HIGHLIGHTS

- Filler Metal for Dissimilar Metal Welding for high temperature applications
- Solution for some common mistakes
- Welding 254 SMO

For your free copy please write to:
The Editor,
Weldwell Spectrum, Weldwell Speciality Pvt. Ltd.
401, Vikas Commercial Centre,
Dr. C. Gidwani Road, Chembur, Mumbai - 400 074.
E-Mail: technical@weldwell.com

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"Mr. Jaydeep Vora of Godrej (second from left) in discussion with (L to R) Mr. Ashok Rai, Mr. C.C. Girotra and Mr. Navin Badlani at Weldwell Speciality stall during Essen India Welding & Cutting 2012 exhibition, Mumbai, on 30th Oct. 2012."
Dear Reader,

We again have started to hear about ‘Green Shoots’. Index of Industrial Production (IIP) is a healthy 8.2% year-on-year after a long time. If this figure is maintained we may hope to have a turnaround in Indian economy in the near future. The improved IIP will also have much needed positive impact on the welding industry.

Boiler tubing is made of different types of steel. For superheater and reheater sections components that operate at higher temperatures are manufactured from austenitic stainless steel. However, because austenitic stainless steel is expensive tubings in the earlier boiler stages where operating temperatures are lower, can be made of less-costly Cr-Mo steel necessitating dissimilar welding. The welding of dissimilar metal joints in new and retrofit power plant boiler tubing has long proved challenging. The lead article presents the efforts to overcome the constraints faced by the welding fraternity in selecting suitable welding electrodes to meet the requirements.

Making mistakes is human nature, but with some careful consideration, it is easy to avoid some of the more common ones associated with running a welding operation. Many of them can have a significant impact on quality, productivity and a company’s bottom line. Education section discusses each of the mistakes and suggests suitable solution.

The welding of fully austenitic steels usually entails a risk of hot-cracking in the weld metal. However, since 254 SMO has a very high degree of purity, the risk of this type of cracking is greatly reduced. For details read the technical section.

To improve productivity and ease of operation Hypertherm has introduced a new product Powermax105 plasma cutting system. The new product is described in the New Product section.

In a proposal, the steel ministry said that setting up of Ultra Mega Steel Plants (UMSPs) were imperative to bridge the widening demand - supply gap of the metal, which is leading to rise in its imports. However, the ministries of coal, mines and rural development have opposed setting up of UMSPs in the country, saying that land and raw materials were scarce resources and cannot be dedicated exclusively for such units. The steel policy appears to be swinging. We have presented our views in the review section.

We request to let us know your interest you would like to cover in the forthcoming editions. Wishing you a Happy and Prosperous New Year 2013

With regards

Dr. S. Bhattacharya
Editor

International Trade Fair Joining, Cutting & Surfacing

This international welding exhibition - India Essen Welding & Cutting 2012, which takes place every two years in India, was held in Mumbai for the fifth time since 1993 from 30th October to 1st November, 2012 in Hall 6 at the Bombay Convention & Exhibition Centre. With a net exhibition area of over 3,300 square metres, the exhibition achieved an 18-percent increase in the area compared with the previous event in 2010. During INDIA ESSEN WELDING & CUTTING 2012, the German cooperative booth with around 360 square metres and 16 exhibitors was the largest participation in Exhibition Hall 6.

There were over 150 exhibitors from 13 countries presented the newest products, services and technologies. The main product groups exhibited were:

- Welding Technology
- Welding Equipment
- Cutting Tools
- Soldering Apparatus
- Welding Accessories
- Measuring Equipment
- Analysis Technology
- Industrial Health and Safety

The official opening on the occasion of INDIA ESSEN WELDING & CUTTING took place within the framework of a festive ceremony.

Thanks to the cooperation of MESSE ESSEN with Messe Düsseldorf Group, four trade fairs were held concurrently this time: Metallurgy India, Tube India International, Wire & Cable India 2012 as well. This strong trade fair quartet offers exhibitors and visitors an unparalleled overview of the markets represented and enormous synergetic potential under one roof.

