



Overview of GSI services

## **WE INCREASE YOUR QUALITY AND EFFICIENCY**

**MORE THAN WELDING...**

Training people and advancing companies

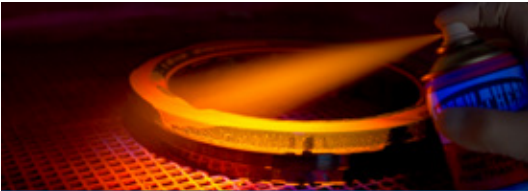
- Note: To make the brochure more readable, we only use one gender form. However, we generally refer to all genders.



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# WELDING TECHNOLOGY 4.0

## **We teach, research, qualify, and support.**

GSI (Gesellschaft für Schweißtechnik International) is the non-profit limited liability company (GmbH) founded by DVS in 1999 for training and development, qualification and advice in the field of welding and joining technology, testing technology and corrosion protection. The GSI has 8 national and 4 international locations.

When consulting companies, we rely on well-founded analyses and individual solutions as well as a rapid technology transfer. With process-oriented methods, we develop efficient strategies for fabrication, inspection, damage analysis and much more.

Our welding educational and research institutes (SLV) have over 90 years of experience in training and education. They also apply state-of-the-art methods such as e-learning and virtual reality welding. For welding technology competence of all kinds, you are in the right place with us.

## Take advantage of...

- the experience of our accredited laboratories and inspection bodies
- high-quality training courses for personnel qualification
- practice-oriented specialists
- the cooperation between industry and research
- our interdisciplinary working method
- individual solutions in the fields of training, certification and production
- the application of standard requirements for your needs
- great expertise in all joining, testing and corrosion protection matters
- high flexibility
- our international scope







## Training & Education

Personnel qualification according to your needs.

The individual training and education of specialists in all welding processes domestically and abroad in German, English and other languages is one of our elementary tasks.

All training courses are conducted according to nationally and internationally harmonised guidelines such as IIW and EWF, which can lead to the recognition of these qualifications in more than 50 countries.

We also take care of all the required certifications for personnel with qualification for welding coordination.

Our range of in-house training courses is addresses companies that want to keep educating their specialists and managers according to their needs.

### Theoretical training

- Welding coordination personnel (IWE, IWT, IWS, ...)
- Specialised welding personnel (welding teachers, welding inspection personnel, welding designers, ...)
- Corrosion protection specialists (FROSIO coating inspector, FROSIO insulation inspector, KOR certificate, assistant coating inspector)
- Personnel for non-destructive testing (VT, MT, PT, UT, RT)
- Adhesive engineer, bonder and specialist (EAE, EAB, EAS)
- Thermal sprayer, specialist and supervisor (ETS, ETSS)
- Resistance welding practitioner and specialist (EWP-RW, EWS-RW)
- Specialist for additive manufacturing (metal)
- Flame straightening specialist
- Subject-specific advanced courses (robotics, superstructure, pressure equipment, steel construction, rail vehicle construction)
- Specialised safety personnel SCC (Safety Certificate Contractors)
- Further education for new managers
- Seminars / Meetings
- Exchange of experience and maintenance of competencies





### **Practical training**

- Individual welder training in all processes, oriented to the learning progress with qualification, e.g. according to DIN EN ISO 9606ff
- Training for special welding processes
- Qualification of coaters and surface preparators, virtual coater training, coat thickness measuring
- Thermal spraying
- Virtual welding trainer

### **e-Learning**

- IWE, IWT, IWS, IWP, welding designers
- Welding inspection personnel
- VT 1+2, PT 1+2, MT 1+2, UT 1
- FROSIO coating inspectors
- Customised company-specific solutions

### **Certified employment promotion measures according to AZAV**

- Theoretical training
- Practical training

### **Personnel qualification/certification**

- International welding coordinators
- Welding teachers
- Welders, operators and brazers/solderers according to the Pressure Equipment Directive

### **Individual advanced training**

- Customised in-house training courses
- Modular further education



# Materials & Processes

Build the right foundation.

In addition to our all-encompassing customer consultation about materials and process engineering, we elaborate all the necessary expert reports, including the damage analysis as well as the accompanying of the process optimisation.

Consultation about welding technology and the optimisation of welding parameters are carried out by our employees in situ. Furthermore, we have all the procedures necessary for destructive and non-destructive materials tests available in our branches.

