CHERRY®
AEROSPACE
SPS Fastener Division, a PCC Company

PACKING LIST

Cherry Aerospace
1224 East Warner Avenue
Santa Ana, CA 92705-5514
USA

Order No: SO428678 **Page:** 1
Order Date: 08/18/21
Print Date: 06/25/22

Sold-To: 10015341

SOLD TO
BOEING DIST. SERVICES INC.
3760 W 108th STREET
HIALEAH, FL 33018
USA

Ship-To: 10015341

SHIP TO
BOEING DIST. SERVICES INC.
3760 W 108th STREET
HIALEAH, FL 33018
USA

Salesperson (s): 110

Credit Terms: NET 45
Net 45

Purchase Order: 00MY959
Ship Via: FED EX FREIGHT
FOB: Origin - Collect

Remarks:

ALL DOMESTIC GROUND; DOMESTIC EXPRESS; INTERNATIONAL USE FDX 6339-4817-8
DOMESTIC FREIGHT LTL USE FDX ACCT 6397-8891-9
GERMANY VAT# DE815535033 UK VAT# GB202335657 FRANCE VAT# FR07808637847
BRITISH AEROSPACE APPROVAL# BAe/AG/30158/MAA to BAe/AG/QC/SC1 PART 3
AIRBUS APPROVAL# 30114
Unless otherwise specified on this order, Cherry will manufacture and certify parts to the part number's latest revision. Latest revisions are shown at cherryaerospace.com Part Number Revision List
GOODS OF UNITED STATES ORIGIN ECCN: EAR99 *IF APPLICABLE, PART MEETS DFARS CLAUSE 252.225-7009 ALT I *PREFERENCE FOR DOMESTIC SPECIALTY METALS
CHERRY IS COMPLIANT TO: **CLAUSE A.3: ALL DOCUMENTS MUST BE SINGLE SIDED**

Ln	Item Number	Site / T Location	Lot/Serial	Qty Open / Qty to Ship	UM	Promised / Shipped
2	CR3523-4-03	1600			EA	07/01/22
	Customer Item: ASNA0078E403					
	B0207005M4-03					
	CAN43078M4-3					
	MBBN3012M3203					
	NAS9307M-4-03					
	*M7885/4-4-03					
		C0204	88782055	13880.0	( )	
		EZL-A27	88803545	7880.0	( )	

TEST REPORTS ENCLOSED

DO NOT DESTROY

These commodities, technology or software were exported from the United States in accordance with the Export Administration Regulations. Diversion contrary to US law is prohibited

CERTIFICATION **ATTENTION: PURCHASING DEPARTMENT**

The material and/or parts we are furnishing in this shipment (as shown above) on the subject Purchase Order conform to the order and applicable specifications, Evidence that the material and/or parts meet the specifications and results of all tests for each lot affected will be in our files and will be avaliable for your inspection at any reasonable time. Cherry certifies that these products are free from mercury contamination. Mercury bearing instruments and equipment which might have caused mercury contamination were not used in the manufacture, fabrication, and assembly or testing of any material furnished under this order.

Quality Assurance Representative

Signed _____
SIM NGUYEN

CHERRY AEROSPACE
SPS Fastener Division, a PCC Company
1224 East Warner Avenue
Santa Ana, CA 92707-0157

Nadcap ACCREDITED
Chemical Processing
Heat Treating
ISO/IEC 17025
Material Testing Lab

Final Inspection & Test Report
CherryMax® Rivet

An ISO9001 and AS9100 registered company. OASIS #6111041606

Part Numbers	Rev	Proc. Spec.	Rev
CR3523-4-03	AJ	PS-CMR-3000	U

** See 2nd Page for the Customer Parts

Lot I.D. No.:	**88782055**
Lot Size:	**13,900**
MFG. Date:	**June 19, 2022**

ASSEMBLY DATA

TYPE	ID #	CERT #	MATERIAL	FINISH	LUBE
Rivet	88763079	A93302	QQ-N-281/MONEL	None	None
Stem	88763204	A93434	AMS5657 / 15-7PH	None	MIL-L-46010 (AS5272), Type I
Collar	00000000	A94117	A-286 / AMS 5731, 5737	Passivate per AMS2700	None

W.O. #: 03260477 Final Lube: WAX

QUALITY CONFORMANCE/ACCEPTANCE RESULTS

	INSTALLED SHEAR		TENSION		SPINDLE RETENTION			DISASSEMBLY
MIN REQ'D	846		400		150			10
SAMPLE SIZE	8	N/A	8	N/A	5	8	N/A	5
SPECS	C-N-M	B	C-N-M	B	C-N-M	M	B	C-N-M
RESULTS	920		626		286	259		55
	940		609		276	270		50
	926		630		280	266		44
	935		630		286	275		50
	914		629		278	263		61
C=CR N=NAS M=MIL B=BAC LOAD VALUES IN POUND	985		599			273		
	1003		597			264		
	979		624			291		

PCS.	ITEM	STATUS	PCS.	ITEM	STATUS
20	EXAMINATION	PASS	20	INSTALLATION (Min and Max Grips)	PASS

Comments:

Blind Fastener

Tr. Rev: 2 Rev. Date: 6/25/2022	Q Code V09
Inspector D Nguyen	ACC 327

The parts contained in this shipment have been manufactured and inspected in accordance with TSO-C148. The conditions and tests required for TSO approval of this article are minimum performance standards. Aircraft fasteners approved under this TSO are not necessarily interchangeable with other aircraft fasteners approved under this TSO. Fasteners of similar dimensional properties may have widely varying performance and metallurgical properties. Substitution of parts may only be done if acceptable to or approved by the Administrator.

This test report shall not be reproduced except in full, without the written approval of the laboratory.
The recording of false, fictitious, or fraudulent statement or entries on the certificate may be punished as a felony under Federal law.

