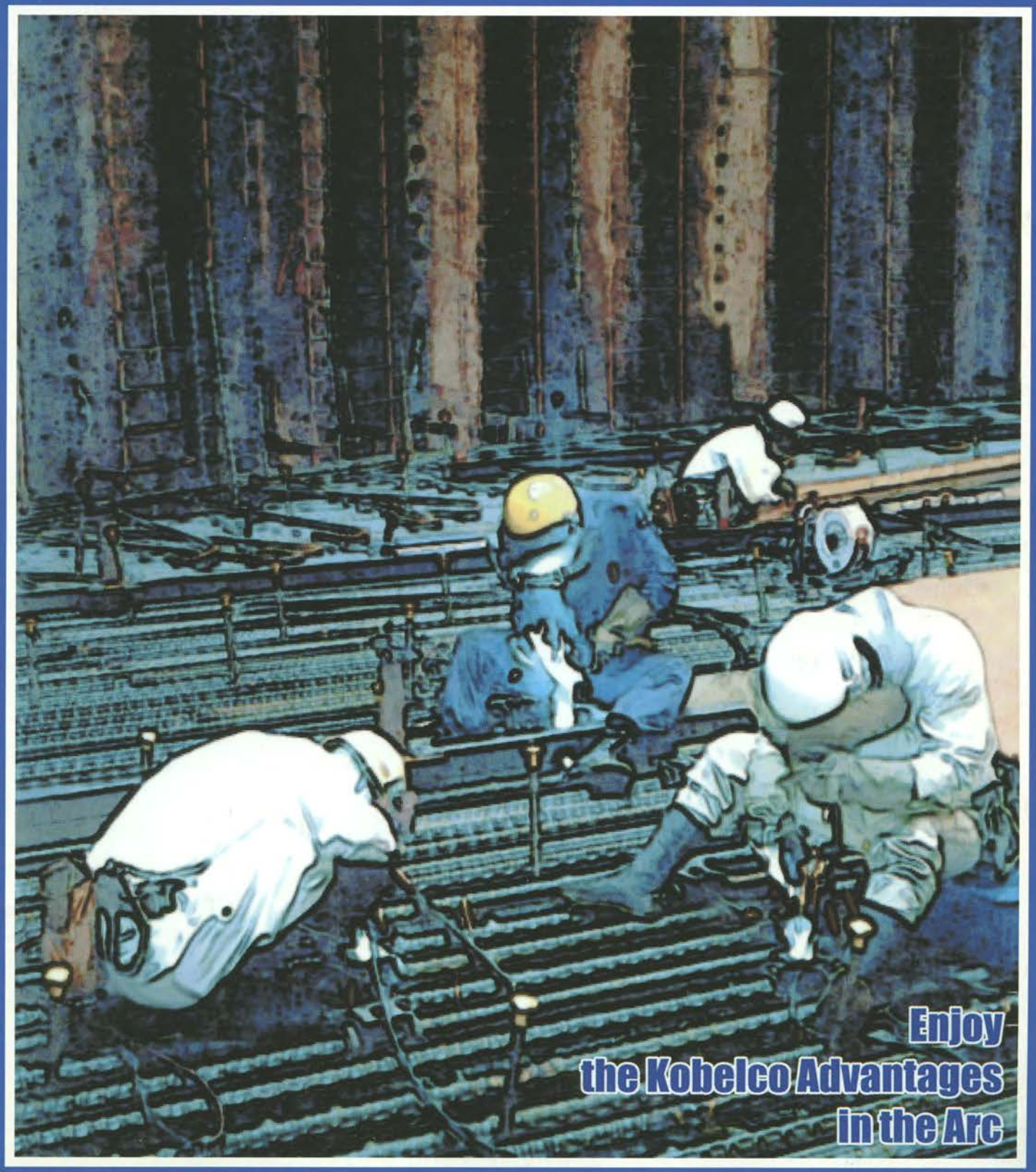
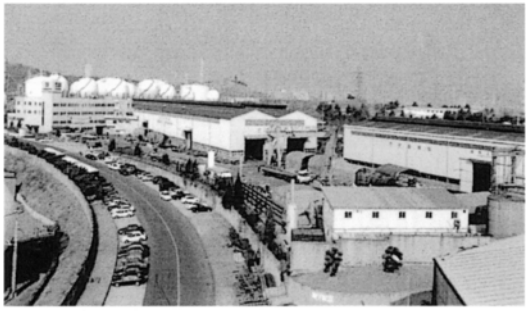
KOBELCO WELDING TODAY

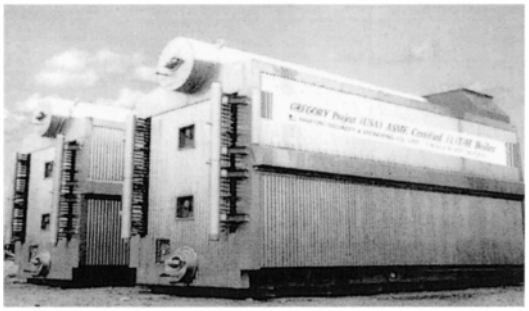
April 2002
Vol.5 (No.2)



Best Quality, Best Delivery and Best Price: the Power of DKME for Worldwide Business

DAEKYUNG Machinery & Engineering Co., Ltd. (DKME) was founded in 1981 and is one of the leading manufacturers of petrochemical equipment in Korea. Starting out with the maintenance of petrochemical equipment, we have succeeded to localize manufacturing shell & tube heat exchangers and today we have grown up to be a worldwide supplier of petrochemical equipment such as heat exchangers, pressure vessels and Heat Recovery Steam Generator (HRSG). We have continually been striving to improve our products and seek innovative ways to be more efficient in manufacturing.





