

Testing of paints, varnishes and similar coatings
Rating scheme for the evaluation of tests

DIN
53 230

Prüfung von Anstrichstoffen und ähnlichen Beschichtungsstoffen;
 Bewertungssystem für die Auswertung von Prüfungen

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In keeping with current practice in standards published by the International Organization for Standardization (ISO), a comma has been used throughout as the decimal marker.

See Explanatory notes for connection with ISO 4628/1 – 1982 issued by the International Organization for Standardization (ISO).

1 Scope and field of application

When testing paints, varnishes and similar coatings, their properties or any changes to them frequently cannot be described in terms of measured values, but must instead be assessed subjectively. This standard specifies a standardized rating scheme on which to base assessments, with the purpose of facilitating evaluation and promoting mutual understanding. This rating scheme shall only be used where the results of tests cannot be expressed in terms of direct measurements and there are no available standards dealing with the evaluation of the properties concerned, e.g. those with special parameters (see the "Other relevant standards" clause on page 3).

Note. Other schemes have been introduced for the evaluation of colour fastness of colorants (see DIN 54 000, DIN 54 001, DIN 54 002, DIN 54 003, DIN 54 004, DIN 53 775 Part 3, for example), where the highest numerical value always corresponds to the greatest fastness. In order to avoid confusion, the colour fastness of colorants shall not be evaluated as specified in DIN 53 230.

The rating scheme can generally reproduce the differences occurring in series of tests in one test facility reliably. If test results from different samples or series of tests not available at the same time are to be compared, then defined reference scales, standards or initial and final values, which are to be agreed for evaluation purposes, shall be used. Without such reference values, a reliable rating is possible only by direct comparison of samples.

2 Fixed and relative rating scales

The rating scales given in subclauses 2.1 and 2.2 below should be used so that the same rating numbers correspond to the same intensity or the same change in the property to be assessed. In addition to the numerical ratings indicated below, intermediate half-steps may be used, if a more detailed assessment is required. The individual numerical ratings and intermediate half-steps

shall, however, only be stated in so far as is permitted by the factor of uncertainty foreseen for the method of evaluation concerned (see also the Explanatory notes). The ratings obtained when evaluating single properties of colorants shall not be taken together to form an overall assessment.

2.1 Fixed rating scale

The fixed rating scale (for assessing the intensity of properties) shall be used for stating the condition concerned, starting with the initial condition which is also to be evaluated by means of this scale. The best possible value is given the rating 0, and the worst possible value the rating 5.

Table 1. Fixed rating scale

Rating	Quality of value
0	Best possible value ↓ Worst possible value
1	
2	
3	
4	
5	

The term 'worst possible value' is understood to mean that a change or worsening beyond this value entails loss of suitability for use.

If defined reference scales, standards or initial and final values are used as the basis for the evaluation, these shall be stated in the test report.

Continued on pages 2 to 4

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2.2 Relative rating scales

In some cases, e.g. when evaluating paint discoloration, fixed rating scales cannot be used. Instead, a relative rating scale (for evaluating changes in properties) is to be used, with rating number 0 for the initial state or a comparative standard and 5 for the maximum change which is still of interest.

Table 2. Relative rating scale

Rating	Intensity of change
0	Unchanged
1	Very slight
2	Slight
3	Moderate
4	Considerable
5	Severe

The reference value (initial state or comparative standard) shall be stated if the relative rating scale is used.

3 Differentiating evaluation of properties

Sometimes it is necessary to evaluate properties or changes, where information on quantity, size and/or depth is of interest. The ratings expressed in letter or numerical form as indicated in subclauses 3.1 to 3.3 are to be used for such an evaluation.

The information obtained from subclauses 3.1 to 3.3 shall not be taken together to form an overall assessment.

3.1 Quantity ratings

Table 3. Quantity ratings

Rating	Quantity
m 0	None
m 1	Very few
m 2	Few
m 3	Moderate
m 4	Considerable
m 5	Dense

The above ratings and the assigned quantities correspond to the ratings as a function of the quantity of blisters required for designation of the degree of blistering of paints, as specified in DIN 53 209.

3.2 Size ratings

Table 4. Size ratings

Rating	Size
g 0	Not visible
g 1	Microfine (can only be seen with optical instrument or just perceivable with the naked eye)
g 2	Clearly visible (0,5 to 1 mm in size)
g 3	Easily visible (1 to 2 mm in size)
g 4	Order of mm in size (2 to 5 mm)
g 5	Order of cm in size (above 5 mm)

When using optical instruments, the magnification required for recognition shall be stated.

3.3 Depth ratings

Table 5. Depth ratings

Rating	Depth
t 0	No surface effects visible
t 1	Microfine surface effects (can only be seen with optical instruments or just perceivable with the naked eye)
t 2	Clearly visible surface effects
t 3	Effects in the top half of the total thickness of coating
t 4	Effects extend to the lower half of the total thickness of coating
t 5	Effects extend to the primer

When using optical instruments, the magnification required for recognition shall be stated.

4 Test report

The test report shall contain the following information:

- a reference to this standard;
- the property and numerical rating assessed in accordance with clause 2 or the letter and numerical rating in accordance with clause 3, stating the rating scale used; for evaluation in accordance with clause 3, the quantity, size and depth ratings shall be separated by oblique strokes;
- the reference values or scales used;
- the date of the evaluation;
- optionally, the type and duration of the test.