

REWEEL
TWO-DAY WORKSHOPS
ON
**EMERGING LEARNING IN THIN SHEET JOINING
RESISTANCE WELDING & MIG BRAZING**



5 - 6 October 2015

FRONIUS INDIA TECHNOLOGY CENTER, CHAKAN, PUNE

9 - 10 October 2015

IC & SR AUDITORIUM, IIT MADRAS, CHENNAI



IIT Madras, Chennai



DYPIET, Pune

INTRODUCTION

The automotive industry is in a new era of greater to sustain its leadership and to sustain growth and capacity management. There is a need to adapt to the changing environment. As the market demands superior performance, higher speed, low fuel consumption, more comfort, more safety and improved aesthetics, designers are looking for new lighter materials with better weight to strength ratios with ease to fabricate. The automotive manufacturers have started to use thinner grades of various Advanced High Strength Steel (AHSS), Ultra High Strength Steel (UHSS) grades, Dual Phase (DP) steels, TRIP (Transformation Induced Plasticity) steel and so on. HSLA (High Strength Low Alloy) steel offers a combination of high strength and good weldability.

Besides, changes in the auto body structure design are also promising; typical examples of such promising measures are the use of tailored blank (TB) and hydro-forming (HF) components. As these efforts advance, the hurdles that welding has to overcome are increasingly higher and new technologies for joining them are being developed. Both car weight reduction and enhanced collision safety can only be achieved through improved reliability of weld joints, by optimising the chemistry and metallographic structure of high strength sheets and developing new welding processes (power supply and work methods). Welding methods for automotive industry must be able to achieve high production rates, provide superior quality weldments, be easily mechanised with short set-up times, have the flexibility to accommodate design changes and maintain acceptable working environment standards. The excellent physical material characteristics of these latest generation steels are derived from heat treatment processes. It follows that the steels are more easily affected by heat, hence they cannot be readily MIG welded, and spot welding is possible. Hence, Resistance welding and MIG brazing are gaining momentum as candidate processes for joining thin sheets. The trends in welding technology both in the existing and new processes that are gaining entry into production of automotive industry are to be taken to production shops for achieving sustained quality and enhanced productivity, especially in the context of India, where almost all automotive manufacturers in the world have set their base. The workshop is intended to serve this purpose of taking the technologies to the shop floors effectively.

RESISTANCE WELDING

Almost all variants of Resistance Welding (RW) processes are widely used in the high-volume manufacture of sheet metal products and the automotive industry has relied on RW as a principal joining method for many decades. A typical car contains at least 2000 to 3000 Resistance Spot Welds (RSW). The advantages of RSW in high volume automotive manufacturing include less expense (per-weld cost), speedy process (< 1 second per weld), easy automation (flexible process), no per-weld consumables (i.e. no issues of piece-cost, inventory, additional weight or recycling difficulties) and low training costs (as in manual operations).

In the recent past, a host of developments are taking place in the RW processes viz., MFDC, Robotic RW, Deformation RW, Modified Projection Welding, to name a few. The use of robotic spot welding is increasingly being used in automotive industry extensively. The speed, precision, efficiency, and the resulting cost reductions afforded by automated resistance spot welding are well documented and accepted, particularly in the automotive industry. However, industry requires that even the most mature solutions continue to evolve. Robotic welding plays a key role in enabling car companies to keep pace with demand for new, more technologically advanced, higher quality products. Automakers are looking for robots with greater repeatability and weld requirements down to ± 2 mm.

As the demands on spot welding applications increase during the manufacture of automobiles, end-users exploring all of the new technologies to help make better products for their customers. Advancements in both AC and DC (inverter-type) weld controllers and the coming of servo gun technology will all help expand welding applications for difficult materials, such as thin or exotic metals. These new technologies are much more capable of dealing with those materials.

The use of single-source control for multiple robots is also emerging. Capabilities have been developed to control up to four robots from a single controller and teach pendant. This lets the robots work closely together without concerns about them colliding. It also provides a safer work environment with all robots under the sole control of a single pendant.



The concept of using a robot to manipulate parts for pedestal-type welding machines has been widely used by many of the Japanese automotive parts suppliers. Once a part is tack welded in a fixture, it can be "passed" between stations by multiple robots.

