

BS EN 6138:2017



BSI Standards Publication

**Aerospace series — Cap,  
protective, non-metallic  
for fitting ends  $\leq 3\ 000$   
PSI hydraulic systems**

**National foreword**

This British Standard is the UK implementation of EN 6138:2017.

The UK participation in its preparation was entrusted to Technical Committee ACE/69, Aerospace hydraulic systems, fluids and components.

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

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EUROPEAN STANDARD

**EN 6138**

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 2017

ICS 49.080

English Version

## Aerospace series - Cap, protective, non-metallic for fitting ends $\leq 3\,000$ PSI hydraulic systems

Série aérospatiale - Chapeau, protecteur, non  
métallique pour raccord  $\leq 3\,000$  PSI circuits  
hydrauliques

Luft- und Raumfahrt - Kappe, nicht metallisch zum  
Schutz für Endfittinge  $\leq 3\,000$  PSI Hydraulik Systeme

This European Standard was approved by CEN on 2 January 2017.

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COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

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## **European foreword**

This document (EN 6138:2017) has been prepared by the Aerospace and Defence Industries Association of Europe - Standardization (ASD-STAN).

After enquiries and votes carried out in accordance with the rules of this Association, this Standard has received the approval of the National Associations and the Official Services of the member countries of ASD, prior to its presentation to CEN.

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of an identical text or by endorsement, at the latest by September 2017, and conflicting national standards shall be withdrawn at the latest by September 2017.

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## 1 Scope

This European Standard specifies the dimensions, tolerances and required characteristics of protective caps to seal fluid ports during transportation and storage in order to prevent:

- contamination by moisture, fluids, chemicals and particles;
- spillage inside package or aircraft section;
- port and pipe end damages;
- port and pipe clogging due to plug ingestion.

Because of the cleanliness requirements, parts shall only be used once.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 2424, *Aerospace series — Marking of aerospace products*

EN 6079, *Aerospace series — Pipe coupling 24° cone — Female fitting ends, flareless type — Inch series<sup>1)</sup>*

EN 6102, *Aerospace series — Fluid-hydraulic, phosphate ester-base, fire resistant — Technical specification<sup>1)</sup>*

EN 9100, *Quality Management Systems — Requirements for Aviation, Space and Defence Organizations*

ISO 2768-1, *General tolerances — Part 1: Tolerances for linear and angular dimensions without individual tolerance indications*

ISO 3161, *Aerospace — UNJ threads — General requirements and limit dimensions*

SAE-AS4059, *Aerospace Fluid Power — Contamination Classification for Hydraulic Fluids<sup>2)</sup>*

SAE-AS4375, *Fitting End, Flareless, Design Standard<sup>2)</sup>*

SAE-AS4395, *Fitting End, Flared, Tube Connection, Design Standard<sup>2)</sup>*

SAE-AS33514, *Fitting End, Standard Dimensions for Flareless Tube Connection and Gasket Seal<sup>2)</sup>*

FED-STD-595C, *Colors used in government procurement*

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<sup>1)</sup> In preparation at the date of publication of this European Standard.

NOTE Until publication of EN 6079 use SAE-AS4375 and until publication of EN 6102 use AS1241.

<sup>2)</sup> Published by: SAE National (US) Society of Automotive Engineers. <http://www.sae.org/>