Top: Head office & 1st plant in Ulsan
Middle: Packed power boiler for export
Bottom: Pressure vessel ready for shipment

DKME's main plant is located at 125-2, Bugok-Dong, Nam-Ku, Ulsan, South Korea. It is operated by well-trained employees and equipped with ultramodern production and port facilities. With our abundant experience, we have direct access to any destination in the world. DKME possesses the ASME Code (PP, S, H, U, U2) and ISO 9001 & 14001 certificates as the basis of quality assurance, quality management and environmental management systems in order to manufacture and supply a wide range of equipment for chemical and petrochemical plants to worldwide clients in accordance with the international standards and to keep our commitment to customer satisfaction. Our business policy can be summed up with the 3-best campaign: *Best Quality, Best Delivery, and Best Price.*

Based on this business philosophy and principle, DKME builds not only petrochemical equipment of the best quality but also has built a high business reputation in many related fields. This good reputation has made us more active in our business and as a result we have achieved eye-opening growth, which is the motivating power of our supply to clients.

The increase of energy consumption and rapid industrialization during the last part of the 20th century caused environmental pollution; therefore, environment preservation is one of the most urgent issues in the world at the end of this century. In order to minimize the air and water pollution and preserve this planet, DKME has recently started to manufacture and supply environment protection equipment for power and industrial plants.

To keep our position in the industry, we always keep our philosophy and principle in mind. As we have been a potential supplier in the petrochemical industry, we will try to supply environmental equipment of better quality and more competitive price to the world as an important name in this field.

KOBELCO has been serving DKME for five years with CMA-96MB, TGS-lCM and MF-29A/US-511 for heat-resistant low-alloy steel as well as NB-3N, TGS-1N, and PFH-203/US-203E for low temperature service steel. In one of our main projects, the HRSG project, which demands high welding quality, KOBELCO products such as TGS-1CM and TGS-9Cb have shown great performance and became the most popular welding filler metals for the HRSG project in Korea.

Now, we are fully satisfied with KOBELCO and we believe KOBELCO will continue to produce high quality welding filler metals and support us with technical services and quick delivery.

Reported by
DAEKYUNG Machinery & Engineering Co., Ltd.
Phone: 82-52-278-9000 Fax: 82-52-278-9099
URL: www.dkme.com
Arranged by
***D.S. Kim**, Deputy General Manager of McQAN*

Message from the Editor

General Manager

International Operations Department

Welding Company
Kobe Steel, Ltd.

The Olympic Winter Games in Salt Lake City have finished. A lot of the best athletes gathered from many countries to join in and compete for Olympic medals. It was fun for me to watch it on TV. I saw a lot of glee and tears, the winners and losers. On the other hand, it seemed there were so many doubtful judgments in some competitions. Some of the countries filed complaints against the unfair judgments to the Olympic Committee. These sorts of things humiliated all the athletes and spectators. I hope the Olympic Committee will improve their judgment system soon for the next Olympic Games to convince all of us.

In our business, we all make a lot of decisions or judgments on so many things everyday. It is possible for us to make the same mistakes that a judge did in the Olympic Games. We, therefore, have to be very careful to avoid making this kind of mistake because it might confuse our customers and partners. In order to avoid such a mistake, it is important for us to have unerring information and intelligence that aids us in making proper decisions and judgments in important matters. I hope KOBELCO WELDING TODAY will provide all the readers with useful and enjoyable information.

Masakazu Tojo
Editorial Chairman

Contents

Letter from Tokyo

KOBELCO | KOBE STEEL, LTD.

T. Morimoto
Manager
Welding Company
Kobe Steel, Ltd.

Hello, readers of Kobelco Welding Today! Tomokazu Morimoto is my name. I joined the International Operations Department this January, being transferred from the Technical Development Department where I was engaged in the research and development in carbon steel type flux-cored wires and welding procedures. My new assignment with IOD is the marketing for the Chinese, Hong Kong, Korean and Taiwanese markets including part of the Philippines. I am looking forward to having more occasions to do jobs with overseas customers than I had when I was with the former post. I will make, much more than I did before, an effort so that many worldwide customers will use high quality Kobelco welding consumables. I hope your cooperation to help me execute our business successfully.

State-of-the-Art Welding Technology Enables Fabrication of High-Temperature High-Pressure Reactor Vessels Using High-Strength 2.25Cr-1Mo-V Steel and Matching Filler Metals:

SMAW Electrode: **CMA-106H**

SAW Flux-Wire: **PF-500/US-521H**

GTAW Filler Wire: **TGS-2CMH**

Why High-Strength 2.25Cr-1Mo-V Steel is Needed

A desulfurization reactor is a thick heavy section pressure vessel that removes, by chemical reaction, sulfur impurities contained in crude oil in the refining of heavy hydrocarbons into lighter, more valuable products in refineries (Photo 1). The reactor is operated in a high-temperature high-pressure hydrogen atmosphere. In order to efficiently carry out the desulfurization reaction, the service temperature and pressure are increased, causing increases in thickness and scale of the reactor. The world's largest heavy oil desulfurization reactor has a shell that is 330-mm thick and weighs 1400 tons (Photo 2). This explains the need for steels that are superior to conventional 2.25Cr-1Mo steel — advanced steels with high strength and resistance to hydrogen at higher operation temperatures. The high-strength 2.25Cr-1Mo-V steel is the one for this application; it has been used to fabricate reactors since 1998.

How High-Strength 2.25Cr-1Mo-V Steel and Matching Welding Filler Metals are Specified in ASME

Table 1 shows steel grades and requirements for chemical composition and mechanical properties of 2.25Cr-1Mo-V steel, as specified by ASME Boiler and Pressure Vessel Code Sec. VIII Div. 1 Appendix 31 and Div. 2 Appendix 26. In using these specific materials for the fabrication of pressure vessels, these ASME Code Appendixes require using welding filler metals that satisfy the requirements of chemical composition and mechanical properties of weld metal, as shown in Table 1.