Resistance spot welding systems which are based on medium-frequency inverters are recently gaining in importance and are being used for welding of steel sheets. The energy can be effectively utilized for spot welds at lower current levels with desired nugget size in Medium Frequency Direct Current (MFDC). With the established parameters for weld lobe, current is the most influencing factor in achieving the wider welding window in MFDC. In general, MFDC process saves 20% of the total energy. MFDC can be the adaptive welding technology for welding of thin sheets in RSW process. Medium Frequency Direct Current (MFDC) technique offers automatic load distribution in which 3 phase current drawn from the capacitor that are used in the system and also from the mains, thus reducing the peak current.

GMA BRAZE WELDING

Welding Processes of GI sheet Welding is a fabrication or sculptural process that joins materials, usually metals or thermoplastics, by causing fusion, which is distinct from lower temperature metal-joining techniques such as brazing and soldering, which do not melt the base metal. In addition to melting the base metal, a filler material is often added to the joint to form a pool of molten material (the weld pool) that cools to form a joint that can be as strong as the base material. Pressure may also be used in conjunction with heat, or by itself, to produce a weld.

Welding of galvanized steel is done almost exactly the same way as welding of the bare steel of the same composition; the same welding processes, volts, amps, travel speed, etc. can be used with little modification when the switch is made from uncoated steel to galvanized steel - unless the zinc coating is unusually thick.

An extension of the GMA process, GMA braze welding utilises a filler metal with a lower melting point than the parent metal. The joint relies neither on capillary action nor on intentional melting of the parent metal. Shielding gases of argon / oxygen type are the most suitable, the low oxygen level being sufficient to permit excellent edge wash and a flat weld without causing surface oxidation. The low heat input minimises damage to the coating on the underside of the parent plate, enables the corrosion resistant bronze filler to cover any of the coating damaged by the arc, and minimises the level of distortion when welding sheet metal components. Finishing costs of sheet metal components such as automotive panels can therefore be reduced substantially

Cold Metal Transfer (CMT) is a welding process developed by Fronius Welding, Austria. The process is based upon conventional Dip Transfer MIG welding where material deposition is initiated at the point of short circuit of the wire electrode into the molten weld pool. However, whereas traditional welding processes are controlled electrically CMT employs an innovative wire feed system, integrated to a high speed digital control which controls material transfer and the amount of thermal input to the work piece.

CMT is characterised by an arcing period during which both the work surface and the wire electrode are heated. The molten electrode is then fed forward to make contact with the work surface. At the point of short circuit the welding current is cut practically extinguishing the welding arc and hence limiting the amount of heat transferred to the work piece. After a defined short circuit duration the electrode is mechanically retracted pinching the molten droplet from the end of the electrode. The arc is then re-ignited and the process repeats. This hot cold, arc on arc off cycle is repeated up to 70 times per second depending on welding parameters employed. When compared to conventional MIG welding processes, CMT exhibits a high wire melting coefficient requiring in the region of 20 – 30% less thermal energy for welding. Although suited to a range of welding applications, notably thin aluminium, when considering arc brazing the process offers single sided access, with reduced part distortion - due to low thermal input, minimal weld spatter - greatly reducing the requirement for rework, and good gap bridging capabilities.



REWEEL 15

WELDING RESEARCH INSTITUTE (WRI), Bharat Heavy Electricals Limited (BHEL), and **INDIAN WELDING SOCIETY (IWS)** are jointly organising this series of two-day Workshops on “**RESISTANCE WELDING – EMERGING LEARNING**” (REWEEL 15) with the theme *Emerging Learning in Thin Sheet Joining – Resistance Welding and MIG Brazing* at Pune and Chennai.

REWEEL 15 is organised with the support of **The Indian Institute of Technology Madras, Chennai** and the **Dr. D. Y. Patil Institute of Engineering & Technology (DYPIET), Pune**.

REWEEL will deliberate on the recent trends in resistance welding processes and the MIG Brazing. Thanks to the support of DVS, German Welding Society, and faculty supported by the **German Welding Institute, GSI SLV Duisburg, Germany**, and expert from **Fronius, Austria**, the first workshop in this series will be held at **Pune on 5-6 October 2015** and the second at **Chennai during 9-10 October 2015**.