Weldwell Speciality and its associate company Nivek Agencies participated in the exhibition in a big way covering an area of about 50 sq. mt. On display was the full range of product marketed by them which covered welding consumables, equipment and other accessories. The 'Welding Enclosure' used for welding of titanium attracted attention of large number of visitors.
Improved filler metal enables higher temperature dissimilar metal welds*

The welding of dissimilar metal joints in new and retrofit power plant boiler tubing has long proved challenging. New plants designed to operate at higher temperatures and pressures require advanced alloys and a filler metal that produces reliable welds. Electric Power Research Institute (EPRI) recently developed and sponsored the commercialization of a new filler metal. Its first application is the fabrication of boiler tubes for American Electric Power’s ultra supercritical Power Plant.

INTRODUCTION

Boiler tubing is made of different types of steel. For superheater and reheater sections that operate at higher temperatures, components are manufactured from austenitic stainless steel due to its properties of high creep strength and good corrosion resistance. However, because austenitic stainless steel is expensive, tubing in the earlier boiler stages, where design temperatures are lower, can be made of less-costly ferritic alloys such as Grade 22 steel, which contains chromium and molybdenum, and is commonly known as a Cr-Mo steel. Unfortunately, at some point, the austenitic steel and the ferritic alloy have to be welded together, with the result that, among the thousands of tubing joints in a typical boiler, many are transition joints, where the two metals have to be joined by dissimilar metal welds (DMWs).

Historically, DMWs have proven to be a weak location where premature failures may occur. If not properly fabricated, these welds can result in inferior properties and substantially reduce component life. Careful selection of welding filler material, preheat temperature, and postweld heat treatment temperature are paramount for dissimilar welds to avoid poor reliability.

Causes of Dissimilar Metal Welds Failure

In the 1980s, research conducted by the Electric Power Research Institute (EPRI) and others indicated that a number of the issues associated with DMW failures are related to the composition of the welds’ filler metal - the metal added in the making of a joint during the welding process (Figure 1). Research also showed that conventional 309 stainless steel filler metal resulted in the shortest life and that nickel-based filler metals resulted in three to four times that life.

Research further indicated that DMW failures are caused by two key mechanisms. One mechanism is a result of the difference in the rates of thermal expansion among different alloys and filler metals. Thermal expansion of an alloy is the amount that the material expands upon heating and shrinks during cooling, and that property is unique to a given material. When two alloys with different thermal expansion rates are joined, stress develops at the fusion line between the alloys as temperature changes. This differential expansion mismatch can contribute to creep fatigue damage.

Research also showed that premature failures of DMWs are caused by a mechanism called carbon migration. One of the factors that give the Cr-Mo alloys their creep strength is that they form carbides by the combination of carbon and other elements, including chromium. When two materials with different levels of chromium are joined together, the carbon migrates...
during elevated temperature service from the lower-chromium-containing alloy to the higher-chromium alloy. As the temperature rises, the rate of carbon migration increases. This migration results in an area of depleted carbon, called a “carbon-denuded zone,” in the lower-alloyed material and results in lower creep strength due to there being less carbon available to form carbides (Figure 2).

In dissimilar metal welds using conventional filler metals carbon can migrate, under increased temperature, from the low-alloy base metal to the high-alloy filler metal, creating a weak, carbon-denuded zone in the base metal next to the fusion line.

In the 1990s, based on this research, EPRI developed a new filler metal that was intended to solve these problems. The high nickel content of the filler metal resulted in thermal expansion similar to that of low-alloy ferritic tube materials. The filler metal also contained a low chromium content that would result in a smaller carbon-denuded zone than was possible with available nickel-based and austenitic fillers, thereby eliminating carbon migration. However, because of its tendency to develop microscopic cracks, called microfissures, which resulted in lower service life and was not approved.

**Modified Filler Metal for Grade 91 and 92 Joints**

Over the past 10 years, the need for a new filler metal for DMWs has become even more pressing as new plants have been designed for higher efficiency and as advanced alloys, such as the higher-strength ferritic / martensitic Grade 91 and 92 alloys, have been developed for higher temperature / pressure operation. Grade 91 is specially modified and heat-treated steel with 9% chromium, 1% molybdenum, and is vanadium enhanced. Grade 92 is similar to Grade 91, except that some of the molybdenum has been replaced with tungsten, resulting in even higher creep strength. These alloys have been the materials of choice for piping, tubing, and header retrofits and new installations for many cogeneration activities. They offer several advantages over conventional Cr-Mo steels in that they are often less expensive to install because their higher strength allows for lower material tonnage and fewer overall welding requirements due to the thinner cross sections required.