Photo 1. A refinery is composed of a variety of sophisticated equipment such as reactors, towers, heat exchangers, and pipelines.

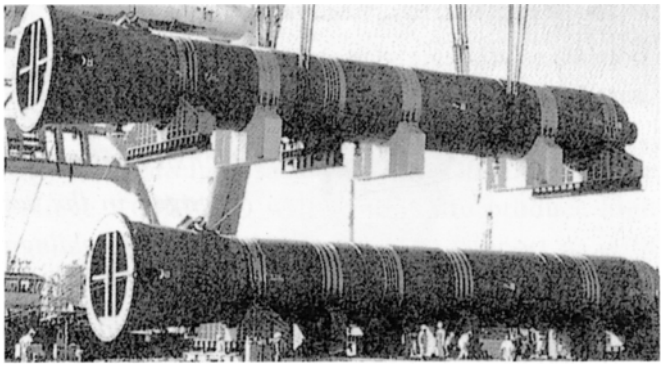


Photo 2. The world's largest heavy oil desulfurization reactor vessel having a shell of 330-mm thick and weighing 1400 tons (Photo source: Welding Technique, Vol. 47, Japan Welding Engineering Society)

Table 1. Requirements of chemical composition and mechanical properties of high-strength 2.25Cr-1Mo-V steel and weld metal (ASME Boiler and Pressure Vessel Code Sec. VIII Div. 1 Appendix 31 and Div. 2 Appendix 26)

Steel spec. and grade	Chemical composition of steel (%) (1)													
	C	Mn	P	S	Si	Cr	Mo	Cu	Ni	V	Cb	Ti	B	Ca
SA-182, F22V SA-336, F22V SA541, 22V SA542, D-4a SA-832, 22V	0.11-0.15	0.30-0.60	0.015	0.010	0.10	2.00-2.50	0.90-1.10	0.20	0.25	0.25-0.35	0.07	0.030	0.0020	0.015
	Mechanical properties of steel (2)													
	Tensile strength (N/mm2): 585-760 0.2% offset strength (N/mm2): 415 min.							Elongation (%): 18 min Impact energy at –18°C (J): 54/47 min.(3)						

Welding process	Chemical composition of weld metal (%) (1)								
	C	Mn	Si	Cr	Mo	P	S	V	Cb
SMAW	0.05-0.15	050-1.30	0.20-0.50	2.00-2.60	0.90-1.20	0.015	0.015	0.20-0.40	0.010-0.040
SAW	0.05-0.15	0.50-1.30	0.05-0.35	2.00-2.60	0.90-1.20	0.015	0.015	0.20-0.40	0.010-0.040
GTAW	0.05-0.15	0.30-1.10	0.05-0.35	2.00-2.60	0.90-1.20	0.015	0.015	0.20-0.40	0.010-0.040
SMAW SAW GTAW	Mechanical properties of weld metal (2)								
	Tensile strength (N/mm^2): 585-760 0.2% offset strength (N/mm^2): 415 min. Elongation (%): 18 min					Impact energy at –18°C (J): 54/47 min. (3) Creep rupture life at 538°C and 205 N/mm^2: (4) Exceed 900 h			

Note (1) Single values are the maximum.
(2) The heat treatment conditions for tensile test are specified based on the maximum and minimum vessel-portion temperatures and holding time. The heat treatment condition for impact test is specified based on the minimum vessel-portion temperature and holding time in fabrication. The heat treatment condition for creep rupture tests is specified based on the maximum vessel-portion temperature and holding time.
(3) For Charpy impact energy requirement, 54J is for three-specimen average and 47J is for one specimen
(4) Specified by ASME Sec. VIII Div. 2 Appendix 26 for category A welds (both all weld metal and welded joint)

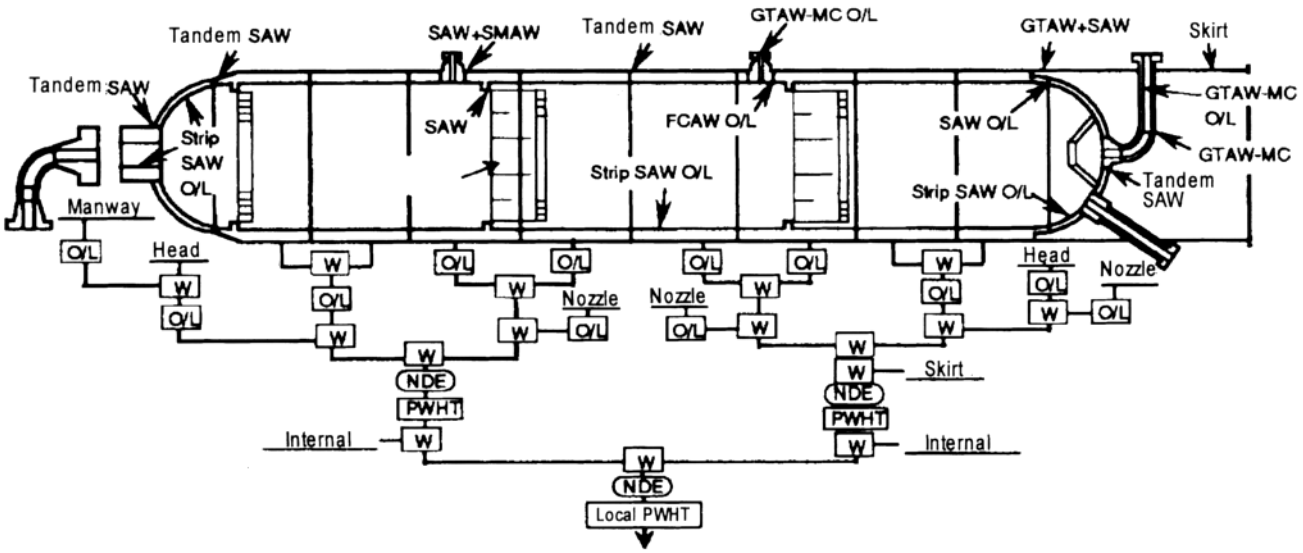
What are the Advantages of High-Strength 2.25Cr-1Mo-V Steel and Filler Metal?

