International Standard 6803

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Rubber or plastics hoses and hose assemblies — Hydraulic pressure impulse test without flexing

Tuyaux et flexibles en caoutchouc et en plastique — Essai d'impulsions de pression hydraulique sans flexions

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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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

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Rubber or plastics hoses and hose assemblies — Hydraulic pressure impulse test without flexing

1 Scope and field of application

This International Standard describes a pressure impulse test without flexing for rubber or plastics hydraulic hoses and hose assemblies.

The test is applicable to high pressure hydraulic hoses and hose assemblies which are subject to pulsating pressures in service.

If it is required to carry out the test with flexing, the method described in ISO 6802 should be used.

2 References

ISO 1219, *Fluid power systems and components — Graphic symbols.*

ISO 2719, *Petroleum products — Determination of flash point — Pensky-Martens closed cup method.*

ISO 2977, *Petroleum products and hydrocarbon solvents — Determination of aniline point and mixed aniline point.*

ISO 3016, *Petroleum oils — Determination of pour point.*

ISO 3104, *Petroleum products — Transparent and opaque liquids — Determination of kinematic viscosity and calculation of dynamic viscosity.*

ISO 6802, *Rubber and plastics hoses and hose assemblies — Hydraulic impulse test with flexing.*[1]

3 Apparatus

3.1 The apparatus shall be capable of applying an internal pulsating pressure to the test piece at a rate between 0,5 and 1,0 Hz using a hydraulic fluid which circulates through the test piece, the fluid being maintained at the required test temperature. Each pressure cycle shall be within the tolerances shown in figure 2. The rate of pressure rise during the first part of the pressure impulse cycle shall be between 300 and 600 MPa/s (3 000 and 6 000 bar/s), determined as shown in figure 3.

3.2 A typical hydraulic circuit for the test rig is shown schematically in figure 1.

3.3 A suitable graphical recorder is required to enable the pressure cycle to be checked against figure 2. The recorder shall have a natural frequency of more than 250 Hz, critically damped to give a response flat to within 5 % up to 0,6 times the natural frequency.

4 Test fluid

Unless otherwise specified, the test fluid shall be a fully fortified mineral oil complying with the requirements of the table

Table

Property	Requirement	Method of test
Viscosity at 40 °C	127 ± 20 mm^2/s	ISO 3104
Pour point, max.	−24 °C	ISO 3016
Flash point, closed cup, min.	218 °C	ISO 2719
Aniline point	103 ± 10 °C	ISO 2977

5 Test temperature

The test temperature shall be one of the following temperatures:

55 — 85 — 93 — 100 — 125 — 135 or 150 °C

The test fluid shall be circulated through the test pieces at the specified temperature with a tolerance of ±3 °C. The test fluid temperature shall be measured at the inlet and at the outlet of the test pieces and the test temperature is defined as the mean value of the two measured temperatures. No one of the measured values may deviate from the test temperature by more than 3 °C.

6 Test pieces

6.1 Test pieces shall consist of complete hose assemblies or length of hose with suitable end fittings attached.

Unless otherwise specified, four test pieces should be tested.

1) At present at the stage of draft.

6.2 The free length of the test pieces (exclusive of end fittings) shall be

a) if bending through 90°, $0{,}5\pi r + 2d$,

b) if bending through 180°, $\pi r + 2d$,

where r is the specified minimum bend radius for the hose and d is the external diameter of the hose with a tolerance of $^{+15}_{0}$ mm. (See figure 4.)

7 Procedure

7.1 Connect the test pieces to the apparatus. The test pieces shall be installed according to figure 4, where the test pieces of hose nominal bore size up to 25 mm shall be bent through 180° and hoses of nominal bore sizes 25 mm and greater shall be bent through 90°.

7.2 Bring the test fluid to the test temperature and then apply the impulse pressure cycle according to figure 2. Continue the test for the specified number of cycles or until the assembly fails.

