
Indian Welding : From Manual to Moon Probe

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INDIA TODAY

The present industrial scenario in India is moving very fast and the growth is reaching 8 to 10%, with a steel production of 50 million tons which is expected to reach 80 million tons by 2010.

In India most weld metal is deposited by the Shielded Metal Arc Welding (SMAW) process while the trend is to use more and more Gas Metal and Flux Cored Arc Welding (GMAW / FCAW) processes, using solid flux cored or metal cored wires for increasing overall productivity on the shop floor. With increasing global competition, India's fabricators have become more quality conscious, and many of them have achieved ISO 9000 or ASME U Stamp certification.

Welding in India has come to play a vital role in the growth and development of a variety of important sectors of the economy such as thermal, hydro, nuclear and wind power generation, petrochemicals, offshore drilling, steel plants, industrial machinery, heavy engineering, ship building, transportation, fertiliser, oil and water pipelines and ultimately space technology.

The Moon Impact Probe, one of the 11 payloads of Chandrayaan-1 spacecraft, is the first Indian-built object to reach the surface of the moon and was completely fabricated at the Indian

Space Research Organisation (ISRO). The Chandrayaan-1 spacecraft was launched on 22 October 2008 and entered the lunar orbit on 8 November 2008.

WELDING TECHNOLOGY

Besides electrodes for manual Metal Arc Welding (MMAW) which constitute over 80% of welding in India, Indian manufacturers have developed consumables to match stringent metal joining and metallurgical needs. These include wire-flux combinations for submerged-arc welding, filler wires for GMAW welding and flux-cored wires for FCAW.

The industry has developed processes and systems for mechanised welding which are used with advantage in automobile manufacturing, offshore fabrication, rail wagon building and so on. Heavy engineering companies like L&T, Walchandnagar Industries Ltd., Texmaco Ltd., Bharat Heavy Plate Vessels Ltd. and Bharat Heavy Electricals Ltd. have fabricated some of the most gigantic and critical weldments, involving exotic materials and modern production methods.

The industry has transformed itself to meet the challenges of India's internal needs in the areas of conventional and nuclear power industries, chemical and petrochemical plants, high performance

components for defence and aerospace industries, and the automobile sector.

Indian capabilities are among the most competitive on a global level and goods manufactured in India are now sought after. Indian manufacturing technology is poised to play a major role worldwide in the next few years and beyond. Technological leadership, however, places stringent demands on upgrading and expanding knowledge and innovation, requiring continuous feedback between these two processes.

Materials joining technologies are the key to manufacturing, since most often joining is the vital link between raw material and finished component. Welding appears in the manufacturing cycle at locations that are crucial to the quality and functionality of the component. Materials, manufacturing processes and quality assessment are but different facets of quality management in an organisation. Continuous innovation and upgrading knowledge are part of any effective strategy for quality management. With the manufacturing sector becoming more broad-based, the use of a wide variety of materials becomes inevitable.

EMERGING TRENDS AND NEEDS

SMAW and GMAW together constitute more than 85% in terms of deposited weld metal for joining in India. The

relative share of these two processes in the total welding activity varies from country to country, depending on the state of technological advancement in the entire engineering industry. While the share of SMAW in the USA, Europe, Japan and Korea has declined progressively to the low level of 15 - 20%, India will have to reckon with a level of about 65% despite the rapid growth in the employment of the continuous wire processes. Obviously, this can be attributed to the very large proportion of small and medium size fabricators.

The total weld metal requirement is expected to rise to about 300,000 tonnes per year. This implies a wider use of mechanisation, automation and robotics and hence demand for a more knowledgeable workforce.

On a conservative estimate there will be a need for 3,000+ qualified technicians to handle all the activity. What is the availability? This particular issues calls for joint efforts by professional bodies, academic institutes, the All India Council for Technical Education (AICTE) and the welding industry.

Apparent steel demand in the year 2006 rose by about 10% in India and about 14.4% in China. The projected annual growth in demand is :

Period	Global	India	China	Others
Till 2010	4.9%	7.0%	8.4%	4.0%
2010-15	4.2%	7.7%	6.6%	-

Due to rapid technological advancement, India today is self sufficient in welding technology and welded products and services can easily be exported to Australia as there are no constraints as such. The cost of the exported item will be cheaper because labour cost is significantly lower in India than in Australia. As at present, India is exporting to Middle East countries and also place like Germany and the USA.

India is now part of the global market, and there is no restriction on imports, from Australia. India is importing from China, Japan, Korea and, in special cases from the USA and UK, depending on the price and the landed cost.

As regards training of welding personnel, we at the Indian Institute of Welding with eleven Branches spread over the country are regularly conducting courses and arranging training round the year. We are also running Diploma course in all Polytechnics spread all over India nearly 2200 centres. There is also a Welding Post Graduate Diploma Course at the Indian Institute of Technology offered at Kharagpur, Kanpur, Delhi, Mumbai and Chennai and also Master of Science Degrees in a few Universities.

The Indian Institute of Welding has been accredited the status of an Authorised National Body (ANB) for training and certification of welding personnel by the International Institute of Welding and Diplomas awarded by us are acceptable to all over the world. The Indian Institute of welding also conducts Associate Membership-IIW Examinations twice a year which is equivalent to a Bachelor or Engineering Degree as approved by the Ministry of Human Resources Development, Government of India.

CONCLUSION

Although India's economic success is probably not dependant on growth in the West, most analysts agree that the current global economic crisis will impact the growing service and manufacturing sectors. At worst, however, India's growth rate may be less than the Indian Government target of 10% and this nation of 1.148 billion people will remain a significant player in the world welding arena.

The sheer size of the Indian domestic market means that manual welding methods are still employed in a large number of small and medium sized businesses, however the welding industry in India has attained a very high level of sophistication which enables it to support high level technology applications as well as compete successfully at a global level.

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