As shown in Table 1 above, the high-strength 2.25Cr-1Mo-V steel and matching filler metals contains small amounts of vanadium and columbium (or niobium). Alloying these elements is, first, to strengthen the Cr-Mo steel by the precipitation of vanadium and columbium carbides in the matrix. Second, stable vanadium and columbium carbides improve resistance to high temperature hydrogen attack. High temperature hydrogen attack is believed to be one form of hydrogen damage, where molecular hydrogen dissociates into the atomic form, atomic hydrogen readily enters and diffuses through the steel rapidly, and hydrogen may react with carbon in the steel ($Fe_3C + 4H \rightarrow CH_4 + Fe$) to cause either surface decarburization or internal decarburization and fissuring. Thirdly, fine particles of vanadium carbide improve resistance to hydrogen embrittlement, by trapping diffusible hydrogen to prevent its concentration at crack tips.

With higher strength, the wall thickness of a 2.25Cr-1Mo-V steel pressure vessel can be reduced by about 12% when compared with conventional 2.25Cr-1Mo steel because the allowable stress can be increased by about 12%. Thinner material means welding can be finished faster and time for postweld heat treatment soaking can be reduced, thereby reducing fabrication costs. Superior resistance to high temperature hydrogen attack and hydrogen embrittlement facilitates more efficient operation of the reactor vessel at higher temperatures (482°C max. for operation temperature) and higher atmospheres of hydrogen pressure.

How Reactor Vessels are Fabricated

Fig. 1 shows a fabrication procedure for reactor pressure vessels. Stainless steel overlay welding of the internal surfaces of the Cr-Mo shell ring forgings is carried out on a single ring forging or two ring forgings joined circumferentially. Overlay stainless steel welds protect the Cr-Mo base metal and weld metal from high-temperature high-pressure hydrogen during desulfurization. After this process, all the shell ring forgings are circumferentially joined by SAW accompanied by SAW and SMAW of nozzles in the shell rings. The heads of a reactor have a thickness about one half of that of the shell, and they are produced by hot pressing Cr-Mo steel plates without joints. The heads are processed by stainless steel overlay welding on their internal surfaces, followed by



SAW: Submerged arc welding	W: Joint welding
Strip SAW: SAW with strip electrodes	O/L: Overlay welding
GTAW-MC: Automatic gas tungsten arc welding	NDE: Nondestructive examination
FCAW: Flux cored arc welding (CO_2 shielding)	PWHT: Postweld heat treatment
SMAW: Shielded metal arc welding	

Fig. 1. An example of fabrication procedure for reactor vessels by arc welding (Source: Welding Technique Vol. 47, Japan Welding Engineering Society)

SAW of nozzles and SAW of head-to-shell circumferential joints. Bend pipe-to-nozzle neck and bend pipe-to-flange pipe girth joints are welded by automatic GTAW. All the welds are subjected to nondestructive examinations (NDE) such as X-ray, ultrasonic, magnetic particle and liquid penetrant tests, followed by postweld heat treatment (PWHT). After PWHT, the soundness of the welds is again checked by NDE to ensure no cracking has developed. Next, the vessel is subjected to a pressure test, followed by the final NDE. The completed pressure vessel is then shipped. More than 95% of the welding operations in fabrication of reactor vessels are reportedly automated to assure consistent quality.

Unbeatable Characteristics of Kobelco 2.25Cr-1Mo-V Filler Metals

Kobe Steel has long carried out research in welding metallurgy of Cr-Mo weld metals and has developed innovative filler metals suited specifically for 2.25Cr-1Mo-V steel. These filler metals are SMAW covered electrode of CMA-106H, SAW flux and wire of PF-500/US-521H, and GTAW filler wire of TGS-2CMH. These filler metals fulfill the requirements, shown in Table 1, of ASME Sec. VIII Div. 1 Appendix 31 and Div. 2 Appendix 26. Table 2 shows some typical weld metal chemical compositions of these advanced welding consumables. The filler metals are characterized by a sophisticated chemical composition that provides the weld metal with sufficient impact toughness and minimized temper embrittlement. The resulting weld metal also contains adequate amounts of vanadium and columbium to ensure tensile strength, creep rupture strength and resistance to high temperature hydrogen attack and hydrogen embrittlement.

In addition, the coating flux of CMA-106H is designed so as to perform sufficient usability in all position welding. The coating flux is of an extra-low hydrogen type; therefore, CMA-106H deposits very low hydrogen weld metal, thereby minimizing the susceptibility to delayed cracking. PF-500 is an extra-low hydrogen bonded type flux for SAW. PF-500 flux picks up moisture at slower rates compared with conventional bonded type fluxes. Furthermore, this SAW flux offers unsurpassed usability providing self-peeling slag removability in the narrow groove of heavy thick section work. TGS-2CMH offers excellent usability with sufficient wetting of the molten pool in narrow groove work, which ensures good performance

Table 2. Typical chemical compositions of weld metals by 2.25Cr-1Mo-V welding consumables