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Packing List

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SPS Fastener Division, a PCC Company
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Nadcap ACCREDITED
Chemical Processing
Heat Treating
ISO/IEC 17025
Material Testing Lab

An ISO9001 and AS9100 registered company. OASIS #6111041606

Final Inspection & Test Report
CherryMax® Rivet

Lot I.D. No.:	**88782055**
Rev:	**2**

Customer Parts List

Customer Part Number	Rev	Proc. Spec.	Rev
ASNA0078E403	R	NAS1687	3
B0207005M4-03	E	NAS1687	3
CAN43078M4-3	8	NAS1687	3
MBBN3012M3203	01/06	MBBN3015	12.2003
NAS9307M-4-03	5	NAS1687	3
M7885/4-4-03	D	MIL-R-7885	D2

Parts delivered in accordance with the standard amendments as agreed by Cherry/EADS.

CENTRAL WIRE, INC.

Certificate Of Conformance

Central Wire Inc.
2500 South "A" Street
Perris, CA 92570
United States

Sold to	Ship to
CHERRY AEROSPACE	CHERRY AEROSPACE
P.O. BOX 2157 SANTA ANA, CA 92707 United States	1224 EAST WARNER AVE. SANTA ANA, CA 92705 United States

Customer PO	Certification No.	Customer No.	Order No.	Work order	Date shipped
PO246413	CWUS-00017593	C0004545	3RSO0010100	3W012366	12/21/2021

Description	Cold Heading | 400 : 400 | Cold Drawn | Super Finish | TECHCOTE SIZE 0.1230 M015.1230

Tag	Packing slip	Quantity	UOM	Heat	Country of Manufacture	Country of Melt
3W012366	3RPS000254 47	1,097.00	lb	11994	USA	Germany

Note

M-15 REV AD
AMS 4730H
QQ-N-281D CLASS A
DFARS 252.225-7009 COMPLIANT

Chemical Analysis (Wt %)									
C	MN	P	S	SI	NI	CU	AL	CO	FE
0.024	0.95	0.0012	0.001	0.05	63.95	33.46	0.004	0.009	1.50
ZN	PB	SN							
0.001	< 0.006	< 0.006							

Mechanical Properties				
As Shipped				
Tensile	Yield	Grain Size	Diameter	
83 KSI	69.8 KSI	9 ASTM	0.123 in	

ACC 977
DEC 3 1 2021

Central Wire, Inc -f- 11994

A93302

The material as shipped is free from mercury contamination.
I certify the chemical analysis and physical and mechanical test results reported above are correct as contained in the records of the company.
I hereby certify that this material meets the requirements to which it was purchased.

Eduardo Cisneros
Lab Technician

Signature

Deutsche Nickel

Rosenweg 15 · 58239 Schwerte · Germany

Inspection Certificate

EN 10204 - 3.1

Certificate No: 3519 / 2020

DEUTSCHE NICKEL AMERICA

70 Industrial Road
USA - 02864 Cumberland, RI
USA

Order-No.:
403310 / 03.03.2020

Confirmation-No.:
80159236 / 1

Material:	LC-Silverin 400	**Specification:**	Analyse gem. QQN 281D, Amd.2 v. 23.10.85 Class A, Analyse gem. ASTM B 164, CWI D3 PRS.028.S Ausg.B vom 06.09.2018
Mat.-No.:	2.4361		
Form of delivery:	wire		
Dimension:	dia. 7,010 mm dia. 0.276"	**Condition:**	hot worked, peeled, ground, Borax coated

Net Weight:	**No. of pieces:**	**Heat-No.:**
265,00 kg 584,23 lbs	2 coils	11994

MEASURED VALUES

Melting Composition (mass-%):

Al	C	Co	Cu	Fe	Mn	Ni
0,004	0,024	0,01	33,48	1,50	0,95	63,95

P	Pb	S	Si	Sn	Zn
0,0012	<0,006	0,001	0,05	<0,006	0,001

Tensile strength [KSI] 72 - 75

ACC 377 DEC 3 1 2021

The material supplied is free from contamination of mercury and has not been weld repaired.
The material was manufactured without the use of ozone-depleting chemicals.
The reported results represent the actual attributes of the material furnished and indicate full compliance with all applicable specification and contract requirements.
The recording of false, fictitious or fraudulent statements or entries on this document may be punished as a felony under Federal Statutes.
DFAR 252-225-7009 Compliant
Country of Origin (Melt & Manufacture): Federal Republic of Germany

Our QM-system is certified by Lloyd's Register Quality Assurance in accordance to DINENISO9001, certificate-no.: KLN 4000313-10
Our QM-system is certified by Lloyd's Register Quality Assurance in accordance to DINENISO/TS16949, certificate-no.: KLN 4000313-14
Our EM-system is certified by Lloyd's Register Quality Assurance in accordance to DINENISO14001, certificate-no.: KLN 4001026

Schwerte, 01.10.2020

QA Manager
Ferudun Atak

A93302

Central Wire, Inc.
11994

CARPENTER TECHNOLOGY

Certification ID: 001248044

CARPENTER TECHNOLOGY CORP.
READING OPERATIONS (PA)
HARTMAN & SOFIANOS STS GATE
#6
READING PA 19601

Certificate of Tests

Ship To
CHERRY AEROSPACE LLC 1224 E WARNER AVE SANTA ANA CA 92705-5414

Cert To
CHERRY AEROSPACE LLC 1224 E WARNER AVE SANTA ANA CA 92705-5414

Sales Order Information	
Sales Order/Item:	26479/10
Customer PO/Item:	241591

Delivery Information	
Delivery:	80104248
Picked Date:	01/05/2022
Quantity Shipped:	930 LB

Production Information	
Production Order:	W74850
Heat Number:	590491
Ingot(s) Shipped*:	6

A93434
Cartech Corp
590491

The recording of false, fictitious or fraudulent statements or entries on this document may be punished as a felony under federal statues including federal law, Title 18, Chapter 47.
The values and other technical data represent the results of analyses and tests made on samples collected from the total lot. Original data records can be traced by reference to the Carpenter order number.
During the manufacturing process, this material has not come in direct contact with Mercury or any of its compounds. The material has not come in contact with any radioactive sources, Cobalt 60, Radium or Alpha-Source nor devices employing a single boundary of containment. Material is also weld free.

