Long-term stability of joint repairs in building construction

Long-Term Stability of Joint Repairs in Building Construction

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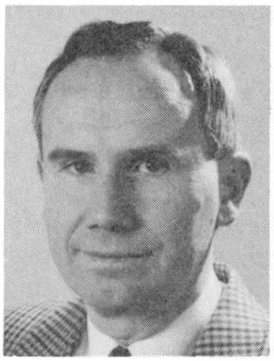

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Summary

Trial results with elastomer jointing strips based on polysulphide and silicone rubber are evaluated from the aspect of long-term stability. The authors have based themselves on the applications maintained since 1974. A report is given on the following results:

- Trial on structure
- Seal against driving rain
- Extension-compression strain
- Adhesion on concrete
- Tensile strength and elongation at break

The verified long-term-stability up to now is 23 years for the best joint solution investigated. So as to be able to determine the probable long-term stability, work is taking place on a test method.

1. Introduction

It is preferable to renovate the joint seals on external walls with elastomer jointing strips. At this point, a few results should be updated from the point of view of long-term durability.

2. On-site testing

Testing on a construction site is the most practical form of ageing test. Site trials provide proven values for long-term durability, but the maximum values actually achievable could be slightly or considerably higher than these and an accurate estimate is rather difficult to make. We present two selected applications of silicone and polysulphide jointing strips which have been dealt with by the writers since 1974 respectively 1979.

3. Test evidence

It was investigated six polysulphide rubbers PS I-VI, one silicone rubber SI and three primers P I-III.

- Watertightness to driving rain
  The test was carried out in a special rain chamber (see Fig. 1).

- Extension and compression strain
  The exercise was carried out on a special extension/compression test machine, the clamping part of which can be positioned in a temperature-controlled chamber (Fig. 2).
- Adhesion to concrete
  It can be concluded from the compression shear tests that the adhesion of jointing strips to concrete will not fail in the long term if it proved to be up to the mark in the first few years.
- Tensile strength and elongation at break
  When exposed to the open-air, the values of the tensile strength only drop slightly or even increase a little. The prediction period is an unknown quantity. As the elongation at break reduces continuously, it is suitable for predicting the long-term durability of jointing strips. We decided on a probable useful working life of 20 to 35 years for elastomer jointing strips.

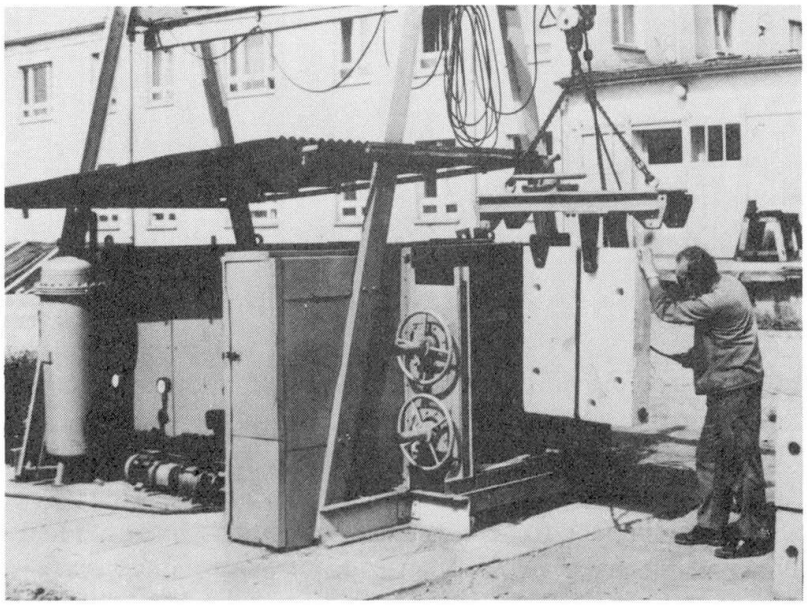

Fig. 1 Evaluation of the watertightness to driving rain in the rain chamber

4. Conclusion

The long-term durability of the elastomer jointing strips tested turned out to be very high. In order to be able to assess this property in the case of the addition of colouring agents and other formula changes, or even completely new formulae, new rapid tests are necessary. The authors are working on the general problem of the artificial ageing of elastomeric building sealants. However we shall not be reporting on this at this stage, but at the CIB World Building Congress which takes place in Gävle (Sweden) from 7 to 12 June 1998.

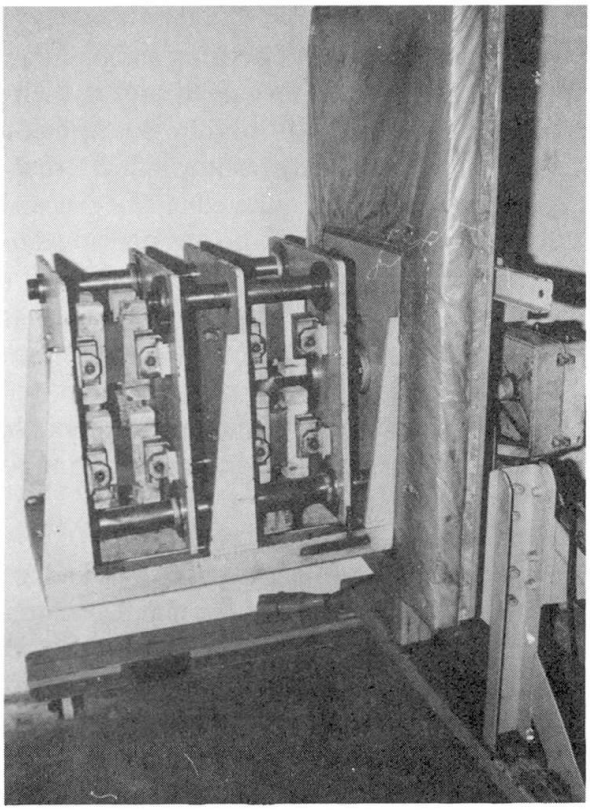

Fig. 2 Extension/compression test machine