Welding process	Filler metal brand name	Power source	C	Mn	Si	P	S	Cr	Mo	V	Cb
SMAW	CMA-106H	AC	0.08	1.15	0.29	0.007	0.003	2.41	1.00	0.28	0.016
SAW	PF-500/US-521H	AC	0.08	1.16	0.13	0.004	0.004	2.53	1.03	0.35	0.015
GTAW	TGS-2CMH	DCEN	0.10	0.38	0.14	0.003	0.004	2.21	1.02	0.21	0.025

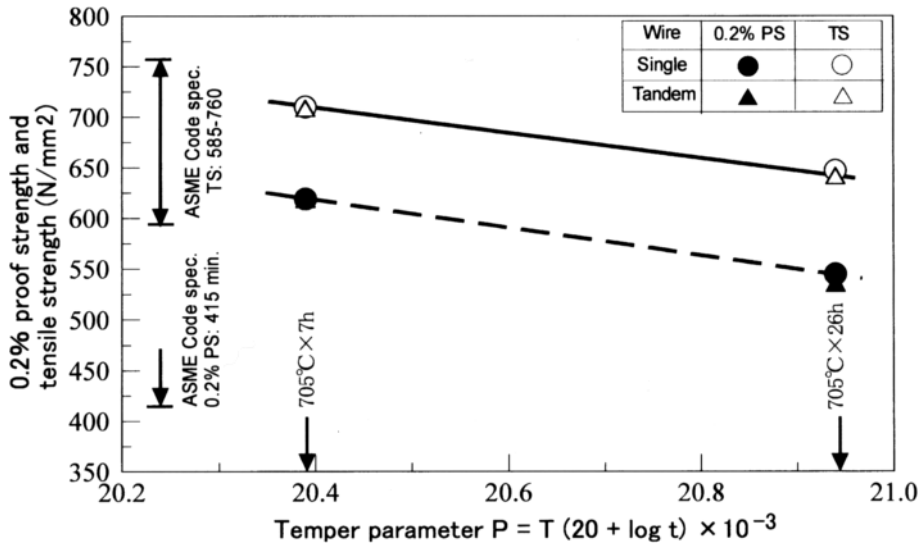


Fig. 2. Room temperature tensile test results of PF-500/US-521H weld metal after postweld heat treatment (Power source: AC)

in automatic or mechanized welding processes. These outstanding characteristics of the filler metals are provided by Kobe Steel's persistent quality control for each lot or heat of filler metal.

High strength 2.25Cr-1Mo-V weld metal has a fine bainitic structure as shown in Photo 3 for CMA-106H and Photo 4 for PF-500/US-521H. This is the reason why the weld metal exhibits high tensile strength, adequate creep rupture strength, sufficient impact toughness, and low susceptibility to temper embrittlement. Tensile test results of PF-500/US-521H weld metals that were postweld heat-treated at the condition of temperature and holding time used in fabrication are shown in Fig. 2. It is obvious that tensile properties fulfill the ASME Code requirements over the range of soaking hours needed in fabrication.

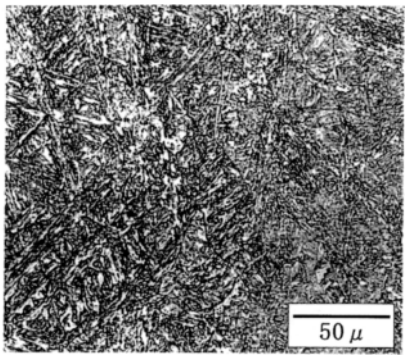


Photo 3. Microstructure of CMA-106H weld metal of fine bainite (2% nital etching)

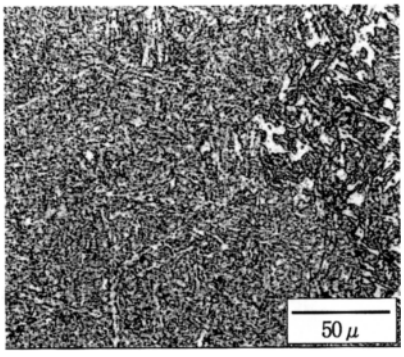


Photo 4. Microstructure of PF-500/US-521H tandem weld metal of fine bainite (2% nital etching)

Figs. 3, 4 and 5 show Charpy impact and temper embrittlement test results of CMA-106H, PF-500/US-521H and TGS-2CMH weld metals respectively. These results exhibit quite high notch toughness satisfying the ASME Code requirement of energy at –18°C in the as-PWHT condition and sufficiently low susceptibility to the temper embrittlement by step cooling.

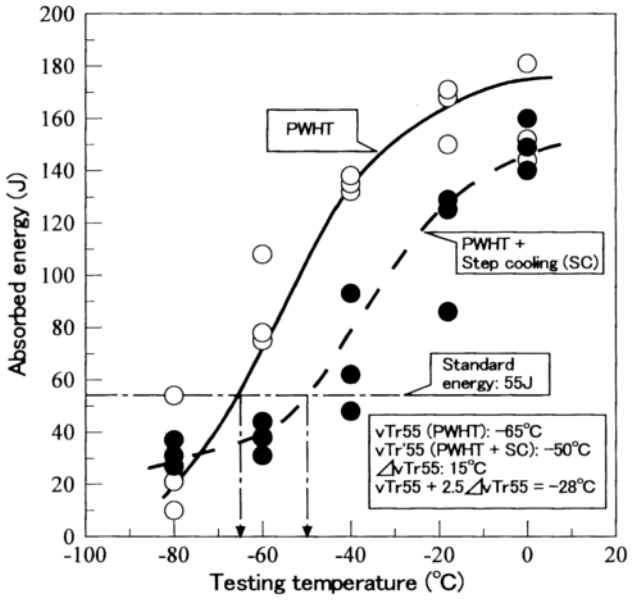


Fig. 3. Charpy impact test results of CMA-106H (4.0Ø) weld metal after PWHT (715°C x 7h) and PWHT + Step Cooling (Power source: AC; Welding position: flat)