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Material has been melted in USA or qualifying country to DFARS requirements 252.225-7014 with alternate 1 for qualifying country 225.872.1, superseded by DFARS requirements DFARS 252.225-7008 and 252.225-7009.

This order was manufactured in accordance with Carpenter Specialty Alloys Operations Quality Program Manual, Revision 37 dated 07/31/2019.
Carpenter Technology Corporation is registered to Quality Management System Standards: ISO 9001, AS9120 and AS9100.
This certificate of test is Type 3.1 prepared in accordance with EN 10204 (DIN 50049).
We certify this material to have been manufactured, inspected, and tested; and found the results to conform to all drawing and/or specification requirements and order requirements as applicable.
Carpenter Technology third party accreditation certificates are available on the company website: https://www.carpentertechnology.com/quality-certifications

Decision Rule: Unless otherwise specified in a customer/industry specification, Carpenter Technology Corporation will determine acceptability of any test result by comparison of the result with the specification limits, without any additional consideration of the measurement uncertainty. When requested, Carpenter Technology Corporation will provide uncertainty budgets for any test result that is not addressed by the industry standard. When a Decision Rule is defined in a customer/industry specification it will supersede the Corporate Decision Rule.

*Ingot(s) Shipped represents the ingots that were shipped on the specified delivery. The material produced and certified may include additional ingots that were not shipped.

JAN 17 2022

The certification is made to the customer printed on the form. Carpenter neither makes, nor assumes responsibility for any representation or certification to other parties.(Form E2-366)

CERTIFICATE OF TESTS **ABNAHMEPRUEFZEUGNIS** **CERTIFICAT DE CONTROLE**

Certification ID:001248044

CARPENTER

Carpenter Technology Corporation
101 West Bern Street Reading, Pa. 19601
Tel: (610) 208-2000 (800) 338-4592

- THE RECORDING OF FALSE, FICTICIOUS OR FRAUDULENT STATEMENTS OR ENTRIES ON THIS DOCUMENT MAY BE PUNISHED AS A FELONY UNDER FEDERAL STATUTES INCLUDING FEDERAL LAW, TITLE 18, CHAPTER 47.
- THE VALUES AND OTHER TECHNICAL DATA REPRESENT THE RESULTS OF ANALYSES AND TESTS MADE ON SAMPLES COLLECTED FROM THE TOTAL LOT. ORIGINAL DATA RECORDS CAN BE TRACED BY REFERENCE TO THE CARPENTER ORDER NUMBER.
- MATERIAL IS MANUFACTURED FREE FROM MERCURY, RADIUM, ALPHA AND GAMMA SOURCE CONTAMINATION.
- THIS DOCUMENT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT THE WRITTEN CONSENT OF CARPENTER TECHNOLOGY CORPORATION.

12/08/21

CUSTOMER / BESTELLER / CLIENT

REFER TO PAGE 1

SELLER / VERKÄUFER / VENDEUR

REFER TO PAGE 1

CUSTOMER ORDER NO./BESTELL-NR./N° DE COMMANDE	CARPENTER NO./WERKS-NR./N° DE REFERENCE INTERNE	DATE/DATUM/DATE	WEIGHT/GEWICHT/POIDS
REFER TO PAGE 1	W74850	SEE PG 1	SEE PG 1

HEAT NUMBER / SCHMELZE-NR. / N° DE COULEE : 590491

PRODUCT DESCRIPTION: CARPENTER 15-7 PH ANNEALED COLD FINISH SEAM FREE C HDG SC2 STRAND CU/SOAP
PART NUMBER: M084.0830 ✓

SPECIFICATION: CHERRY AEROSPACE M-84 REV AG (08/21/20) EXCPT LTR (02/15/21) APPROVED
AMS 5657 (CHEMISTRY ONLY) REV D (04/ /17) CHEMISTRY ONLY
CHERRY AEROSPACE 1141-06-002 REV P (10/30/18) EXCPT LTR (11/13/18) APPROVED
PRATT MCL F-17 REV D (10/17/19)
PRATT MCL F-23 REV G (04/26/19)
PRATT PWA 300 REV BR (12/11/19)
PRATT PWA 301 REV AY (08/06/15)
AS6279 REV B (06/ /19)

SIZE 0.083000 IN.(2.11 MM) RD WIRE INGOT 6 LOT 1

HEAT CHEMISTRY(WT%): (TEST METHOD IS SHOWN IN PARENTHESIS)

C (COM)	MN(XRF)	SI(XRF)	P (XRF)	S (COM)	CR(XRF)
0.07 ✓	0.56 ✓	0.38 ✓	0.014 ✓	0.001 ✓	15.44 ✓

NI(XRF)	MO(XRF)	AL(XRF)	N (FUS)
7.15 ✓	2.13 ✓	1.19 ✓	0.017

MATERIAL PRODUCED UNDER LCS IN ACCORDANCE WITH P&WA F-17.
TESTING WAS PERFORMED IN ACCORDANCE WITH MCL MANUAL SECTION F-23.
MATERIAL SUPPLIED MEETS THE TECHNICAL REQUIREMENTS OF THE SPECIFICATION(S) NOTED ON THIS ORDER.
THIS MATERIAL WAS MANUFACTURED IN ACCORDANCE WITH CARPENTER SPECIALTY ALLOYS OPERATIONS QUALITY PROGRAM MANUAL REVISION 37, DATED 07/31/19.
MATERIAL MELTED AND MANUFACTURED IN THE U.S.A.
CARPENTER TECHNOLOGY HAS COMPLIED WITH ALL PRODUCER REQUIREMENTS OF AS 6279
THIS HEAT MELTED BY THE ELECTRIC ARC/AOD PROCESSES
COUNTRY OF MELT: U.S.A.

