
**Polypropylene (PP) pipes — Effect of time
and temperature on the expected
strength**

*Tubes en polypropylène (PP) — Influence du temps et de la
température sur la résistance espérée*



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Published in Switzerland

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

ISO 3213 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*.

This third edition cancels and replaces the second edition (ISO 3213:1996), which has been revised technically to accommodate technical developments of the polypropylene material. A new type of PP-R is introduced, with a modified crystallinity, designated PP-RCT in accordance with ISO 1043-1^[1].

ISO (the International Organization for Standardization) draws attention to the fact that it is claimed that compliance with this document can involve the use of a patent concerning the material class PP-RCT given in Clause 1, Clause 4, Table 5 and Figure 4.

ISO takes no position concerning the evidence, validity and scope of this patent right.

The holder of this patent right has assured ISO that it is willing to negotiate licenses under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statement of the holder of this patent right (EP1448631) is registered with ISO. Information may be obtained from:

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Polypropylene (PP) pipes — Effect of time and temperature on the expected strength

1 Scope

This International Standard specifies the minimum values for expected strength as a function of time and temperature in the form of reference lines, for use in calculations on pipes made of:

- polypropylene homopolymer (PP-H);
- polypropylene block copolymer¹⁾ (PP-B);
- polypropylene random copolymer (PP-R);
- polypropylene random copolymer²⁾ with a modified crystallinity (PP-RCT).

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 1167-1, *Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 1: General method*

ISO 1167-2, *Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 2: Preparation of pipe test pieces*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

reference lines

generic description of the minimum long-term hydrostatic strength to be expected from a particular polymer

NOTE 1 Reference lines are not to be considered as characteristic of a specific grade or of material from a specific supplier.

NOTE 2 The lines are described by a mathematical equation, which permits interpolation and extrapolation in an unambiguous way at various temperatures.

NOTE 3 The reference lines for PP-H, PP-B, PP-R and PP-RCT have been agreed upon by a group of experts after consideration of experimental data, and are accepted by the relevant technical committees in ISO.

1) This is also called heterophasic copolymer.

2) This material can be distinguished by DSC testing or other appropriate method to indicate a second melting peak.