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Rubber and plastics hoses and hose assemblies — Guidelines for selection, storage, use and maintenance

Tuyaux et flexibles en caoutchouc et en plastique — Lignes directrices pour la sélection, le stockage, l'utilisation et la maintenance

[Revision of second edition (ISO 8331:2007)]

ICS 23.040.70

ISO/CEN PARALLEL PROCESSING

This draft has been developed within the International Organization for Standardization (ISO), and processed under the **ISO-lead** mode of collaboration as defined in the Vienna Agreement.

This draft is hereby submitted to the ISO member bodies and to the CEN member bodies for a parallel five-month enquiry.

Should this draft be accepted, a final draft, established on the basis of comments received, will be submitted to a parallel two-month approval vote in ISO and formal vote in CEN.

To expedite distribution, this document is circulated as received from the committee secretariat. ISO Central Secretariat work of editing and text composition will be undertaken at publication stage.

Pour accélérer la distribution, le présent document est distribué tel qu'il est parvenu du secrétariat du comité. Le travail de rédaction et de composition de texte sera effectué au Secrétariat central de l'ISO au stade de publication.

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Foreword

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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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 8331 was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 1, Hoses (rubber and plastics).

This third edition cancels and replaces the second edition (ISO 8331:2007), which has been technically revised.

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Introduction

Compared to the second edition of this international standard, the following principal changes were introduced:

- Clause 3.2.2: Reference to ISO 2330 for long term storage was deleted and recommendations for bulk hoses and hose assemblies were added
- Clause 3.2.3: “hose assembly” was added
- Clause 3.2.4.: requirement for polyurethane products was added
- Clause 4.9: Reference to ISO/TR 17165-2 chapter 9 was added and clause 9.2.2 of that standard was copied to specify conditions for long term storage of hydraulic hoses
- Bibliography: reference to the OCIMF Guide was updated.

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Rubber and plastics hoses and hose assemblies — Guidelines for selection, storage, use and maintenance

1 Scope

This International Standard sets out recommendations designed to maintain rubber and plastics hoses and hose assemblies, prior to use, in a condition as close as possible to the condition they were in when they were received and to obtain the expected service life.

NOTE It is intended that this International Standard be used in conjunction with any applicable national statutory regulations.

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 1402, *Rubber and plastics hoses and hose assemblies — Hydrostatic testing*

ISO 2230, *Rubber products — Guidelines for storage*

ISO 8031, *Rubber and plastics hoses and hose assemblies — Determination of electrical properties*

ISO/TR 17165-2, *Hydraulic fluid power — Hose assemblies — Part 2: Recommended practices for hydraulic hose assemblies*

3 General recommendations

3.1 Selection criteria

It is in the best interests of the user to select hoses or hose assemblies complying with national or international standards whenever such standards exist for the intended application. For applications outside the scope of such standards, needing special requirements or for which the necessary information is not available, the hose manufacturer or trade association should be consulted.

The following points should be taken into consideration when selecting a hose or hose assembly for a specific application:

- a) Operational environment:
 - ambient temperature;
 - atmospheric conditions;
 - contact with chemically aggressive liquids;

— contact with other deleterious media.

b) Media conveyed:

— liquid;

— gaseous;

— solids;

— combinations of the above.

c) Method of conveyance:

— pressure (including rate of flow);

— suction (including rate of flow);

— gravity (including rate of flow);

— assisted (mixture of solid/fluid, solid/air).

d) Operating conditions:

— pressure and temperature of product conveyed;

— frequency of use.

e) Installation:

— degree of curvature (minimum bend radius);

— vibration of system;

— risk of damage by impact and abrasion;

— use of correct type of connection;

— type of movement and frequency.

3.2 Storage conditions

3.2.1 General

During storage, especially for long periods, and when hoses and hose assemblies are exposed to certain adverse influences, the physical properties of hoses and hose assemblies can undergo changes that may result in them no longer having the optimum characteristics corresponding to their application when they are put into service. The storage conditions should be such as will offer maximum protection and minimize deterioration of the articles during storage.

3.2.2 Storage period

The storage period should be kept to a minimum. Rotation of stock is therefore essential and the “first-in first-out” rule applied. For long-term storage, the following maximum storage periods are recommended:

— For bulk hoses (without fittings attached) maximum 4 years

— For hose assemblies maximum 2 years

These two periods can be interpreted as consecutive for a maximum storage duration of 6 years (4 years as bulk hose + 2 years as hose assembly).

3.2.3 Temperature

The storage temperature should be below 25 °C and articles stored away from direct heat sources. Storage above 25 °C may shorten the life of the hose or hose assembly. Articles should not be subjected to temperatures over 50 °C or below – 30°C or to abnormal fluctuations in temperature during the storage period. See ISO 2230 for information on the effect of higher and lower temperatures on the storage time.

3.2.4 Humidity

The relative humidity should not exceed 70 %, or 65 % for polyurethane hose products.

3.2.5 Light

The articles should be stored in a dark place away from sunlight and strong artificial light. If the storage area has windows or glazed openings, they should be obscured with red, orange or white coverings.

3.2.6 Ozone

Due to the harmful effect of ozone on rubber-based articles, storage areas should not contain equipment capable of generating ozone, for example mercury vapour lamps or tubes, high-voltage electrical equipment, electric motors or other equipment likely to cause sparks or electrical discharges.

3.2.7 Environment

Articles should not be placed in contact with certain products or exposed to their vapours, particularly solvents, oils, greases, acids, disinfectants, etc. Some metals, such as copper, iron and manganese, have a harmful effect on certain rubber compounds.

3.2.8 Sources of heat

Articles should not be stored in close proximity to heat sources. The distance between the articles and the heat sources should be sufficient to ensure compliance with the recommendations of 3.2.3.

3.2.9 Electric and magnetic fields

Storage areas should not be in the vicinity of equipment that may generate electric or magnetic fields, as variations/fluctuations in such fields could induce currents in metallic joints, which in turn generate heat.

3.2.10 Method of storing

Articles should be stored in such a way that they are not subjected to excessive stress, elongation or deformation. Contact with sharp, pointed or abrasive objects or surfaces should be avoided, and storage racks should be provided whenever possible.

Coiled hose or hose assemblies should be stored flat and preferably not stacked. When stacking is unavoidable, the height of the stack should be restricted so that the articles at the bottom do not suffer permanent deformation. The hanging of coils on pegs is not recommended. Hoses and hose assemblies supplied in straight lengths should be stored flat and unbent. End caps should be kept on hoses supplied with them.