BRITISH STANDARD

BS EN ISO 13760:2000
BS 2782-11: Method 1120M:2000

Plastics pipes for the conveyance of fluids under pressure — Miner's rule — Calculation method for cumulative damage

The European Standard EN ISO 13760:1998 has the status of a British Standard

ICS 23.040.20

National foreword

This British Standard is the official English language version of EN ISO 13760:1998. It is identical with ISO 13760:1998.

The UK participation in its preparation was entrusted to Technical Committee PRI/61, Plastics piping systems and components, which has the responsibility to:

— aid enquirers to understand the text;
— present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
— monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

It is incorporated into BS 2782-11 *Methods of testing plastics — Part 11: Thermoplastics pipes, fittings and valves*, as Method 1120M:2000, for association with related test methods for plastics materials and plastics piping components.

This test method has been prepared for reference by other standards under preparation by CEN for specification of plastics piping and ducting systems and components. It has been implemented to enable experience of the method to be gained and for use for other fresh applications.

The responsible UK Technical Committee draws attention to the following aspects of this standard and considers it important that these aspects be taken into account as appropriate when considering fresh applications of this standard or any changes to calculation procedures.

- The second of the principles underlying the method as set out in clause **4**, i.e. item b), is the **proportionality rule**, whereby "under constant conditions the amount of damage done is proportional to the duration of the attack". This is not self-evident, and whilst it may be approximately true for metals (the field of application in which its use originated), it will be misleading when the response of a given property is both significantly non-linear with time and is serious for the given application, e.g. the creep strain of a plastics pipe under constant pressure.
- The third of the principles, item c), assumes that the damage from a fraction of time a of any given time is also the fraction a of the damage caused by the total time. This assumption is not necessarily correct as it follows directly from item b), and would also cause Miner's rule to fail if the proportionality rule is not valid for the conditions of use.

For the treatment of long-term data which is non-linear with time, attention is drawn to ISO 9967, *Thermoplastics pipes — Determination of creep ratio* and to ISO 10928, *Plastics piping systems — Glass-reinforced thermosetting plastics (GRP) pipes and fittings — Methods for regression analaysis and their use.*

- Annex A includes an example of an actual calculation, with base data given in Table A.1 and a consequent result expressed in the final paragraph of annex A. Attention is drawn to the information given in the second paragraph in **A.2** that for the actual calculation of t_x more decimal places were used than are given in Table A.1. This means that if the data given is used to check the validity of a given calculation package (i.e. for an appropriate calculation sequence and rounding rules for significant figures), the result may not be identical to that given in the final paragraph, and judgement may be necessary as to whether the magnitude of any deviation from the example given is excessive for the purposes of using this method.

Cross-references

Attention is drawn to the fact that CEN and CENELEC Standards normally include an annex which lists normative references to international publications with their corresponding European publications. The British Standards which implement these international or European publications may be found in the BSI Standards Catalogue under the section entitled "International Standards Correspondence Index", or by using the "Find" facility of the BSI Standards Electronic Catalogue.

This British Standard, having been prepared under the direction of the Sector Committee for Materials and Chemicals, was published under the authority of the Standards Committee and comes into effect on 15 April 2000

WARNING This British Standard, which is identical with EN ISO 13760:1998, does not necessarily detail all the precautions necessary to meet the requirements of the Health and Safety at Work etc. Act 1974. Attention should be paid to any appropriate safety precautions and the method should be operated only be trained personnel.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, the EN ISO title page, the EN ISO foreword page, the ISO title page, page ii, pages 1 to 6, an inside back cover and a back cover

ISBN 0 580 32570 9