



**SLOVENSKI STANDARD**  
**SIST EN 3933:2002**  
**01-januar-2002**

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**Aerospace series - Nickel base alloy NI-B13001 (NiP11) - Filler metal for brazing - Powder or paste**

Aerospace series - Nickel base alloy NI-B13001 (NiP11) - Filler metal for brazing - Powder or paste

Luft- und Raumfahrt - Nickelbasislegierung NI-B13001 (NiP11) - Hartlot in Form von Pulver oder Paste

Série aérospatiale - Alliage base nickel NI-B13001 (NiP11) - Métal d'apport de brasage - Poudre ou pâte

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**Ta slovenski standard je istoveten z: EN 3933:2001**

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**ICS:**

|           |                               |                               |
|-----------|-------------------------------|-------------------------------|
| 49.025.15 | Neželezove zlitine na splošno | Non-ferrous alloys in general |
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| <b>SIST EN 3933:2002</b> | <b>en</b> |
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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 3933**

June 2001

ICS 49.025.15

English version

**Aerospace series - Nickel base alloy NI-B13001 (NiP11) - Filler  
metal for brazing - Powder or paste**

Série aérospatiale - Alliage base nickel NI-B13001 (NiP11)  
- Métal d'apport de brasage - Poudre ou pâte

Luft- und Raumfahrt - Nickelbasislegierung NI-B13001  
(NiP11) - Hartlot in Form von Pulver oder Paste

This European Standard was approved by CEN on 19 April 2001.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**Management Centre: rue de Stassart, 36 B-1050 Brussels**

## Foreword

This European Standard has been prepared by the European Association of Aerospace Manufacturers (AECMA).

After inquiries 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 AECMA, prior to its presentation to CEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by December 2001, and conflicting national standards shall be withdrawn at the latest by December 2001.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

## 0 Introduction

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

This standard has been prepared in accordance with EN 4500-6.

## 1 Scope

This standard specifies the requirements relating to:

Nickel base alloy NI-B13001 (NiP11)  
Filler metal for brazing  
Powder or paste

for aerospace applications.

## 2 Normative references

This European Standard incorporates by dated or undated reference provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

|           |  |
|-----------|--|
| EN 2043   | Aerospace series - Metallic materials - General requirements for semi-finished product qualification (excluding forgings and castings) <sup>1)</sup>                   |
| EN 3875   | Aerospace series - Metallic materials - Filler metal for brazing - Technical specification <sup>1)</sup>   |
| EN 4258   | Aerospace series - Metallic materials - General organization of standardization - Links between types of EN standards and their use                                    |
| EN 4500-6 | Aerospace series - Metallic materials - Rules for drafting and presentation of material standards - Part 6: Specific rules for filler metals for brazing <sup>1)</sup> |

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1) Published as AECMA Prestandard at the date of publication of this standard

|      |  |         |   |      |      |       |      |  |      |    |        |    |
|------|--|---------|---|------|------|-------|------|--|------|----|--------|----|
| 1    | Material designation                   |         | Nickel base braze alloy NI-B13001 (NiP11) |      |      |       |      |  |      |    |        |    |
| 2    | Chemical composition <sup>a</sup><br>% | Element | C   | P    | S    | Al    | Co   | Se   | Ti   | Zr | Others | Ni |
|      |  |         |   |      |      |       |      |  |      |    | Total  |    |
|      |  | min.    | –   | 10,0 | –    | –     | –    | –  | –    | –  | –      | –  |
| max. | 0,10                                   | 12,0    | 0,02                                      | 0,05 | 0,10 | 50 *) | 0,05 | 0,05   | 0,15 |    |        |    |
| 3    | Method of melting                      |         | Air or inert gas or vacuum melted         |      |      |       |      |  |      |    |        |    |
| 4.1  | Form                                   |         | Powder                                    |      |      |       |      | Paste  |      |    |        |    |
| 4.2  | Method of production                   |         | Water or inert gas atomised and sieved    |      |      |       |      | Water or inert gas atomised and sieved and mixed with a binder |      |    |        |    |
| 4.3  | Limit dimension(s)                     | mm      | –   |      |      |       |      | –  |      |    |        |    |
| 5    | Technical specification                |         | EN 3875                                   |      |      |       |      |  |      |    |        |    |

|     |                         |  |   |  |  |  |  |                    |  |  |  |  |
|-----|-------------------------|--|---|--|--|--|--|--------------------|--|--|--|--|
| 6.1 | Delivery condition      |  | As manufactured                           |  |  |  |  | As manufactured    |  |  |  |  |
|     | Heat treatment          |  | –   |  |  |  |  | –                  |  |  |  |  |
| 6.2 | Delivery condition code |  | U   |  |  |  |  | U                  |  |  |  |  |
| 7   | Use condition           |  | Delivery condition or mixed with a binder |  |  |  |  | Delivery condition |  |  |  |  |
|     | Heat treatment          |  | –   |  |  |  |  | –                  |  |  |  |  |

