BS EN 2959:2019

BSI Standards Publication

Aerospace series – Heat resisting alloy NI-PH1302 (NiCr20Co13Mo4Ti3Al) – Solution treated and cold worked – Bar for forged fasteners – 3 mm ≤ D ≤ 30 mm

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 2959

June 2019

ICS 49.025.15; 49.025.99

English Version

Aerospace series - Heat resisting alloy NI-PH1302 (NiCr20Co13Mo4Ti3Al) - Solution treated and cold worked - Bar for forged fasteners - 3 mm ≤ D ≤ 30 mm

Série aérospatiale - Alliage résistant à chaud - NI-PH1302 (NiCr20Co13Mo4Ti3Al) - Mis en solution et écroui - Barres pour éléments de fixations forgés - 3 mm ≤ D ≤ 30 mm

Luft- und Raumfahrt - Hochwarmfeste Legierung - NI-PH1302 (NiCr20Co13Mo4Ti3Al) - Lösungsgeglüht und kaltverfestigt - Stangen zum Warmstauchschmieden für Verbindungselemente - 3 mm ≤ D ≤ 30 mm

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COMITÉ EUROPÉEN DE NORMALISATION
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European foreword

This document (EN 2959:2019) 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.

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Introduction

This document is part of the series of EN metallic material standards for aerospace applications. The general organization of this series is described in EN 4258.

This document has been prepared in accordance with EN 4500-003.

1 Scope

This document specifies the requirements relating to:

Heat resisting alloy NI-PH1302 (NiCr20Co13Mo4Ti3Al)
Solution treated and cold worked
Bar for forged fasteners
3 mm ≤ D ≤ 30 mm

for aerospace applications.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 2043, *Aerospace series — Metallic materials — General requirements for semi-finished product qualification (excluding forgings and castings)*

EN 4258, *Aerospace series — Metallic materials — General organization of standardization — Links between types of EN standards and their use*

EN 4500-003, *Aerospace series — Metallic materials — Rules for drafting and presentation of material standards — Part 003: Specific rules for heat resisting alloys*

EN 4700-002, *Aerospace series — Steel and heat resisting alloys — Wrought products — Technical specification — Part 002 : bar and section*[1)]

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

4 Requirements

See Table 1.

1) Published as ASD-STAN Prestandard at the date of publication of this standard by AeroSpace and Defence industries Association of Europe — Standardization (ASD-STAN) (http://www.asd-stan.org/)

Table 1 — Requirements for heat resisting alloy NI-PH1302 (NiCr20Co13Mo4Ti3Al)

1	Material designation		Heat resisting alloy NI-PH1302 (NiCr20Co13Mo4Ti3Al)									
2	Chemical composition %	Element	C	Si	Mn	P	S	Al	B	Co	Cr	Fe
		min.	0,02	–	–	–	–	1,20	0,003	12,0	18,0	–
		max.	0,10	0,15	0,10	0,015	0,008	1,60	0,010	15,0	21,0	2,0
		Element	Mo	Ti	Zr	Ag	Bi	Ca	Cu	Pb	Mg	Ni
		min.	3,50	2,80	0,02	–	–	–	–	–	–	Base
		max.	5,00	3,30	0,08	5*)	1*)	0,01	0,10	10*)	0,01	
3	Method of melting		Vacuum melted and consumable electrode remelted									
4.1	Form		Bar for forged fasteners									
4.2	Method of production		Wrought									
4.3	Limit dimension(s)	mm	$3 \leq D \leq 30$									
5	Technical specification		See EN 4700-002.									

6.1	Delivery condition	Solution treated, cold worked, straightened and ground
	Heat treatment	1 010 °C ≤ θ ≤ 1 080 °C / t ≥ 1 h / AC or faster + 10 % ≤ cold worked ≤ 30 % at θ ≤ 870 °C + straightened + ground
6.2	Delivery condition code	U
7	Use condition	Delivery condition
	Heat treatment	–

					Characteristics	
8.1	Test sample(s)				See EN 4700-002.	See EN 4700-002.
8.2	Test piece(s)				See EN 4700-002.	See EN 4700-002.
8.3	Heat treatment				Delivery condition	See line 29
9	Dimensions concerned			mm	$3 \leq D \leq 30$	$3 \leq D \leq 30$
10	Thickness of cladding on each face			%	–	–
11	Direction of test piece				–	–
12	T	Temperature	θ	°C	–	Ambient
13		Proof stress	$R_{p0,2}$	MPa	–	≥ 800
14		Strength	R_m	MPa	–	≥ 1 210
15		Elongation	A	%	–	≥ 13
16		Reduction of area	Z	%	–	≥ 18
17	Hardness				≤ 385 HV	320 ≤ HV ≤ 410
18	Shear strength		R_c	MPa	–	–
19	Bending		k	–	–	–
20	Impact strength				–	–
21	C	Temperature	θ	–	–	730
22		Time		h	–	t_R ≥ 23
23		Stress	σ_a	–	–	–
24		Elongation	a	–	–	–
25		Rupture stress	σ_R	MPa	–	520
26		Elongation at rupture	A	%	–	≥ 5
27	Notes (see line 98)				*)	

29	Reference heat treatment	–	Delivery condition + 850 °C / t = 4 h / AC or faster + 760 °C / t = 16 h / AC or faster	
34	Grain size	–	See EN 4700-002.	
		7	Grain size number	% of area
			≥ 3	≥ 95
			2 ≤ G < 3	≤ 5
			< 2	Not acceptable
44	External defects	–	See EN 4700-002.	
		1	Visual inspection	
95	Marking inspection	–	See EN 4700-002.	
96	Dimensional inspection	–	See EN 4700-002.	
98	Notes	–	*) p.p.m	
99	Typical use	–	–	

100	–	Product qualification	–	See EN 2043.
				Qualification programme to be agreed between manufacturer and purchaser.

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