MILL HEAT TREATMENT:
TYPE FINISH STRAND ANNEAL
TEMP. 2050F (1121C)
TIME AT TEMP. .50 HOURS
QUENCH WATER

JAN 17 2022

ATTACHMENT: MATERIAL SAFETY DATA SHEETS

CONTINUED ON NEXT PAGE

A93434

Certech Corp-f-
590491

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FORM 12-346

CERTIFICATE OF TESTS **ABNAHMEPRUEFZEUGNIS** **CERTIFICAT DE CONTROLE**

Certification ID:001248044

CARPENTER

Carpenter Technology Corporation
101 West Bern Street, Reading, Pa 19601
Tel: (610) 208 2000 (800) 338-4592

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REFER TO PAGE 1	W74850	SEE PG 1	SEE PG 1

HEAT NUMBER / SCHMELZE-NR. / N° DE COULEE : 590491

HARDNESS AS SHIPPED, HV - 308 (CENTER)
PER ASTM E384 500 GRAM LOAD
*-->TESTED AT READING

GRAIN SIZE PER ASTM E112: 12 (KALLINGS NO.2)
*-->TESTED AT READING

CAST TEST: SATISFACTORY

MICRO SURFACE DEFECT - ACCEPTABLE

(T)RANSVERSE (L)ONGITUDINAL	L	(COIL 1)	L	(COIL 2)	L	(COIL 3)
YIELD STRENGTH, (0.20 %) KSI(MPA)	99.5	(686)	101.0	(696)	101.0	(696)
TENSILE STRENGTH, KSI(MPA)	*158.0	(1089)	*157.0	(1082)	*157.0	(1082)
ELONGATION IN 2.00", %	22.0		21.0		24.0	
REDUCTION OF AREA, %	57.0		46.0		53.0	

*-->TESTED AT READING

(T)RANSVERSE (L)ONGITUDINAL	L	(COIL 4)	L	(COIL 5)	L	(COIL 6)
YIELD STRENGTH, (0.20 %) KSI(MPA)	101.0	(696)	102.0	(703)	96.0	(662)
TENSILE STRENGTH, KSI(MPA)	*157.0	(1082)	*158.0	(1089)	155.0	(1069)
ELONGATION IN 2.00", %	21.0		25.0		29.0	
REDUCTION OF AREA, %	38.0		44.0		59.0	

*-->TESTED AT READING

(T)RANSVERSE (L)ONGITUDINAL	L	(COIL 7)	L	(COIL 8)
YIELD STRENGTH, (0.20 %) KSI(MPA)	97.0	(669)	101.0	(696)
TENSILE STRENGTH, KSI(MPA)	155.0	(1069)	*158.0	(1089)
ELONGATION IN 2.00", %	27.0		26.0	
REDUCTION OF AREA, %	32.0		56.0	

*-->TESTED AT READING

* APPROVED BY CUSTOMER

JAN 17 2022

A93434

Carlson Corp-t-
590491

CONTINUED ON NEXT PAGE

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F008_F2-366

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SELLER / VERKÄUFER / VENDEUR

REFER TO PAGE 1

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REFER TO PAGE 1	W74850	SEE PG 1	SEE PG 1

HEAT NUMBER / SCHMELZE-NR. / N° DE COULEE : 590491

CAPABILITY

1750 F(954 C), 10 MN AIR COOL
WITHIN 1 HR, COOL TO -100F +/-10F, 8HRS
WARM IN AIR TO ROOM TEMPERATURE
1000 F(538 C), 01 HR AIR COOL

(T)RANSVERSE (L)ONGITUDINAL	L
YIELD STRENGTH, (0.20 %) KSI(MPA)	242.0(1669)
TENSILE STRENGTH, KSI(MPA)	251.0(1731)
ELONGATION IN 2.00", %	1.7
REDUCTION OF AREA, %	40.0

*-->TESTED AT READING

A93434
Certech Corp-
590491

JAN 17 2022

CONTINUED ON NEXT PAGE

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Certification ID:001248044

CARPENTER

Carpenter Technology Corporation
101 West Bern Street, Reading, Pa. 19601
Tel: (610) 208-2000 (800) 338-4592

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12/08/21
CUSTOMER / BESTELLER / CLIENT

REFER TO PAGE 1

SELLER / VERKÄUFER / VENDEUR

REFER TO PAGE 1

CUSTOMER ORDER NO./BESTELL-NR./N° DE COMMANDE	CARPENTER NO./WERKS-NR./N° DE REFERENCE INTERNE	DATE/DATUM/DATE	WEIGHT/GEWICHT/POIDS
REFER TO PAGE 1	W74850	SEE PG 1	SEE PG 1

HEAT NUMBER / SCHMELZE-NR. / N° DE COULEE : 590491

ADDRESS OF TESTING LOCATIONS:
READING - 101 WEST BERN ST, READING, PA 19601

MATERIAL HAS BEEN MELTED AND MANUFACTURED IN THE USA WHICH IS A QUALIFYING COUNTRY TO DFARS REQUIREMENTS 252.225-7014 WITH ALTERNATE 1 FOR QUALIFYING COUNTRY 225.872.1, SUPERSEDED BY DFARS REQUIREMENTS DFARS 252.225-7008 AND 252.225-7009.

UNLESS OTHERWISE STATED, THE TEST WERE PERFORMED TO THE LATEST REVISION OF THE STANDARDS LISTED BELOW: 1) BEND TEST - ASTM E290, 2) CHARPY IMPACT - ASTM E23, 3)COEFFICIENT OF LINEAR THERMAL EXPANSION - ASTM E228, 4)FRACTURE TOUGHNESS - ASTM E399, 5) BRINELL HARDNESS - ASTM E10, 6)ROCKWELL HARDNESS-ASTM E18, 7)MICRO VICKERS HARDNESS-ASTM E92, 8)KNOOP HARDNESS-ASTM E92, 9)MACRO VICKERS HARDNESS-ASTM E92, 10)STRESS RUPTURE/CREEP RUPTURE-ASTM E139, 11)STRESS RUPTURE(COMBINATION)-ASTM E292, 12)ROOM TEMPERATURE TENSILE-ASTM E8, 13)ELEVATED ROOM TEMPERATURE TENSILE-ASTM E21, 14)DECARBURIZATION-ASTM E1077 15)DELTA FERRITE AMS 2315, 16)GRAIN SIZE-ASTM E112, 17)INCLUSION CONTENT/MICROCLEANLINESS-ASTM E45, 18) INTERGRANULAR ATTACH - ASTM A262, 19)INTERGRANULAR CORROSION-ASTM A262, 20)MACRO ETCH&TESTING - ASTM A604/E381, 21)PITTING CORROSION - ASTM A923, 22)CREVICE CORROSION-ASTM G48, 23) HARDNESS CONVERSIONS - ASTM E140, 24)XRF-ASTM E572/E1085/E2465, 25) OES - ASTM E415/E1086, 26)COM - ASTM E1019, 27)FUS - ASTM E1019, 28)MS - CARPENTER METHODS 206.8500/206.8530
THIS ORDER WAS MANUFACTURED IN ACCORDANCE WITH CARPENTER SPECIALTY ALLOYS OPERATIONS QUALITY PROGRAM MANUAL, REVISION 37 DATED 07/31/2019.

