

TALAT Lecture 4705

Quality Assurance

4 pages, 4 figures

Basic Level

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Objectives:

- to describe the factors important for the quality assurance of adhesive joining
- to give information about the destructive and non-destructive testing methods for the quality control of adhesive joining

Prerequisites:

- general background in production engineering and material science
- background in mechanics and polymer science

Date of Issue: 1994

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4705 Quality Assurance


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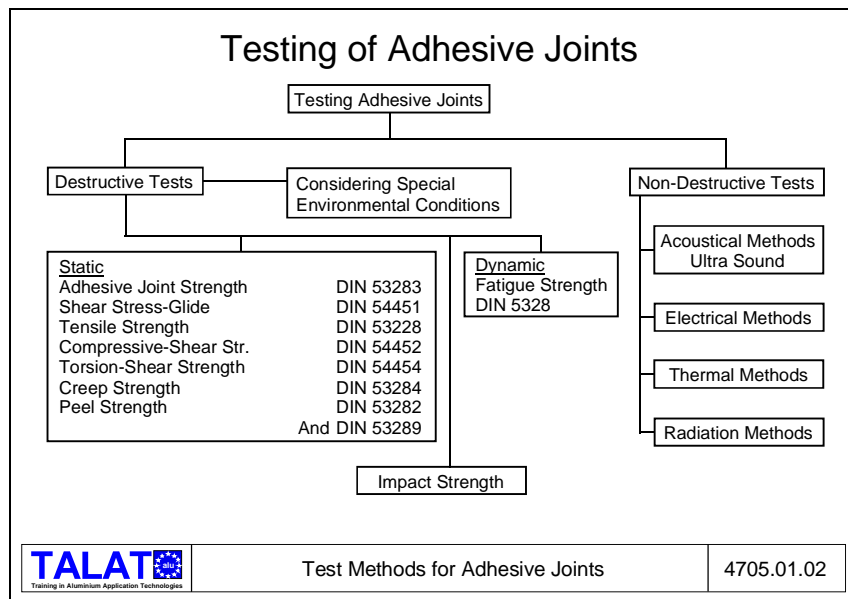
4705.01 Test Methods and Test Procedures

The quality assurance in adhesive joining starts with the choice of suitable adhesives and continues with the control and regulation of the adhesive, auxiliary mediums, joining parts, adhesive preparation and working and the adhesive joining.

The biggest problem is that a completely non-destructive method for testing adhesive joints does not exist. Consequently, preventive measures are most important: quality should be produced and not tested (**Figure 4705.01.01**).

| | | |
|---|-------------------|------------|
| <h2>Quality Assurance</h2> | | |
| 1. Controlling the Adhesive | | |
| For Example: Manufacturer's Data Sheet | | |
| Incoming Ware Control | | |
| Storage Condition | | |
| Production Clearance | | |
| 2. Control of Adhesive | | |
| For Example: Mixing Ratio | | |
| Pot Life | | |
| Application Method | | |
| Application Amount | | |
| Single or Double-Sided Application | | |
| Hardening Parameters (Temperature, Time, Pressure) | | |
| 3. Control of Joining Parts and their Pretreatment | | |
| For Example: Dimensional Control | | |
| Freedom from Burrs | | |
| Pretreatment Methods | | |
| Process Parameters | | |
| 4. Control of Adhesive Joint | | |
| For Example : Functionality Test (Component) | | |
| Random Sample Testing (Component) | | |
| Comparative Tests (Specimen Sample) | | |
| Non-Destructive Testing (Component) | | |
|  | Quality Assurance | 4705.01.01 |

The test methods are based on the tests for metals which have been correspondingly modified. The statistical destructive methods serve primarily to determine and control characteristic values for the adhesive (**Figure 4705.01.02**).



