

Certified Material Test Report

HEAT #
64555

Load ID. **16584200**

Page 1

SOLD TO

Re-Steel Supply Company, Inc.
51640 Quadrate Dr
MACOMB, MI 48042
USA



QUALITY SYSTEM
CERTIFICATION
Complies with EN ISO 10204, Type 3.1
TUV Rheinland Cert# 9105081167

SALES ORDER / RLS
165842 / 1

Date Printed **10/08/2025**

CUSTOMER P.O. 5979	CUSTOMER PART	QUANTITY 400.0 Lbs 181.5 kg	PIECES 40	CMTR DATE 10/02/2025
PRODUCT: NILO Filler Metal CF36 .093 x 36 NCF36-093-10TS				
CERTIFICATION REQUIREMENTS				
Typical Minimum Mechanical Properties		Tensile Strength 80,000 psi (550 MPa);		Elongation, (4d) 25 %
Chemical Analysis %				
C 0.25	Mn 0.45	Fe 61.5	S 0.001	Si 0.10
				Cu 0.01
				Ni 36.01
				Cr 0.01
				Al 0.02
				Ti 0.22
				P <0.003
B 0.002	Nb 1.4	Others <0.50		
Specifications				
Country of Origin Melted in France.				
End of Certification				

Visual and dimensional examination is satisfactory. Material, when shipped, is free from contamination by mercury radium, alpha source, and low melting point elements.

X

DATE:

PRINTED BY: mcha

**CERTIFICAT DE RECEPTION 3.1-EN 10204****n° YX038540/1****Inspection certificate - Abnahmeprüfzeugnis**

Usine - Works - Werk
Alloys Imphy
58160 IMPHY FRANCE
Telephone : 03 86 21 30 00
Telecopie : 03 86 21 31 00

Client : RESTEEL
Customer :
Kunde :
V/Commande : 501020879
Your order :
Ihre Bestell. Nr :
Spécification : ASTM F1684-06 - UNS K93603
Specification :
Vorschrift : BOEING D33028-2 REV. Y

N/Référence : 15603701/01
Our reference :
Unser Auftrag Nr :

du : 20/01/25
of :
Von :

Produit : INVAR SLAB
Product :
Erzeugnisform :
Etat de livraison : HOT ROLLED
Condition of delivery :
Lieferzustand : GROUND

THIC/5,5000/IN
WIDT/49,5000/IN
LENG/118,0000/IN

N° de Fabric. : STPL603867
Manufact.Nr :
Fabrik.Nr :

Composition Chimique (% poids)
Chemical Composition (% weight)
Chemische Zusammensetzung (% gewicht)

Coulée N° : RQ807
Heat Nr :
Schmelze Nr :

	C	Mn	Si	S	P	Ni	Cr	Cu	Co
%	.004	.28	.06	< .001	< .003	35.93	.03	.031	.05
Meth.	ACS	AFX	ASP	ACS	ASP	AFX	AFX	AFX	AFX
Al	Ti	Mg	Fe						
< .01	< .01	< .002	bal.						
ASP	AFX	ASP							

-*- MECHANICAL AND PHYSICAL TESTS -*-

CONFORME A L'ASTM F1684-06 - UNS NO. K93603
BOEING D33028-2 REV Y
ACCORDING TO ASTM F1684-06 - UNS NO. K93603
BOEING D33028-2 REV Y

ZR : 0,10 % MAX BASED ON STATISTICAL DATA AND CERTIFICATION OF
MATERIALS SUPPLIER

QUALITY CONTROL

DOLE R

Signature
Signature
Unterschrift

26/05/25
Imphy plant

Usine - Works - Werk
Alloys Imphy
58160 IMPHY FRANCE
Telephone : 03 86 21 30 00
Telecopie : 03 86 21 31 00

Client
Customer
Kunde : RESTEEL

N/Référence
Our reference : 15603701/01
Unser Auftrag Nr

V/Commande
Your order : 501020879
Ihre Bestell. Nr
du
of : 20/01/25
Von

Spécification
Specification : ASTM F1684-06 - UNS K93603
Vorschrift : BOEING D33028-2 REV. Y

MG : 0,002% MAX GUARANTEED BY APERAM BASED ON HISTORICAL DATA
LEVEL NOT REACHED FOR THE PAST 10 YEARS

HARDNESS TEST

<----- Test Results ----->
HRB (HRB) 60,0

EXTERNAL MEASUREMENT - ULTRASONIC TEST- EN 16810 - EN 10307

<----- Test Results ----->
TEST RESULT CONF.