CARPENTER'S QUALITY MANAGEMENT SYSTEM WAS REGISTERED TO ISO 9001, AS9100, AND AS9120. THIS CERTIFICATION OF TEST IS TYPE 3.1 PREPARED IN ACCORDANCE WITH EN 10204 (DIN 50049). WE HEREBY CERTIFY THAT THE ABOVE TEST DATA ARE IN ACCORDANCE WITH THE PURCHASE ORDER AND SPECIFICATION REQUIREMENTS, AS DOCUMENTED IN THIS CERTIFICATE OF TESTS.

TEST METHODS ARE PER THE ASTM STANDARDS ON FILE AND IN EFFECT AT TIME OF ORDER ACCEPTANCE, STANDARD PRACTICES, OR AS AGREED UPON BETWEEN CARPENTER & CUSTOMER.

THE ABSENCE OF A REPORTED TEST TEMPERATURE INDICATES THAT THE TEST WAS COMPLETED AT ROOM TEMPERATURE.

JAN 17 2022



CONTINUED ON NEXT PAGE

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FORM 82-366

CERTIFICATE OF TESTS **ABNAHMEPRUEFZEUGNIS** **CERTIFICAT DE CONTROLE**

Certification ID:001248044

CARPENTER

Carpenter Technology Corporation
101 West Bern Street, Reading, Pa. 19601
Tel: (610) 208-2000 (800) 338-4592

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12/08/21
CUSTOMER / BESTELLER / CLIENT

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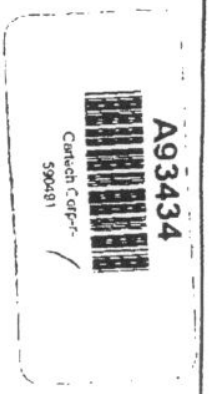
REFER TO PAGE 1

CUSTOMER ORDER NO. / BESTELL-NR. / N° DE COMMANDE	CARPENTER NO. / WERKS-NR. / N° DE REFERENCE INTERNE	DATE / DATUM / DATE	WEIGHT / GEWICHT / POIDS
REFER TO PAGE 1	W74850	SEE PG 1	SEE PG 1

HEAT NUMBER / SCHMELZE-NR. / N° DE COULEE : 590491

DECISION RULE: UNLESS OTHERWISE SPECIFIED IN A CUSTOMER/INDUSTRY SPECIFICATION, CARPENTER TECHNOLOGY CORPORATION WILL DETERMINE ACCEPTABILITY OF ANY TEST RESULT BY COMPARISON OF THE RESULT WITH THE SPECIFICATION LIMITS, WITHOUT ANY ADDITIONAL CONSIDERATION OF THE MEASUREMENT UNCERTAINTY. WHEN REQUESTED, CARPENTER TECHNOLOGY CORPORATION WILL PROVIDE UNCERTAINTY BUDGETS FOR ANY TEST RESULT THAT IS NOT ADDRESSED BY THE INDUSTRY STANDARD.

DIGITALLY SIGNED BY TERRY L GABRILL
ADMINISTRATOR - QUALITY
CARPENTER TECHNOLOGY CORPORATION



JAN 17 2022

Terry L Gabrill

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RADCLIFF WIRE INC.
FLAT, SQUARE AND SHAPED WIRE

97 Ronzo Road • Bristol, CT 06010
Ph: (860) 583-1305 • Fax: (860) 583-6553
www.radcliffwire.com

Cert of Conformance / Material Cert

Sold To: CHERRY AEROSPACE
PO BOX 2157
SANTA ANA,, CA 92707

Date Shipped: 4/7/2022
PO #: VP122821
Radcliff No.: 158002
Heat No.: 589535 ✓
Qty. Shipped: 190.3 LBS-10-BLACK MIG SPOOLS

Item Description

.006 ±.0005 X .011 ± .0005 X .056 ±.001 | A286 Stainless Steel | Edge: SPECIAL SHAPE-SEE PRINT | Spec: AMS 5731 REV L, AMS 5737 REV P CHEM ONLY ✓

Melting Country: United States
Producing Country: United States

Notes:
M189.44 Rev AA ✓

Chemical Analysis

Al: .21000% ✓	B: .00700% ✓	Bi: <.00003%	C: .03700% ✓
Co: .82000% ✓	Cr: 14.82000% ✓	Cu: .11000% ✓	Fe: 54.32000% ✓
Mn: .24000% ✓	Mo: 1.18000% ✓	Ni: 25.36000% ✓	P: .01600% ✓
Pb: <.00030%	S: <.00050% ✓	Si: .14000% ✓	Ti: 2.21000% ✓
V: .25000% ✓			

Mechanical Properties

Tensile: 99 KSI

APR 2 1 2022

We certify that the chemical analysis, physical properties, and mechanical test results are correct as contained in our records, and that they conform to customer requirements.

Material as shipped, is free from mercury contamination.

All material complies with RoHS 3, REACH and Conflict Minerals unless a lead plating has been specified.

Shipment does not contain any conterfeit material.

Material is DFAR compliant

RADCLIFF WIRE, INC
589535
A94117

Lisa Piatek

Lisa Piatek
Certification Clerk

CENTRAL WIRE, INC.