8 Expression of results

8.1 Record the number of cycles to failure, or, if failure did not occur, the number of cycles completed.

8.2 The failure criteria are as follows:

— when testing hose assemblies, failure due to blowing off of couplings or bursting within 25 mm of the fitting shall not be interpreted as a true hose burst or recorded as such in the test report;

— when testing test pieces of hoses, failures occurring within 25 mm of the end fittings, or within a distance equal to the external diameter of the hose, whichever is greater, shall be discounted and the test shall be repeated.

9 Test report

The test report shall include the following information:

a) a reference to this International Standard;

b) a full description of the hose or hose assembly tested;

c) the test temperature;

d) the test pressure;

e) the test fluid;

f) the rate of pressure rise;

g) the impulse cycle rate;

h) whether the test pieces were bent through 90° or through 180°;

i) the number of cycles to failure, or the number of cycles completed, for each test piece;

k) the position and mode of failure of each test piece, or the condition of each test piece on completion of the test.

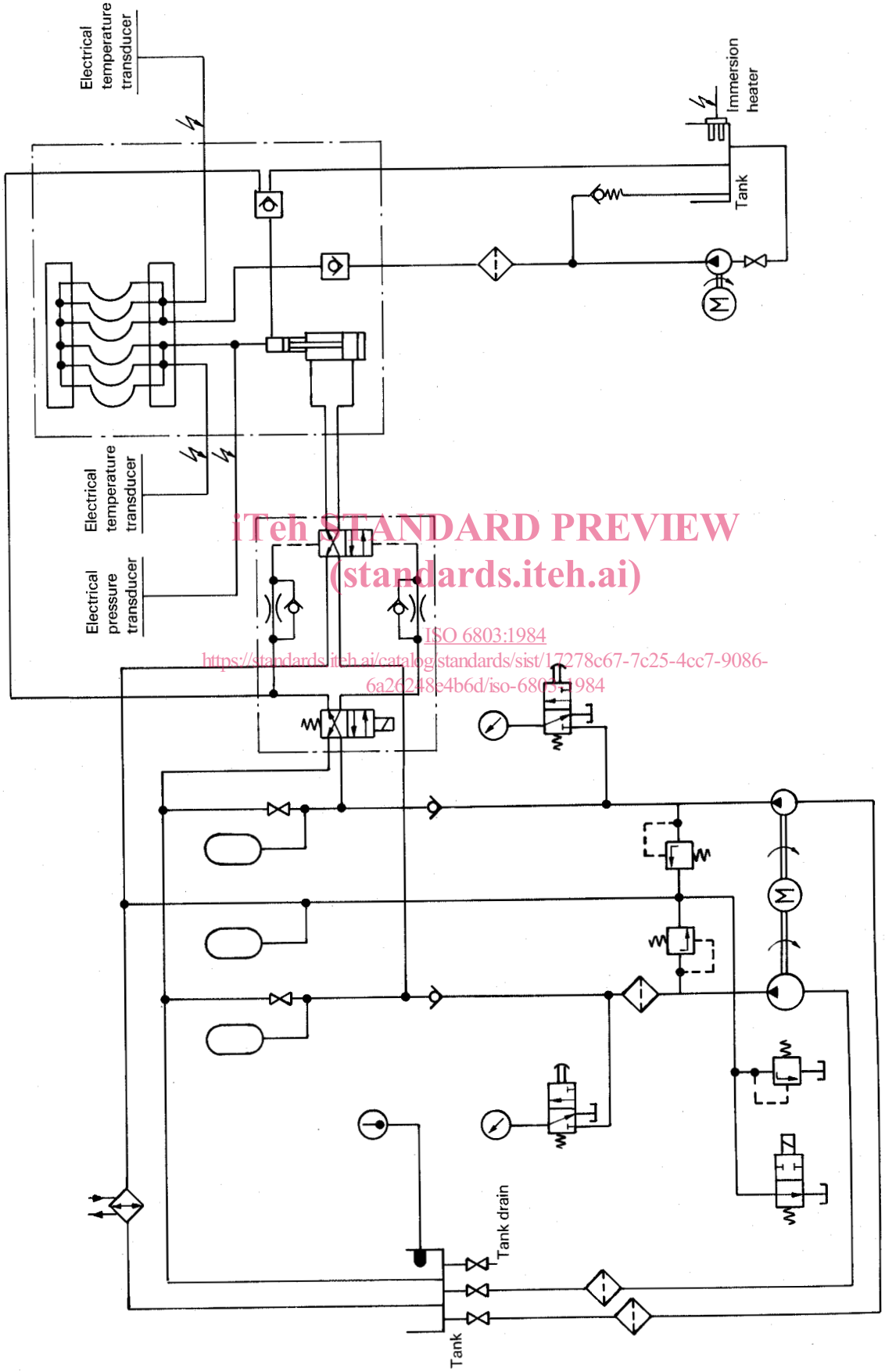

Figure 1 — Typical schematic hydraulic circuit for the hose test rig (see ISO 1219)