COEFFICIENT OF THERMAL EXPANSION (*1E-6)

<----- Test Results ----->
77-400 °F (/°F) 1,30

APERAM ALLOYS CERTIFIES THAT THIS MATERIAL
HAS BEEN MELTED IN FRANCE

We hereby declare, barring exceptions, reservations or exemptions listed in this statement of conformity,
that the listed supplies comply with the contract requirements and that after completion of testing and verification
, they completely satisfy all specified requirements and applicable standards and regulations.
Document validated by electronic signature
QSE manual in latest edition is available on this link : <https://www.aperam.com/documentation/>

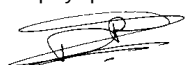
AAA : Spectrométrie d'Absorption Atomique (SAA) = Atomic Absorption Spectrometry (AAS) / APL : Spectrométrie d'Emission Atomique à Plasma couplé Inductivement (ICP AES)
= Inductively Coupled Plasma Spectrometry / AFX : spectrométrie de Fluorescence X = X-Ray fluorescence spectrometry (XRF) / ASP : Spectrométrie d'Emission Optique à
source étincelle = optical Emission Spectrometry (OES) / ACS : analyseur spécifique carbone soufre = combustion and infrared measurement / ANO : analyseur spécifique
oxygène azote = fusion, conductivity and infrared measurement / AEX : dosage extérieur = analysis outsourced)

QUALITY CONTROL

DOLE R

Signature
Signature
Unterschrift

26/05/25
Imphy plant



ELLWOOD QUALITY STEELS COMPANY

A PENNSYLVANIA BUSINESS TRUST
700 MORAVIA STREET, NEW CASTLE, PA 16101

Page 1 of 1



(724) 658-6788
Telefax (724) 658-6802

CERTIFIED TEST REPORT

Date: **4/23/24**

Report of Tests of: **(3), 6" x 50" - Grade Invar 36 Ingot(s)**

For Company: **Re-Steel Supply**
Specialty Metals Division
Denver, CO 80206

Customer's Order: **5820**
Date of Order: **2/22/24**
Our Shop Order: **H000290428**
Specification: **Boeing D33028-2 Rev.AF, Table 1 chem only**

CHEMICAL ANALYSIS

Heat #	C	Mn	P	S	Si	Ni	Cr	Mo	V	Cu	Al	Ti	Co	Zr
FC711	.02	.32	.002	.002	.30	36.23	.05	.03	.003	.19	.020	.003	.027	.007
	Se	Mg												
	.005	<.001												

The material was melted using the electric furnace-ladle refined-vacuum degas process and was subsequently bottom poured.

P+S = .004

Al + Mg + Ti + Zr < .031

Fe Balance = 63

Material meets the chemistry requirements of Boeing D33028-2 Rev. AF, Table 1 for Invar 36 and ASTM F1684-06 (reapproved 2021) table 1 UNS No K93603.

Coefficient of Thermal Expansion = 1.58×10^{-5} in/in/°F (77-400 F).

The material was produced in accordance with the EQS Quality Manual dtd. 02/02/24, Rev.7, which meets the intent of the latest revisions of ISO 10012-1, MIL-I-45208, NCA-3300 (formerly NCA 3800), and 10-CFR-50 App. B for quality assurance, inspection and calibration systems. EQS QMS is certified to AS9100D and ISO 9001:2015.

The material was melted in the U.S.A.

Forged to a 7.5" x 50" from a 22" x 57" ingot. Reduction Ratio: 3.19:1. Subsequently ground to 6" x 50" slab.

