



## CERTIFICATO DI COLLAUDO - ABNAHMEPRUEFZEUGNIS - INSPECTION CERTIFICATE - CERTIFICAT DE RECEPTION

In conformità a : EN 10204 (2004) , 3.1 / ISO 10474 (2013) , 3.1

Certificato nr. MEST408461 / 2019 /  
 Prüfung/Test/Essai

Cliente / Besteler/Purchaser/Client  
**VALBRUNA CANADA LTD**  
 8724 HOLGATE CRESCENT  
 L5T 5Z1 - MLTON, ONT L5T 5Z1 - CA

Stato di fornitura : Forged - Annealed Peeled  
 Lieferzustand  
 Delivery state  
 Etat de livraison

Produttore :  
 Hersteller/Item/Usine productrice

**ACCIAIERIE VALBRUNA S.P.A.**

Ordine nr: 902007352 15384  
 Bestell  
 Your order  
 Commande

Tipo di Elaborazione: E+AOD  
 Erschmelzungsart  
 Melting process  
 Mode d'elaboration

Marchi di Fabbrica:  
 Zeichen des Lieferwerkes  
 Trade marks  
 Sigles de l'usine productrice



Conferma ordine nr: E119001518  
 Werks/Our Order/Ref nr.

Qualità: 316/316L  
 Werkstoff/Grade/Nuance

Punzone del Collaudatore:  
 Stempel des Werkssachverständigen  
 Inspector's stamp/Poinçon de l'assayeur

MR

Avviso di Spedizione: D-VI19013983  
 Lieferanzeige/Pack ng list/B.L.

Marca: APML  
 Markenbezeichnung  
 Brand / Nuance

Punzonatura: 316/316L  
 Kennzeichnung  
 Marking  
 Marquage

### SPECIFICHE :

Anforderungen / Requirements / Exigences

Note:

Anzeichnungen / Notes / Notes

VSI 0 316/316L A  
 AISI 316/316L  
 AMS 5648 M S31600 A  
 AMS 5653 H S31603 A  
 AMS-QQ-S-763 D 316/316L A  
 ASME SA182 2017 S31600/03 A (0)  
 ASME SA193 2017 B8M CLASS 1 (1)  
 ASME SA276 2017 S31600/03 A (2)  
 ASME SA320 2017 B8M CLASS1 (3)  
 ASME SA479 2017 S31600/03 A (4)  
 ASTM A182 2018 S31600/03 A (5)  
 ASTM A193 2017 B8M CLASS 1  
 ASTM A262 2015 PRACTICE E  
 ASTM A276 2017 S31600/03 A  
 ASTM A314 2015 S31600/03  
 ASTM A320 2017A B8M CLASS1  
 ASTM A370 2017 .  
 ASTM A473 2001 S31600/03 (6)  
 ASTM A479 2018 S31600/03 A  
 MIL-S-862 B/1 316/316L  
 NACE MR0103 2015 S31600/03 A (7)  
 NACE MR0175 2015 S31600/03 A (8)  
 QQ-S-763 F 316/316L A

(0)Section II Part A 2017 EDITION For products machined directly from bar refer to ASME SA479.

(1)Section II Part A 2017 EDITION

(2)Section II Part A 2017 EDITION

(3)Section II Part A 2017 EDITION

(4)Section II Part A 2017 EDITION

(5)For products machined directly from bar refer also to ASTM A479.

(6)Chemical analysis only.

(7)ANSI/NACE MR0103/ISO 17945 November 23, 2015

(8)ANSI/NACE MR0175/ISO 15156-3, third edition November 23,2015

Tolleranza: ASTM A484-18A TABLE 3

Tolleranza/Allowance/Tolerance

| Pos. nr.<br>Pos. nr.<br>Item nr.<br>N. de poste | Oggetto<br>Gegenstand<br>Product description<br>Descrip. du produit | Dimensioni - In<br>Abmessungen<br>Dimension<br>Dimension | Lunghezza - In<br>Länge<br>Length<br>Longueur | Colata<br>Schmelze<br>Heat<br>Coulée | Pezzi<br>Stückzahl<br>Pieces<br>Pieces | Peso - LB<br>Gewicht<br>Weight<br>Poids | Lotto nr.<br>Losnr.<br>Lot nr.<br>Lot nr. |
|---|---|--|---|--------------------------------------|--|---|---|
| 0050  | Round   | 15,0000  | 132/ 132                                      | 279461                               |  | 6.808                                   | 829603850                                 |

ANS



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### TEST ALLO STATO DI FORNITURA

