

Specification for

Limits of surface imperfections on elastomeric toroidal sealing rings ("O"-rings)

ICS 21.140

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW



Document Sharing Hub

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Mechanical Engineering Standards Committee (MEE/-) to Technical Committee MEE/109 upon which the following bodies were represented:

- Association of Hydraulic Equipment Manufacturers
- British Compressed Air Society
- British Hydromechanics Research Association
- British Industrial Truck Association
- British Rubber Manufacturers' Association
- Engineering Equipment and Materials Users' Association
- Hydraulic Press Manufacturers' Association
- Ministry of Defence
- National Coal Board
- Society of British Aerospace Companies Limited
- Society of Motor Manufacturers and Traders Limited

This British Standard, having been prepared under the direction of the Mechanical Engineering Standards Committee, was published under the authority of the Board of BSI and comes into effect on 31 May 1984

© BSI 03-2000

ISBN 0 580 13641 8

Amendments issued since publication

Amd. No.	Date of issue	Comments
9624	October 1997	Indicated by a sideline in the margin

Contents

	Page
Committees responsible	Inside front cover
Foreword	ii
1 Scope	1
2 Definitions	1
3 Quality grades	1
4 Surface condition	2
Figure 1 — Example of backrind	4
Figure 2 — Example of combined flash	4
Figure 3 — Examples of flow marks	5
Figure 4 — Example of foreign material	5
Figure 5 — Example of an indentation	6
Figure 6 — Example of mismatch	6
Figure 7 — Example of a non-fill	7
Figure 8 — Example of a parting line indentation	8
Table 1 — Limits of size for surface imperfections	3
Publications referred to	Inside back cover

Foreword

This British Standard has been prepared under the direction of the Mechanical Engineering Standards Committee and is technically equivalent to ISO 3601-3:1987 which has been published by the International Organization for Standardization (ISO).

The standard is suitable for establishing the surface quality of elastomeric toroidal sealing rings ("O"-rings), particularly those manufactured in accordance with BS 1806, BS 4518 and BS M 48.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 8, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This British Standard specifies the acceptable limits of defined and assessed surface imperfections on elastomeric toroidal sealing rings ("O"-rings). It is applicable to "O"-rings having a cross section up to and including 8 mm diameter. Two quality grades are included.

The standard primarily relates to "O"-rings manufactured in accordance with BS 1806, BS 4518 and BS M 48, but may also be applied to other "O"-rings.

NOTE The titles of the publications referred to in this standard are listed on the inside back cover.

2 Definitions

For the purposes of this British Standard the following definitions apply (see Table 1).

2.1

backrind ($g \times h$)

a longitudinal imperfection in which the rubber adjacent to the flash line shrinks below the level of the moulding and has a "U" or "W" like cross section with the flash frequently being ragged or torn

NOTE This imperfection can be caused by mould pre-cure on the flash (see Figure 1).

2.2

combined flash (f)

the combination of offset, flash and parting line projection (see Figure 2)

2.3

excessive trimming (n)

a flattened and often roughened area around the inner and/or outer diameters of an "O"-ring caused by the trimming process

2.4

flash (f)

a film-like material, which extends from parting line projection on inner and/or outer diameters, caused by mould separation or present due to inadequate trim

2.5

flow marks ($j \times k$)

thread-like recesses, usually curved, of very slight depth in the unflexed state, with normal surface texture and rounded edge, caused by incomplete flow and knit of the material (see Figure 3)

2.6

foreign material

any extraneous matter embedded in the surface of the "O"-ring, e.g. contamination, dirt, etc. (see Figure 4)

2.7

indentations ($l \times m$)

depressions, usually irregular in form, caused by the removal of inclusions from the surface or the build-up of hardened deposits on the surface of the mould cavity (see Figure 5)

2.8

mismatch (e)

the cross-sectional radius in one ring, half being unequal to that of the other half, caused by the dimensional difference in mould halves (see Figure 6)

2.9

non-fills ($l \times m$)

randomly spaced irregular shaped surface indentations having a coarser texture than the normal "O"-ring surface, caused by incomplete filling of the mould cavity and by air trapping (see Figure 7)

2.10

off register (e)

misalignment of "O"-ring halves, caused by the lateral shift of one mould cavity plate relative to the other

2.11

offset (e)

mismatch or off register of "O"-ring halves

2.12

parting line indentation ($l \times m$)

a shallow saucer-like recess sometimes triangular in shape located on the parting line at the inner and/or outer diameters, which is caused by deformation of the mould edge at the parting line (see Figure 8)

2.13

parting line projection (f)

a continuous ridge of material situated at the parting line on inner and/or outer diameters, caused by worn or excessively rounded edges of the mould cavity

3 Quality grades

The "O"-rings shall be designated by the following grades of imperfection limits.

Grade N (General purpose). Seals intended for general usage applications.

Grade S (Special). Seals intended for applications requiring a higher level of quality with respect to dimensional tolerances of surface imperfections. Aerospace applications are covered by this grade.