Certificate Of Conformance

Central Wire Inc.
6509 Olson Road
Union, IL 60180-0423
United States

Sold to	Ship to
RADCLIFF WIRE INC. PO BOX 603 BRISTOL, CT 06011-0603 United States	RADCLIFF WIRE INC. 97 RONZO ROAD BRISTOL, CT 06010 United States

Customer PO	Certification No.	Customer No.	Order No.	Work order	Date shipped
58100	CWUS-00019951	C0000846	3RSO0007307	3W008824	11/24/2021

Description	Round Wire | A286 : A286SF | Cold Drawn | Bright | Clean 0.0430 in 24IN_MOSSBERG_REEL SSA286-043

Tag	Packing slip	Quantity	UOM	Heat	Country of Manufacture	Country of Melt
3W008824	3RPS024291	560.00	lb	589535	USA	USA

Note

AMS 5731L (Chemistry Only), AMS 5737P (Chemistry Only), Material is DFARS 252.225-7008 Compliant, Passivated per AMS 2700C (Method 1 - Type 7)
Must State Daughter heats on certs

Chemical Analysis (Wt %)

C	Mn	P	S	Si	Cr	Ni	Mo	Cu	Ti
0.037	0.24	0.016	< 0.0005	0.14	14.82	25.36	1.18	0.11	2.21
V	Al	B	Co	Bi	Fe	Pb			
0.25	0.21	0.007	0.82	< 0.00003	54.32	< 0.0003			

Mechanical Properties

As Shipped

Tensile	Diameter			
108 KSI	0.0427 in			

APR 21 2022

A94117

RADCLIFF WIRE, INC
589535

The material as shipped is free from mercury contamination.
I certify the chemical analysis and physical and mechanical test results reported above are correct as contained in the records of the company.
I hereby certify that this material meets the requirements to which it was purchased.

Samuel Rappeport
Group Metallurgical Engineer

Signature

CARPENTER TECHNOLOGY

Certification ID: 001235531

CARPENTER TECHNOLOGY CORP.
READING OPERATIONS (PA)
HARTMAN & SOFIANOS STS GATE
#6
READING PA 19601

Certificate of Tests

Ship To
CENTRAL WIRE INDUSTRIES 6509 OLSON RD UNION IL 60180

Cert To
CENTRAL WIRE INDUSTRIES INC 1 NORTH ST PERTH ON K7H 2S2

Sales Order Information	
Sales Order/Item:	18274/20
Customer PO/Item:	3PPO002275-1

Delivery Information	
Delivery:	80053363
Picked Date:	06/28/2021
Quantity Shipped:	7,222 LB

Production Information	
Production Order:	W71061
Heat Number:	589535

The recording of false, fictitious or fraudulent statements or entries on this document may be punished as a felony under federal statutes including federal law, Title 18, Chapter 47.
The values and other technical data represent the results of analyses and tests made on samples collected from the total lot. Original data records can be traced by reference to the Carpenter order number.
During the manufacturing process, this material has not come in direct contact with Mercury or any of its compounds. The material has not come in contact with any radioactive sources, Cobalt 60, Radium or Alpha-Source nor devices employing a single boundary of containment. Material is also weld free.

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Material has been melted in USA or qualifying country to DFARS requirements 252.225-7014 with alternate 1 for qualifying country 225.872-1, superseded by DFARS requirements DFARS 252.225-7008 and 252.225-7009.

This order was manufactured in accordance with Carpenter Specialty Alloys Operations Quality Program Manual, Revision 36 dated 12/15/2017.
Carpenter Technology Corporation is registered to Quality Management System Standards: ISO 9001, AS9120 and AS9100.
This certificate of test is Type 3.1 prepared in accordance with EN 10204 (DIN 50049).
We certify this material to have been manufactured, inspected, and tested; and found the results to conform to all drawing and/or specification requirements and order requirements as applicable.
Carpenter Technology third party accreditation certificates are available on the company website: https://www.carpentertechnology.com/quality-certifications

Decision Rule: Unless otherwise specified in a customer/industry specification, Carpenter Technology Corporation will determine acceptability of any test result by comparison of the result with the specification limits, without any additional consideration of the measurement uncertainty. When requested, Carpenter Technology Corporation will provide uncertainty budgets for any test result that is not addressed by the industry standard. When a Decision Rule is defined in a customer/industry specification it will supersede the Corporate Decision Rule.

*Ingot(s) Shipped represents the ingots that were shipped on the specified delivery. The material produced and certified may include additional ingots that were not shipped.

APR 2 1 2022

A94117
RADCLIFF WIRE, INC
589535

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CERTIFICATE OF TESTS
Certification ID:001235531

ABNAHMEPRUEFZEUGNIS

CERTIFICAT DE CONTROLE

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06/28/21

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REFER TO PAGE 1

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REFER TO PAGE 1

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REFER TO PAGE 1	W71061	SEE PG 1	SEE PG 1

HEAT NUMBER / SCHMELZE-NR. / N° DE COULEE: 589535

PRODUCT DESCRIPTION: A286 HOT FINISH SEAM FREE ANNEALED PICKLED REDRAW QUAL
COMMODITY CODE: 7221.00.0000
PART NUMBER: 102733

SPECIFICATION: CENTRAL WIRE D.3.PRS.153.S UNSS66286-MOD FORM REV B (03/29/16) EXCPT LTR (10/23/17) PENDING
AMS 2750 REV F (06/ /20)
AMS 5731 MODIFIED FORM REV L (10/01/18)
AMS 5732 HEADING STK.(CAP OF) REV J REAFFIRMED (10/01/18) CAPABLE OF
AMS 5734 EXCPT CAP MICROGRAIN REV K REAFFIRMED (10/ /18) CAP OF/EXCPT MICRO GRAIN
AMS 5737 REAFFIRMED HEADING STK-CAP OF REV P (10/ /18)
CENTRAL WIRE D.3.PRS.009.S "SUPER FINISH" REV J (09/17/13) EXCPT LTR (07/21/20) APPROVED
CENTRAL WIRE 1.GEN.001.S REV 2 (01/30/19) EXCPT LTR (12/31/20) PENDING

