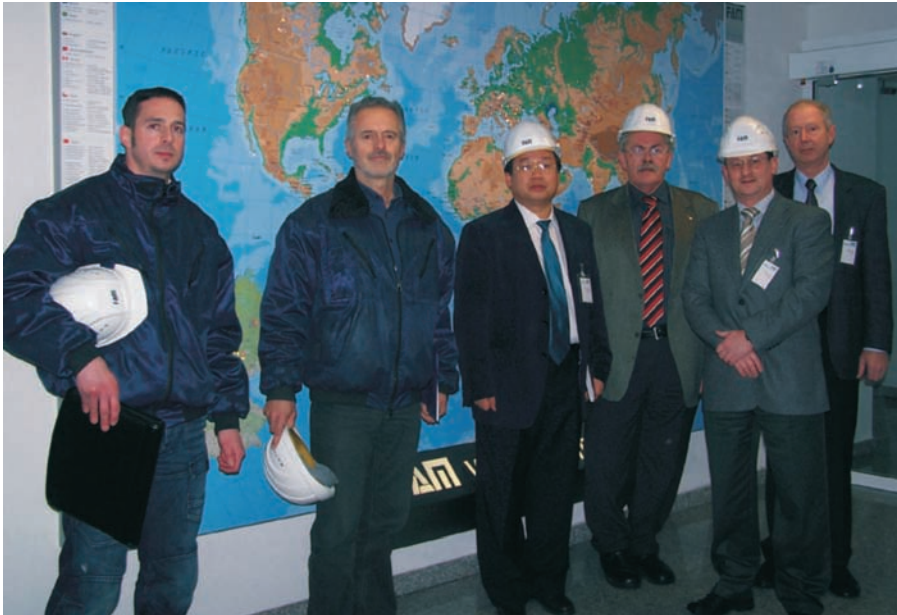


NEWS



DVS

WTI Harbin and GSI – An International Partnership



Prof. Xie with his German colleagues during his visit to the FAM Magdeburger Förderanlagen und Baumaschinen GmbH

In the year 2009 the WTI (Welding Training Institute) Harbin, China, has celebrated its 25th anniversary and its 25-year partnership with the GSI SLV Duisburg. Therefore it is not surprising that Prof. Yinglong Xie, director of the WTI, visited Germany as early as in January.

Beside of variety of common interests connecting the partners today also personal contacts have arisen. A partnership has been created where both partners are developing welding technology side by side. Education and further training is the main focus of

both partners.

The WTI is an institute playing a leading role within the international system of the IIW (International Institute of Welding) due to its high amount of education in welding. Very soon the WTI could be the institute with the highest amount of education worldwide particularly with regard to the demands of the Chinese market.

The visit of the FAM – Förderanlagenbau Magdeburg - having customers worldwide shows that the mutual partnership has been concentrating on internatio-

nally active companies, too.

Beside of the various activities of German colleagues in China, in the meantime the GSI has underlined the partnership on the occasion of the international fair "Schweißen und Schneiden 2009" (welding and cutting) in Essen while expecting the Chinese colleagues.

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	INTERNATIONAL WELDING ENGINEER/TECHNOLOGIST (IWE/IWT) Distance Learning & Blended Learning Classroom Learning: 10 May - 04 June 2010 and 27 September - 26 October 2010 in Duisburg Details: www.slv-duisburg.de
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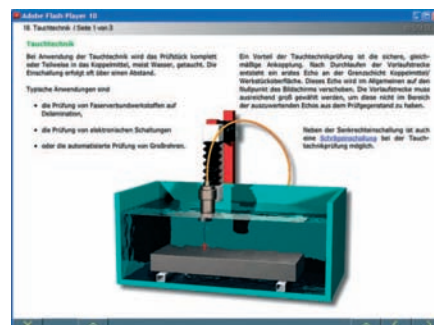
Schweißtechnische Lehr- und Versuchsanstalt Halle GmbH 	8th International Conference on Beam Technology 2010 14 - 15 April 2010, Halle (Saale), Germany DVS www.beamtec-conf.com
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Distance Learning Course CBT Ultrasonic - UT 1

Since the year 2001 the GSI has been offering approved alternatives on the field of welding in the form of CBT distance learning courses (computer based training). These interactive programs have proven their suitability for many years on many fields of the education of welding coordinators. The multimedia concept developed by the GSI is now being supplemented by non-destructive testing (ndt). Now the concept will be offered for the ndt-training course ultrasonic testing level 1 (UT 1) according to EN 473 for the first time.

