International Standard 2281

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION•МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ•ORGANISATION INTERNATIONALE DE NORMALISATION

Horology — Water-resistant watches

Horlogerie — Montres étanches

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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 developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been authorized 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.

International Standard ISO 2281 was developed by Technical Committee ISO/TC 114, *Horology*, and was circulated to the member bodies in May 1983.

It has been approved by the member bodies of the following countries :

Czechoslovakia	Romania
France	Switzerland
India	USSR
Japan	

The member body of the following country expressed disapproval of the document on technical grounds :

Germany, F. R.

This second edition cancels and replaces the first edition (i.e. ISO 2281-1972).

Printed in Switzerland

Horology — Water-resistant watches

0 Introduction

The revision of this International Standard has become necessary in order to give better information on the requirements for water-resistant watches.

1 Scope and field of application

This International Standard specifies the requirements for two types of water-resistant watch, together with the corresponding methods of tests :

a) watches bearing the designation "water-resistant";

b) watches bearing the designation "water-resistant" with an additional indication of pressure or depth.

Watches bearing the designation "water-resistant" are intended for ordinary daily use and are resistant to sweat, water drops, rain, etc., and to immersion in water for 30 min at a depth of approximately 1 m. They are not intended for use under conditions where water pressure and temperature may vary significantly.

Watches bearing the designation "water-resistant" with an additional indication of pressure or depth are intended for ordinary daily use and to be resistant to water during exercises such as swimming. They may be used under conditions where water pressure and temperature vary significantly.

This International Standard does not apply to divers' watches, which are specified in ISO 6425.[1)]

2 Reference

ISO 2859, *Sampling procedures and tables for inspection by attributes.*

3 Definition

For the purpose of this International Standard, the following definition applies.

water-resistant watch : A watch complying with the requirements of this International Standard.

4 Requirements

Watches bearing the designation "water-resistant" shall comply with the requirements specified in 4.1 and 4.3 or 4.2 and 4.3.

Watches bearing the designation "water-resistant" with an additional indication of pressure or depth shall comply with the requirements described in 4.2, 4.3 and 4.4.

4.1 Resistance to air overpressure

When tested by the method specified in 5.4.1, the flow of air shall not exceed 50 µg/min.

4.2 Resistance to water overpressure

When tested by the method specified in 5.4.2, there shall be no condensation.

4.3 Resistance when immersed in water to a depth of 10 cm

When tested by the method specified in 5.4.3, there shall be no condensation.

4.4 Resistance of operating parts

When tested by the method specified in 5.4.4, there shall be no condensation.

5 Methods of test

5.1 Types of tests

Two types of test are given : homologation tests and individual tests.

5.2 Test sequence

These controls involve consecutive testing and give rise to considerable costs. It is, therefore, recommended that the tests be

1) ISO 6425, *Divers' watches.*

Table 1 — Test sequence for watches bearing the designation "water-resistant"

No.	Test	Type of test	See sub-clause
1	Resistance to air overpressure	individual	5.4.1
2	Resistance when immersed in water	homologation	5.4.3
3	Resistance to water overpressure	individual	5.4.2

Table 2 — Test sequence for watches bearing the designation "water-resistant" with an additional indication of pressure depth

No.	Test	Type of test	See sub-clause
1	Resistance when immersed in water	homologation	5.4.3
2	Resistance of operating parts	homologation	5.4.4
3	Resistance to water overpressure	individual	5.4.2

carried out in the order given in tables 1 and 2, as appropriate, in order to reduce these costs. Sampling for homologation tests shall be carried out in accordance with ISO 2859.

5.3 Test conditions

5.3.1 Prior to testing, operating parts shall be operated and set back to their normal position.

5.3.2 Throughout the period of testing, the ambient temperature shall be between 18 and 25 °C.

5.4 Test procedures

5.4.1 Resistance to air overpressure

Subject the watch to an air overpressure of 2 bar* and measure the flow of air entering the case. (Comparable test procedures, for example using inert gases, are permitted.)

Watches showing a flow of air greater than 50 µg/min do not satisfy the requirements of 4.1, and shall not be subject to the subsequent tests.

5.4.2 Resistance to water overpressure

Carry out the condensation test specified in 5.4.5. If the watch satisfies the requirements for this test, immerse the watch in water in a suitable vessel. Apply, within 1 min, an overpressure of 2 bar for watches bearing the designation "water-resistant" or the specified pressure (see clause 6) in the case of watches with an additional indication of pressure and maintain the overpressure for 5 min. Then reduce the overpressure to the normal pressure within 1 min. Repeat the condensation test specified in 5.4.5.

5.4.3 Resistance when immersed in water at a depth of 10 cm

Carry out the condensation test specified in 5.4.5. If the watch satisfies the requirements for this test, immerse the watch in water at a depth of 10 ± 2 cm and leave for 1 h. Repeat the condensation test specified in 5.4.5.

5.4.4 Resistance of operating parts

Carry out the condensation test specified in 5.4.5. If the watch satisfies the requirements for this test, completely immerse the watch in water. Apply an external force of 5 N perpendicularly to the axis of the crown and buttons for 5 min. (See the figure.) Repeat the condensation test specified in 5.4.5.

5.4.5 Condensation test

Place the watch on a heating cushion controlled at 40 to 45 °C until the temperature of the watch is equal to that of the heating cushion (usually, a heating time of 30 min is sufficient). Moisten a piece of felt or cloth of surface area 1 cm^2 with water at 18 to 25 °C and place it on the glass of the watch.

After about 1 min, quickly remove the piece of felt or cloth and wipe the glass with a dry cloth.

If condensation appears on the inside surface of the glass, the watch does not satisfy the requirements and shall not be subjected to the subsequent tests.

NOTE — A drop of water at the same temperature may be used for this test instead of the piece of felt or cloth.

* 1 bar = 10^5 Pa

6 Marking

Watches which satisfy the appropriate requirements specified in clause 4 at the time of testing may be marked with the following terms in the respective language :

— English : water-resistant

— French : étanche

— Russian : водонепроницаемые

— German : wasserdicht

— Japanese : 日常生活用防水

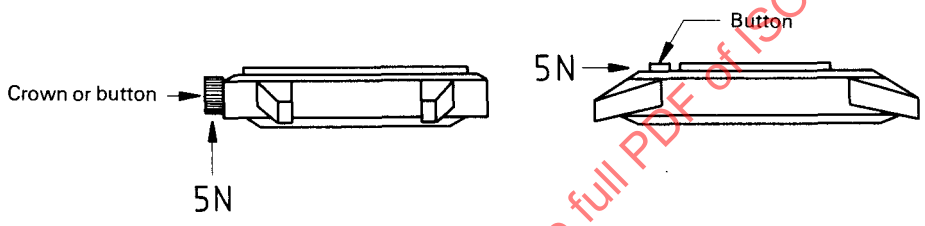
— Chinese : 防水

The terms may be supplemented with an indication of a pressure, in bars, or a depth, in metres.

The following pressures are permitted : 4, 5, ..., bar (equivalent to the pressure at a depth of 40, 50, ..., m in water). Pressures in bars are test pressures and should not be considered as corresponding to diving depths.

NOTE — For a clear distinction between water-resistant watches and divers' watches, the indication of a pressure in bars is preferred.

In each language, only the above-mentioned term shall be used. Similar terms in other languages, only one for each, are permitted.



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