Introduction into adhesive technology
Successful adhesive bonding of plastics
Adhesive bonder according to DVS 2291
European Adhesive Bonder (EAB)
Innovative adhesive bonding technologies
Introduction into adhesive technology
3-day training course

Overview
The course provides an overview for the good start into adhesive technology. The various surface treatment methods and adhesives for different materials as well as their application possibilities are presented here.

Who will benefit?
Engineers, technicians, designers, product developers, decision makers, manufacturing planners, quality assurance, application engineers, sales assistants, process managers.

max. 12 participants

Contents

 ► Theory:

Basic principles of adhesive technology
• Importance of adhesion, cohesion and wetting for adhesive bonding
• Advantages and limits of application of adhesive technology

Surface treatment
• Cleaning agents and methods
• Methods of surface pretreatment (Mechanically, chemically, thermally, high energy)
• Application of low pressure plasma,
• Atmospheric pressure plasma, corona, fl aming, laser

Adhesives
• Physical setting adhesives (solvent adhesives, dispersion adhesives, hot-melt adhesives, contact adhesives)
• Pressure sensitive adhesives (adhesive tapes, transfer adhesive tape)
• Chemical curing adhesives (1K, 2K adhesives)
• Selection criteria
• Processing of adhesives
• Dosing technology
• Application examples and innovations
• Presentation of various adhesives from various manufacturers

Constructive design of adhesive joints
• Adhesive design (adhesive layer thickness, overlapping length)
• Stress
• Long-term stability

 ► Practical training:

Quality control and testing
• Destructive and non-destructive testing methods
• Criteria for selecting test methods
• Standards and guidelines
• Importance of DIN 2304 for bonding processes

Occupational health and safety
• Requirements for adhesive work stations
• Hazards and assessment of risks

Discussion of problems and professional exchange of expertise

Surface treatment of the joining parts

Application of various adhesives and processing methods
Overview
Because of being a universally applicable and effective assembling technique, adhesive bonding has been gaining more and more importance. With adhesive bonding technology one can assemble e.g. lightweight materials or even miniature parts precisely and reliably. Nowadays adhesive bonding techniques are used in a wide range of work fields, especially automotive engineering, railway vehicle manufacturing as well as the aircraft and boat building industry.

Who will benefit?
Specialists and professionals/skilled personnel from industry and small trade in the area of metal, wood, glass and plastic manufacturing.

max. 12 participants

Contents

Theory:

Introduction to adhesive bonding technology
- Basics, terms and definitions
- Adhesion, cohesion, wetting of the assembly parts
- Application of adhesive bonding technology, advantages and limits

Health-, work- and environmental-protection
- Dangers, workplace layout
- Hazardous substances, warning-symbols
- Disposal, storage and transport

Types of adhesives and their use
- Physically hardening adhesives (e.g. solvent-containing adhesives, dispersion adhesives, hotmelts, pressure sensitive adhesives)
- Chemically curing adhesives
- Application, bonding and fixing
- Curing of adhesives

Surface treatment of parts for bonded joints
- Surface preparation (mechanical, chemical, thermal, high-energy, priming)
- Surface post-treatment

Fundamentals of bond design
- Stresses on the bonds
- Design of adhesive bonds (thickness of adhesive layer, overlap length)
- Long term resistance

Quality control and testing of adhesive bonds
- Test methods (destructive, non-destructive) and evaluation
- Standards and terms of reference

Practical training:

Surface treatment of parts for bonded joints
Methods of surface preparation, treatment and post-treatment

Use of different adhesives
- Bonding of metal and plastic
- Bonding of material combination/ material hybrids

Practical, written and oral exam
The exam takes place on the last day of the course. Examination is executed by TC Kleben GmbH, Ubach-Palenberg

Advanced training
1-day training course

As a specific measure, we offer advanced training courses for updating your knowledge and getting information on the latest developments. Please feel free to contact us! We will inform you.

Subject to alterations · Further information about our training courses at: www.skz.de/en/training/trainingcourses
Successful adhesive bonding of plastics
2-day training course

Overview
This course teaches basic knowledge about the successful bonding of plastics within various industrial sectors. For this purpose, the range of different methods, processing technologies and various surface preparation methods are presented.

