

# Gas welding equipment — Safety devices —

## Part 1: Incorporating a flame (flashback) arrestor

The European Standard EN 730-1:2002 has the status of a  
British Standard

ICS 25.160.30

# National foreword

This British Standard is the official English language version of EN 730-1:2002. Together with BS EN 730-2:2002 it supersedes BS EN 730:1995 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee WEE/18, Gas welding appliances, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

### Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the *BSI Catalogue* under the section entitled “International Standards Correspondence Index”, or by using the “Search” facility of the *BSI Electronic Catalogue* or of British Standards Online.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

**Compliance with a British Standard does not of itself confer immunity from legal obligations.**

This British Standard, having been prepared under the direction of the Engineering Sector Policy and Strategy Committee, was published under the authority of the Standards Policy and Strategy Committee on 13 November 2002

### Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 20, an inside back cover and a back cover.

The BSI copyright date displayed in this document indicates when the document was last issued.

### Amendments issued since publication

| Amd. No. | Date | Comments |
|----------|------|----------|
|          |      |          |
|          |      |          |
|          |      |          |
|          |      |          |

© BSI 13 November 2002

ISBN 0 580 40732 2

English version

## Gas welding equipment - Safety devices - Part 1: Incorporating a flame (flashback) arrestor

Matériel de soudage aux gaz - Dispositifs de sécurité -  
Partie 1: Avec arrêt de flamme

Gasschweißgeräte - Sicherheitseinrichtungen - Teil 1: Mit  
integrierter Flammensperre

This European Standard was approved by CEN on 8 August 2002.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**Management Centre: rue de Stassart, 36 B-1050 Brussels**

## Contents

|                                                                   | page |
|-------------------------------------------------------------------|------|
| Foreword .....                                                    | 3    |
| 1 Scope .....                                                     | 4    |
| 2 Normative references .....                                      | 4    |
| 3 Terms and definitions .....                                     | 4    |
| 4 Design and materials .....                                      | 7    |
| 4.1 Connection .....                                              | 7    |
| 4.2 Materials .....                                               | 7    |
| 5 Requirements .....                                              | 7    |
| 5.1 General .....                                                 | 7    |
| 5.2 Gas tightness .....                                           | 9    |
| 5.3 Pressure resistance .....                                     | 9    |
| 5.4 Flame arrestor .....                                          | 9    |
| 5.5 Flame arrestor with non-return valve .....                    | 9    |
| 5.6 Flame arrestor with temperature sensitive cut-off valve ..... | 9    |
| 5.7 Flame arrestor with pressure-sensitive cut-off valve .....    | 9    |
| 5.8 Other multifunctional safety devices .....                    | 10   |
| 6 Methods for type testing .....                                  | 10   |
| 6.1 General .....                                                 | 10   |
| 6.2 Accuracy of pressure and flow measurements .....              | 10   |
| 6.3 Test gases .....                                              | 10   |
| 6.4 Gas tightness test .....                                      | 10   |
| 6.5 Pressure resistance test .....                                | 10   |
| 6.6 Non-return valve test .....                                   | 11   |
| 6.7 Flame arrestor test .....                                     | 11   |
| 6.8 Temperature-sensitive cut-off valve test .....                | 13   |
| 6.9 Pressure-sensitive cut-off valve test .....                   | 14   |
| 6.10 Internal leakage test for cut-off valves .....               | 14   |
| 7 Further tests .....                                             | 14   |
| 8 Manufacturer's instructions .....                               | 14   |
| 9 Marking .....                                                   | 15   |
| Annex A (informative) Gas flow measurement .....                  | 17   |
| A.1 General .....                                                 | 17   |
| A.2 Procedure .....                                               | 17   |
| Annex B (informative) Third party testing information .....       | 19   |
| B.1 General .....                                                 | 19   |
| B.2 Samples and documentation .....                               | 19   |
| Annex C (informative) Production tests .....                      | 20   |
| C.1 General .....                                                 | 20   |
| C.2 Production flashback test .....                               | 20   |

## Foreword

This document EN 730-1:2002 has been prepared by Technical Committee CEN/TC 121 "Welding", the secretariat of which is held by DS.

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 April 2003, and conflicting national standards shall be withdrawn at the latest by April 2003.

This European Standard "*Gas welding equipment – Safety devices*" consists of the following Parts:

$\frac{3}{4}$  *Part 1: Incorporating a flame (flashback) arrestor.*

$\frac{3}{4}$  *Part 2: Not incorporating a flame (flashback) arrestor.*

This Part and EN 730-2 supersedes EN 730:1995.

Annexes A, B and C are informative.

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, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

## 1 Scope

This Part of this European Standard specifies the general requirements and tests for safety devices for fuel gases and oxygen or compressed air incorporating a flame (flashback) arrestor used downstream of manifold, cylinder and (or) pipeline outlet regulators, and upstream of blowpipes for welding, cutting and allied processes.