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|     |                                    |                       |   |     |   |  |  |  |  |  |  |  |
|-----|------------------------------------|-----------------------|---|-----|---|--|--|--|--|--|--|--|
| 8.1 | Test sample(s)                     |                       | <a href="https://standards.itech.ai/catalog/standards/sist/46da12bb-d9d-40da-b9c2-d70df179a9a4/sist-en-3933-2002">SIST EN 3933:2002</a>   |     |   |  |  |  |  |  |  |  |
| 8.2 | Test piece(s)                      |                       | <a href="https://standards.itech.ai/catalog/standards/sist/46da12bb-d9d-40da-b9c2-d70df179a9a4/sist-en-3933-2002">https://standards.itech.ai/catalog/standards/sist/46da12bb-d9d-40da-b9c2-d70df179a9a4/sist-en-3933-2002</a> |     |   |  |  |  |  |  |  |  |
| 8.3 | Heat treatment                     |                       | –   |     |   |  |  |  |  |  |  |  |
| 9   | Dimensions concerned               | mm                    | –   |     |   |  |  |  |  |  |  |  |
| 10  | Thickness of cladding on each face | %                     | –   |     |   |  |  |  |  |  |  |  |
| 11  | Direction of test piece            |                       | –   |     |   |  |  |  |  |  |  |  |
| 12  | Temperature                        | $\theta$              | °C  | –   |   |  |  |  |  |  |  |  |
| 13  | Proof stress                       | $R_{p0,2}$            | MPa   | –   |   |  |  |  |  |  |  |  |
| 14  | T                                  | Strength              | $R_m$   | MPa | – |  |  |  |  |  |  |  |
| 15  |                                    | Elongation            | A   | %   | – |  |  |  |  |  |  |  |
| 16  |                                    | Reduction of area     | Z   | %   | – |  |  |  |  |  |  |  |
| 17  |                                    | Hardness              |   | –   |   |  |  |  |  |  |  |  |
| 18  | Shear strength                     | $R_c$                 | MPa   | –   |   |  |  |  |  |  |  |  |
| 19  | Bending                            | k                     | –   | –   |   |  |  |  |  |  |  |  |
| 20  | Impact strength                    |                       | –   |     |   |  |  |  |  |  |  |  |
| 21  | Temperature                        | $\theta$              | °C  | –   |   |  |  |  |  |  |  |  |
| 22  | Time                               |                       | h   | –   |   |  |  |  |  |  |  |  |
| 23  | C                                  | Stress                | $\sigma_a$  | MPa | – |  |  |  |  |  |  |  |
| 24  |                                    | Elongation            | a   | %   | – |  |  |  |  |  |  |  |
| 25  |                                    | Rupture stress        | $\sigma_R$  | MPa | – |  |  |  |  |  |  |  |
| 26  |                                    | Elongation at rupture | A   | %   | – |  |  |  |  |  |  |  |
| 27  | Notes (see line 98)                |                       | *) <sup>a</sup>   |     |   |  |  |  |  |  |  |  |

|   |   |   |   |                                      |
|---|---|---|---|--------------------------------------|
| 44  | External defects                                    | - | Powder  | Paste                                |
|   |   |   | See EN 3875   | -                                    |
| 53  | Thermal analysis<br>(Differential thermal analysis) | - | See EN 3875   |                                      |
|   |   | 7 | Eutectic: 877 °C  |                                      |
| 76  | Wettability<br>(Fusion test)                        | - | See EN 3875   |                                      |
| 78  | Metallic alloy content                              | - | See EN 3875   |                                      |
|   |   | 7 | Powder  | Paste                                |
|   |   |   | -   | 84 % ≤ metallic alloy content ≤ 90 % |
| 82  | Batch uniformity<br>(Material verification)         | - | See EN 3875   |                                      |
| 83  | Particle size<br>(Sieve analysis)                   | - | See EN 3875   |                                      |
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| 95  | Marking inspection                                  | - | See EN 3875   |                                      |
| 96  | Dimensional inspection                              | - | See EN 3875   |                                      |
| 98  | Notes   | - | <p>*) p.p.m.<br/> <sup>a</sup> The chemical composition refers to the metallic alloy content.</p> |                                      |
| 99  | Typical use   | - | Joining nickel and cobalt base heat resisting alloys.   |                                      |

|  |   |                       |   |  |
|--|---|-----------------------|---|--|
| 100  | - | Product qualification | - | See EN 2043  |
|  |   |                       |   | Qualification programme to be agreed between manufacturer and purchaser. |
| <p><b>iTeh STANDARD PREVIEW</b><br/><b>(standards.iteh.ai)</b></p> <p><u>SIST EN 3933:2002</u><br/><a href="https://standards.iteh.ai/catalog/standards/sist/46da12bb-df9d-40da-b9c2-d70df179a9a4/sist-en-3933-2002">https://standards.iteh.ai/catalog/standards/sist/46da12bb-df9d-40da-b9c2-d70df179a9a4/sist-en-3933-2002</a></p> |   |                       |   |  |