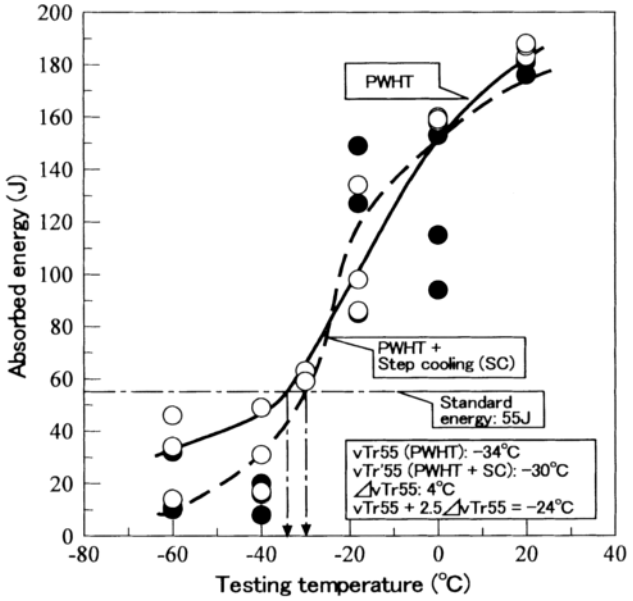


Fig. 4. Charpy impact test results of PF-500/US-521H weld metal after PWHT (705°C x 7h) and PWHT + Step Cooling (Power source: AC; Tandem SAW)

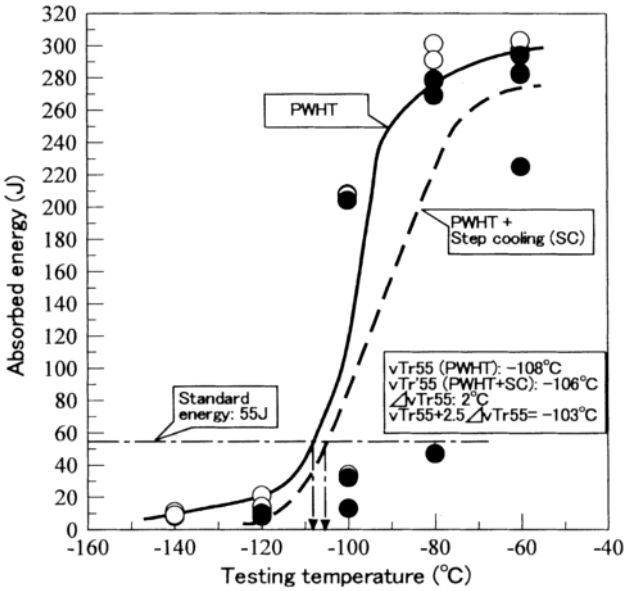


Fig. 5. Charpy impact test results of TGS-2CMH weld metal after PWHT (705°C x 7h) and PWHT + Step Cooling (Power source: DCEN; Welding position: flat; Ar shielding)

Fig. 6 shows creep rupture test results of CMA-106H and PF-500/US-521H weld metals that were postweld heat-treated at the condition of temperature and holding hour used in fabrication. It is obvious that the test results satisfy the ASME Code requirement. In this test, testing temperature is 538°C that is higher than the permissible maximum operation temperature (482°C) as per the ASME Code. The use of higher temperature is to know the creep rupture strength with shorter hours, by accelerating creep of the specimen.

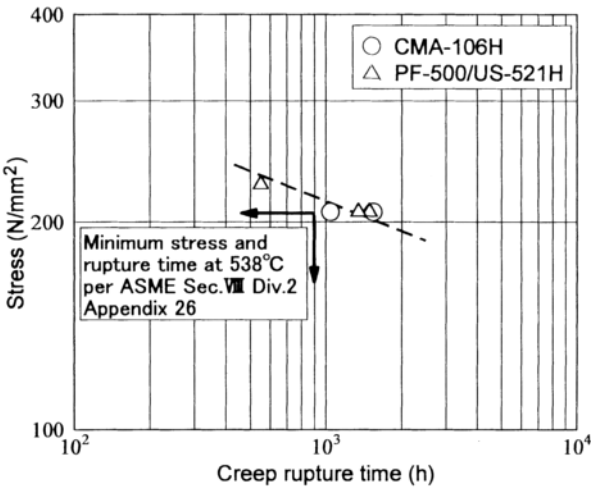


Fig. 6. Creep rupture test results of CMA-106H and PF-500/US-521H weld metals after PWHT (705°C x 26h) (Power source: AC; Testing temperature: 538°C)

How Polarity Affects Electrode Performance in Arc Welding

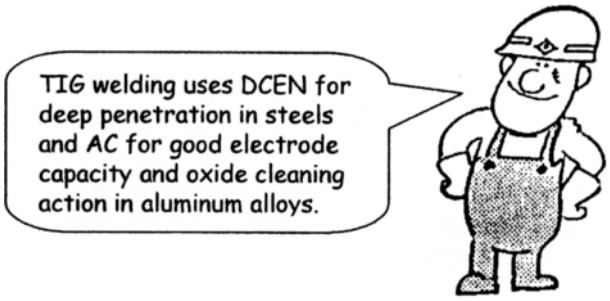
The term 'polarity' is used to describe the electrical connection of the electrode in relation to the terminal of a power source. With direct current (DC), when the electrode is connected to the positive terminal, the polarity is designated as direct current electrode positive (DCEP). When the electrode is connected to the negative terminal, the polarity is designated as direct current electrode negative (DCEN). When alternating current (AC) is used, the polarity changes every half cycle of 50 or 60 Hz.