The UT 1-distance learning course will be offered within the scope of a so called blended learning concept intended to have a part of distance learning (CBT) and a phase of classroom learning (classroom

phase). By means of self studying using the CBT program part of the time required for the training will



Screen shot of the learning program

be covered, among others part of the theoretical formation of basic knowledge.

The prevailing part of the UT 1 training course will be taught in the classroom focusing practical training. Based on this there is the possibility to reduce the classroom phase thus saving time and money. This blended learning course entitles the participant to conduct the qualification test together with the possibility of subsequent certification according to EN 473.

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Mechanical Joining at SLV München - Topics of Current Interest

Mechanical joining has gained more and more importance, particularly on the field of processing thin sheets such as in the automotive engineering industry and its suppliers, respectively. Hence, medium sized companies have been more and more confronted with the "new" joining processes. A variety of new materials, dissimilar joints and structures limit welding applications in such a way that these "new" technologies are applied. This, in connection with the current concepts of design and manufacture requires innovative solutions for joining tasks. In many cases hence the solution is mechanical joining.

Material developments

The material developments directing to the future are generated from the demands by engineers. Often, the incentive is the reduction of weight. In order to assure safety, more and more high strength materials have been developed and applied. Deforming behaviour of the plates in most cases is assured by reduced plate thicknesses. Due to the fact that plates of high strength tend to hardness cracks if thermally joined, i.e. welded or brazed, as well as austenites and aluminium tend to hot cracking, the need for different joining processes and technology such as the "low temperature joining processes" has arisen. Since then there have been new requirements every day the manufacturers of systems/equipment from mechanical joining are reacting to. These trends have more and more lead to the application of high strength steels, dissimilar construction styles, the application of coated materials and the application of aluminium, magnesium and fiber reinforced plastics. Alternative joining technologies are: mechanical joining, bonding, hybrid joining.

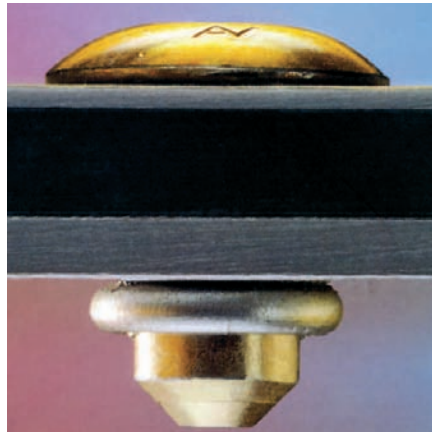
Potential of application of mechanical joining

Mechanical joining is low temperature joining treating the material and the parts to be joined with care. Often, the structural design of the parts is a problem while the accessibility of the parts from one side only limits the selection of the joining process to be used. A large advantage is the possibility of joining dissimilar or coated materials. Often, no pre-punching of the joining spot is required, thus reducing the time of manufacture. In many cases only little investment is necessary, in order to introduce the mechanical joining

technology. Mechanical joining (riveting, bolting, lock-seaming, clinching, among others) is very much suitable for joints of high-strength steel, aluminium, magnesium, plastic and multiple-shear joints thus having gained acceptance in the construction of car bodies.

Why is a qualified education in mechanical joining necessary?

Operating personnel must be able to react to different cases of application thus responding to the different joining tasks. To this end, the potential of the mechanical joining technology should be known. The machine



Radiographic testing on an inner conductor using IR 192

operator is confronted with different tasks and failures during manufacture thus having to be able to face the different joining tasks with the suitable joining technology. To this end, the potential of mechanical joining should be known. During manufacture the machine operator is confronted with different tasks. Changes in plate thickness and material strength challenge him every day. Material wear or damage have a negative impact on the quality of the joint. Here, it is important that the trained machine operator recognizes the problem early.