I certify that the reported results and statements of the certificate represent the actual attributes of the material furnished and are in full compliance with all purchase order/ specification requirements. Note: The recording of false, fictitious or fraudulent statements or entries on this document may be punishable as a felony under Federal Statute. During the manufacturing process, tests, and inspections, the material did not come in direct contact with mercury or any of its compounds nor with any mercury containing device employing a single boundary of containment. No welding or weld repair was performed on this material. The material was produced free of radioactive elements.


Chris McVay
Quality Assurance Manager

Electronic Signature

ELLWOOD QUALITY STEELS COMPANY

A PENNSYLVANIA BUSINESS TRUST
700 MORAVIA STREET, NEW CASTLE, PA 16101

Page 1 of 1



(724) 658-6788
Telefax (724) 658-6802

CERTIFIED TEST REPORT

Date: 4/9/25

Report of Tests of: (3), 7" x 50" - Grade Invar 36 Forged Slab(s)

For Company: Re-Steel Supply
Specialty Metals Division
Denver, CO 80206

Customer's Order: 5888
Date of Order: 12/12/24
Our Shop Order: H000297566
Specification: Boeing D33028-2 Rev.AF, Table 1 chem only

CHEMICAL ANALYSIS

Heat #	C	Mn	P	S	Si	Ni	Cr	Mo	V	Cu	Al	Ti	Co	Zr
FK380	.03	.26	.003	.001	.23	36.01	.03	.03	.002	.14	.022	.002	.023	.015
	Se	Mg												
	.0036	.0001												

The material was melted using the electric furnace-ladle refined-vacuum degas process and was subsequently bottom poured.

P+S = .004

Al + Mg + Ti + Zr = .039

Fe Balance = 63

Material meets the chemistry requirements of Boeing D33028-2 Rev. AF, Table 1 for Invar 36 and ASTM F1684-06 (reapproved 2021) table 1 UNS No K93603.

Coefficient of Thermal Expansion = 1.66×10^{-6} in/in/deg F (77 - 400 deg F)

The material was produced in accordance with the EQS Quality Manual dtd. 02/02/24, Rev.7, which meets the intent of the latest revisions of ISO 10012-1, MIL-I-45208, NCA-3300 (formerly NCA 3800), and 10-CFR-50 App. B for quality assurance, inspection and calibration systems. EQS QMS is certified to AS9100D and ISO 9001:2015.

The material was melted in the U.S.A.

Forged to a 7" x 50" Slab from a 22" x 57" ingot. Reduction Ratio: 3.19:1

I certify that the reported results and statements of the certificate represent the actual attributes of the material furnished and are in full compliance with all purchase order/ specification requirements. Note: The recording of false, fictitious or fraudulent statements or entries on this document may be punishable as a felony under Federal Statute. During the manufacturing process, tests, and inspections, the material did not come in direct contact with mercury or any of its compounds nor with any mercury containing device employing a single boundary of containment. No welding or weld repair was performed on this material. The material was produced free of radioactive elements.


Chris McVay
Quality Assurance Manager

ELLWOOD QUALITY STEELS COMPANY

A PENNSYLVANIA BUSINESS TRUST
700 MORAVIA STREET, NEW CASTLE, PA 16101

Page 1 of 1



(724) 658-6788
Telefax (724) 658-6802

CERTIFIED TEST REPORT

Date: **4/24/25**

Report of Tests of: **(3), 7" X 50" - Grade Invar 36 Forged Slab(s)**

For Company: **Re-Steel Supply**
Specialty Metals Division
Denver, CO 80206

Customer's Order: **5888**
Date of Order: **12/12/24**
Our Shop Order: **H000297570**
Specification: **Boeing D33028-2 Rev.AF, Table 1 chem only**

CHEMICAL ANALYSIS

Heat #	C	Mn	P	S	Si	Ni	Cr	Mo	V	Cu	Al	Ti	Co	Zr
FK788	.02	.29	.004	.001	.24	36.68	.06	.02	.003	.13	.016	.003	.018	.017
	Se	Mg												
	.003	.0001												

The material was melted using the electric furnace-ladle refined-vacuum degas process and was subsequently bottom poured.