## Consultation and expert reports

- Technical consultation about all aspects of the fields of materials and process engineering as well as corrosion protection technology
- Damage analysis from the evaluation in situ via the report right up to the process optimisation on your premises in the fabrication in order to avoid any damage in the future
- Weldability tests, e.g. on old steel grades

## Simulation

- of materials
- of welding processes
- of welding deposit properties
- of influences of the procedure parameters

## Material approvals at your or your customers' site

- Checking that supplied materials match with the corresponding inspection document
- Issuing of inspection certificates

## Materials tests

- Destructive and non-destructive material tests on base materials as well as on welded joints
- Spark spectral analyses in order to determine material compositions
- Determination of diffusible hydrogen in welded joints, in welding consumables as well as in base materials
- Corrosion tests in specific corrosion systems
- Metallographic analyses on metallic materials as well as on non-metallic coat systems
- Fractographic investigations using a scanning electron microscope (SEM)
- Chemical analytics by means of EDX analysis
- Determination of the vibration fatigue strength, also on large components and on subassemblies

## Process engineering

- Customer-oriented optimisation and testing of process and procedure variants
  - welding
  - brazing/soldering
  - cutting
  - coating
  - adhesive bonding
  - mechanical joining
- Support with regard to automation and robotics





## Qualification, Inspection & Certification

Safety for companies and products.

As a notified testing, surveillance and certifying body according to national building regulation we review manufacturers, test products, certify companies and also specific products.

As a notified body within the scope of the Pressure Equipment Directive we certify processes and quality assurance systems in accordance with Annex III to Directive 2014/68/EU as well as welding and soldering processes.

We carry out all the audits and quality controls also for the customers or ancillary suppliers of our clients, paying attention to country-specific peculiarities.

Moreover, our inspectors are available for comprehensive construction and fabrication inspection and elaborate all the necessary expert reports on our clients' behalf.

### Qualification

- of welding procedures
  - e.g. according to DIN EN ISO 15613, DIN EN ISO 15614ff., DIN EN ISO 14555 etc.
  - according to the Pressure Equipment Directive
- of cutting and flame straightening processes, e.g. according to EN 1090-2
- of welding fillers for railway construction (testing agency)
- of shop primers according to DIN EN ISO 17652

### Inspection

- Testing and inspection of products
- Inspection of welding and corrosion protection works, combined with non-destructive testing, in workshops and at construction sites (accredited testing laboratory according to DIN EN ISO/IEC 17025:2012)
- Supplier evaluation
- Expert opinion in the event of damage



## Certifications

- Construction products according to state construction regulations
- DIN EN ISO 17660-1 and -2 (reinforcing steel)
- DIN 6701-2 (adhesive bonding in the rail vehicle construction)
- DIN 2303 (welding in the defence engineering)
- StaWaR (catch basins up to 1,000 litres)
- Pressure Equipment Directive 2014/68/EU
- Modules A2, B, F, G, H, H1 and D
- AD 2000 leaflet, HP0/HP100R approval (pressure equipment, piping)
- DIN EN ISO 14922 (quality requirements for manufacturers of thermal sprayed coatings)
- DAST 022 (hot-dip galvanising of load-bearing steel components)
- DIN EN ISO 2063 (Execution of thermally sprayed corrosion protection systems made of zinc, aluminium and their alloys)
- FROSIO Guide CP
- ISO/DIS 22688 Quality requirements for brazing of metallic materials
- ASME

## Audits as part of certifications via DVS ZERT GmbH

- DIN EN ISO 9001 (Quality management systems)
- DIN EN ISO 45001 (Occupational health and safety management systems)
- DIN EN ISO 3834 (Welding quality requirements)
- DVS 1715 (Requirements for businesses for the manufacture of welded parts for mobile cranes)
- EN 1090-1 (Factory production control for manufacturers of steel and aluminium structures)
- DIN EN 1090-2 Welding, cutting, corrosion protection, dimensioning, etc. (steel structures/metal construction)
- DIN EN 1090-3 Welding, cutting, dimensioning, etc. (aluminium structures/metal construction)
- DIN EN 1090-4 and DIN EN 1090-5
- DIN EN 15085-2 and DIN EN 15085-6 (Welding in rail vehicle construction/maintenance)
- DIN EN 13084-7 (Free-standing chimneys)
- Construction products according to the Construction Products Regulation (e.g. DIN EN 10025, 10210, 10219, 14399, 15048, 15088 and 13479)
- SCC (Safety Certificate Contractors)
- UKCA





## DAkKS accreditation

We make your company fit for the future.