Who will benefit?
The course is ideal for technical employees, engineers, designers, developers and production managers.

max. 12 participants

Contents

Theory:

- Material science for plastics
  - Thermoplastics, thermosets, elastomers
  - Structure, characteristics

- Surface tension and testing methods
  Wetting, adhesion, cohesion

- Surface pretreatment
  - Atmospheric plasma, low pressure plasma, corona
  - flaming, fluorination, primers
  - Pickling, laser, grinding

- Adhesives for plastics
  Epoxies, 2K-acrylates, special acrylates, cyanoacrylates, UV curing agents, adhesives, polyurethanes, adhesive tapes, solvent adhesives

- Adhesive processing, specifics
  Information from the technical data

- Testing methods for the plastic adhesives joints

Practical training:

- Implementation of special surface pretreatment methods
  such as low pressure plasma, corona and flaming

- Adhesive bonding of different plastics,
  Taking into account their specifics

- Testing of plastic adhesive joints
  and evaluation of the results

Also possible as in-house training!
All our courses can be customized to company’s specifications. Please feel free to contact us. We will provide you with further details.
Overview
The quality of an adhesive-bonded joint in new fabrication and maintenance in piping construction, apparatus engineering and domestic installation depends on skills and knowledge of the plastic adhesive bonder. Therefore, the proof of qualification of the plastic adhesive bonder in practical and theoretical tests is essential. Successful participation may conclude with the adhesive bonder qualification test according to the DVS 2221 guideline.

Who will benefit?
Professionals from companies dealing with chemical apparatus construction, plant engineering and pipeline construction, repairing as well as processing of semi-finished products.

max. 12 participants

Contents

有害物质及安全—管道/袖管接头胶粘
— 胶粘用溶剂型胶粘剂

理论
— 塑料材料科学
  — 制造、结构、性能
  — 尤其是 PVC-U、PVC-C 和 ABS
  — 管道及管道部件的标记

胶粘剂的原理
— 用溶剂型胶粘剂胶粘
— 胶粘用管道及管道部件

环境保探测及安全

Information about the qualification test
Only those people whose training and previous activities mean that they are expected to have adequate specialist knowledge and skills in order to pass this qualification test are allowed to take part in the qualification tests. The qualification test encompasses a theoretical part and a specialist practical part. For passing the test of group 1 the specimen No. 1a and 1b have to be manufactured. If there are additional qualification tests of test group 2 and/or 3 necessary, the manufacturing of No. 1b is not required.

Period of validity of the exam
Adhesive bonders must repeat a qualification test every year.

Admission to the qualification tests to DVS 2221 has to fulfill one of the following conditions:
• Qualification as technician or process mechanic for plastics and rubber with practical experience in the field of adhesive bonding.
• Many years of practical experience in plastics processing of thermoplastics, including joining by means of adhesive bonding.
• Technical training as a skilled worker or journeyman in a relevant profession and experience in the processing of semi-finished products made of thermoplastics, including joining by means of adhesive bonding.
• Successful participation at a preparatory course according to DVS 2291.

Practical training:

Adhesive bonding
— 胶粘用管道的胶粘
— 用溶剂型胶粘剂的胶粘
— 实践操作的管道不同直径胶粘

制造产品

Multiple-choice written exam

Scopes of application

<table>
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<th>No.</th>
<th>Diameter d</th>
<th>Materials</th>
</tr>
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<tr>
<td>1</td>
<td>1a</td>
<td>d ≤ 32 mm</td>
<td>PVC -U/C, ABS</td>
</tr>
<tr>
<td></td>
<td>1b</td>
<td>32 &lt; d ≤ 90 mm</td>
<td>PVC -U/C, ABS</td>
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<tr>
<td>2</td>
<td>2</td>
<td>90 &lt; d ≤ 225 mm</td>
<td>PVC -U/C, ABS</td>
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<tr>
<td>3</td>
<td>3</td>
<td>d &gt; 225 mm</td>
<td>PVC -U/C, ABS</td>
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*TG = test group*
Overview
The course offers the opportunity to get comprehensive knowledge of the innovative adhesive bonding technologies and to give a summary of state of the art technology.

Who will benefit?
Addressed are companies, who already use adhesive bonding or will use the technology in the future. The course is suitable for engineers, designers, developers and managers in the areas of production, product and process development.

Contents

- Introduction to future adhesive bonding technology
- Advantages of adhesive bonding
- Adhesive layer and forces of bonding joints
- Different surface treatment of metals, plastics and glass
- Adhesives overview
- Mixing and dispensing technology
- Technique to apply adhesives
- Processing of adhesive bonding
- Information of technical data sheet and safety data sheet
- Requirements of structural adhesive bonding, additional functions
- Mechanical stress
- Engineering design information
- Selection of adhesives according to the application
- Quality assurance, lifetime and aging behavior of adhesive joints
- Current applications of the bonding technology

Practical training:

- Methods of surface treatment
- Selection of adhesives
- Adhesive bonding of plastics and metal
- New equipment for mixing and dispensing
- Various processing equipment
- Testing of bonded joints

Remark
The course is supported by adhesive manufacturers and producers of mixing and dispensing.