This standard does not specify the location of these devices in the gas system.

This standard does not include requirements for safety devices which do not incorporate a flame arrestor which are covered by EN 730-2.

This standard does not cover the use of safety devices incorporating flame arrestors for applications with premixed oxy/fuel or air/fuel gas supply systems, for example downstream of gas mixers or a generator to produce hydrogen/oxygen mixture by electrolytic decomposition of water.

## 2 Normative references

This European 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 European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 560, *Gas welding equipment — Hose connections for equipment for welding, cutting and allied processes.*

EN 561, *Gas welding equipment — Quick-action coupling with shut-off valves for welding, cutting and allied processes.*

EN 730-2, *Gas welding equipment — Safety devices — Part 2: Not incorporating a flame (flashback) arrestor.*

EN 29090, *Gas tightness of equipment for gas welding and allied processes (ISO 9090:1989).*

EN 29539, *Materials for equipment used in gas welding, cutting and allied processes (ISO 9539:1988).*

ISO 554, *Standard atmospheres for conditioning and/or testing — Specifications.*

## 3 Terms and definitions

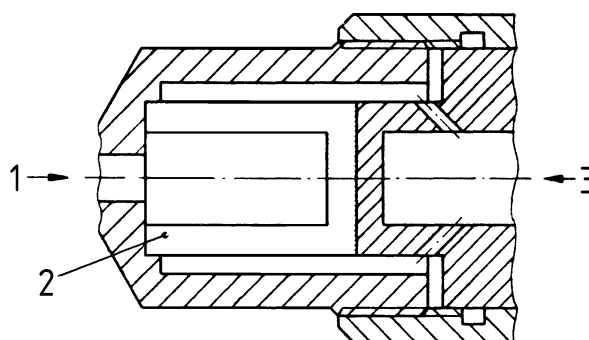
For the purposes of this European Standard, the following terms and definitions apply.

### 3.1

#### **flame arrestor**

device which quenches a flame front

**EXAMPLE** The good thermal conductivity, high porosity and small pore size (larger surface) of sintered metal elements lead to flame quenching.



### Key

- 1 Normal direction of gas flow
- 2 E.g. sintered metal element
- 3 Flame

**Figure 1 — Flame arrester (example)**

### 3.2

#### **maximum operating pressure**

maximum pressure to which the equipment may be subjected in service

### 3.3

#### **multifunctional safety device**

device which incorporates two or more of the safety functions

EXAMPLE Flame arrester with non-return valve and cut-off valve.

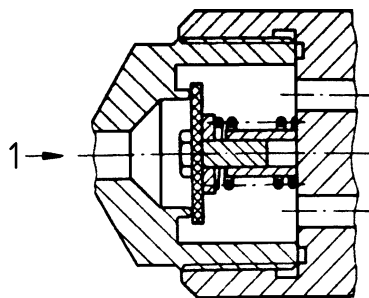
NOTE The temperature sensitive cut-off valve is normally used in combination with a flame arrester as its purpose is to cut-off the gas flow before the temperature at the flame arrester reaches a point where flame transmission across the flame arrester takes place. It is normal for pressure and or temperature cut-off valves only to be used in combination with flame arrestors. Due to the burning characteristics of hydrogen it is recommended all flame arrestors for hydrogen incorporate a temperature sensitive cut-off valve.

### 3.4

#### **non-return valve**

device which prevents passage of gas in the direction opposite to flow

EXAMPLE Valve is held open by energy in gas stream and closes when downstream pressure is approximately equal to or greater than that in normal direction of flow.



#### Key

1 Normal direction of gas flow

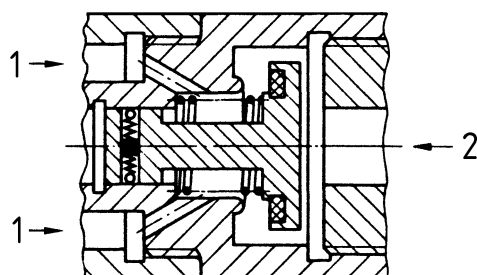
**Figure 2 — Non-return valve (example)**

### 3.5

#### **pressure-sensitive cut-off valve**

device which stops the gas flow in the event of a back-pressure wave from the downstream side

**EXAMPLE** Valve is held open, e.g. by a spring; it is actuated by a pressure wave from down-stream and is then automatically held closed by a special device.



#### Key

1 Normal direction of gas flow

2 Back-pressure wave

**Figure 3 — Pressure-sensitive cut-off valve (example)**

### 3.6

#### **temperature-sensitive cut-off valve**

device which stops the gas flow when a predetermined temperature is exceeded

**EXAMPLE** Valve is held open, e.g. by a fusible metal, and actuated by sustained temperature rise.