Test on delivery condition / Prüfung auf lieferbarem produkt / test a l'etat de fourniture / Prueba sobre el material así como entregado

| TEST  | Provetta/ Probe<br>Specimen/Eprovette<br>Larg diam Spers<br>Bore Diam. Dicks<br>Widn Diam. Thickness<br>Larg diam. epais<br>mm | °F | Posiz<br>Saggio<br>Probenlage<br>Location<br>Empfänger | Snervamento<br>Streckgrenze<br>Yield Stress<br>Rp 0,2%<br>k.s.i. | Snervamento<br>Streckgrenze<br>Yield Stress<br>Limite elastique | Resistenza<br>Zugfestigkeit<br>Tensile strength<br>Resistance à traction<br>Rm<br>k.s.i. | Allungamento<br>Bruchdehnung<br>Elongation<br>Allongement<br>E 4d<br>% | Strizione<br>Einschnürung<br>Reduction of area<br>Striction<br>% | RA<br>% | Resilienza<br>Kerbschlagarbeit<br>Impact Value<br>Resilience | Durezza<br>Härte<br>Hardness<br>Dureté<br>HB |
|---|--|----|--|--|---|--|--|--|---------|--|--|
|   |  |    |  |  |   |  |  |  |         |  |  |
| Valori richiesti                                  |  |    |  | 30   | -   | 75   | -  | 40   | -       | 50   | 140  |
| Anteferenzen/Required values<br>Valeurs demandées |  |    |  |  |   | 115  |  |  |         |  | 223  |
| A   | 12,5   | 68 | L  | 39   |   | 82   |  | 61   |         | 76   | 169  |

### TEST ALLO STATO DI FORNITURA

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| TEST                       | min | max |
|----------------------------|-----|-----|
| A Grain size for ASTM E112 |     | 1   |

Mechanical properties according to ASTM A370.

### Analisi chimica

Chemische Zusammensetzung/Chemical Analysis/Analyse chimique

| Colata /Heat<br>Schmelze/Coulée | min   | max  | 1,25 | 16,50 | 2,00 | 10,00 | 0,020 | 0,020 | 0,020 | 0,020 | 0,100 | - | - | - | - |
|---------------------------------|-------|------|------|-------|------|-------|-------|-------|-------|-------|-------|---|---|---|---|
|                                 | 0,030 | 1,00 | 2,00 | 16,00 | 3,00 | 1,00  | 14,00 | 0,040 | 0,030 | 0,100 | -     | - | - | - | - |
|                                 | C %   | Si % | Mn % | Cr %  | Mo % | Cu %  | Ni %  | Co %  | P %   | S %   | N %   | - | - | - | - |
| 279461                          | 0,019 | 0,32 | 1,77 | 16,78 | 2,07 | 0,54  | 10,10 | 0,107 | 0,028 | 0,022 | 0,093 | - | - | - | - |

### Corrosion test in 16% sulfuric acid and copper sulfate solutions

Test standard: ASTM A262-Practice E

| Test                    | Heat treatment before test | Length of Period (h) | Test temp (°C) | Bend Angle (°) | Ø spindle (mm) | Result of visual inspection at 20 x magnification after bend test | Result       |
|-------------------------|----------------------------|----------------------|----------------|----------------|----------------|---|--------------|
| Intergranular corrosion | Sensitization              | 15                   | boil           | 180            | 5              | Absence of cracks   | SATISFACTORY |

Produced without class I-II Ozone depleting substances.  
 Solution heat treated free from continuous carbide network.  
 Annealing temperature : 1940° F for 6.5 h/water.  
 Micro and macro etch test : OK  
 Reduction ratio > 4 : 1  
 Material is DFARS Compliant

Sono state soddisfatte tutte le condizioni richieste  
 Die gestellten Anforderungen sind erfüllt  
 The material has been furnished in accordance with the requirements  
 Le matières à été trouvé conforme aux exigences

Controllo antimescolanza: OK  
 Verwechslungsprüfung: spectralanalytisch durchgeführt  
 Anämikung testing performed: OK  
 Contrôle antimélange: fait: r.a.s.

Controllo visivo e dimensionale: soddisfa le esigenze  
 Besichtigung und Ausmessung: ohne Beanstandung  
 Visual inspection and dimensional checks satisfactory  
 Contrôle visuel et dimensions: satisfaisant



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Melted and manufactured in Italy No welding or weld repair Material free from Mercury contamination

We declare that the finished product is checked for radioactive contamination through Portal System when it leaves the production plant.

**QUALITY MANAGEMENT SYSTEM CERTIFIED BY LLOYD'S REGISTER ACCORDING TO ISO 9001 : 2015, IATF 16949 : 2016, AS 9100D**

The Quality Management System is Certified acc. Pressure Equipment Directive 2014/68/EU Annex 1, chapt.4.3 by TUEV and LLOYD'S  
 Any act of tampering, modification, alteration, counterfeiting and/or falsification and/or any other action which modifies the contents of this test certificate shall constitute a violation of applicable civil and criminal laws. Acciaierie Valbruna shall protect its rights and interests before any competent court, authority and jurisdiction.

Maximal and/or Valplus grades/products are manufactured with ladle techniques to control composition, distribution, size and shape of non-metallic inclusions for improved machinability.

The supplied product conforms to requirements expressly requested by the purchaser and conforms to requirements specified by certified norms and standards. Should the product be used for more severe, critical and/ or in any case different applications than those the material is generally intended for, any different and/or supplementary requirements shall be specifically demanded, at least, upon order of the Product by the Purchaser. Acciaierie Valbruna SpA shall not be responsible for any improper use of the Products.

WSP18E020ME3034EFG4045JEC0478