Why GMAW uses mostly DCEP

The vast majority of gas metal arc welding (GMAW) applications use DCEP. This condition yields a stable arc, smooth metal transfer, relatively low spatter, good weld bead characteristics and deep penetration for a wide range of welding currents. In contrast, with DCEN, the molten droplet size tends to increase and the droplet transfer becomes irregular, thereby increasing large grain spatter. However, some specific wires with unique chemical composition have been developed specifically for DCEN, which offers excellent performance on galvanized sheets. Attempts to use conventional AC have generally been unsuccessful due to the instable arc in GMAW. However, state-of-the-art inverter and digital control technology have developed AC pulsed GMAW power sources for sheet metals.

SMAW is the most versatile welding process in terms of polarity

The large variety of coating fluxes for covered electrodes enable the SMAW process to be the most versatile in terms of polarity. The majority of covered electrodes use either AC or DCEP. Some electrodes, specifically E6013 (RB-26), E6019 (B-17) and E7024 (ZERODE-43F) offer good performance with AC, DCEP or DCEN. In contrast, high cellulose type electrodes such as E6010 (KOBE-6010), E7010-P1 (KOBE-7010S), and E8010-P1 (KOBE-8010S) for pipe welding are designed for use with DCEP only for smoother droplet transfer. Low carbon type Cr-Mo electrodes such as E7015-B2L (CMB-95) and E8015-B3L (CMB-105) are also designed for use with



DCEP only, for better performance. Some specific electrodes such as LB-80UL for high strength steels and NB-1S for low temperature steels are recommended to use AC only in order to guarantee strict requirements for strength and impact toughness of weld metal in fabrication.

How polarity affects SAW

The particular combination of wire and flux determines the choice of AC, DCEP or DCEN in SAW. With DCEP, the flux consumption ratio (the ratio of the amount of slag to the amount of deposited metal) is higher than with AC by roughly 10-30% depending on the type of flux. Consequently, the chemical composition — thus mechanical properties — of the weld metal can be affected by the polarity, although the degree of effect depends on the type of flux. This is why a careful choice of wire and flux combination is necessary taking into account the polarity of the power source to be used when the quality requirement for the weld metal is strict. Table 1 shows an example of the effect of polarity on chemical composition and mechanical properties of weld metal. In these test results, marked differences are recognized in carbon, oxygen, 0.2%PS, TS and IV between AC and DCEP.

Table 1. An example of the effect of polarity in SAW using a fused type flux and solid wire for mild steel and 490N/mm^2 high strength steel (as-welded condition)

Polarity	C	Si	Mn	P	S	O
AC	0.07	0.30	1.61	0.017	0.005	0.067
DCEP	0.05	0.35	1.67	0.018	0.006	0.098

Polarity	0.2% PS (N/mm^2)	TS (N/mm^2)	El (%)	RA (%)	Av. IV at –40°C (J)
AC	462	565	30	70	93
DCEP	411	512	33	69	74

United We Stand; We are KOBELCO WELDING OF AMERICA

Hello!, Hi!, How do you do!... from KWAI

The magnificent world-event, the Salt Lake City Olympics has ended, and the exciting atmosphere and performances inspired us a lot on the way back to normal life after the Sep. 11 tragedy. At KWAI, we have been growing continuously since our establishment in North America, and are confident we can continue this trend. Although KWAI consists of only 11 members, our sales calls are spread all over the U.S. and even from Mexico up to Canada. Here, let me introduce our sales-people who are calling on customers daily with their eager personalities.

I have been working for KOBELCO since 1988, covering the southern area of Texas, Louisiana, Oklahoma and Arkansas. It is not unusual for me to drive 8 hours to call on customers. I prefer driving, so I can carry samples of our product, and demonstrate it when possible. I spend most of the time calling on distributors, but enjoy seeing end users (fabricators) whenever possible. I particularly enjoy going to southern Louisiana because it is a totally different culture than anywhere else in USA. It is called the 'Acadian Country (Cajun)" and the food is excellent, with great seafood such as boiled crawfish and gumbo.

***Glenn Villemez** (Houston)*

Being a native Texan for all my life, going to work for KOBELCO in 1995 was quite a change. When I started to work for KOBELCO, they said "GO WEST YOUNG MAN." And to the west I went — all the way to Salt Lake City, Utah about 1,500 miles from Dallas, Texas, my home. I like meeting new people and sales to me is about making good friends, understanding their needs, as well as my own. I try to always remember a good deal is a good deal for both parties. I only wished that my distributors felt the same.

***Richard Rust** (Dallas)*

I have been working with KWAI for five years as a Welding Engineer/Regional Manager. I started with KOBELCO after receiving a Bachelors of Science degree in Welding Engineering from Utah Stale University. I continue to learn from our experienced (old) regional managers. They are experts on forming distributor relationships and maintaining our current customer distributor base. My favorite part of my job is to work with End-user types, and do welding demonstrations and show them the advantages of KOBELCO products.

***David Haynie** (Cincinnati)*

I am married 23 years to Judi and have three sons, Kenny, Josh and Corey. I started in the welding business in 1978 repairing welding equipment in Philadelphia, Pennsylvania while attending night school on the GI. Bill. I received my degree in electronics from R.E.T.S. and started my sales career in 1985 as a technical salesman. This is where I learned the value of demonstrating products to the end user. I like to think that it is based on knowledge of the products and honesty to my customers. I try to build trust with my customer by never making false statements about the products that I sell.

***Ken Schwerin Jr.** (Philadelphia)*

I think of myself as being a Texan from my head to toes. I've been in the welding business for longer than I care to remember. I will tell you a little story about myself, as to why everyone calls me "THE WIRE MAN," I will tell you it's not because I am skinny. On one of my visits to Oklahoma, I went out for drinks with customers and after everyone had a few drinks, someone introduced me as; "This is Jerry. He works for KOBELCO. He is 'A WIRE MAN'." From that night on I like to use this title as light humor when we're out drinking. I refer to myself as "THE WIRE MAN," and I love to sell KOBELCO wire very much.