Therefore, SLV München offers the training course "Einrichter mechanisches Fügen nach DVS/ EFB Richtlinie 3403" (setter of mechanical joining acc. to DVS/EFB guideline 3403). The intensive courses I of the single subjects clinching, punch riveting, blind riveting, mas-

ter pins and function elements as well as the basic course mechanical joining and the repair course - current possibilities - complete the scope of education for the practical user.

Advantages and use for a company by trained personnel

The quality management system ISO 9001 has a need for qualified, skilled personnel. The new ISO 9001, planned to enter into force 2009 will even more require the proof of skills and qualification.

The staff is trained according to the latest-state-of-the-art of manufacture and testing, thus avoiding the wrong use of the joining processes or a wrong design of the joints. This saves unnecessary cost. The staff gets motivated while for the company a competitive advantage will result. Furthermore, the company is prepared very well for questions on product liability and claims.

Information Course "Mechanisches Fügen" (mechanical joining) all over Germany free of charge

In January and February 2009 our new department and field of education "Mechanisches Fügen" (mechanical joining) will be presented at the various locations in Germany.

The joining processes and the possibilities of using them will be explained with the help of examples. After that the aspect of the cost-benefit factor will be shown. The goal is that all factors important for the decision on the use of one of these joining processes and to be considered when using one of these process will be explained. Calculations on the economic efficiency shall be of support. All those who are interested are welcome to inform themselves!

Locations/dates: www.slv-muenchen.de

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The Latest News from the Education on NDT

In the year 2008 education in non destructive testing was successfully set forth in the branches of the GSI. The concept of education near to practice and application is appreciated and accepted by our customers. Therefore, we are going to extend our scope of offers:

Within the scope of rail vehicle construction EN 15085 requires suitable qualified personnel for non-destructive testing. Hence, the new, revised DVS®-guideline 1109 intends to extend the one-week course for welding coordinators by a VT-2-course which may be concluded within that week and completed by a certificate according to EN 473.

The DVGW-worksheet GW 350 for welded joints to pipe lines made of steel in the supply of gas and water partly demand extended knowledge of the welding coordination and construction supervision, respectively in testing. In order to fulfill this responsibility, we

are of the opinion that a VT 2-course together with certification according to EN 473 is supportive in particular in visual testing. To this end, the SLVs will offer a special course on visual testing VT2 designed for pipe line construction.

Based on the results achieved from research projects of the GSI special continuation courses for special examination tasks are within our scope of offer. Important in this regard is the quantitative measuring of residual gaps using ultrasound on non-penetrated joints, the proof of cracks under organic coatings and in case of galvanization using the eddy current technology or the detection of cracks on orthotropic decks.

No other NDT-process requires such a comprehensive extent of special knowledge concerning the manufacturing processes and fields of application as visual testing. Therefore, we are going to extend our scope of

knowledge by VT2-courses according to EN 473 with a course on visual testing for welded joints using electron and laser beam welding. The focus of the course will be: Assessment of the welded joints according to ISO 13919.

You will get extensive information on the stated topics and on our complete scope of education on the occasion of our next technical conference "Prüfen in der Schweißtechnik" (testing in welding engineering) on 29 and 30 January 2009 at the SLV München.

GSI - the competent partner nearby!

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Consolidation of the GSI Markets Abroad

GSI SLV TR (Turkey)

