HC 9 : May : 1974

*(Superseding, in part, Ministry of Defence specifications DTD 666 and DTD 5172)*

UDC 629.7 : 669.15'24'26'28–14

British Standard: Aerospace Series

Specification for

# Nickel-chromium-molybdenum steel castings (880 - 1080 MPa)

## 1. Special foundry approval

Manufacture of castings to this specification may be restricted to foundries specially approved in accordance with the requirements of British Standard HC 100, Section 1.

## 2. Inspection and testing procedure

This British Standard shall be used in conjunction with the relevant sections of British Standard HC 100 as follows:

| | |
|---|---|
| Re-melting stock | Sections 1 and 2 |
| Precision castings | Sections 1 and 3 |
| Sand castings | Sections 1 and 4 |
| Centrifugal castings | Sections 1 and 5 |

## 3. Chemical composition

The re-melting stock and the castings shall contain:

| | % | |
|---|---|---|
| Element | min. | max. |
| Carbon | 0.22 | 0.34 |
| Silicon | 0.3 | 0.6 |
| Manganese | 0.3 | 0.8 |
| Phosphorus | – | 0.025 |
| Sulphur | – | 0.025 |
| Chromium | 0.5 | 1.3 |
| Copper | – | 0.4 |
| Molybdenum | 0.2 | 0.7 |
| Nickel | 0.5 | 3.0 |

## 4. Condition

Castings shall be supplied finally heat treated.

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## 5. Heat treatment

The final heat treatment shall be as follows.

5.1 **Annealing.** Heat uniformly at a temperature between 880 °C and 960 °C.

5.2 **Hardening.** Heat uniformly at a temperature between 830 °C and 910 °C and quench in oil or water.

5.3 **Tempering.** Heat uniformly at a temperature between 510 °C and 610 °C.

## 6. Mechanical properties

6.1 **Tensile and impact.** The tensile and impact properties obtained from test pieces representing castings, selected, prepared and tested in accordance with the relevant requirements of British Standard HC 100, shall be:

| 0.2 % proof stress | Tensile strength | | Elongation | Reduction of area | Izod impact |
|---|---|---|---|---|---|
| min. | min. | max. | min. | min. | min. |
| MPa ($N/mm^2$) | MPa ($N/mm^2$) | MPa ($N/mm^2$) | % | % | ft lbf |
| 700 | 880 | 1080 | 8 | 30 | 30 |

NOTE. Information on SI units is given in BS 3763, 'The International System of units (SI)', and BS 350, 'Conversion factors and tables'.

6.2 **Hardness.** The hardness of hardened and tempered castings and their representative test samples shall be:

| | min. | max. |
|---|---|---|
| HB | 262 | 321 |
| HV | 265 | 330 |
| HRC | 27 | 34 |

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The following BSI references relate to the work on this standard:
Committee reference ACE/60 Draft for comment 72/35126 DC

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