WELDING INDUSTRY IN INDIA: CHALLENGES & APPLICATIONS

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ABSTARCT

In this paper,'Welding' under the theme of innovation, challenges and applications in India provided an excellent opportunity for engineers, speakers and participant's to showcase and understand the advancement of welding in manufacturing and different nation-wide infrastructure. The increasing investments in the oil and gas industry are leading to the construction of new gas manufacturing facilities and new pipelines. This is expected to create a demand for welding consumables in India. The repair of existing oil infrastructure will also aid in the growth of the market. Similarly, a surge in infrastructural development activities will help drive the welding consumables market in India. The construction of residential and commercial buildings in the future is expected to create heightened demand for welding consumables. The automotive industry is also witnessing a growth in the past few years owing to growing population and improved lifestyles, translating into higher demand for automobiles. This is fueling the demand for welding consumables in India.

Keywords: *welding industry, welding equipment,Indian market, welding consumables.*

INTRODUCTION

Welding is a precise, reliable, cost-effective, and high-tech method for joining materials in manufacturing industries. In fact, no other technique is so widely used by manufacturers, in India, to join metals and alloys efficiently to add value to their products. Most of the familiar objects in modern society, right from buildings and bridges, to vehicles and medical devices, could not be made without the use of welding.Welding today is applied to a wide variety of materials and products, using such advanced technologies as lasers and plasma arcs. The future of welding holds even greater promise as methods are devised for joining dissimilar and non-metallic materials, and for creating products of innovative shapes and designs. Welding is the core of modern technology and it has gone through a complete evolution today, following the utmost precedence that machines have garnered in our lives. There is a rapid development in this industry and new methods are being discovered and added day by day. Welding is an ever growing discipline which presents challenges and work opportunities for new generations of engineers. The Indian welding industry was dominated by low technology and very rare technological innovation. However, in recent years, the demand of automatic and semi automatic welding production systems are rising. However, economic crisis has impacted the flow of FDI in India which may result in decline in demand of welding equipment over the short period. There has been an overall growth of about 10% in steel industry in India. The rising demand of steel has promoted the use of modern, unique, uses of steel, increasing the demand of welding equipment.

INDIAN WIELDING INDUSTRY

One of the big challenges faced by the local manufacturers of equipment in India is the considerable import of welding equipment.The increased imports has negatively impacted the market share of local participant in various industries such as shipbuilding, automotive and transportation and white appliances.Another challenge faced by welding electrode plant is the unorganized sector that presently occupies nearly 50-55% of the market. Lack of standard specification and tedious approval process is resulting in the growth of unorganised sector.Indian welding consumables and equipment manufacturers need to produce high quality and unique goods in order to stay competitive in Indian and international markets.With increasing competition and lower profit margins, manufacturers need to improve their service, performance and delivery.

The Indian welding industry was dominated by low technology and very rare technological innovation. However, in recent years, the demand of automatic and semi automatic welding electrode production machine has been rising. Simultaneously, low budgets and recession have marked the ongoing popularity of manual, economical techniques. Increased FDI equity inflow in India has contributed to the rise in projects in offshore activities, oil and gas sector, aerospace and heavy machinery industries. Many foreign automobile companies have set up their manufacturing units in India. This has positively affected the rise of consumables and welding equipments. However, economic crisis has impacted the flow of FDI in India which may result in decline in demand of welding equipment over the short period. There has been an overall growth of about 10% in steel industry in India. The rising demand of steel has promoted the use of modern, unique, uses of steel, increasing the demand of welding equipment.

One of the big challenges faced by the local manufacturers in India is the considerable import of welding equipment. The increased imports has negatively impacted the market share of local participant in various industries such as shipbuilding, automative and transportation and white appliances. Another challenge faced by welding electrode plant is the unorganized sector that presently occupies nearly 50-55% of the market. Lack of standard specification and tedious approval process is resulting in

the growth of unorganised sector. In order to remain competitive, Welding Electrodes Machine Manufacturers India need to produce high quality and unique goods. With increasing competition and lower profit margins, manufacturers need to improve their service, performance and delivery.

ENERGY, SHIPBUILDING AND CIVIL CONSTRUCTION TO BOOST LONG-TERM EXPANSION OF INDIAN WELDING MARKET

The Indian welding market is dominated by the use of manual welding equipment. However, this situation is expected to change as several end-user industries have started demanding automated equipment to support higher productivity. Robust expansion of the Indian shipbuilding, construction and energy, particularly wind power sectors will underline strong growth of the Indian welding market over the medium- and long-term. "While the financial meltdown has adversely affected most end user industries for welding equipment in India, energy, construction and shipbuilding sectors have, to a large extent, been recession-proof and have been generating moderate demand," notes the analyst of this research. "A key driver boosting market revenues has also been the gradual move from manual to automatic and semi-automatic welding equipment."

The welding industry in India has generally been low technology with infrequent innovation. However, the adoption of automatic and the semi-automatic welding systems has been rising in recent years. At the same time, the recession and reduced budgets have underlined the continued popularity of economical, manual techniques. Enhanced foreign direct investment (FDI) equity inflow in India has supported projects in the oil and gas sector, offshore activities, aerospace and heavy machinery industries. Several foreign automobile companies have established their manufacturing base in India. Such trends have had a positive impact on the uptake of welding equipment and consumables. However, the recession has affected the flow of FDI into the country. Hence, demand for welding equipment in India is expected to decline over the short- term. Although global steel demand slumped in the past year, India's steel market has experienced nearly 10 per cent growth. The spiralling demand for steel is promoting the use of innovative, state-of-the-art uses of steel while triggering the uptake of high volumes of welding equipment.