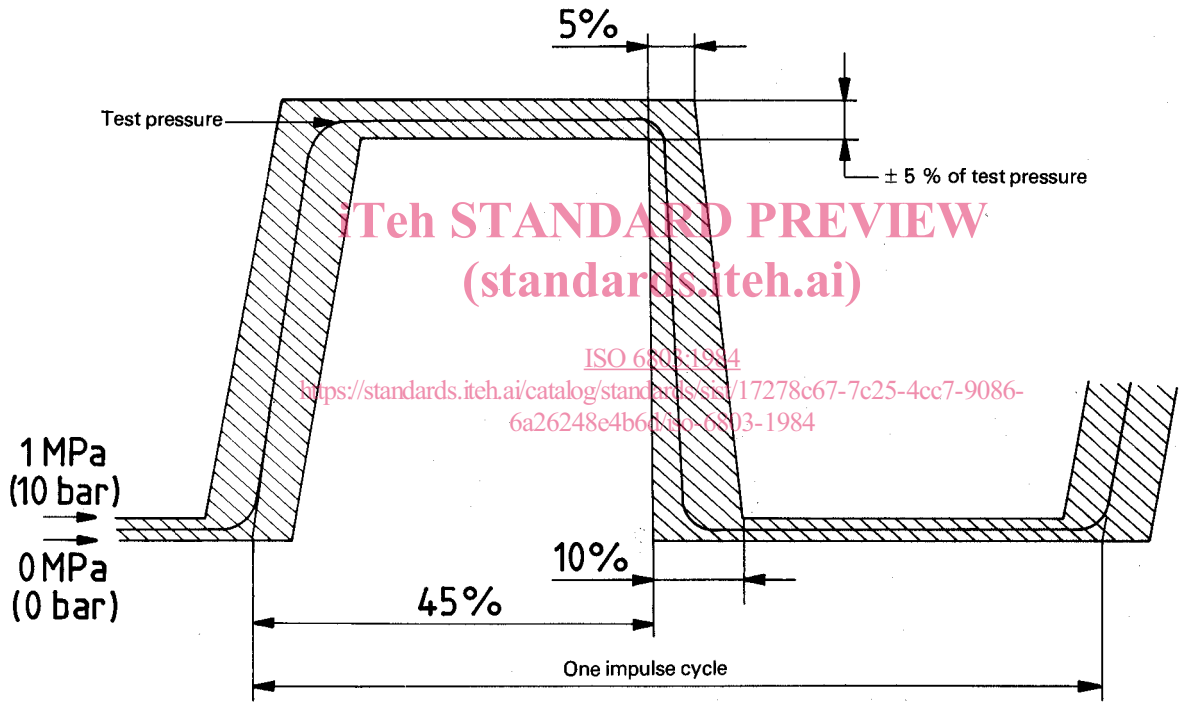

Figure 2 — Pressure impulse cycle