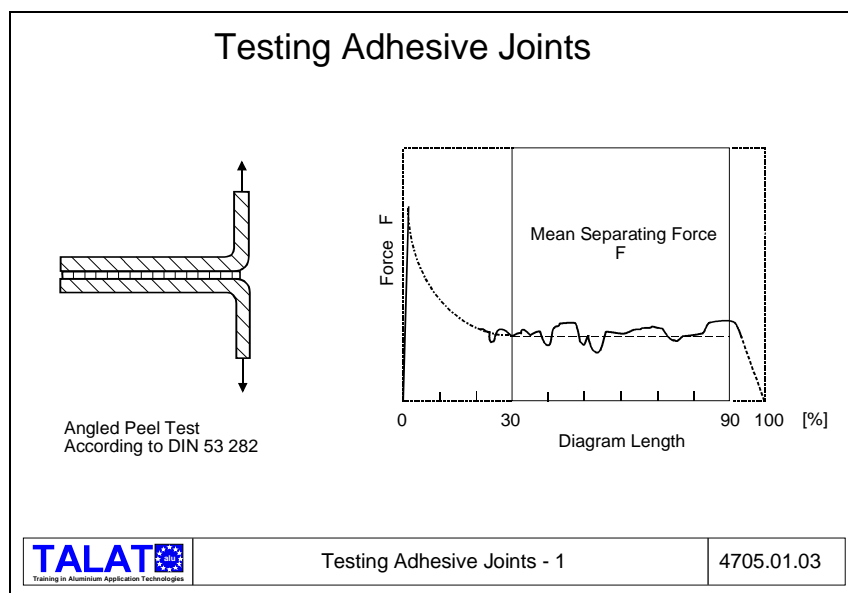
Test Methods for Adhesive Joints

4705.01.02

A disadvantage of all non-destructive tests is that these allow the measurement of pores, non-uniform adhesive layer thickness and absolute joining defects but not, however, the quality of adhesion of the adhesive and joining parts surfaces.

Specially prepared test samples which are also run through the normal manufacturing process are used to control the adhesive joining process.

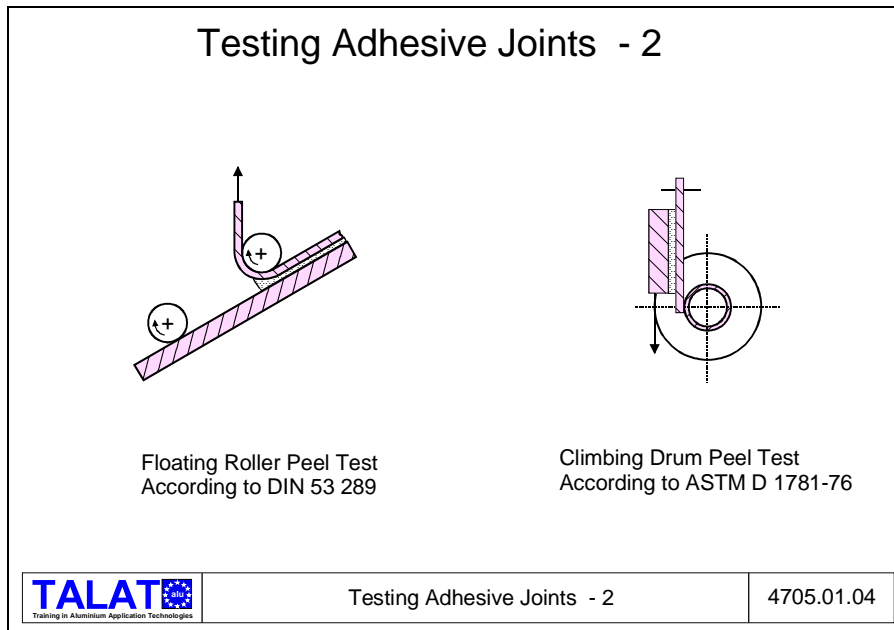
The simplest forms of test samples are the peel samples and the tensile-shear samples (**Figure 4705.01.03** and **Figure 4705.01.04**).



Testing Adhesive Joints - 1

4705.01.03

The former are subjected to the same technological conditions as the adhesively joint component and then used for comparative tests, since these indicate the presence of production defects most clearly.



The surfaces of parts which have to be joint are treated prior to joining in order to have an optimal adhesion force between joint part surface and the adhesive layer.

4705.02 Literature/References

1. **Habenicht, G.:** Kleben. Springer-Verlag Berlin-Heidelberg-New York 1990.
2. **Sauer, J.:** Neue Aspekte der Qualitätssicherung bei der Herstellung von Klebverbindungen mit zweikomponentigen Klebstoffen. Dissertation TH Aachen 1989. Adhäsion Buchreihe Heinrich Vogel Fachzeitschriften, München 1989.
3. **Brockmann, W.:** Schadensuntersuchungen an Klebverbindungen und ihre Lehren. Aus: Tagungsband Fertigungssystem Kleben, TUB-Dokumentation (1984) H. 21, S. 280-297.
4. **Endlich, W.:** Kleb- und Dichtstoffe in der modernen Technik. Vulkan Verlag Essen 1990.
5. **Brockmann, W., Dorn, L. und Käufer, H.:** Kleben von Kunststoff mit Metall. Springer Verlag Berlin-Heidelberg-New York 1989.

4705.03 List of Figures

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