
British Standard: Aerospace Series
Specification for

Heat-resisting alloy plate, sheet and strip

(Ni 25.5, Cr 14.7, Ti 1.8, Mn 1.5, Mo 1.2, V 0.3, Fe remainder)

NOTE 1. This specification complies with AECMA Recommendation FE-PA93-HT.

NOTE 2. Other forms of this alloy are covered by British Standard:

HR 52 Billets, bars, forgings and parts

NOTE 3. Although the issue number is not specified when reference is made to an Aerospace standard, it should be understood that the latest revision, as shown by a prefix number, is to be used.

1. INSPECTION AND TESTING PROCEDURE

This British Standard shall be used in conjunction with British Standard HR 100, Sections 1 and 5.

2. MANUFACTURE

Unless otherwise agreed between the manufacturer and the purchaser in accordance with British Standard HR 100, the material shall be manufactured by an electric process, followed by consumable electrode vacuum arc remelting.

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3. CHEMICAL COMPOSITION

The alloy shall contain:

Element	%	
	min.	max.
Carbon	-	0.06
Silicon	-	0.5
Manganese	1.0	2.0
Phosphorus	-	0.020
Sulphur	-	0.015
Aluminium	-	0.35
Boron	-	0.010
Chromium	13.5	16.0
Molybdenum	1.0	1.5
Nickel	24.0	27.0
Lead	-	0.0050 (50 p.p.m)
Titanium	1.7	2.0
Vanadium	0.10	0.50
Iron	Remainder	

4. CONDITION

Unless otherwise agreed, the material shall be supplied in the appropriate condition stated below:

Thickness	Condition of supply
mm	
Up to and including 3	Cold rolled, solution treated and descaled
Greater than 3	Hot rolled, solution treated and descaled

5. HEAT TREATMENT

5.1 Solution treatment. The material shall be heated at a temperature of 980 ± 10 °C for a minimum time based on 1 h per 25 mm of thickness, followed by cooling in air or other suitable medium.

5.2 Precipitation treatment. The material shall be heated at a temperature of 720 ± 10 °C for 16 h, followed by cooling in air. It shall be heated steadily in the temperature range 550 °C to 720 °C in a period not less than 1 h.

6. MECHANICAL PROPERTIES

6.1 Mechanical tests. The mechanical properties obtained from test pieces selected, prepared and tested in accordance with the relevant requirements of British Standard HR 100 shall be as follows.

6.1.1 Tensile test at room temperature

0.2 % proof stress	Tensile strength	Elongation
MPa (= N/mm ²)	MPa (= N/mm ²)	%
min.	min.	min.
550	850	20

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

6.1.2 Stress rupture test

Temperature	Stress	Time to rupture	Elongation at rupture
°C	MPa (= N/mm ²)	h	%
		min.	min.
650	410	30	3.5

6.1.3 *Single bend test* (only applicable to sheet and strip). Each test piece shall be bent at room temperature, without cracking, through an angle of 180° over a former with a radius equal to 0.5 times the nominal thickness of the sheet or strip.

6.2 Hardness test

6.2.1 The hardness of material heat treated in accordance with 5.1 shall be not greater than 200 HV.

6.2.2 The hardness of material heat treated in accordance with 5.1 and 5.2 shall be not less than 250 HV.

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Contract requirements

Attention is drawn to the fact that this British Standard does not purport to include all the necessary provisions of a contract.

Revision of British Standards

British Standards are revised, when necessary, by the issue either of amendment slips or of revised editions. It is important that users of British Standards should ascertain that they are in possession of the latest amendments or editions.

The following BSI references relate to the work on this standard:
Committee reference ACE/48 Draft for comment 72/35139 DC