P+S = .005

Al + Mg + Ti + Zr = .036

Fe Balance = 62

Material meets the chemistry requirements of Boeing D33028-2 Rev. AF, Table 1 for Invar 36 and ASTM F1684-06 (reapproved 2021) table 1 UNS No K93603.

Coefficient of Thermal Expansion = 1.79×10^{-6} in/in/deg F (77 - 400 deg F)

The material was produced in accordance with the EQS Quality Manual dtd. 02/02/24, Rev.7, which meets the intent of the latest revisions of ISO 10012-1, MIL-I-45208, NCA-3300 (formerly NCA 3800), and 10-CFR-50 App. B for quality assurance, inspection and calibration systems. EQS QMS is certified to AS9100D and ISO 9001:2015.

The material was melted in the U.S.A.

Forged to a 7" x 50" Slab from a 22" x 57" ingot. Reduction Ratio: 3.19:1

I certify that the reported results and statements of the certificate represent the actual attributes of the material furnished and are in full compliance with all purchase order/ specification requirements. Note: The recording of false, fictitious or fraudulent statements or entries on this document may be punishable as a felony under Federal Statute. During the manufacturing process, tests, and inspections, the material did not come in direct contact with mercury or any of its compounds nor with any mercury containing device employing a single boundary of containment. No welding or weld repair was performed on this material. The material was produced free of radioactive elements.


Chris McVay
Quality Assurance Manager

**CERTIFICAT DE RECEPTION 3.1-EN 10204****n° YX037256/1****Inspection certificate - Abnahmeprüfzeugnis**

Usine - Works - Werk
Alloys Imphy
58160 IMPHY FRANCE
Telephone : 03 86 21 30 00
Telecopie : 03 86 21 31 00

Client
Customer
Kunde : RESTEEL

N/Référence
Our reference : V3453818/01
Unser Auftrag Nr

V/Commande
Your order
Ihre Bestell. Nr : 403019987
du
of : 12/03/24
Von

Spécification
Specification
Vorschrift : ASTM F1684-06 - UNS K93603
BOEING D33028-2 REV. Y

Produit
Product
Erzeugnisform : INVAR SLAB

Etat de livraison
Condition of delivery : HOT ROLLED
Lieferzustand
GROUND

THIC/5,5000/IN
WIDT/49,5000/IN
LENG/118,0000/IN

N° de Fabric.
Manufact.Nr
Fabrik.Nr : STPL581808

Composition Chimique (% poids)
Chemical Composition (% weight)
Chemische Zusammensetzung (% gewicht)

Coulée N°
Heat Nr : RP670
Schmelze Nr

	C	Mn	Si	S	P	Ni	Cr	Cu	Co
%	.003	.29	.07	< .001	< .003	35.92	.04	.032	.12
Meth.	ACS	AFX	ASP	ACS	ASP	AFX	AFX	AFX	AFX
Al	Ti	Mg	Fe						
< .01	< .01	< .002	bal.						
ASP	AFX	ASP							

-*- MECHANICAL AND PHYSICAL TESTS -*-

CONFORME A L'ASTM F1684-06 - UNS NO. K93603
BOEING D33028-2 REV Y
ACCORDING TO ASTM F1684-06 - UNS NO. K93603
BOEING D33028-2 REV Y

ZR : 0,10 % MAX BASED ON STATISTICAL DATA AND CERTIFICATION OF
MATERIALS SUPPLIER

QUALITY CONTROL

DOLE R

Signature
Signature
Unterschrift

26/06/24
Imphy plant

Usine - Works - Werk
Alloys Imphy
58160 IMPHY FRANCE
Telephone : 03 86 21 30 00
Telecopie : 03 86 21 31 00

Client
Customer
Kunde : RESTEEL

N/Référence
Our reference : V3453818/01
Unser Auftrag Nr

V/Commande
Your order : 403019987
Ihre Bestell. Nr du of : 12/03/24
Von

Spécification
Specification : ASTM F1684-06 - UNS K93603
Vorschrift : BOEING D33028-2 REV. Y

MG : 0,002% MAX GUARANTEED BY APERAM BASED ON HISTORICAL DATA
LEVEL NOT REACHED FOR THE PAST 10 YEARS

HARDNESS TEST

<----- Test Results ----->

HRB (HRB) NO_VAL

EXTERNAL MEASUREMENT - ULTRASONIC CONTROL NF EN 10160 S3/E4

<----- Test Results ----->

TEST RESULT CONF.