Mr. Stefan Schreiber, Deputy Head of Department of Materials and Process Engineering, GSI SLV Duisburg, Germany, will be the key speaker of the workshop. The lectures during the workshop will provide full coverage of all important topics on materials, welding equipment, innovations and the latest industrial applications in resistance welding. The topics will also cover the recent developments in resistance welding with special emphasis on adaptive control technologies and applications for welding of challenging materials e.g. aluminium alloys and advanced high strength steels etc., as well as new achievements on inspection of weld quality. There would be a session from the leading experts in the Indian industry.

Fronius, Austria have agreed to join in with their automotive welding expert to deliver lecture on MIG Brazing and its advancements and some of the best practices being employed by the Automotive Sector in Europe.

There will be a session on Q&A on issues faced by industry in resistance welding and also on MIG Brazing. The participants are requested to send the issues to be discussed well in advance along with the registration forms to the organisers.

PROFILE OF THE KEY SPEAKER

Mr. Stefan Schreiber is from GSI SLV Duisburg, Germany, which is the largest of the ten training and educational institutes for welding engineering in Germany; and one of the largest and most important welding engineering institute in the whole of Europe. They have about 215 employees, including 31 engineers.





SLV Duisburg works on Education and examination, quality assurance, construction surveillance, manufacture qualification, destructive and non-destructive testing and research. In Duisburg, about 200 people can be trained practically. They have about 600 seats in their 16 lecture rooms in Essen, Gelsenkirchen, Kamen-Heeren-Weve, Oberhausen, Wesel and Wuppertal.

The Resistance Welding Facilities (3 labs with about 50 different machines) and expertise at SLV Duisburg includes Spot Welding (RSW), Projection Welding, Roller Seam Welding, Pressure Butt Welding, Flash Butt Welding, and associated processes such as Stud Welding and Mechanical Joining Processes (Clinch, Tox,...). Automotive industry personnel from all major OEMs, such as Audi, Volkswagen, Mercedes Benz, Porsche and their suppliers are regularly trained and certified through one or three week resistance welding trainings in SLV Duisburg, Germany. It is actively associated with optimization of resistance welding equipment, quality standards and evaluation of resistance welding controllers and machinery from all over the world. This is where SLV Duisburg plays a nodal role.



ABOUT THE ORGANISERS

 **WELDING RESEARCH INSTITUTE (WRI)**, one of its kind in the Asia Pacific Region, has been serving Indian industry for the past 40 years, as a part of the Maharatna PSU. BHEL. It is providing consultancy/ training support to almost all automotive industries in India as well as steel makers like JSW, TATA, ESSAR, etc. in developing and applying new generation materials for automotive industry. So far, WRI has provided extensive consultancy to leading automotive manufacturers like TVSM, Bajaj Auto, Maruti, Hyundai, TATA Motors, TVS group, Gabriel group, Axle India Ltd., Hero, Volvo, BEML, Ashok Leyland, Ford motors, etc. as well as to component suppliers to the auto makers by solving many issues like online monitoring of parameters, feedback controllers, weldability studies, weld defect analysis, parameter and process establishment, productivity improvement, training and qualification, etc. For more details please visit www.wriindia.com

 **Indian Welding Society** is a premier professional body, devoted to the cause of welding in the country since 2002. The society is committed for promoting advancement in welding, cutting and reclamation, hard facing & related technologies and in providing a forum for professional exchange of information, experience and developments in the field. With its headquarters at New Delhi, the capital city of India, the society has a federal structure consisting of 15 centres in the North, East, West, South and Central Zones of India. Since its inception, IWS is pursuing the knowledge dissemination goal on a continual basis. It is organising national / international workshops, seminars, training programmes, lectures, technical talks, etc. through its centres, zones and headquarters throughout the year. The technical activities of the society make it very vibrant.



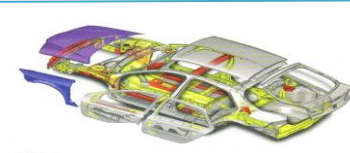
Indian Institute of Technology Madras, Chennai is one among the foremost institutes of national importance in higher technological education, basic and applied research. The first Indo-German agreement in Bonn, West Germany for the establishment of the Indian Institute of Technology at Madras was signed in 1959. IIT Madras is a residential institute with nearly 550 faculty, 8000 students and 1250 administrative & supporting staff and is a self-contained campus located in a beautiful wooded land of about 250

hectares. It has established itself as a premier centre for teaching, research and industrial consultancy in the country. The Institute has sixteen academic departments and a few advanced research centres in various disciplines of engineering and pure sciences, with nearly 100 laboratories organised in a unique pattern of functioning. A faculty team of international repute, a brilliant student community, excellent technical & supporting staff and an effective administration have all contributed to the pre-eminent status of IIT Madras. The Department of Metallurgical & Materials Engineering is associated with the programme.