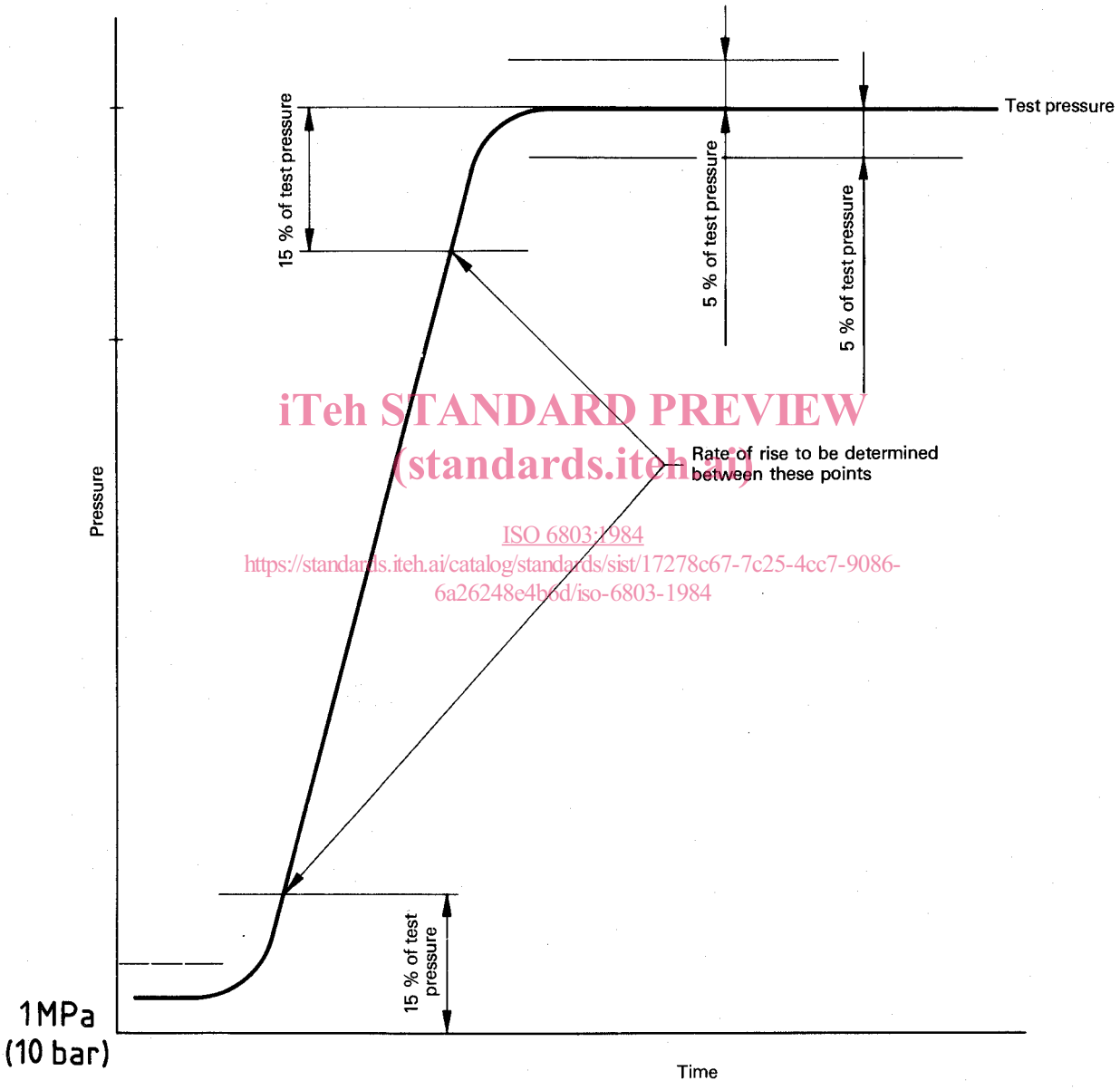

Figure 3 — Method of determination of rate of pressure rise in impulse test