EXTERNAL MEASUREMENT - COEFFICIENT OF THERMAL EXPANSION (*1E-6)

<----- Test Results ----->

77-400 °F (/°F)

APERAM ALLOYS CERTIFIES THAT THIS MATERIAL
HAS BEEN MELTED IN FRANCE

We hereby declare, barring exceptions, reservations or exemptions listed in this statement of conformity,
that the listed supplies comply with the contract requirements and that after completion of testing and verification
, they completely satisfy all specified requirements and applicable standards and regulations.
Document validated by electronic signature
QSE manual in latest edition is available on this link : <https://www.aperam.com/documentation/>

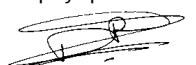
AAA : Spectrométrie d'Absorption Atomique (SAA) = Atomic Absorption Spectrometry (AAS) / APL : Spectrométrie d'Emission Atomique à Plasma couplé Inductivement (ICP AES)
= Inductively Coupled Plasma Spectrometry / AFX : spectrométrie de Fluorescence X = X-Ray fluorescence spectrometry (XRF) / ASP : Spectrométrie d'Emission Optique à
source étincelle = optical Emission Spectrometry (OES) / ACS : analyseur spécifique carbone soufre = combustion and infrared measurement / ANO : analyseur spécifique
oxygène azote = fusion, conductivity and infrared measurement / AEX : dosage extérieur = analysis outsourced)

QUALITY CONTROL

DOLE R

Signature
Signature
Unterschrift

26/06/24
Imphy plant



CERTIFIED TEST REPORTDate: **2/19/25**Report of Tests of: **(2), 20" X 65" X 115" - Grade Invar 36 Ingots**For Company: **Re-Steel Supply
Specialty Metals Division
Denver, CO 80206**Customer's Order: **5889**Date of Order: **12/12/24**Our Shop Order: **H000297565**Specification: **Boeing D33028-2 Rev.AF, Table 1 chem only****CHEMICAL ANALYSIS**

Heat #	C	Mn	P	S	Si	Ni	Cr	Mo	V	Cu	Al	Ti	Co	Zr
2271A	.012	.23	.001	.001	.18	36.43	.05	.02	.002	.09	.019	.002	.017	<.001
	Se	Mg	P+S	Al + Mg + Ti + Zr	Fe Balance									
	.002	.001	.002	<.023	63									

Material certified: 2271A-01; 2271A-02

The material was melted using the electric furnace-ladle refined-vacuum degas process and was subsequently bottom poured.

Coefficient of Thermal Expansion = 1.67×10^{-6} in/in/°F (77 - 400°F)

This material was melted and produced in the USA, in accordance with the ENS QA Manual Rev. 5 dated 05/03/2021 which meets the intent of the latest revisions of ISO 10012-1, MIL-I-45208, NCA-3300 latest edition (formerly NCA-3800) and 10CFR50 Appendix B for quality assurance, inspection and calibration systems. ENS QMS is certified to AS9100D and ISO 9001:2015.

Material meets the chemistry requirements of Boeing D33028-2 Rev. AF, Table 1 and ASTM F 1684-06 (Reapproved 2011) Table 1 UNS No. K93603

I certify that the reported results and statements of the certificate represent the actual attributes of the material furnished and are in full compliance with all purchase order/ specification requirements. Note: The recording of false, fictitious or fraudulent statements or entries on this document may be punishable as a felony under Federal Statute. During the manufacturing process, tests, and inspections, the material did not come in direct contact with mercury or any of its compounds nor with any mercury containing device employing a single boundary of containment. No welding or weld repair was performed on this material. The material was produced free of radioactive elements.