Dr. D. Y. Patil Institute of Engineering & Technology, Pimpri, Pune, is situated in the vicinity of Pimpri - Chinchwad industrial belt, which is one of the biggest industrial belts in Asia, and is very close to the Rajiv Gandhi IT Park as well as Auto cluster - the automotive hub of India. Since its inception in the year 1998, the Institute has grown leaps and bounds to reach the present state of education colossal. The Institute caters to six UG programs, five PG and five Ph. D programmes, affiliated to Savitribai Phule Pune University (SPPU). The Institute advocates quality culture and ensures quality at all levels aspiring to have its name engraved on an alcove, as "Excellence in Quality Education". Institute yearns to create and propagate knowledge complemented with skills and values. It firmly believes that excellence can be accomplished by incessant assessment and accreditation process leading to its quality evaluation. Institute has initiated this endeavour by subjecting itself to the process of accreditation since 2004. In this journey it has been accredited by NBA for all eligible programmes (Thrice, twice and once as per their eligibility). The Institute is also a recipient of ISO 9001:2008 certification, ISO 14001:2004 certification, and permanent affiliation from SPPU, Industrial Accreditation by Infosys, Capgemini, Wipro Technologies and Johnson Controls Ltd. The Institute has been acknowledged for teaching – learning at various platforms, the most prominent being the one which is bestowed on the Institute by SPPU as "Best College" under professional category (Urban) for the year 2015. DYPIET was the first Institute to be selected by Wipro Mission 10X for Deeper Engagement.

The Institute is the first Elite member and received Unified Teaching Learning Kits (UTLK) developed by Wipro Technologies. DYPIET is a consortium member of



Indo-US Collaboration in Engineering Education (IUCEE) and International Federation for Engineering Education (IFEES). The Institute has been awarded 'A' grade by the Government of Maharashtra (India). The Institute has well-equipped laboratories with ultra-modern facilities supported by highly qualified teaching faculty in all branches catered to by the Institute. The Central Library is furnished with reference books, textbooks, national and international journals and internet facility as a part of informal teaching. The alumni of this Institute are conscientious in elevating the name of the Institute to International levels by securing admission in reputed foreign University to pursue higher studies.

PARTICIPANTS' PROFILE

Engineers engaged in Design, Production and inspection components made through resistance welding processes from Automotive OEMs and Automotive Component Manufacturers, researchers working on thin sheet joining and students aspiring to have a career in automotive industry are invited to attend the workshop.

DELIVERABLES OF THE PROGRAMME

At the end of the programme the participant is expected to have a sound understanding of the resistance welding and MIG Brazing in thin sheet welding applications. Also see detailed content of the Workshop.

PROGRAMME FEE

This is a non-residential programme. The participants will be provided snacks and lunch on the days of the workshop and are eligible to receive the delegate kit. The course fee is as follows:

Delegate from Industry:	Rs 9000/- *	IWS Members:	Rs 8000/-*
Faculty from Research & Educational Institutes:	Rs 5000/-*	Students and Research scholars:	Rs 4000/-*

One free member delegate may be nominated from each college having IWS student forum.

* Service tax @ 14% has to be added extra over and above the course fee.