Given the promising nature of the original filler metal with higher nickel content more than 55 different chemical compositions of filler metals were evaluated for microfissuring tendencies. The filler metals were produced through controlled additions of 16 different elements: carbon, silicon, manganese, phosphorus, sulfur, chromium, molybdenum, iron, vanadium, tungsten, copper, aluminum, cobalt, niobium, tin, and nickel.

Modifications to the baseline alloy composition eventually yielded an alloy that is virtually microfissure-free in the area where the weld is deposited. Like its predecessor the new filler metal avoids the damage mechanisms that lead to failures in conventional filler metals. The thermal expansion of the new filler metal is closer to that of low-alloy ferritic base metals, such as Grades 22, 91, and 92, than to traditional Inconel 625 and 309 stainless steel filler metals. This means that, as tubing is heated and expands, there is less difference in expansion between the filler metal and the base metal on the ferritic side of the joint, and therefore less stress on the welds. Because it contains less chromium the new filler metal also eliminates carbide formation and carbon migration, which have historically been shown to be detrimental in traditional DMWs.

In addition, it offers several advantages related to how
the welding process is done. Welding requires post-
weld heat treatment (PWHT), which is a standard
tempering procedure of applying heat following the
welding process in order to toughen the weld metal
and the base metal affected by the welding. Current
construction codes require PWHT at different
temperatures for the hardenable ferritic materials,
Grade 22 and Grade 91/92 steels. However, when
two different steels are joined, the PWHT must be
performed using the higher temperature of the two
materials. If the lower-alloyed materials are heated to
too high a temperature, it can weaken the base metal
affected by the welding, and failures can occur.

Many studies have also shown that, at low stress
levels (where piping and tubing normally operate),
Grade 91 and 92 weldments will fail in the so-called
Type IV location, which is an area of the base metal
affected by the heat of welding. Research conducted
by EPRI shows that the new filler metal can be used,
prior to making the final joint, to “butter the base
metals,” or to add metal to the end of the tube or
pipe and thereby provide a protective buffer, allowing
separate PWHT of each alloy at the optimum
temperature. Once this step is performed, the final
weld may then be made without PWHT.

The EPRI filler metal also allows this separate PWHT
to be done at the factory, on many components at
a time, rather than at the plant site, joint by joint.
This capability can avoid the need for additional
bracing that may be required during field PWHT to
prevent distorting piping and can significantly reduce
the time allotted for PWHT, thereby shortening the
construction schedule.

Commercialization and Application
The new filler metal has been used for a new plant
application and can be used in retrofit applications
as well.

Babcock & Wilcox has used this filler metal for
installation of a 600-MW net pulverized coal – fired
spiral-wound universal pressure boiler. Ultra super
critical (USC) plants are designed to operate with
overall plant heat-to-electricity conversion efficiencies
that are higher than those of supercritical plants. To
achieve these efficiencies, USC plants operate at
higher temperatures; in the case of the Turk Plant, the
design calls for a main steam condition temperature
of 600° C at 3.675 ksi and a reheat steam condition
temperature of 610° C at 0.775 ksi.

These higher temperatures pose challenges for
the DMWs in the tubes of a USC boiler. For this
application, the new filler metal was used because
it allows the design to increase the temperature use
limits for the DMWs between the Grade 91 and 92
alloys and the austenitic stainless steels above the
boiler roof line. With this filler metal, the operating
temperature of the DMWs can be increased, while
the inherent joint stresses can be maintained at
values similar to those of the traditional Inco Weld A /182 DMWs used at lower operating temperatures.

Fabrication of the boiler pressure parts for the Turk
plant has been completed, and the parts are being
delivered to the plant site for erection. The plant is
under construction, and major foundations are being
installed. Figure 3 shows sample welds. These
DMWs also used the EPRI modified 60-degree weld
preparation angle, on the Grade 91 side of the joint.