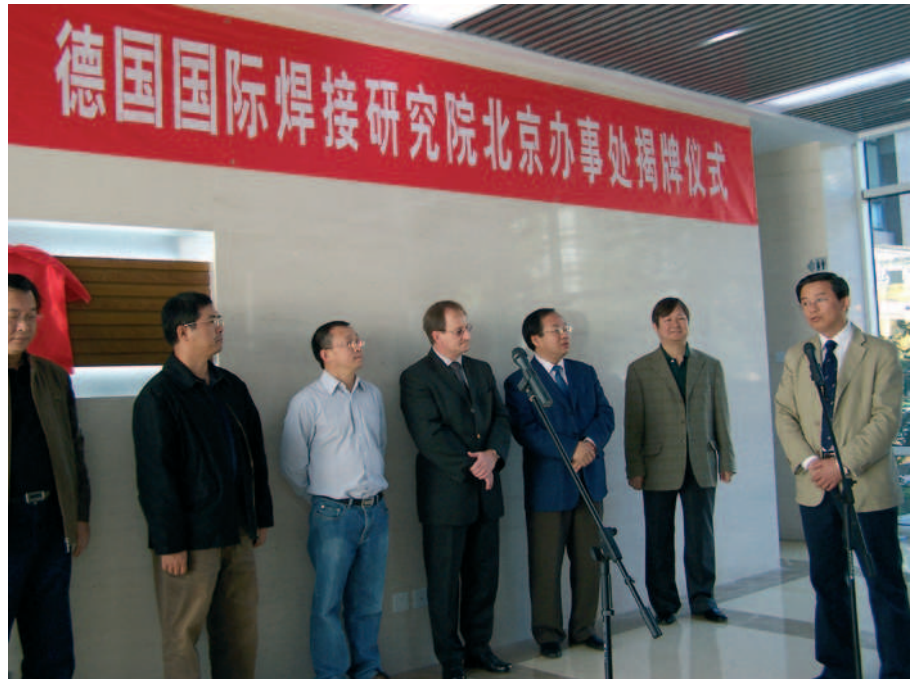
On 1 November 2008 the GSI SLV TR (Turkey) started its business. From the location in Ankara the new association with the GSI as the main associate bundles and develops its activities on the fields of education and training as well as quality assurance. This has been developed from a successful engagement over the past years where particularly the SLVs Berlin and München with the focus on manufacturer qualification and IWE education had prepared this step. What is new is the close cooperation with the Managing Director Foreign Business and the new CFO of the GSI. Mr. Akcam as an experienced insider of the Turkish market could be engaged as managing director. Emphasis has been laid on servicing the Turkish market but also on superregional projects in the Near East as well as southern European countries.



The director of the GSI SLV TR, Mr. Akcam, together with his staff

Opening of an office of the GSI at the WTI in Beijing

Similar to Turkey the GSI has prepared its next step in the People's Republic of China. Due to the Chinese form of government, the Asian mentality and the very large distances intensive preparation is required. SLV Duisburg, however, has had a cooperation



Opening of the GSI office in China

with WTI in Harbin for 25 years. It can also be stated that the German industry has already established itself in China. In the cosmopolitan area of Shanghai alone more than 4,000 companies of German origin are active that do not want to give up the quality standards of the SLVs known from Germany. The scope ranges from theoretical up to practical education, comprises manufacturer certifications for steel and rail vehicle construction up to offering

technical support by consulting and expertise. As early as today German engineers from the GSI are active in China every month.

This development has led to opening an office of the GSI in the building of the WTI in Beijing in October 2008. Starting from this central point further steps have been planned in the cosmopolitan area of Shanghai with the GSI trading new paths of cooperation.

NDT-Education on Behalf of Alstom in India



The participants of the course as well as the trainers Helmut Schmeink and Philipp Lukas from SLV Duisburg

Within two sessions of education - from 06 April to 09 April and from 27 April to 12 May 2009 - education on non-destructive testing was carried out by the division NDT of SLV Duisburg at Alstom. The place chosen was the branch in Durgapur, about 170 km north west of Kolkata (former Calcutta), an industrial site in the Indian Federal State West Bengal (approx. 500,000 inhabitants).

The reason to perform the education has been the intention of the company Alstom to extend their commercial relations towards Europe within the range of products of pressure vessels and roller sets. This means qualification and certification of the NDT testing personnel becoming necessary

according to the European standard 473.

Focus in the first session of the education was radiographic testing and penetration testing. During the second session the participants were instructed in ultrasonic testing, magnetic particle testing and visual testing.

With some exceptions most of the participants had basic knowledge according to the American educational system ASNT-TC-1A.

