TKH Technical Briefing Note 2

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Industrieverband Klebstoffe e.V.

DIN EN 14257 (WATT 91)

A test procedure to determine heat resistance

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DIN EN 14257, formerly WATT 91
A test procedure to determine heat resistance

In practically all areas of glueing and adhesive technology, determination of the heat resistance of a bond is of substantial interest. On account of the variety of adhesives, materials, type of thermal effects and construction of the test specimen, no generally accepted test procedure is applicable. Consequently, a number of different methods have been established subject to the varying requirements. The main objective is to obtain reproducible measurements.

In order to determine heat resistance for applications in the wood industry, WATT 91 is the prevailing standard, which has been changed to DIN EN 14257 in 2006. It is almost exclusively used for assessment of PVAc adhesives (thermoplastic adhesives).

Frequently however, WATT 91 is interpreted incorrectly and improperly used as "quality feature".

But what is correct?

In DIN EN 14257 (WATT 91), the parameter given for heat resistance of an adhesive is the breaking load tensile shear strength at 80 °C in N/mm2.
For this, several criteria must be standardized and defined:

- Appearance, measurement, and fabrication of the test specimen; for this, DIN EN 205 is referred to.
- When testing the specimen, the objective is the assessment of the adhesive film, not the object itself.
- Storage at 80 ± 2 °C under defined conditions
- Performing of the test; minimum number of measurements, statistics

DIN EN 14257 (WATT 91) does not require minimum values (such as required by EN 204); it is a completely neutral assessment.

Consequently, DIN EN 14257 (WATT 91) does not constitute a quality feature of an adhesive.

Frequently, the value of 7 N/mm2 is cited in connection with DIN EN 14527 (WATT 91). However, this value is not an element of this test method.

It is merely a recommendation for a minimum requirement regarding heat resistance when fabricating window frame squares (also refer to DIN SPEC 1140; DIN CEN/TS 13307-2:2010-03).

Therefore, the correct description for an adhesive can read as follows:

XYZ is a D4 adhesive according to DIN EN 204; heat resistance according to DIN EN 14257 (WATT 91) 7.5 N/mm2.

In March 2024, WATT 91 was also published as ISO 34257 Adhesives – Wood adhesives – Determination of tensile strength of lap joints at elevated temperature (WATT '91)

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