Future Work
The filler metal used for the Turk plant was shielded
metal arc electrodes. Work is ongoing between EPRI
and B&W on the development of a suitable solid
wire; a prototype has been tested in trial welds, but
the material has not been commercialized. A suitable
solid wire would allow the filler metal to be used in
gas metal arc welding and gas tungsten arc welding.
Use in these other welding processes would increase
applications of the filler metal.
Top 10 Mistakes in Welding and Simple Ways to Solve Them*

Mistakes in the welding operation are not uncommon, but many of them can have a significant impact on quality, productivity and a company’s bottom line. Paying close attention to long-term savings, as opposed to cutting costs upfront, is one way to help avoid costly pitfalls.

INTRODUCTION
Making mistakes is human nature, but with some careful consideration, it is easy to avoid some of the more common ones associated with running a welding operation. With so many factors to monitor - equipment, weld procedures, filler metals and consumables - it’s inevitable that mistakes will occur in most welding operations on any given day.

The reality is, however, that these mistakes can have a significant impact on quality, productivity and a company’s bottom line. Fortunately, they do not have to happen. Consider the followings as the top 10 mistakes involved in running a welding operation, along with some recommendations provided for solving them.

Mistake No. 1: Improper Filler Metal Storage and Handling
Storing filler metals in an area where they are prone to accumulating moisture or exposed to other contaminants (e.g., dirt, oil or grease) can have an adverse effect on their welding performance. To prevent damage, companies should store filler metals in a dry and clean area with a relatively constant temperature until they are ready for use. Spools and coils of wire that are kept on the wire feeder for an extended period should be covered securely with a plastic bag or removed from the wire feeder and stored in the original packaging. An enclosed wire feeder can also protect against contaminants. Such precautions prevent damage that can lead to poor weld quality, and ultimately, rework.

Mistake No. 2: Repurposing Old Equipment
Welding operators rarely spend the entire day welding or welding continuously. For that reason, it may be possible to use a lower amperage MIG gun or one with a lesser duty cycle on some applications. For example, using a lighter and smaller 300-amp MIG gun instead of a 400-amp model can provide welding operators with greater maneuverability and reduce downtime for fatigue. Conversely, on higher amperage applications and / or those that require longer periods of welding, it is important to use a higher amperage gun. Skimping and purchasing a lower amperage MIG gun in this situation can lead to overheating, premature failure and greater long-term costs.

Mistake No. 3: Improper Preheat or Interpass Temperature Control
It is not uncommon for companies to preheat too little or skip this portion of the weld procedure altogether. Yet preheating is one of the biggest deterrents against cracking, as it slows down the cooling rate after welding. These requirements can be found in the welding procedure, welding codes or other fabrication documents. For the best results, welding operators need to preheat the material completely through and extend the heated area to approximately three inches on either side of the weld joint. Welding

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*Miller website
Mistake No. 5: Ignoring Preventive Maintenance
A well-performed PM program can help increase productivity, extend equipment life and create a workplace philosophy that encourages shared responsibility for, and interest in, preserving the integrity of the welding equipment. Companies should develop a regular timetable to inspect their power sources, wire feeders and MIG gun or TIG torches during scheduled downtime in production. Between welding shifts there is often enough time to perform routine inspections. Checking consumables regularly for spatter build-up — and replacing these components as needed — is also an important part of a viable PM program.

Mistake No. 6: Shielding Gas Inconsistencies
Using the correct type and / or mixture of shielding gas can help companies prevent weld defects, minimize excessive spatter and reduce costs for rework or post-weld cleanup. Shielding gases also determine arc characteristics and weld penetration on a given application. Straight CO₂ provides good weld penetration, but it is prone to spatter and has a less stable arc than mixtures that include argon. High argon mixtures (a minimum of 85 percent argon for solid wire or as low as 75 percent for metal-cored wires) are the best choice. These mixtures can be used in the spray transfer process to promote higher deposition rates and generate less spatter. For TIG welding, the appropriate argon / helium mixture can improve speed, quality and arc characteristics. For both MIG and TIG welding operations, companies should purchase their shielding gas from a reputable welding distributor and be certain that it meets the purity requirements for their application. All gas delivery systems should be free of contaminants that could enter the weld puddle and welding operators should use the correct shielding gas flow rate. Too little gas flow won’t properly shield the molten weld pool, while too much flow can cause turbulence and aspirate air into the weld puddle. Protecting the weld puddle from drafts is also critical.