Payments can be made by 'at par cheques', Demand drafts / NEFT in favour of **Indian Welding Society**, payable at Tiruchirappalli, India. The details of PAN No., Service tax Registration No. and NEFT details are furnished in the registration

ADDRESS FOR CORRESPONDENCE:

INDIAN WELDING SOCIETY

Institutions Building (Near Kailasapuum Club)
 BHEL Township
 Tiruchirappalli – 620 014
 Tamil Nadu, India
 Phone: + 91-431- 2551847, 257 2988, 257 2702
 E mail: hqiwsindia@gmail.com

FOR DETAILS CONTACT

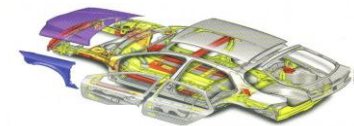
Convenor	Co-Convenors			IWS Centre Co-ordinators		
Dr. K Asokkumar	Mr. V B Tamboli	Mrs. A Santhakumari	Dr.(Mrs.) Rupa Bindu	Dr. M Kamaraj	Shri R G Ganesan	Shri R. D. Mate
CONVENOR (REWEEL) Honorary Secretary, IWS & Additional General Manager, Welding Technology Centre & Tool Engineering, BHEL, Tiruchirappalli E-Mail: asokkumark@bheltry.co.in Mobile: + 91 94426 49147 Website: www.iwsevents.com	Former Senior Vice President, (Engineering & Application Development), Ador Welding Ltd., Chinchwad Plant, Chinchwad, Pune 411019 Mob: No.: + 91 9822601560 Email ID.: vilas.b.tamboli@gmail.com	Senior Deputy General Manager, WRI, BHEL, Tiruchirappalli Phone: +91-431- 257 7112 Fax: +91-431- 257 6824 E-Mail: santha@bheltry.co.in Website: www.wriindia.com	Director- Activities, Students' Professional Cells Professor, Mechanical Engineering Department, Dr. D Y Patil Institute of Engineering & Technology, Pimpri, Pune, 411018 Mob. + 91 98233 98023	Professor & Head, Dept. of Metallurgical & Materials Engineering, IIT Madras, Chennai - 600 036 Mob: No.: + 91 9445964269 Email: kamaraj@iitm.ac.in	Hon. Secretary (IWS, Chennai Centre) & Head- Inspection Services, Betz Engineering & Technology Zone, No: 49, Vellalar street, Adambakkam, Chennai - 600 088	Chairman (IWS, Pune Centre) Flat No. 16, Apurvai Near Navashya Maruti Mandir Pune- Sinhgad Road Pune 411030, Maharashtra Mob: + 91 9881496556



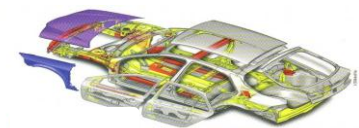
REWEEL
TWO-DAY WORKSHOPS
ON
EMERGING LEARNING IN THIN SHEET JOINING RESISTANCE WELDING & MIG BRAZING

DAY 1 FRONIUS INDIA TECHNOLOGY CENTER, CHAKAN, PUNE, India / ICSR Auditorium, IIT Madras, Chennai - 600036, India

Time	Topic	Speaker
8:00 – 9:00	Registration	
9:00 – 9:30	Opening Remarks	
9:30 – 11.00	Introduction to Resistance Welding Resistance Welding Processes - an overview - (materials for automotive sector, working principle of spot, seam, and projection welding, process of heat generation and heat dissipation)	Mr. Stefan Schreiber, GSI SLV, Germany
11.00 – 11:15	Tea Break	
11:15 – 13.00	Latest Welding Trends in Automotive Sector Current Trends and some of the best practices in welding new Base Materials	Expert, Fronius, Austria
13.00 - 13:45	Lunch Break	
13.45 – 15.30	Resistance Welding – Status in India	Mr. Tsutomu-Koide, Managing Director, Amada Miyachi India Pvt. Ltd.
15:30 – 15.45	Tea Break	
15.45 – 16-30	Spot Welding Machine settings – process variables – Weldability Lobe – Influences and Disturbances, Power sources - weld control - electrodes (materials, shapes, electrode cooling, tip dressing) - types of machines - pneumatic system, cooling System & controller circuit	Mr. Stefan Schreiber, GSI SLV, Germany
16.30 – 18.30	Welding of GI Sheets and its Latest Welding Technologies Live Demonstrations	Expert, Fronius, Austria



