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**INTERNATIONAL STANDARD**



**3821**

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

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**Welding — Flexible hoses for gas welding and allied processes**

*Soudage — Tuyaux souples pour soudage aux gaz et techniques connexes*

First edition — 1977-08-01

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UDC 621.791.035 : 621.643.3 : 678.06

Ref. No. ISO 3821-1977 (E)

**Descriptors :** welding, gas welding, gas cutting, brazing and soldering, metallizing, welding equipment, hoses, specifications, dimensions, pressure, marking, tests, tensile strength.

Price based on 3 pages

## FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (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 set up 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 3821 was developed by Technical Committee ISO/TC 44, *Welding*, and was circulated to the member bodies in September 1975.

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

Austria	Israel	Portugal
Belgium	Italy	Romania
Egypt, Arab Rep. of	Korea, Rep. of	South Africa, Rep. of
Finland	Mexico	Spain
France	Netherlands	Switzerland
Germany	Norway	Turkey
India	Poland	U.S.S.R.

The member bodies of the following countries expressed disapproval of the document on technical grounds :

Canada	United Kingdom
Japan	U.S.A.
Sweden	

# Welding — Flexible hoses for gas welding and allied processes

## 1 SCOPE

This International Standard specifies requirements for flexible hoses for gas welding and allied processes. The term "allied processes" means, in particular, gas cutting, brazing and metallization.

Two classes are provided in order to meet the safety regulations of different countries.

Different colours are recommended for identification of the gas.

## 2 FIELD OF APPLICATION

This International Standard applies to hoses used in:

- gas welding;
- arc welding under the protection of an inert or active gas;
- processes allied to welding.

It does not apply to hoses for liquefied petroleum gases, for which another International Standard is planned.

## 3 REFERENCES

ISO/R 36, *Determination of the adhesion strength of vulcanized rubbers to textile fabrics.*

ISO 37, *Rubber, vulcanized — Determination of tensile stress-strain properties.*

ISO 1307, *Rubber hose — Bore sizes, test pressures and tolerances on length.*

ISO 1402, *Rubber hose — Hydrostatic testing.*

ISO 1746, *Rubber hose — Bending test.*

## 4 REQUIREMENTS

### 4.1 General service requirements

The hose shall be of a flexible material (see clause 6), suitably reinforced if necessary to withstand the test requirements, and shall be unaffected by the gases conveyed.

### 4.2 Dimensions and tolerances

4.2.1 The internal diameters and tolerances shall be as given in table 1.

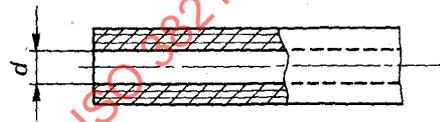


TABLE 1 — Sizes and tolerances

Values in millimetres

Internal diameter $d$	Tolerance
6,3	$\pm 0,55$
8,0	$\pm 0,60$
10,0	$\pm 0,60$
12,5	$\pm 0,65$
16,0	$\pm 0,65$
20,0	$\pm 0,75$

If special cases call for extra sizes:

- for smaller or larger dimensions, further numbers should be chosen from the R 10 series of preferred numbers.
- for intermediate dimensions, numbers should be chosen from the R 20 series of preferred numbers.

Tolerances for both additional groups of hose should not be larger than 0,55 mm for hoses smaller than 6,3 mm internal diameter and of the same order for the intermediate range of sizes.

4.2.2 Cut length and tolerance: The cut length of hose shall be to the manufacturer's specification and the tolerance on length shall be  $\pm 1\%$  in accordance with ISO 1307.

### 4.3 Pressures

4.3.1 Two categories for hoses are specified, i.e.:

- Class A — Light duty
- Class B — Heavy duty

(For marking and colour coding see clause 5.)

4.3.2 The requirements for the two classes are given in table 2.

TABLE 2 – Pressures

Values in bars<sup>1)</sup>

Pressure	Symbol	Class A	Class B
Working pressure	WP	10	20
Test pressure	TP	20	40
Minimum burst pressure	MBP	30	60

1) 1 bar = 10<sup>5</sup> N/m<sup>2</sup>

4.4 Surface condition

The external surface shall be resistant to sparks and to external influences which normally occur.

The internal surface of the hose shall be smooth and clean and shall be free from any exposed reinforcement (tests to be devised).

5 IDENTIFICATION AND MARKING

5.1 Each hose shall be identified in the following way :

- a) by a conventional colour defined in table 3 corresponding to the gas conveyed;

TABLE 3 – Colours

Colour <sup>1)</sup>	Gas conveyed
Red	Combustible gases except liquefied petroleum gases
Blue	Oxygen
Black	Other non-combustible gases

1) Orange is reserved for marking hoses intended for liquefied petroleum gases.

- b) by the number of this International Standard (ISO 3821);

- c) by stars for the category :

Class A – one star (★)

Class B – two stars (★★)

(it is also permissible to add, for a transitional period, the markings in force in national standards);

- d) by the mark of the manufacturer or supplier (YZ).

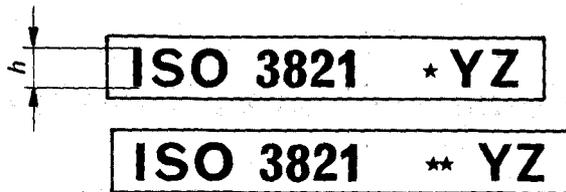
Examples :

ISO 3821 ★YZ

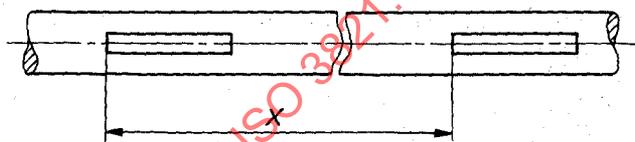
ISO 3821 ★★YZ

5.2 The height *h* (see figure) shall be as large as practical compatible with the radius of the external cover. Where possible, the height *h* shall be 2/3 of the diameter *d* and, in principle, a maximum of 10 mm.

For hoses greater in diameter than the range quoted in this International Standard, a height *h* greater than 10 mm may be adopted at the manufacturer's discretion.



5.3 The distance *X* between successive complete inscriptions shall not exceed 3 m.



6 PHYSICAL TESTS ON FINISHED HOSE AND ITS COMPONENTS

6.1 Tests on a full length of hose or on a disposable portion of hose of adequate length

6.1.1 Flexibility test

Test in accordance with ISO 1746, using a diameter of curvature (*C*) of ten times the nominal bore [with a minimum of 80 mm and a coefficient of deformation (*K*) of 0,8].

6.1.2 Hydrostatic test

Test in accordance with ISO 1402 (see table 4).

TABLE 4 – Test pressures

Values in bars

Test pressure	Class A	Class B
1 min hold pressure	20	40
Minimum burst pressure	30	60

6.2 Tests on a special test piece

If possible, this test piece shall be cut from the hose.

6.2.1 Adhesion test

When tested in accordance with ISO/R 36, the minimum adhesion between the rubber lining and reinforcement between layers of reinforcement and between reinforcement and cover shall be not less than 1,5 kN/m.

**6.2.2 Tensile strength and elongation at break of rubber lining and cover**

The rubber, natural or synthetic, used for the lining and cover of the hose shall, when tested in the manner described in ISO 37, have a tensile strength and elongation at break not less than the values in table 5.

TABLE 5 – Tensile strength and elongation at break

Classes A and B	Tensile strength, MPa	Elongation at break, %
Lining	5,0	200
Cover	7,0	300

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