Mistake No. 7: Purchasing Filler Metals Based on Cost Only
Purchase of less expensive filler metals can often lead to greater long-term costs and lower productivity levels. It is not uncommon, for example, to experience downtime associated with poor wire feeding, excessive spatter or, potentially, weld defects when using lower quality filler metals. Companies may also find themselves spending an excessive amount of time for non-value-added activities, such as applying anti-spatter and post-weld grinding or rework. For that reason, it is important to look at the total cost of using particular filler metals, as opposed to the per-unit cost.

Mistake No. 8: Improper Weld Preparation
Skipping steps in weld preparation can lead to weld defects, rework or scrapped parts. Welding operators should always take care to clean the base material before welding to prevent contaminants like dirt, oil or grease from entering the weld puddle. Similarly, monitoring part fit-up is a critical part of the pre-weld process. Welding operators should carefully assess the weld joints to ensure there are no excessive gaps, as poor part fit-up can lead to issues like burn-through or distortion on all materials, but particularly when welding materials like aluminum or stainless steel. Clamping or fixturing a part in the correct position is also a good practice to help protect materials like stainless steel against distortion or buckling.

Mistake No. 9: Disregarding MIG Gun Consumables
Overlooking the importance of MIG gun consumables can lead to a host of problems like rework of weld defects caused by a poorly performing contact tip, nozzle or liner. Welding operators should always select the appropriate style of nozzle for their application to ensure good shielding gas coverage, properly trim and install their liners according to the manufacturer’s recommendations, and select a contact tip that corresponds appropriately with their welding wire diameter. As with filler metals, companies should also avoid the temptation to purchase less expensive, lower quality consumables.

....continued on Page 10
Welding of 254 SMO

INTRODUCTION
Alloy 254 SMO is an austenitic stainless steel designed for maximum resistance to pitting and crevice corrosion. With high levels of chromium, molybdenum, and nitrogen, 254 SMO is especially suited for high chloride environments such as brackish water, seawater, pulp mill bleach plants and other high chloride process streams. 254 SMO offers chloride resistance superior to that of Alloy 904L, Alloy 20, Alloy 825 and Alloy G. This alloy is compatible with the common austenitic stainless steels. It is often used as a replacement in critical components of larger constructions where Type 316L or 317L has failed by pitting, crevice attack, or chloride stress corrosion cracking. In new construction, 254 SMO has been found in many cases to be a technically adequate and much less costly substitute for nickel based and titanium alloys. 254 SMO is substantially stronger (Tensile Strength 650 MPa, Yield Strength 300 MPa) than the common austenitic grades, but is also characterized by high ductility and impact strength with excellent workability and weldability.

CHEMICAL COMPOSITION
It has already been indicated that this alloy contains high levels of chromium, molybdenum, and nitrogen. Nominal composition is given below:

<table>
<thead>
<tr>
<th>Chemical composition (nominal) %</th>
</tr>
</thead>
<tbody>
<tr>
<td>C max</td>
</tr>
<tr>
<td>0.020</td>
</tr>
</tbody>
</table>

Cr 20 Ni 18 Mo 6.1 N 0.20 Cu 0.7

TYPICAL APPLICATIONS
254SMO is extensively used for the fabrication of the following equipments:

i. Seawater handling equipment
ii. Pulp mill bleach systems
iii. Tall oil distillation columns and equipment
iv. Chemical processing equipment
v. Food processing equipment
vi. Desalination equipment
vii. Flue gas desulfurization scrubbers

WELDING
Welding of 254 SMO should be undertaken without preheating, and if correctly performed there will be no need for any subsequent heat treatment. Suitable methods of fusion welding are manual metal-arc welding with covered electrodes and gas-shielded arc welding, mainly by means of the TIG and MIG methods.

Since the material is intended for use under severe corrosion conditions, welding must be carried out with care and followed by thorough cleaning to ensure that the weld metal and the heat-affected zone maintain the best possible corrosion properties.

The heat input during welding should not exceed 1.5 kJ/mm, and in multi-pass welding the interpass temperature should not exceed 100°C. A stringer bead welding technique should be used.

The welding of fully austenitic steels usually entails a risk of hot-cracking in the weld metal, particularly if the weldment is under constraint. However, since 254 SMO has a very high degree of purity, the risk of this type of cracking is greatly reduced. Backing bars or similar devices of copper alloys must not be used since copper penetration into the grain boundaries in stainless steel can lead to cracking.