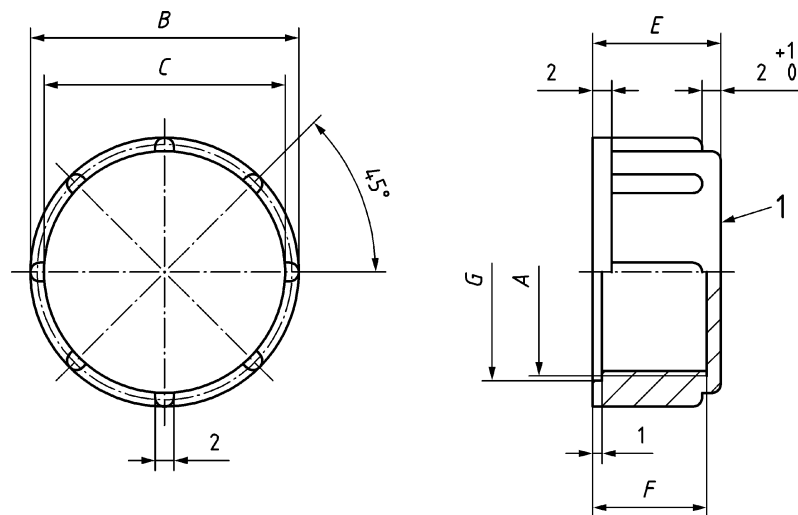
### 3 Requirements

#### 3.1 Configuration, dimensions, tolerances and mass

The configuration, dimensions, tolerances and mass shall conform with Figure 1 and Table 1.

Linear tolerances not specified, shall be in accordance with ISO 2768-m.

All internal surfaces shall be free of burrs and moulding joints.



#### Key

1 Area for marking

Unless otherwise specified all radius shall be  $R = (1,0 \pm 0,2)$  mm.

**Figure 1 — Configuration and dimensions**

**Table 1 — Dimensions and mass**

Dimensions in millimetres

Size code <sup>a</sup>	A Thread per ISO 3161	$\varnothing B$	$\varnothing C$	E	F	$\varnothing G$	Mass g
04	.4375-20UNJF	17,0	13,9	10,1	8,6	12	0,9
06	.5625-18UNJF	20,5	17,3	10,3	8,8	15	1,3
08	.7500-16UNJF	25,5	22,1	12,4	10,9	20	2,2
10	.8750-14UNJF	28,5	25,6	13,6	12,1	23	2,7
12	1.0625-12UNJ	33,5	30,6	14,8	13,3	28	3,7
16	1.3125-12UNJ	39,5	37,2			34	4,1
20	1.6250-12UNJ	48,5	45,3			42	6,5
24	1.8750-12UNJ	55,0	51,0			49	8,0

<sup>a</sup> Size code corresponds to the nominal tube diameter in 1/16 inch.

### 3.2 Material, surface treatment and colour

The material and colour shall be in accordance with Table 2.

The caps shall be resistant to phosphate ester hydraulic fluids according to EN 6102.

The surface of the parts shall be free of burrs and moulding joints.

**Table 2 — Material**

Code	Material	Density	Melt Flow Index (MFI)	Colour
—	Polyethylene (HD-PE)	0,940 to 0,970	7,5 to 15,0	Red (e. g. FED-STD-595C No. 11302 or No. 11310)

### 3.3 Sealing areas

Contact surface mates with the dimensions and tolerances of the fitting part (see Figure 2).

### 3.4 Proof pressure

100 kPa (1 bar).

### 3.5 Temperature range

#### 3.5.1 Storage and transportation temperature

-54 °C to 85 °C.

#### 3.5.2 Installation and removal

At room temperature (25 ± 10) °C.

#### 3.5.3 Cleanliness

Parts shall be in accordance with SAE-AS4059 class 7 or better.

## 4 Technical requirement

### 4.1 General

For qualification, three specimens per size shall be tested at a temperature of (25 ± 10) °C. The requirements given in 3.3 have to be fulfilled.

On the sealing area, there shall be a consistently good contact between cap and end fitting when hand tightened.

After removal of the plugs, chips inside the equipment/tube/hose are not allowed.

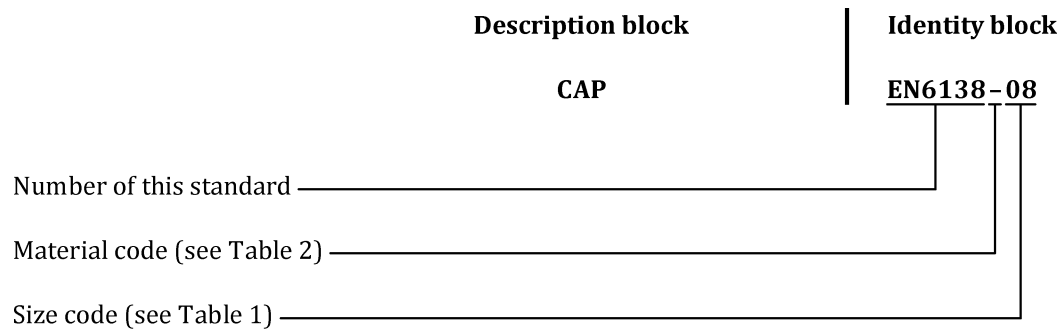


## 4.2 First article inspection

For first article inspection, the test assembly shall withstand a pressure equal the proof pressure (see 3.4) without leakage, evidence of permanent deformation or other malfunction, a period of 3 min after pressure stabilization. Six specimens shall be tested at a temperature of  $(25 \pm 10)$  °C.