### Inspection body

The inspection body of the GSI is accredited according to ISO/IEC 17020 as a type C inspection body by Deutsche Akkreditierungsstelle GmbH and as an independent institute, it offers a wide range of different inspection activities. The GSI SLV inspection body performs its tasks objectively and impartially. Our accredited inspection body offers the following services:

- Production monitoring (construction supervision) as an independent inspection body according to ISO/IEC 17020, among other things, for welding and corrosion protection projects in steel construction (including structural steel construction, steel bridge construction, hydraulic steel construction, civil engineering), machine and plant engineering (including machine engineering, plant construction, crane construction, vehicle construction) and comparable areas
- Procedure qualifications in the technology fields such as welding, soldering and flame straightening
- Damage analyses and damage prevention investigations (e.g. checking the weldability of old steel) as well as damage investigations on damaged or repairable parts (components), installations and systems of metallic materials, as well as their connections and coatings (if applicable, e.g. inorganic layers)

### Accredited testing laboratory

The entire range of testing technologies is available to check the integrity of products:

The testing laboratory of the GSI is accredited according to ISO/IEC 17025 by Deutsche Akkreditierungsstelle GmbH and as an independent institute, it offers a wide range of different testing activities:

- Destructive testing, non-destructive testing, chemical analyses, surface analysis, metallography, scanning electron microscopy, corrosion tests, tests in surface technology, control tests when carrying out corrosion protection works, fatigue testing, mechanical and technological tests on plastics, examination of production coatings, hydrogen determination



# Research & Development

Innovatively into the future.

All our research activities are close to the applications and are oriented to the customers and to our core competence.

In principle, upstream subjects are processed within publicly promoted projects. For these subjects, we strive for close partnerships with potential users who support our projects in different ways.

Within the framework of job research and development for industry and skilled trades, we adjust the processes exclusively to our clients' needs.

## Publicly promoted research

- Possibility for industrial partners to exert direct influences on project objectives and results (e.g. within the Federation of Industrial Research Associations (AiF) and the Research Association on Welding and Allied Processes)
- Processing ahead of competition
- Publication of the research results
- Acquisition of promotion possibilities

## Industrial research

- Application-oriented development and optimisation of technologies and procedures
- Fabrication of prototypes, small-scale series and zero series
- Neutral comparisons of procedures

## Specialist fields

- Beam welding  
(laser beam welding, ...)
- Arc welding  
(MAG, TIG, SAW, ...)
- Pressure welding  
(resistance, stud, friction and friction stir welding, ...)
- Thermal spraying  
(arc spraying, flame spraying, plasma spraying, HVOF spraying and cold gas spraying)
- Thermal cutting  
(flame, plasma and laser beam cutting)
- Mechanical joining processes  
(self-piercing riveting, clinching and riveting)
- Brazing/soldering  
(flame, induction, furnace, GMA and resistance)
- Structural design
- Adhesive bonding







## Your contacts within GSI

**GSI – Gesellschaft für Schweißtechnik  
International mbH**  
[www.gsi-slv.de](http://www.gsi-slv.de)

### Branches

**SLV Berlin-Brandenburg**  
[www.slv-bb.de](http://www.slv-bb.de)

**SK Bielefeld**  
[www.dvs-bielefeld.de](http://www.dvs-bielefeld.de)

**SLV Bildungszentren Rhein-Ruhr**  
[www.slv-bz.de](http://www.slv-bz.de)

**SLV Duisburg**  
[www.slv-duisburg.de](http://www.slv-duisburg.de)

**SLV Fellbach**  
[www.slv-fellbach.de](http://www.slv-fellbach.de)

**SLV Hannover**  
[www.slv-hannover.de](http://www.slv-hannover.de)

**SLV München**  
[www.slv-muenchen.de](http://www.slv-muenchen.de)

**SLV Saarbrücken**  
[www.slv-saar.de](http://www.slv-saar.de)

### Cooperating facilities

**SLV Halle GmbH**  
[www.slv-halle.de](http://www.slv-halle.de)

**SLV Mannheim GmbH**  
[www.slv-mannheim.de](http://www.slv-mannheim.de)

**SLV Mecklenburg-Vorpommern GmbH**  
[www.slv-rostock.de](http://www.slv-rostock.de)

**SLV Nord GmbH**  
[www.slv-nord.de](http://www.slv-nord.de)

### Foreign companies

**China: GSI SLV Kunshan**  
[www.gsi-kunshan.cn](http://www.gsi-kunshan.cn)

**Turkey: GSI SLV-TR**  
[www.gsi.com.tr](http://www.gsi.com.tr)

**Poland: SLV-GSI Polska Sp. z o.o.**  
[www.slv-polska.pl](http://www.slv-polska.pl)

**Czech Republic: SVV Praha**  
[www.svv.cz](http://www.svv.cz)



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