



National Standards Authority of Ireland

IRISH STANDARD

I.S. EN 12107:1998

ICS 83.140.30

**PLASTICS PIPING SYSTEMS -
INJECTION-MOULDED THERMOPLASTICS
FITTINGS, VALVES AND ANCILLARY
EQUIPMENT - DETERMINATION OF THE
LONG-TERM HYDROSTATIC STRENGTH OF
THERMOPLASTICS MATERIALS FOR
INJECTION MOULDING OF PIPING
COMPONENTS**

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Údarás um Chaighdeán Náisiúnta na hÉireann

**EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM**

EN 12107

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Descriptors: plastics, piping, thermoplastics, material, injection-moulded, fittings, valves, internal pressure, test

English version

**Plastics piping systems - Injection-moulded
thermoplastics fittings, valves and ancillary equipment -
Determination of the long-term hydrostatic strength of
thermoplastics materials for injection moulding of piping
components**

Systèmes de canalisation en plastique -
Raccords, robinets et équipements auxiliaires en
thermoplastiques moulés par injection -
Détermination de la résistance hydrostatique à
long terme des matières thermoplastiques
utilisées pour le moulage par injection des
composants de canalisation

Kunststoff-Rohrleitungssysteme -
Spritzgegossene thermoplastische Formstücke,
Armaturen und Zubehörteile - Bestimmung des
Zeitstand-Innendruckverhaltens von
thermoplastischen Werkstoffen für das
Spritzgiessen von Rohrleitungsteilen

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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to Central Secretariat or any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart 36, B - 1050 Brussels

Foreword

This European standard has been prepared by Technical Committee CEN/TC 155 "Plastics piping systems and ducting systems" the secretariat of which is held by NNI.

In some System Standards material strength requirements are specified including design stress values based on a minimum required strength (MRS) in accordance with EN ISO 12162.

To determine MRS values the extrapolation method is specified in ISO/TR 9080:1992 and for extruded pipes the test method is described in EN 921.

This standard specifies the test method for injection-moulded tubular test pieces as well as for extruded pipe test pieces, both of material compound intended for use for injection moulding. Generally the test method for extruded pipes described in EN 921 is included in this standard or it is referred to.

The material-dependent parameters and/or performance requirements are incorporated in the System Standard(s) concerned.

Annex A, which is informative, gives a bibliography.

This standard is one of a series of standards on test methods which support System Standards for plastics piping systems and ducting systems.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 1998, and conflicting national standards shall be withdrawn at the latest by February 1998.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This standard specifies methods for preparing tubular test pieces for testing thermoplastics materials used for injection moulding, to evaluate the long-term resistance to constant internal water pressure at constant temperature and to check the hydrostatic strength of the material.

2 Normative references

This Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 921	<i>Plastics piping systems - Thermoplastics pipes - Determination of resistance to internal pressure at constant temperature</i>
ISO/TR 9080:1992	<i>Thermoplastics pipes for the transport of fluids - Methods of extrapolation of hydrostatic stress rupture data to determine the long-term hydrostatic strength of thermoplastics pipe materials</i>

3 Principle

This test method is intended to evaluate and to check the long-term resistance of thermoplastics material compounds for injection moulding. The evaluation comprises a comparison with long-term resistance of the equivalent material compound used for the extruded pipe in the same piping system. For both injection-moulding compounds and extrusion compounds, the long-term hydrostatic resistance is determined according to the extrapolation method given in ISO/TR 9080:1992 and the MRS values are considered valid for the design of all piping components having the same material type.

This test method is also used for checking individual points of the established regression curves as a minimum material test requirement.

Whatever the type of material or method of test piece manufacture, after conditioning, test pieces are subjected to a specified constant internal hydrostatic pressure for a specified period of time or until the test piece fails.

Throughout the test, the test pieces are kept in an environment, at a specified constant temperature, comprising water (water-in-water test), another liquid (water-in-liquid test) or air (water-in-air test).

NOTE: It is assumed that the following test parameters are set by the standard making reference to this standard:

- a) the type of test piece, i.e. extruded or injection-moulded and its diameter and wall thickness (see clause 4 and 6.3);
- b) the type of end caps to be used (see clauses 5 and 9);
- c) the sampling procedure (see 6.1);
- d) the number of test pieces (see 6.4);
- e) the following parameters as required by EN 921 (see clauses 7, 8 and 9):
 - 1) the test temperature;
 - 2) the test pressure, p , or the circumferential (hoop) stress, σ , to be induced by the test pressure;
 - 3) the conditioning period;
 - 4) the type of test, i.e. water-in-water/liquid/air;
 - 5) the duration of the test under pressure and the criteria for a failure;
 - 6) the requirements, or patterns of requirements, if any, which determine the initiation of additional testing.

4 Test conditions

For the evaluation of the MRS of injection-moulded material compounds the following two cases shall be considered:

a) The material compound used for injection moulding is different from the material compound used for extrusion

The MRS-value for the compound, used for injection moulding, shall be evaluated in accordance with ISO/TR 9080:1992.

For a compound used only for injection moulding, the MRS-value shall be evaluated using injection-moulded tubular test pieces.

If the injection-moulding compound can also be processed by extrusion, the MRS value may be evaluated using either injection-moulded or extruded tubular test pieces.

If the MRS-value has been determined using extruded pipe test pieces, a comparison test with injection-moulded tubular test pieces shall not be required, unless specified in the referring standard.

If the MRS-value is determined using injection-moulded test pieces with a bond line and a failure occurs in the bond line area, the result may be disregarded and the test repeated on another test piece.

NOTE: To evaluate the MRS and to compare results, it is important that the extruded and the injection-moulded test pieces have the same characteristics. Therefore, for all these tests, preferably an injection-moulded test piece without a bond (weld) line is used.

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