

## Summary

of the research project  
**Testing methods for masonry – Determining the shear strength**  
ZP 52-5-15.65-1152/06

According to DIN 1053-1 the shear bonding strength of masonry mortars should be tested as stipulated in DIN 18555-5 using twin unit specimens from reference units. The shear bonding strength gained in this manner is then the basis for determining such properties as flexural and thrust behaviour in masonry. The European harmonised standard for masonry mortar, DIN EN 998-2, provides for testing shear bonding strength according to DIN EN 1052-3. The test carried out according to this standard is different from the DIN 18555-5 test. According to DIN EN 1052-3 the test involves loading three-unit specimens to various degrees. In some cases this test can also be carried out using large block units. DIN EN 1052-3 has been revised several times and therefore no reliable relationship between the results from these two testing standards is known.

The aim of our research is to fill the gaps in our knowledge of the relationship between shear bonding strength test results gained from these two different standards by means of tests with normal, lightweight and thin bed mortars. Finally, the relationship of 0.5, stipulated by DIN V 18580 and DIN V 20000-412, when comparing shear bonding strengths according to DIN EN 1052-3 and DIN 18555-5, is being examined.

The research plan involved tests to compare shear bonding strength according to DIN 18555-5 and DIN EN 1052-3. The results can be summed up as follows:

- Shear bonding test results are always very scattered
- Standard requirements for shear bonding strength are in general fulfilled.
- Thin bed mortar with supporting aggregate and calcium silicate reference units do not fulfill the requirements.
- The highest shear bonding strengths were registered when using normal and lightweight mortars with lightweight concrete blocks.
- The highest shear bonding strengths with thin bed mortar were registered with aerated concrete blocks.
- Testing according to method A of DIN EN 1052-3 results in about 10 % higher values than testing according to method B.
- Testing shear bonding strength according to DIN EN 1052-3, with preload, may result in adulterated values, since it is possible that the longitudinal compressive strength is decisive here.
- After comparing the results of all test series carried out according to both test methods the following relationships can be found:
  - DIN EN 1052-3 method B compared with DIN 18555-5 ==> about 0.5
  - DIN EN 1052-3 method A compared with DIN 18555-5 ==> about 0.55

Variations in the relationship lie, with a few exceptions, between about 0.4 and 0.6. A normative stipulation of the relationship between DIN EN 1052-3 and DIN 18555-5 seems practicable for all typical unit/mortar combinations.