DAY 2		
FRONIUS INDIA TECHNOLOGY CENTER, CHAKAN, PUNE, India / ICSR Auditorium, IIT Madras, Chennai - 600036, India		
9:00 – 10:30	<p>Projection and Seam Welding, Process Control, Advances in Resistance Welding</p> <p>Principle - types of projections - machine settings- special requirements, Process Control - measuring & monitoring - adaptive control</p> <p>Recent innovations in resistance welding technology</p>	<p>Mr. Stefan Schreiber, GSI SLV, Germany</p>
10:45 – 11:00	Tea Break	
11:00 – 12:00	<p>WRI Experience in Thin Sheet Welding</p>	<p>Dr K. Asokkumar, BHEL, Tiruchy</p>
12.00 – 13.00	<p>Testing the Weld</p> <p>Manual testing - testing machines- NDT</p> <p>Standards & Safety</p> <p>Weldability of different steels as per various standard - Safety aspects when Resistance welding</p>	<p>Mr. Stefan Schreiber, GSI SLV, Germany</p>
13.00 - 14:00	Lunch Break	
14:00 – 15:00	<p>Automated Welding Systems for Welding of Automotive Components</p>	
15:00 – 15:45	<p>Mastering Critical Combinations of Resistance Welding</p> <p>Typical Case studies on Thin sheet joining - Welding asymmetrical (dissimilar) 3-sheet stack-ups (results from research projects)</p>	<p>Mr. Stefan Schreiber GSI SLV, Germany</p>
15:45 – 16:00	Tea Break	
15:45 – 17:00	Demo / Open House	
17:00 – 17:30	Valedictory Function	





**TWO-DAY WORKSHOPS ON
EMERGING LEARNING IN THIN SHEET JOINING RESISTANCE WELDING & MIG BRAZING
REWEEL 15**

DELEGATE REGISTRATION FORM

Venue: PUNE / CHENNAI (Tick Mark whichever is your choice)

Dates: At Pune: 05-06, October 2015

At Chennai: 09 – 10, October 2015

Delegate(s) Details	Name	Designation		
1				
2				
3				
4				
5				
Organisation				
Address for Communication				
Payment Details	Amount (Rs)	DD / Cheque Number	DD / Cheque Date	Drawn on
	Details of e-Transfer			
Contact Details	Phone	Mobile	E-Mail	Fax

Signature of participant / Sponsoring Authority with Seal



Points to Note:

01. It is a Non Residential Programme. However, on the days of the programme, lunch and snacks will be provided to the delegates. Delegate fee as follows:

Delegate from Industry:	Rs 9000/- *	IWS Members:	Rs 8000/-*
Faculty from Research & Educational Institutes:	Rs 5000/-*	Students and Research scholars:	Rs 4000/-*

*** Service tax @ 14% has to be added extra, over and above the course fee.**

One free member delegate may be nominated from each college having IWS student forum.

02. All Payments are payable by a DD / At Par Cheque drawn in favour of “**Indian Welding Society**”, payable at Tiruchirappalli, Tamil Nadu, India. The payments to be forwarded to: **Indian Welding Society, Institutions Building, Near Kailasapuram Club, BHEL Township, Tiruchirappalli – 620 014, Tamil Nadu, India, Phone: + 91-431- 2551847, 257 2988, 257 2702, E mail: hqiwsindia@gmail.com**. Payments also could be made through EFT mode. Details are as follows:

Name of the Bank: ICICI Bank

Name of the Branch: Trichy Cantonment Branch

Address of the Bank: No: 52, Heber Road, Espee Complex, Tiruchirappalli 620001, India