## 5 Designation

This type of standard shall be designated according to the philosophy of the following example:



## 6 Marking

The caps shall be legibly and permanently marked per EN 2424 style A with the following:

- the full standard part designation;
  - manufacturer's name;
- or trademark;  
or CAGE code.

## 7 Packaging

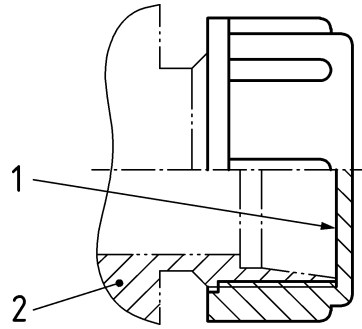
All parts shall be delivered individually in suitable bags, which are marked per EN 2424 style G. The standard parts shall be protected against humidity, embitterment, impact, contamination and other negative influences by suitable approved materials, so that no damage or deterioration will occur under normal transport and storage conditions. The packaging materials used shall conform with national health and safety requirements and shall not affect the appearance or quality of the packaged items.

Cleanness requirements shall be kept up to package opening.

Chlorine free package shall be used.

## 8 Example of installation

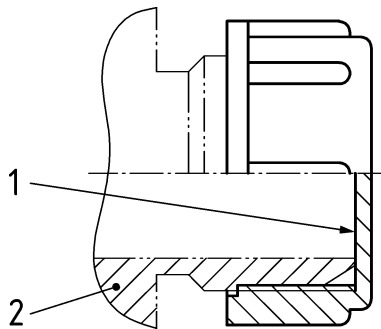
See Figure 2 and Figure 3.



**Key**

- 1 Sealing surface
- 2 Fitting end per EN 6079 or SAE-AS33514

**Figure 2 — Sealing surface for flareless fitting ends and hose ends**



**Key**

- 1 Sealing surface
- 2 Fitting end per SAE-AS4395

**Figure 3 — Sealing surface for flared fitting ends**

## 9 Technical specification

### 9.1 Simple standard part

Caps are defined as simple standard parts, which do not need a specific technical specification.

### 9.2 Production lot (batch)

A production lot according to this specification consists of parts or assemblies, which shall have the same physical characteristics (dimensions, materials, manufacturing methods, heat treatment, surface finish, etc.), being manufactured under the same conditions and submitted together for inspection.

### 9.3 Materials

Materials shall conform to the specifications as specified or described in detail in the product standard.

Other materials not specified or described in the product standard, may be introduced by the manufacturer to ensure compliance with technical requirements.

The suitability of materials not specified in the product standard shall be verified by qualification tests.

Any changes to materials shall be approved by the customer prior to the next delivery.

#### **9.4 Approval of manufacturers**

The manufacturer's quality system shall conform to EN 9100 or equivalent. The purpose of these procedures is to ensure that a manufacturer has a quality system and the capability for continuous manufacture and release of parts complying with the specified quality requirements. The granting of an approval of the manufacturer is a function of the Certification Authorities, or their appointed representative, who is a prime contractor.

#### **9.5 Responsibility for inspection**

Unless otherwise specified in the contract or purchase order, the supplier is responsible for the completion of all inspection requirements as specified in this specification.

The supplier may use his own or other approved facilities and inspection methods to achieve satisfactorily the inspection requirements as covered by this specification.

The customer reserves the right to perform counter-acceptance tests to ensure performance attains the required characteristics.

#### **9.6 Labelling**

All packages shall be permanently and legibly marked with the following:

- the full standard part designation;
- manufacturer's name and address;
- order or purchase number.

#### **9.7 Unit and transport packages**

The products shall be packed in unit or transport packages that comply with the customers' requirements.





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