

Code of practice for

Zinc alloy pressure die casting for engineering

(formerly CP 3001)

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The Non-ferrous Metals Standards Committee, under whose supervision this British Standard was prepared, consists of representatives from the following Government departments and scientific and industrial organizations:

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- Association of Bronze and Brass Founders
- British Electrical and Allied Manufacturers' Association
- British Lead Manufacturers' Association
- BNF Metals Technology Centre
- British Non-ferrous Metals Technology Centre
- Copper Development Association
- Department of Trade
- Electric Cable Makers' Confederation
- Institute of British Foundrymen
- Institution of Mechanical Engineers*
- Institution of Mining and Metallurgy
- Institution of Production Engineers
- Institution of Structural Engineers
- Lead Development Association
- Light Metal Founders Association
- London Metal Exchange
- Magnesium Industry Council
- Ministry of Defence*
- National Brassfoundry Association
- Non-ferrous Metal Stockists
- Post Office
- Royal Institute of British Architects
- Society of Motor Manufacturers and Traders Ltd.*
- Tin Research Institute
- Zinc Development Association*
- Individual manufacturer

This British Standard, having been prepared under the direction of the Non-ferrous Metals Standards Committee, was published under the authority of the Executive Board on 30 June 1976

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The organizations marked with an asterisk in the above list, together with the following, were directly represented on the committees entrusted with the preparation of this British Standard:

Zinc Alloy Die Casters Association

Amendments issued since publication

Amd. No.	Date of issue	Comments

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Foreword

This code of practice was first published in 1955 as CP 3001 and in accordance with current practice has been renumbered as BS 5338. The revision of BS 1004 "*Zinc alloys for die casting and zinc alloy die castings*" in 1972 made it timely also to revise the code, which makes frequent reference to BS 1004. Accordingly the Zinc Alloy Die Casters Association submitted a draft revision to BSI for submission to a joint committee of BSI and the Institution of Mechanical Engineers. The present document drafted in metric terms is issued with their amendments and approval.

As zinc alloy die castings are increasingly used for engineering components subject to stress, the new edition refers to the recently developed techniques for the control of pressure die casting machines by instrumentation, to ensure that they are working properly and consistently; and to the behaviour of the die castings when subjected to continuous stress. For the majority of engineering applications zinc alloys to BS 1004 are completely satisfactory, but when subjected to continuous stress at temperatures appreciably above those of normal atmospheres they may not be suitable because of their tendency to creep.

Zinc alloy die castings will perform satisfactorily in service only if they are free from contamination by certain elements harmful to their mechanical properties and corrosion resistance. It is therefore essential that these elements and, in particular, lead, tin, cadmium and indium should not be present in higher proportions than those indicated in BS 1004.

When supplies of die castings are required in accordance with this code of practice, it is desirable that both the enquiry and the order should state "Castings to be in accordance with the recommendations of the British Standard Code of practice BS 5338".

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.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 14, 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.

Section 1. General

1 Scope

This code is concerned with the practice to be adopted in the design and manufacture of pressure die castings in compliance with the requirements of BS 1004.

2 References

The titles of the British Standards referred to in this code are listed on the inside back cover.

3 Definitions

For the purposes of this code of practice the following definitions apply.

3.1

pressure die casting

a method of casting components by injecting molten metal into a split metal die where it solidifies under the applied pressure (see section 4); also a casting produced on a pressure die casting machine

3.2

hot chamber pressure die casting machine

a machine incorporating a self-replenishing pump immersed in the molten metal (see Figure 3)

3.3

cold chamber pressure die casting machine

a machine in which a metered quantity of metal is poured into a transfer chamber for injection into the die (see Figure 4)

3.4

injection cylinder

the chamber that, in conjunction with the plunger, enables molten metal to be forced into the die

3.5

plunger

the piston that, operating in a cylinder, forces molten metal into the die

3.6

die cavity

the impression in the die in the shape of the required component

3.7

parting line

the intersection with the die cavity of the surface or surfaces at which the die members abut

3.8

ejector pins

rods bearing on the spray to release it from the die (see Figure 3 and Figure 4)

3.9

draft angle or taper

the angle on the surfaces of the die to facilitate ejection

3.10

runner

a channel in the die through which molten metal fills the die cavity. This term is also applied to the metal that solidifies in this channel

3.11

gate

that part of the die through which the metal enters the die cavity from the runner

3.12

sprue

the metal attached to the runner that solidifies in the sprue bush (see Figure 3) on a hot chamber machine

3.13

slug

the residual metal from the injection cylinder of a cold-chamber machine that is attached to the runner. Sometimes termed "biscuit"

3.14

vent

provision in the die to permit the escape of air from the die cavity or overflow

3.15

overflow

a recess with entry from the die cavity that assists in the production of sound castings

3.16

spray

a casting or castings, complete with sprue or slug resulting from a single casting operation or "shot"

3.17

inserts

shaped pieces, commonly of metal, that are inserted into prepared locations in the die and become part of the cast component

3.18

core

an element of the die forming a recess in the casting

3.19

quenching

the rapid cooling of a casting by immersion in water