

INTERNATIONAL STANDARD

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

*Tubes en matières plastiques pour le transport des fluides sous pression —
Règle de Miner — Méthode de calcul du cumul des dommages*

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ISO 13760:1998(E)**Foreword**

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Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 13760 was prepared by Technical Committee ISO/TC 138, *Plastics pipes, fittings and valves for the transport of fluids*, Subcommittee SC 5, *General properties of pipes, fittings and valves of plastic materials and their accessories — Test methods and basic specifications*.

Annexes A, B and C of this International Standard are for information only.

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

1 Scope

This International Standard specifies a method for calculating the maximum allowable hoop stress applicable to pipes exposed to varying internal pressures and/or temperatures during their expected lifetime. This method is generally known as Miner's rule.

It is necessary to apply Miner's rule to each failure mechanism separately. Thus, for mechanical failure due to internal pressure, other failure mechanisms, such as oxidative or dehydrochlorinative degradative failure mechanisms, are to be neglected (assuming, of course, no interaction). A material may be used only when it is proven to conform to all failure mechanism criteria.

NOTE — Miner's rule is an empirically based procedure, and is only a first approximation to reality.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of the publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 10508:1995, *Thermoplastics pipes and fittings for hot and cold water systems*.

3 Symbols and abbreviated terms

For the purposes of this International Standard, the following symbols and abbreviations apply:

a_j	fraction of a year, expressed as a percentage, when referring to set of conditions "j";
t_j	lifetime under a specified set of conditions "j" ($i = 1, 2, 3, \text{etc.}$) expressed in years;
t_m	lifetime at malfunction temperature T_m as defined in ISO 10508;
t_{\max}	lifetime at maximum operating temperature T_{\max} as defined in ISO 10508;
t_o	lifetime at operating temperature T_o as defined in ISO 10508;
t_x	maximum permissible time of use under varying conditions, expressed in years;
TYD	total yearly damage, expressed as a percentage.