

European standards for **tile adhesives**

Adhesive certification to EN standards and German Flexmortar quality label

Adhesive products used for laying ceramic tiles are required to meet various performance standards. These are precisely defined in European standard DIN EN 12 004 (or ISO 13 007 Part 1), which specifies the criteria for the C1 and C2 ratings (for cementitious adhesives), D1 and D2 ratings (for dispersion adhesives) and R1 and R2 (for reaction resin adhesives) along with extra optional parameters. Standard DIN EN 12 004 sets out the background to the S1 and S2 ratings for cementitious adhesives. The various performance criteria are described in detail in the following sections.



European standards

Cementitious adhesives

Tensile adhesion strength

The C1 and C2 ratings (specified in DIN EN 12 004) relate to tensile adhesion performance. The Class C1 criteria represent the minimum requirements (min. 0.5 N/mm²) for all cementitious tile adhesives. The performance standards specified for Class C2 are appreciably higher, with a minimum tensile adhesion strength of 1 N/mm² required of thin-bed adhesives. Tensile adhesion tests for the C1 and C2 ratings are performed for four different storage conditions.

	Class C1	Class C2
Tensile adhesion strength after dry storage	≥ 0.5 N/mm²	≥ 1 N/mm²
Tensile adhesion strength after water storage	≥ 0.5 N/mm²	≥ 1 N/mm²
Tensile adhesion strength after heat storage	≥ 0.5 N/mm²	≥ 1 N/mm²
Tensile adhesion strength after freeze-thaw storage	≥ 0.5 N/mm²	≥ 1 N/mm²

Deformability

The deformability of hardened, cementitious thin-bed adhesives is tested using a predefined specimen (strip of material) and rated as S1 or S2 (to DIN EN 12 004).

While the S1 rating requires a deformability between min. 2.5 mm and 5 mm, Class S2 is reserved for highly deformable products achieving a minimum value of 5 mm – a requirement twice that specified by the German Flexmortar guidelines.

Dispersion adhesives

The D1 and D2 ratings (specified in DIN EN 12 004) relate to shear strength. All dispersion adhesives are required to meet at least Class D1 requirements i.e. by exhibiting min. 1 N/mm² shear strength after dry and heat storage. The D2 rating additionally requires a minimum shear strength of 0.5 N/mm² after water storage together with a shear strength ≥ 1 N/mm² at elevated temperatures.

Reaction resin adhesives

Like the D1 and D2 ratings for dispersion adhesives, Classes R1 and R2 for reaction resin adhesives (specified in DIN EN 12 004) relate to shear strength. All reaction resin adhesives are required to meet at least Class R1 requirements, i.e. by exhibiting min. 2 N/mm² shear strength after dry and water storage. The R2 rating additionally requires a minimum shear strength of 2 N/mm² after temperature cycles.