In common with all austenitic stainless steels, 254 SMO has low thermal conductivity and high thermal expansion. For this reason, welding should be carefully planned in advance so that distortion of the welded joint can be minimized. If, despite these precautions, it is believed that residual stresses may impair the function of the weldment, it is recommended that the entire structure be solution annealed.

In the as-supplied condition, the material has a homogeneous structure. Welding without filler metal leads to structural changes that reduce corrosion resistance. Such welding should be followed by......continued on Page 10
Powermax105® - A Powerful plasma system for Cutting and Gouging metal

The Powermax105 system from Hypertherm delivers best-in-class productivity with low operating cost in an easy-to-use, powerful air plasma system. The easy set-up and operation of the Powermax105 increase productivity and user confidence. The Duramax™ series of torches and consumables provide unparalleled versatility in handheld, mechanized and now robotic applications, with improved cut quality, speeds and consumable life.

DESCRIPTION
A special value-added system configuration has been created to include accessories in the system box to offer additional value to customers. Three configurations were created to combine a standard 75° hand torch with:

- The Duramax 15° hand torch
- The Duramax 180° mechanized torch
- Plasma Cutting Technology for educational institutions.

The Powermax105 enables end users to do more than ever before with a host of innovations for air plasma cutting and gouging. It offers:

- more productivity with lower operating cost – faster cut speed, improved cut quality, and longer consumable life deliver more performance with less cost.
- better reliability – smart design and intense testing for bulletproof performance.
- improved torch durability - unsurpassed heat and impact resistance with more robust internal design.
- easier to use – simple controls, greater portability (33% smaller, 15%-30% lighter) and automatic gas regulation.
- more versatility – innovative torch designs, including new Duramax Robotic torches, and system features for use in more applications.

ADDITIONAL FEATURES
Some of the additional features of Powermax105 are as follows:

Maximum productivity - Fast cut speeds: three times faster than oxyfuel on 12 mm (½”) mild steel

Easy-to-use for cutting and gouging - Smart Sense™ technology automatically sets correct air pressure based on torch length and operating mode and improved shield reduces dross buildup and enables smoother drag cutting

Withstand harshest conditions - high impact and heat-resistance, ensures consistent starting and low maintenance for maximum uptime

Low operating cost - Long consumable life, high power efficiency lowers energy consumption.

RECOMMENDED CAPACITY AND TECHNICAL SPECIFICATIONS
Recommended capacity for Handheld cut

<table>
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<th>Capacity (80% duty cycle at 40° C)</th>
<th>Thickness</th>
<th>Cut Speed</th>
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<tr>
<td>Recommended</td>
<td>1-1/4&quot; (32 mm) (mm/min)</td>
<td>20 ipm (500)</td>
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<tr>
<td></td>
<td>1-1/2&quot; (38 mm)</td>
<td>10 ipm (250 mm/min)</td>
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<tr>
<td>Severance</td>
<td>2&quot; (50 mm)</td>
<td>5 ipm (125 mm/min)</td>
</tr>
<tr>
<td>Pierce</td>
<td>7/8&quot; (22 mm)*</td>
<td></td>
</tr>
</tbody>
</table>

* Pierce rating for handheld use or with automatic torch height control
Gouge capacity

<table>
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<th>Metal removal rate</th>
<th>Groove profile</th>
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</thead>
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<tr>
<td>21.7 lbs. (9.8 kg) per hour</td>
<td>0.25” (6.4 mm) D x .29” (7.4 mm) W</td>
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</tbody>
</table>

**CONCLUSION**

The Powermax105 is built to meet the needs of a wide variety of industries and applications. From heavy duty handheld cutting and gouging, to pipe beveling, automated track, x-y table and robotic cutting, the Powermax65, Powermax85 and Powermax105 are the most capable and versatile air plasma systems available.

**Mistake No. 10: Overlooking Training Opportunities**

Investing time and money in training can yield significant long-term benefits for companies. Not only do welding operators benefit individually from process and equipment training, but in many cases it can also help them optimize the welding operation for greater efficiency. Typically, training opportunities are available through equipment and filler metal manufacturers or through welding distributors. In some cases, working with a local technical college can lead to training for specific applications and markets, allowing companies to bring in welding operators who are already trained for a given application and better promote their position in a given industry.