Branch Code: 6204

MICR Code: 620229002

Account Number: 620401068433

RTGS / NEFT / IFSC Code Number: ICIC0006204

Service Tax Regn. No.: AAATI9335ESD001

PAN No.: AAATI9335E



Hotel Name	Address	Contact Details	Single / Double Occupancy	Inclusion
Matrix Inn Hotel	I Besides (Indian oil) Petrol Pump I Chakan – Talegaon Road I Kharabwadi I Chakan 410 501I India I	+91 2135 610110, +91 2135 610101, +91 2135 610100, F: +91 2135 610112 E: sales.chakan@matrixinn.com	2500 / 3000 All inclusive	Breakfast , Complimentary Office Transfer with in Chakan Area, Wifi & Taxes
Courtyard Marriotts	Plot P-7, MIDC, Chakan Industrial Area Phase-1, Talegaon Chakan road, Khalumbre, Pune, Maharashtra 410501	Phone: 02135 666 666	4500 +Taxes	Breakfast , Complimentary Office Transfer with in Chakan Area, Wifi
Hotel Stonarc	Hotel Stonarc by Candy Peppermint Arya Prism, Talegaon Road, Chakan Pune	E mail: info@stonarchotels.com Phone; 02135 - 278888 / 9552133838	1600 / 1800 Including taxes	Breakfast , Complimentary Office Transfer with in Chakan Area, Wifi
Cirtus	Opposite PCMC, Old Mumbai - Pune Highway Road, Pimpri , Pune – 411 018, Maharashtra , India.	Toll Free 1800 3001 4001 Tel No. +91 20 3000 4000 Fax No. +91 20 3000 4001 reservations@citrushotels.in	3600 / 4600 + Taxes	Breakfast, Wifi & Airport Transfer
Spree Hotel	Spree Shivai Hotel, Pimpri, Pune -4111018	t: +91 20 3061 4900 f: +91 20 3061 4925 Email: afc.pune@spreehotels.com	3000 / 3500 + Taxes	Breakfast , Complimentary Office Transfer , Wifi , Complimentary Major meal & Airport Transfer
Hotel Formule1	Plot no. 2, Near Ambedkar Chowk Pimpri Pune - 411018, Maharashtra, India	Phone: +91 20 66354444 Fax: +91 20 66354400	1800 / 2000 + taxes	Breakfast ,Wifi , Complimentary Office Transfer, Airport Transfer
Four Points By Sheraton	Viman Nagar, Pune, Maharashtra 411014, India	020 3940 6699	3500 + taxes	Breakfast, Wifi & Airport Transfer

- Resistance Welding
- Micro TIG Welding
- Laser Welding
- Laser Marking
- Laser Cutting
- Hot bar Reflow Soldering & Bonding
- Hermetic Sealing
- Systems

Sponsored by:

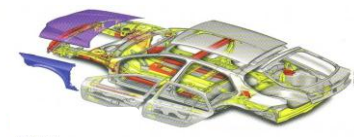
AMADA MIYACHI INDIA PVT LTD

- Amada Miyachi Corporation (Japan) in turn a complete subsidiary of AMADA Holdings.
- proven expert in designing and building suitable machines for, Precision -Resistance welding, Laser Welding, Laser Marking, Hot bar, hermetic Sealing and Systems.
- large dedicated Laser lab & Resistance welding lab equipped with the latest hand held Laser machines and high-end Welding power supply and controllers to perform Sample tests.



AMADA MIYACHI INDIA PRIVATE LIMITED

Raj Arcade, Ground Floor, 5th 'A' Cross, 1st Block HRBR Layout, Kalyan Nagar, Bangalore 560043.
Tel: +91-80-4092 1749/3549 | Fax: +91-80-4091 0592 | www.miyachiindia.com



SPONSORED BY

FEW CONVINCING FACTS ABOUT “FRONIUS INDIA”

- / Dedicated **Technical Team of 50 + Qualified Engineers**
 - / **Head Quartered** at Pune
 - / **Regional Teams** in Delhi, Mumbai, Pune, Bangalore and Chennai
 - / Expertise of **Application Technician & System Technician** to cater Region wise Customer Needs
 - / 33000 Sq Feet **Application Development Centre**
 - / State of the Art **Robotic & Manual** Equipment for Demonstration, Application Development & Trials
 - / **World Class Training Facility** to address the welding personal needs
 - / First of its kind **Torch repair Centre**
 - / Ware House and Logistics incorporated with “ **BAAN ERP System**” implemented in Sync with Fronius Austria for the Quickest & Accurate Delivery of Equipment's & Spares on time & every time
 - / **23500 + Fronius Machines** power sources on the Field in Indian Marker
 - / Partnered in the Tech Centre facility with “ **LINDE**” for the Industrial Gas Needs & “ **Voestalpine Bohler**” for the Consumable needs of Customers. So customer can walk out with complete welding consultancy under one Roof
- Fronius aims to Forge a “Lifetime relationship” by recognizing customer’s evolving business challenges. Therefore Fronius aspires to a “Pioneer in developing & Offering Customized Solutions” rather than Just another resource offering products.*



*For More Details:
Mr. C Raghavan
Fronious India Private Limited
Gat No. 312, Nanekarwadi
Chakan Talika, Khed District
Pune – 410501, India .
Mobile: + 91 8411851166*