One of the major challenges faced by the local market in India is the substantial import of welding equipment. With expanded imports, the market share of domestic participants is continually declining in several industries, especially automotive and transportation, shipbuilding and the white appliances. Another challenge faced by Indian welding equipment manufacturers is the unorganised sector that currently occupies close to 50 to 55 per cent of the market. This sector is growing due to the lack of clear specifications and tedious approval process. "To be competitive, welding manufacturers need to provide standardised goods with a focus on product differentiation," advises the analyst. "With lower profit margins and intensifying competition, manufacturers have to improve on their service, performance and delivery."

Another challenge will be to optimally integrate distributors and dealers within a complete solution model. The technical capabilities of distributors will be vital in any solution-oriented strategy. With advanced technologies and sophisticated machines, it is critical that there be trained experts in key identified regions. "Manufacturers should improve their service portfolio and broaden their market reach," concludes the analyst. "They should increase their penetration into new end user industries such as wind and nuclear power and traditional end user industries such as fabrication and automotives as well as explore opportunities in other general industries which have only lately moved to higher automation levels."

FOUR COMMON CHALLENGES TO ADDRESS BEFORE AUTOMATING THE WELDING OPERATION

For first-time users, welding automation can seem intimidating. When making the investment, it is important to plan the purchase carefully and to implement some best practices in order to achieve the best results. Starting out with simple equipment, getting the appropriate buy-in, and analyzing part volume and workflow are all critical.

A robotic welding system can help companies improve efficiencies, eliminate waste and produce better products — as well generate greater profitability and competitiveness. For those new to automation, it is important to plan carefully before purchasing a system and follow some best practices to gain the most out of the investment. Here are some key challenges to consider when automating a welding operation, along with recommended solutions.

1. Start simply and carefully

It is also imperative to tackle each welding automation project one step at a time. Start by automating production of simple, repeatable parts and then move to more complex ones. For example, consider a heavy equipment manufacturer investing in a welding robot for the very first time. This manufacturer would be better served to automate the welding of sub-assemblies for a backhoe frame first, as opposed to investing in a robotic welding system that welds the entire frame.

For first-time users, pre-engineered robotic weld cells are often the best option. These systems are an easy-to-use solution that includes all the equipment needed for robotic welding — pre-wired and pre-assembled. They are also a better alternative than

buying a used system and trying to retrofit it. Often used systems do not meet current safety standards, which can create a host of unforeseen, and potentially costly problems.

2. Gain buy-in and input

It is important to have buy-in and gather input from management and from welding operators, in order to make the investment in a robotic welding system successful. These two groups, respectively, are responsible for approving the purchase and making it operate as efficiently as possible.

Before gaining buy-in from welding operators, help them understand the opportunities a robotic welding system presents. Some welding operators fear welding automation will ultimately make their jobs obsolete. The truth is, skilled employees are becoming harder to find in the United States as more manufacturing companies fight to stay competitive, particularly with manufacturers abroad.

Robotic welding systems actually provide welding operators the chance to learn new skills and become more valuable by helping the company grow. In some cases, the technology also opens up the opportunity for promotion and long-term career advancement. Not only can welding operators become robot programmers — an excellent way to expand their skill sets and viability — but robotic welding systems can also free up skilled operators for manual welding of more complex welds.

3. Determine part mix and fit-up

Some parts are not well-suited for automation because they require a high degree of operator input. For example, a part with a very tight access point that requires manipulating the gun in a small, confined space would not be a good fit for automation; there would be difficulty gaining joint access with the robotic MIG gun.

High-volume, low-variety applications are very well-suited for automation, as they require minimal considerations when it comes to tooling changes. However, if small batches of product can utilize a quick tooling change, it is possible to produce a low volume part efficiently, too. Timing is everything in this situation — if it takes a welding operator an hour to change the tooling for 10 welds he or she could easily complete by hand in the same amount of time, then it's smarter to do them by hand.

It is important to note that once a program is in the robot, it's always there. So, although there is an investment of time up front to create the program, it is simple to recall for future use on both larger and smaller volume part runs.

4. Analyze workflow

A robot welding system can increase throughput significantly, but ask these questions before implementing one. Are the rest of the operations ready for the gain in throughput? Can upstream manufacturing processes continue to deliver the necessary quantity to the robot? Can downstream processes — such as paint, packaging or assembly — handle the higher production? When looking at the flow of parts in a welding operation, it's critical to consider the whole picture.

Ensure that any rework required of the part before entering the weld cell has been eliminated from the process and the employees supplying parts to the robot can match its cycle time.

Ask these questions ahead of implementation and plan accordingly so that everything continues to flow smoothly. No company can benefit from welding automation if the operation simply consists of moving a bottleneck from one department into another; it is possible to miss out on the overall productivity and efficiency a robotic weld cell can deliver.

CONCLUSION

Welding automation is an investment on both sides: in technology and in employees. The trick is to find a balance between reducing waste (material and money) and increasing productivity and quality, which should be done incrementally. Ideally, the physical and human capital grows in unison. That means training robotic weld cell operators so they can use the robot most effectively to boost productivity and quality. To determine if welding automation is the right choice, it's important to ask one key question: Are the parts good for a robot? The best options are simple, repeatable parts with minimal gaps. Always have a robotic integrator or robot OEM evaluate the part to determine its suitability, as doing so up front can minimize unnecessary and expensive issues. Part evaluation is often as simple as providing an electronic CAD drawing for review of the part. Always remember, any investment in the welding operation should be made with care. Consult a trusted robot OEM, integrator or manufacturer for assistance.

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