Thomas Piotrowski
Thomas Piotrowski
Quality Engineer

Electronic Signature

CERTIFIED TEST REPORTDate: **2/19/25**Report of Tests of: **(2), 20" X 65" X 115" - Grade Invar 36 Ingots**For Company: **Re-Steel Supply
Specialty Metals Division
Denver, CO 80206**Customer's Order: **5889**Date of Order: **12/12/24**Our Shop Order: **H000297564**Specification: **Boeing D33028-2 Rev.AF, Table 1 chem only****CHEMICAL ANALYSIS**

Heat #	C	Mn	P	S	Si	Ni	Cr	Mo	V	Cu	Al	Ti	Co	Zr
2272A	.020	.25	.001	<.001	.25	36.45	.04	.05	.002	.10	.028	.002	.067	<.001
	Se	Mg	P+S	Al + Mg + Ti + Zr	Fe Balance									
	.002	.002	<.002	<.033	63									

Material certified: 2272A-01; 2272A-02

The material was melted using the electric furnace-ladle refined-vacuum degas process and was subsequently bottom poured.

Coefficient of Thermal Expansion = 1.73×10^{-6} in/in/°F (77 - 400°F)

This material was melted and produced in the USA, in accordance with the ENS QA Manual Rev. 5 dated 05/03/2021 which meets the intent of the latest revisions of ISO 10012-1, MIL-I-45208, NCA-3300 latest edition (formerly NCA-3800) and 10CFR50 Appendix B for quality assurance, inspection and calibration systems. ENS QMS is certified to AS9100D and ISO 9001:2015.

Material meets the chemistry requirements of Boeing D33028-2 Rev. AF, Table 1 and ASTM F 1684-06 (Reapproved 2011) Table 1 UNS No. K93603

I certify that the reported results and statements of the certificate represent the actual attributes of the material furnished and are in full compliance with all purchase order/ specification requirements. Note: The recording of false, fictitious or fraudulent statements or entries on this document may be punishable as a felony under Federal Statute. During the manufacturing process, tests, and inspections, the material did not come in direct contact with mercury or any of its compounds nor with any mercury containing device employing a single boundary of containment. No welding or weld repair was performed on this material. The material was produced free of radioactive elements.

Thomas Piotrowski
Thomas Piotrowski
Quality Engineer

Electronic Signature



1401 Burris Road, Newton, North Carolina 28658
Phone (828) 465-0352 - Fax (828) 464-8953

SOLD TO

Certified Material Test Report

HEAT #
RM985

Load ID. **16194200**

Page 1

Re-Steel Supply Company, Inc.
50335 Patricia
Chesterfield, MI 48051
USA



QUALITY SYSTEM
CERTIFICATION
Complies with EN ISO 10204, Type 3.1
TUV Rheinland Cert# 9105081167

SALES ORDER / RLS
161942 / 1

Date Printed **12/18/2023**

CUSTOMER P.O. 5786	CUSTOMER PART	QUANTITY 200.0 Lbs 90.8 kg	PIECES 20	CMTR DATE 12/15/2023						
PRODUCT: NILO Filler Metal CF36 .093 x 36 NCF36-093-10TS										
CERTIFICATION REQUIREMENTS										
Typical Minimum Mechanical Properties		Tensile Strength 80,000 psi (550 MPa);		Elongation, (4d) 25 %						
Country of Origin: Melted and Manufactured in the USA.										
Chemical Analysis %										
C	Mn	Fe	S	Si	Cu	Ni	Cr	Al	Ti	P
0.24	0.45	61.4	0.001	0.06	0.03	36.02	0.04	0.04	0.26	<0.003
B	Nb	Others								
0.002	1.4	<0.50								
Specifications										
Country of Origin Melted in France.										
End of Certification										

Visual and dimensional examination is satisfactory. Material, when shipped, is free from contamination by mercury radium, alpha source, and low melting point elements.