SIZE 0.236000 IN.(5.99 MM) RD ROD

HEAT CHEMISTRY(WT%): (TEST METHOD IS SHOWN IN PARENTHESIS)

C (COM)	MN(XRF)	SI(XRF)	P (OES)	S (COM)	CR(XRF)
0.037	0.24	0.14	0.016	LT .0005	14.82

NI(XRF)	MO(XRF)	CU(XRF)	CO(XRF)	AL(OES)	TI(OES)
25.36	1.18	0.11	0.82	0.21	2.21

V (XRF)	B (OES)	BI(MS)	FE(XRF)	PB(MS)
0.25	0.007	LT .00003	54.32	LT .0003

THIS MATERIAL CONTAINS NO WELDS OR SPLICES
THIS MATERIAL WAS MANUFACTURED FREE FROM MERCURY, RADIUM AND ALPHA SOURCE CONTAMINATION.
PROVISIONS OF 10 CFR PART 21 APPLY
CARPENTER TECHNOLOGY COMPLIES TO THE EUROPEAN DIRECTIVE (EU) 2011/65/EU.
THIS HEAT MELTED BY THE ELECTRIC ARC/AOD + VACUUM ARC MELT

TENSILE AS SHIPPED, KSI(MPA) 91.0(627)
-- -------
*-->TESTED AT READING

APR 21 2022

GRAIN SIZE PER ASTM E112: 10 (70%), 1 (30%) (KALLINGS NO. 2)
*-->TESTED AT READING

RADCLIFF WIRE, INC
589535
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CONTINUED ON NEXT PAGE

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Certification ID:001235531

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REFER TO PAGE 1

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REFER TO PAGE 1	W71061	SEE PG 1	SEE PG 1

HEAT NUMBER / SCHMELZE-NR. / N° DE COULEE: 589535

CAPABILITY

1800 F(982 C), 01 HR OIL TREAT
1325 F(718 C), 16 HR AIR COOL

HARDNESS , HBW - 323 (MIDRADIUS)
*-->TESTED AT READING

COMBINATION STRESS RUPTURE

TEST TEMP	1200 F(649 C)
STRESS, KSI(MPA)	70.0(483)
ELONGATION %	32.4
HOURS	68.8

AFTER MINIMUM TIME UNDER SPECIFIED STRESS, THE STRESS RUPTURE TEST WAS OVERLOADED IN INCREMENTS AS FOLLOWS:

TOTAL HOURS	STRESS KSI(MPA)
53	75.0(517)
68	80.0(552)

*-->TESTED AT READING

(T)RANSVERSE (L)ONGITUDINAL	L
YIELD STRENGTH, (0.20 %) KSI(MPA)	112.0(772)
TENSILE STRENGTH, KSI(MPA)	166.0(1145)
ELONGATION IN 1.00", %	25.0
REDUCTION OF AREA, %	43.0

*-->TESTED AT READING

APR 21 2022

RADCLIFF WIRE, INC.
589535
A94117

CONTINUED ON NEXT PAGE

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SELLER/VERKÄUFER/VENDEUR PAGE 4 OF 6
REFER TO PAGE 1

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REFER TO PAGE 1	W71061	SEE PG 1	SEE PG 1

HEAT NUMBER / SCHMELZE-NR. / N° DE COULEE: 589535

CAPABILITY

1650 F(899 C), 02 HR OIL TREAT
1325 F(718 C), 16 HR AIR COOL

HARDNESS , HBW - 323 (MIDRADIUS)
*-->TESTED AT READING

COMBINATION STRESS RUPTURE
TEST TEMP 1200 F(649 C)
STRESS, KSI(MPA) 65.0(448)
ELONGATION % 31.2
HOURS 72.0

AFTER MINIMUM TIME UNDER SPECIFIED STRESS, THE STRESS RUPTURE TEST WAS OVERLOADED IN INCREMENTS AS FOLLOWS:

TOTAL HOURS	STRESS KSI(MPA)
57	70.0(483)
65	75.0(517)

*-->TESTED AT READING

	(T)RANSVERSE (L)ONGITUDINAL	L
YIELD STRENGTH, (0.20 %) KSI(MPA)		114.0(786)
TENSILE STRENGTH, KSI(MPA)		168.0(1158)
ELONGATION IN 1.00", %		25.0
REDUCTION OF AREA, %		46.0

*-->TESTED AT READING

APR 21 2022

A94117
RADCLIFF WIRE, INC -/-
589535

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HEAT NUMBER / SCHMELZE-NR. / N° DE COULEE: 589535
ADDRESS OF TESTING LOCATIONS:
READING - 101 WEST BERN ST, READING, PA 19601

MATERIAL HAS BEEN MELTED AND MANUFACTURED IN THE USA WHICH IS A QUALIFYING COUNTRY TO DFARS REQUIREMENTS 252.225-7014 WITH ALTERNATE 1 FOR QUALIFYING COUNTRY 225.872.1, SUPERSEDED BY DFARS REQUIREMENTS DFARS 252.225-7008 AND 252.225-7009.

