

Aerospace Material Specification

CHROMIUM-NICKEL CORROSION-RESISTING STEEL INVESTMENT
CASTINGS (Not stabilised)(Tensile strength 47 kgf/mm²)

(Not to be used for applications at temperatures exceeding 350°C)

NOTE 1. This specification is issued by the Ministry of Technology to meet a limited requirement not covered by an existing British Standard for aerospace material.

NOTE 2. Where metric units are stated these are to be regarded as the standard. The conversions of metric units to British units are approximate and more accurate conversions should be based on B.S.350: "Conversion factors and tables".

1. Inspection and testing procedure

1.1 This specification shall be used in conjunction with specification D.T.D. 999.

2. Chemical composition

2.1 The steel shall contain:

Element	Per cent	
	min.	max.
Carbon	—	0.12
Silicon	—	2.0
Manganese	—	2.0
Phosphorus	—	0.035
Sulphur	—	0.035
Chromium	17.0*	20.0
Nickel	7.5*	12.0

* The total content of nickel and chromium shall be not less than 25.0 per cent. Additional elements such as copper, tungsten and vanadium may be present at the option of the founder.

3. Condition of castings

3.1 The castings shall be supplied in the softened and descaled condition.

4. Final heat treatment

4.1 The final heat treatment shall be:

Soften by cooling freely in air or quenching in oil or water from a temperature between 1000°C and 1100°C.

5. Mechanical properties

5.1 *Mechanical tests.* The mechanical properties obtained from test pieces selected, prepared and tested in accordance with the relevant requirements of D.T.D. 999 shall be:

5.1.1 *Tensile and impact properties.*

0.1 per cent proof stress		Tensile strength		Elongation per cent on gauge length	Izod impact
kgf/mm ²	tonf/in ²	kgf/mm ²	tonf/in ²	5.65√So	ft lbf
min.	min.	min.	min.	min.	min.
20.5	13	47	30	20	25

5.1.2 *Single bend test.* Radius of former — one and one half times the thickness or diameter of the test piece. Angle of bend — 120°.

5.2 *Hardness.* The hardness of the finally heat treated material shall be not more than 207 HB.

6. **Intercrystalline corrosion test**

6.1 One intercrystalline corrosion test piece shall be provided with each heat treatment batch and shall be tested in accordance with Clause 17 of D.T.D. 999 except that the specimen shall not be heated before being pickled.

Approved for issue,

E. W. RUSSELL,

Director of Materials Research and Development/Aviation.

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