Through the education by the SLV Duisburg the participants have received the opportunity to complete a level 2 examination according to EN 473 taken by the TÜV Nord India.

All participants distinguished themselves by a quick and concentrated uptake of the subject. There was an excellent feedback concerning the training contents.

Based on the economic development of India a high demand of education on the field of welding and testing is to be expected for the future, thus forming the basis for a further cooperation with the GSI.

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Schweißtechnische Lehr- und Versuchsanstalt Halle GmbH	GSI SLV Halle
	1st European Conference JOIN-TRANS 2010 „Joining and Construction of Rail Vehicles“
April 28 - 29, 2010, Halle (Saale), Germany	
DVS	www.jointrans.eu

Large Laser at SLV Halle

By the turn of the year 2008/2009 SLV Halle GmbH receive a fiber laser with a nominal power of 12 kW. The cause of this is among others a project on laser beam GMA orbital welding to pipe joints. Due to this extension it becomes possible to get a 4.4 kW solid state laser for SLV Duisburg, too. There, mainly cutting applications in combination with the most modern robot technology are to enable new solutions.

Under consideration of all locations the GSI with its branches and cooperating institutes has a leading position concerning the spread and variety of the laser technology available defined for the most different branches on the field of research and technology transfer.

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Friction Stir Welding of Steel at SLV Berlin-Brandenburg

Friction stir welding is a relatively young joining process having predominantly proven with aluminium and magnesium materials. To this end, friction heat is produced by means of a rotating tool, locally heating the components, plastifying and then stirring them. The material consists of a cylindrical basic body and welding pin centrally joining the face. Both, the face (welding shoulder) and the welding pin are in contact with the component surface and may have further feeding aids. By means of friction stir welding large surface aluminium structures can be welded with a low amount of distortions and free of pores. The mechanical-technological properties of the quality are good up to excellent. In addition, there are further advantages but also one decisive disadvantage for the application on higher melting materials such as steel. In most cases the creep resistance of the tool materials is affected. Only some materials have a sufficient creep resistance and metallic material wearing resistance. Materials having these properties are relatively brittle in most

cases. Therefore, it was investigated within the scope of this project how far the loads exerted on the tool can be reduced using a forward travelling inductive heat source.

It could be proven that just during the dipping phase of the tool into the preheated material the loads exerted on the tool are much lower, thus considerably reducing



Friction stir welding of high strength structural steel with inductive preheating process

the risk of breaking off.

The strengths of the welds to be obtained for general structural steel S235 JR are above those of the parent metal. With the thermally-mechanically tempered structural steel S700 MC the strength of the parent metal could not be achieved since thermomechanical strengthening could not be maintained using this process. The results of joining hot galvanized dual phase steel DP800+Z were negative since a martensitic structure was formed within the range of the weld seam. On the other hand, the results of welding performed on the material X5CrNi18-10 were very good with strength and hardness values almost on the same level as the parent metal providing for a uniform elongation across the whole area of the tensile test samples.

Moreover, the project has offered the possibility to collect experience with the promising tool material pcBN. The issue of research promoted by the AiF was conducted from April 2006 to June 2008.

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SLV Duisburg supervises the New Construction of Hall 7 at Dusseldorf International Airport



The largest aircraft hall at the Dusseldorf International Airport was officially opened in April 2009. A huge, self supporting steel structure made of three-

cord tubular pipe connectors with a bearing distance of more than 90 meters and structural heights of more than 7 meters forms the roof of the hall of approximately 210 meters length, 90 meters width and 30 meters height.

The roof connectors rest on composite columns at the rear side of the hall and on a 7 meters high, 210 meters long steel lattice girder supported by two steel supports due to the large gate openings. The front of the hall of a length of 210 meters is closed by six movable gates.

3.800 tons of steel were used in total for the new construction of the hall.

SLV Duisburg was entrusted with the quality assurance during the construction of the hangar by the Flughafen Düsseldorf GmbH. Beside of consulting the owner the verification of the welding drawings, the supervision of the works on the material, welding and corrosion protection performed at the different steel companies as well as the whole supervision of the assembly works on the site was performed by SLV Duisburg.

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