**Technical Lecture Series - VI**

Welding of Stainless Steels - A technical lecture series on Welding of Stainless Steel with emphasis on metallurgical aspects of Stainless Steels and role of shielding gas is being organized by The Indian Institute of Welding – Foundation. The lecture series is aimed at dissemination of technical information related to arc welding of stainless steels. The speaker is Mr. Fred A. Schweighardt, Senior Welding Applications Specialist, Air Liquide Industrial, USA. He is Chairman of AWS C5 Recommended Practices Committee on Arc Welding and Arc Cutting. He is an international authority on welding and use of shielding gases.

The lecture series is being held from 15th to 23rd January, 2013 at New Delhi, Kolkata, Chennai, Pune, Mumbai, Vadodara and Surat.

If you are involved in welding of stainless steel in any capacity then this programme is for you. You will gain vastly from the experience and knowledge of the world renowned expert. The contents have been specially designed for welding technologists, engineers, managers, consultants and academicians. You are requested to contact the local branch of the IIW-India for registration.
Swinging Indian Steel Policy*

Production of finished steel in India rose by 2.6% to 37.3 million tonnes (mt) during the first half of 2012-13, as per data released by the Joint Plant Committee. The growth in production is much lower when compared to the 14.4% growth registered during the corresponding period last year. The mining ban in Karnataka had resulted in limited availability of iron ore, thereby impacting steel production.

The demand for steel however rose at a faster pace than production during the first half of 2012-13. Domestic finished steel consumption rose by 5.1% to 36.6 mt during the period. “With easing of supply constraints, we expect the growth in finished steel production to accelerate to 7.6% during the second half of 2012-13. This is likely to translate into a 5.1% growth for the year,” Centre for Monitoring Indian Economy (CMIE) said in its November 2012 bulletin.

Domestic steel companies reduced prices by one to two per cent across product categories during October 2012. Weakness in international prices, subdued demand, rise in imports and a strengthening of Indian rupee weighed in on prices during the month. Moreover, growth in consumption is expected to gather pace in the coming months with a pick-up in demand from the construction sector. “We expect finished steel consumption to rise by six per cent during 2012-13,” CMIE said.

To increase the steel production Steel Authority of India Ltd (SAIL) has entered into a joint venture with Kobe Steel, Japan. SAIL expects to begin construction work within a year on the 50:50 iron making joint venture. The JV - named SAIL-Kobe Iron India - envisages a 500,000 tons per year iron nuggets plant incorporating Kobe’s ITmk3 technology. The production unit will be situated in SAIL’s alloy steel works at Durgapur. The necessary approvals for environmental clearances are under progress and in less than one year the company should be in a position to start the project, sources said. The timing is in line with Kobe’s earlier expectations of beginning construction work in 2013 and commercial operations in 2015.

In a proposal, the steel ministry said that setting up of UMSPs were imperative to bridge the widening demand supply gap of the metal, which is leading to rise in its imports. It had proposed for setting up of a Steel Finance Corporation (SFC) as a special purpose vehicle on the lines of Power Finance Corporation to help set up mega steel plants on a fast track basis in the next few years. According to the proposal, the SFC would have an initial corpus of INR 1,500 crore and it would be conferred the status of a non banking finance corporation. Each state would have a SPV for an UMSP and would part-finance setting up of such a plant. According to the ministry’s proposal, each UMSP will come with a yearly capacity of at least 10 million tonne in Orissa, Jharkhand, Maharashtra and Chhattisgarh. However, commenting on the proposal, the land resources department of the rural development ministry contended that since land is a limited source, its optimum utilization is of paramount importance. The ministry said, “The suggestion of minimum capacity for a steel plant is good as it would lead to lesser requirement of land in comparison to various plants of smaller capacity.” The coal ministry too discouraged setting up of UMSPs with one of its top officials writing to the steel ministry that given the paucity in the overall availability of coal, it would not be possible to consider grant of special status to these plants for priority allocation of linkages as has been demanded by the steel ministry. The mines ministry, while shooting down the steel ministry’s demand for granting captive iron ore mines for UMSPs, said that assured supply of iron ore can happen through a separate linkage policy. Instead it has made out a strong case for setting up Ultra Mega Mining Projects.

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When asked how much educated men were superior to those uneducated, Aristotle answered, ‘As much as the living are to the dead.’ - Diogenes Laertius
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