UNLESS OTHERWISE STATED, THE TEST WERE PERFORMED TO THE LATEST REVISION OF THE STANDARDS LISTED BELOW: 1) BEND TEST - ASTM E290, 2) CHARPY IMPACT - ASTM E23, 3)COEFFICIENT OF LINEAR THERMAL EXPANSION - ASTM E228, 4)FRACTURE TOUGHNESS - ASTM E399, 5) BRINELL HARDNESS - ASTM E10, 6)ROCKWELL HARDNESS-ASTM E18, 7)MICRO VICKERS HARDNESS-ASTM E92, 8)KNOOP HARDNESS-ASTM E92, 9)MACRO VICKERS HARDNESS-ASTM E92, 10)STRESS RUPTURE/CREEP RUPTURE-ASTM E139, 11)STRESS RUPTURE(COMBINATION)-ASTM E292, 12)ROOM TEMPERATURE TENSILE-ASTM E8, 13)ELEVATED ROOM TEMPERATURE TENSILE-ASTM E21, 14)DECARBURIZATION-ASTM E1077 15)DELTA FERRITE AMS 2315, 16)GRAIN SIZE-ASTM E112, 17)INCLUSION CONTENT/MICROCLEANLINESS-ASTM E45, 18) INTERGRANULAR ATTACK - ASTM A262, 19)INTERGRANULAR CORROSION-ASTM A262, 20)MACRO ETCH&TESTING - ASTM A604/E381, 21)PITTING CORROSION - ASTM A923, 22)CREVICE CORROSION-ASTM G48, 23) HARDNESS CONVERSIONS - ASTM E140, 24)XRF-ASTM E572/E1085/E2465, 25) OES - ASTM E415/E1086, 26)COM - ASTM E1019, 27)FUS - ASTM E1019, 28)NS - CARPENTER METHODS 206.8500/206.8530
THIS ORDER WAS MANUFACTURED IN ACCORDANCE WITH CARPENTER SPECIALTY ALLOYS OPERATIONS QUALITY PROGRAM MANUAL, REVISION 37 DATED 07/31/2019.

CARPENTER'S QUALITY MANAGEMENT SYSTEM WAS REGISTERED TO ISO 9001, AS9100, AND AS9120. THIS CERTIFICATION OF TEST IS TYPE 3.1 PREPARED IN ACCORDANCE WITH EN 10204 (DIN 50049). WE HEREBY CERTIFY THAT THE ABOVE TEST DATA ARE IN ACCORDANCE WITH THE PURCHASE ORDER AND SPECIFICATION REQUIREMENTS, AS DOCUMENTED IN THIS CERTIFICATE OF TESTS.

TEST METHODS ARE PER THE ASTM STANDARDS ON FILE AND IN EFFECT AT TIME OF ORDER ACCEPTANCE, STANDARD PRACTICES, OR AS AGREED UPON BETWEEN CARPENTER & CUSTOMER.

THE ABSENCE OF A REPORTED TEST TEMPERATURE INDICATES THAT THE TEST WAS COMPLETED AT ROOM TEMPERATURE.

APR 21 2022

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CONTINUED ON NEXT PAGE

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Certification ID:001235531

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CERTIFICAT DE CONTROLE

CARPENTER
Carpenter Technology Corporation
101 West Bern Street, Reading, Pa. 19601
Tel: (610) 208-2000 (800) 338-4592

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06/28/21

CUSTOMER/BESTELLER/CLIENT
REFER TO PAGE 1

SELLER/VERKÄUFER/VENDEUR PAGE 6 OF 6
REFER TO PAGE 1

CUSTOMER ORDER NO./BESTELL-NR./N° DE COMMANDE	CARPENTER NO./WERKS-NR./N° DE REFERENCE INTERNE	DATE/DATUM/DATE	WEIGHT/GEWICHT/POIDS
REFER TO PAGE 1	W71061	SEE PG 1	SEE PG 1

HEAT NUMBER / SCHMELZE-NR. / N° DE COULEE: 589535

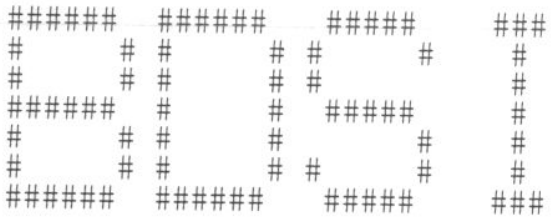
DECISION RULE: UNLESS OTHERWISE SPECIFIED IN A CUSTOMER/INDUSTRY SPECIFICATION, CARPENTER TECHNOLOGY CORPORATION WILL DETERMINE ACCEPTABILITY OF ANY TEST RESULT BY COMPARISON OF THE RESULT WITH THE SPECIFICATION LIMITS, WITHOUT ANY ADDITIONAL CONSIDERATION OF THE MEASUREMENT UNCERTAINTY. WHEN REQUESTED, CARPENTER TECHNOLOGY CORPORATION WILL PROVIDE UNCERTAINTY BUDGETS FOR ANY TEST RESULT THAT IS NOT ADDRESSED BY THE INDUSTRY STANDARD.

MICHELE L. HEFFNER
ADMINISTRATOR - QUALITY
CARPENTER TECHNOLOGY CORPORATION

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Order No:	Date:	Ship Via:	Terms:	Shipping Terms:
CPE139102	07/26/22	FEDX INTL P1 COLL	NET 60	FCA-SELLER'S WHSE

Item No:	Quantity Ordered	Part Number and Description:	Unit:		Shipped:
	100	CR3523-4-3 BLIND RIVET ECCN : EAR99 Tariff : 8308.20.6000 Schedule B :8308.20.0000 MFR : CHERRY AERO SANTA ANA Ctrl# : 2022GMN4SA Lot# : 88782055 Lot Qty : 100 Country of Origin : US Cust PN: CR3523-4-3 Cage Code: 11815 Net weight: 0.3225 LB / 0.1 KG CTN: MK000007887726	EA		100

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FIRM: AJ WALTER AVIATION LTD

PURCHASE ORDER#: CPE139102

QUANTITY	U/M	PART-NUMBER	CUST REF#	LOT-NUMBER	MANUFACTURER	CCODE	MFR DTE	EXP DATE
100	EA	CR3523-4-3		88782055	CHERRY AERO SANTA AN 11815			
		BDSI CTRL/LOT # :2022GMN4SA						

Michelle M Suggs 07/26/22
Michelle Suggs
Quality Leader

Inv #KET3W4 07/26/22

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MAYDWELL AVENUE
SLINFOLD
SLINFOLD RH13 0AS
GB

DATE: 07/28/22 SHIP VIA: FEDX INTL P1 COLL TERMS: NET 60 SHIPPING TERMS: FCA-SELLER'S WHSE

BOX NO **CB0000001308734** DIMENSIONS **9 X 9 X 9** WEIGHT **1.138** **0.52 KG**

CUSTOMER PO	PICK TICKET NO	PART NUMBER	QTY SHIPPED	UOM
CPE139102	H4M5A4.101	CR3523-4-3	100	EA

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