X

12/18/2023

DATE:

PRINTED BY: sburton

Usine - Works - Werk
Alloys Imphy
58160 IMPHY FRANCE
Telephone : 03 86 21 30 00
Telecopie : 03 86 21 31 00

Client Customer Kunde	:	RESTEEL	N/Référence Our reference Unser Auftrag Nr	:	15600376/01
V/Commande Your order Ihre Bestell. Nr	:	406020337	du of Von	:	28/06/24
Spécification Specification Vorschrift	:	ASTM F1684-06 - UNS K93603 BOEING D33028-2 REV. Y			

Produit Product Erzeugnisform	:	INVAR SLAB	Etat de livraison Condition of delivery Lieferzustand	:	HOT ROLLED GROUND
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THIC/5,5000/IN
WIDT/49,5000/IN
LENG/118,0000/IN

N° de Fabric. Manufact.Nr Fabrik.Nr	:	STPL590354
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Composition Chimique (% poids)
Chemical Composition (% weight)
Chemische Zusammensetzung (% gewicht)

Coulée N°
Heat Nr : RQ108
Schmelze Nr

	C	Mn	Si	S	P	Ni	Cr	Cu	Co
%	< .001	.30	.06	< .001	< .003	35.95	.06	.034	.09
Meth.	ACS	AFX	ASP	ACS	ASP	AFX	AFX	AFX	AFX
Al	Ti	Mg	Fe						
< .01	< .01	< .002	bal.						
ASP	AFX	ASP							

-*- MECHANICAL AND PHYSICAL TESTS -*-

CONFORME A L'ASTM F1684-06 - UNS NO. K93603
BOEING D33028-2 REV Y
ACCORDING TO ASTM F1684-06 - UNS NO. K93603
BOEING D33028-2 REV Y

ZR : 0,10 % MAX BASED ON STATISTICAL DATA AND CERTIFICATION OF
MATERIALS SUPPLIER

QUALITY CONTROL

DOLE R

Signature
Signature
Unterschrift

06/11/24
Imphy plant



Usine - Works - Werk
Alloys Imphy
58160 IMPHY FRANCE
Telephone : 03 86 21 30 00
Telecopie : 03 86 21 31 00

Client
Customer
Kunde : RESTEEL

N/Référence
Our reference : 15600376/01
Unser Auftrag Nr

V/Commande
Your order
Ihre Bestell. Nr : 406020337
du
of : 28/06/24
Von

Spécification
Specification
Vorschrift : ASTM F1684-06 - UNS K93603
BOEING D33028-2 REV. Y

MG : 0,002% MAX GUARANTEED BY APERAM BASED ON HISTORICAL DATA
LEVEL NOT REACHED FOR THE PAST 10 YEARS

HARDNESS TEST

<----- Test Results ----->
HRB (HRB) 72,1

EXTERNAL MEASUREMENT - ULTRASONIC CONTROL NF EN 10160 S3/E4

<----- Test Results ----->
TEST RESULT CONF.

COEFFICIENT OF THERMAL EXPANSION (*1E-6)

<----- Test Results ----->
77-400 °F (/°F) 1,41

APERAM ALLOYS CERTIFIES THAT THIS MATERIAL
HAS BEEN MELTED IN FRANCE

We hereby declare, barring exceptions, reservations or exemptions listed in this statement of conformity,
that the listed supplies comply with the contract requirements and that after completion of testing and verification
, they completely satisfy all specified requirements and applicable standards and regulations.
Document validated by electronic signature
QSE manual in latest edition is available on this link : <https://www.aperam.com/documentation/>

AAA : Spectrométrie d'Absorption Atomique (SAA) = Atomic Absorption Spectrometry (AAS) / APL : Spectrométrie d'Emission Atomique à Plasma couplé Inductivement (ICP AES)
= Inductively Coupled Plasma Spectrometry / AFX : spectrométrie de Fluorescence X = X-Ray fluorescence spectrometry (XRF) / ASP : Spectrométrie d'Emission Optique à
source étincelle = optical Emission Spectrometry (OES) / ACS : analyseur spécifique carbone soufre = combustion and infrared measurement / ANO : analyseur spécifique
oxygène azote = fusion, conductivity and infrared measurement / AEX : dosage extérieur = analysis outsourced)

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