***Jerry Whiteley** (Houston)*

My territory is the southeast corner of the U.S. It makes up 5 states that we call "Dixie," which is the old south. In the 12 years that I have been working for KWAI, I have made many friends that I like to call our "Red Neck" customers. Most all are very good people that are true gentlemen. They all like to joke around with me and I give it right back to them. I try and stay one step ahead of them in this manner. One thing that I have had to learn very quickly in dealing with salesmen and managements is that I have had to adapt my personality to theirs. The hardest lesson, though, was to use the "Soft Sell" approach. They dislike anyone coming in and telling them that they are doing things wrong. You have to make "Suggestions" rather than demands. I think everyone can lean from this style of selling. I am 44 years old and have been married 27 years. I have a daughter 26 years old and a son 20. I feel like I am 55, though. I like to cook, and eat pizza and spaghetti. I like to golf with our customers and have some beers while we beat the little white ball around.
P.S.
Don't play billiards against me for money. I wish I were as good at golf as I am at pool.

***K.C. Sollers** (Houston)*

Good bye; Then Hello!

Netherlands

Dear readers of Kobelco Welding Today: It is time for me to leave for Japan after a five years stay in Europe. It was my exciting and challenging experience, working together with very supportive customers and colleagues. As Kobelco always has been doing and Kobelco will continue the same way, the sincerity through the QTQ is our commitment. Whoever you are, wherever you are, please talk to Kobelco whenever you need Kobelco. I look forward to seeing you again.

M. Tsuji, retiring Managing Director, KWE

The time has come for me to leave the International Operations Department, where I have worked for 10 years. During that period, I got acquainted with many people, who helped me very much. Let me express my hearty gratitude for their kindest patronage. In Europe, too, where I am taking up a new post I will be able to make many new friends for sure. As I will do my best in my new assignment, I hope that those old and new friends will extend warm support to me.

K. Nakamura, succeeding Managing Director, KWE

Thailand

So swiftly these three years have passed. Since May 1999 when I took over from my predecessor, the achievements of TKW/KMWT have continued to recover steadily, even surpassing the levels achieved before the currency crisis. Our positive sales strategy has seen successful in every field and plant operations have been smooth without any big trouble. In this sense, these three years have really been clays of full sailing in the following wind. I was really lucky to have been the President during such a good time. In fact, my full gratitude goes to the members of Thai-Shin-yo-kai and dealers in ASEAN countries. I have made many new and precious friends through my job for the past three years. I hope, friends, that you will regard me as a friend from now on, too. It will be a real pleasure to meet you sometime, somewhere in the world again. With heartfelt gratitude, I remain.

Y. Takagi, retiring President, TKW/KMWT

During the past two weeks since I came to Thai land for my new post, I have made a few trips to Ho Chi Minh, Hanoi, Jakarta and Singapore for taking over the job. People in those cities were all so active, powerful, positive and optimistic, reminding me of Japanese people in the late sixties and early seventies. I felt embarrassed at the same time at the harsh reality they are confronted with. But surely their limitless energy will overcome any difficulty. Whenever I came back to Thailand from those trips and touched down at Don Mining Airport. I had a sense of relaxation. It seems that Thailand is already my second home country.

S. Takei, succeeding President, TKW/KMWT

Editorial Postscript

AWS Welding Show 2002 was held at McCormick Place South, Chicago, Il. on March 4-7. You will enjoy news from KWAI in the next issue.

Japan International Welding Show 2002 will be held at Tokyo Big Sight on April 24-27. KSL will welcome you to our booth.

KOBELCO WELDING TODAY
April 2002, Vol.5 (No.2)

Publisher: The International Operations Dept., Welding Company, Kobe Steel, Ltd.
Printer: Fukuda Printing Co., Ltd.
Editor: KOBELCO WELDING TODAY Editorial Staff
URL: http://www.kobelco.co.jp
E-MAIL: iod@melts.kobelco.co.jp

WELDING CONSUMABLE

KOBELCO

THE WORLDWIDE MANUFACTURER

GLOBAL MANUFACTURING AND SALES BASES

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

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
7478 Harwin Drive, Houston, Texas 77036, USA
Tel.(1) 713 974-5774 Fax. (1) 713 974-6543
CHICAGO SALES OFFICE
543 W. Algonquin Rd., Suite 201 Arlington Heights, Illinois. 60005
Tel.(1) 847 439-8450 Fax.(1) 847 439-8455

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

SINGAPORE :
KOBE WELDING (SINGAPORE) PTE. LTD.
20, Pandan Avenue, Jurong, Singapore 609387, Republic of Singapore
Tel.(65)2 68 27 11 Fax.(65)2 64 17 51

THAILAND :
THAI-KOBE WELDING CO., LTD.
500, Soi1, Bangpoo Industrial Estate, Sukhumvit Road, Praeksa, Samutprakarn 10280, Thailand
Tel.(66)2 324-05 88 ~ 91 Fax.(66)2 324-07 97

KOBE MIG WIRE (THAILAND) CO., LTD.
491, Soi 1, Bangpoo Industrial Estate, Sukhumvit Road, Praeksa Samutprakarn 10280, Thailand
Tel.(66)2 324-05 88 ~ 91 Fax.(66)2 324-07 97

MALAYSIA :
ST 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
(Technically-Collaborated Company)
Jalan P Jayakarta 45, Block A/27,
Jakarta 11110, Indonesia
Tel.(62)21-639-2608 Fax.(62)21-649-6081

THE KOBELCO GUARANTEE: QTQ

QUALITY PRODUCTS
TECHNICAL SUPPORT
QUICK DELIVERY

International slogan of Kobelco Welding Group