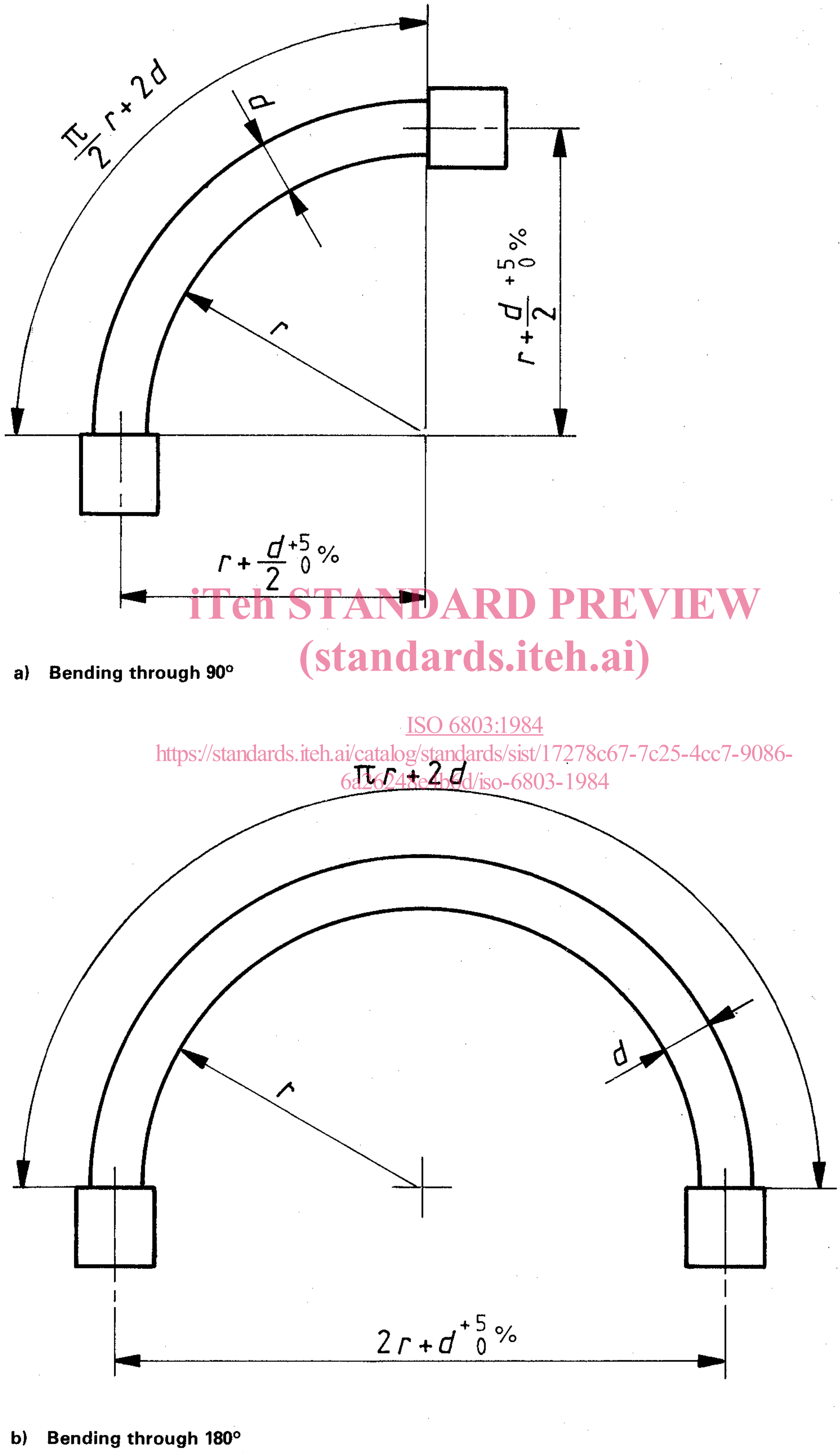

Figure 4 — Test pieces for pressure impulse test