

Laboratory Report

SATAIR

1000126871



Customer	Satair A/S		
Customer order no	4500021825		
Customer part no	ASNA2001VN4-12		
Quantity	1000.00	Date	17/02/10

Linread Northbridge
Crossgate Road
Park Farm
Redditch, Worcestershire B98 7TD
Phone: 01527 525719
Fax: 01527 526881

Lot Number	562399	Material specification	6 AL4V/TA28 Rod
Material Supplier	Dynamet	Material Lot	27339
Procurement Specification	NAS 621	C of C no	429516*004*9

Chem	Results	Units	Chem	Results	Units	Chem	Results	Units
AL	6.14000	%	V	3.86000	%	C	0.02000	%
FE	0.16000	%	N	0.01400	%	O	0.17000	%
H	0.00460	%	Y<	0.00100	%	OT<	0.05000	%
TOE<	0.30000	%	TI		BAL			

Laboratory test results

Test	Results	Unit
Fabrication		HF
Thermal Treatment 1		T67382
Thermal Treatment 2		E7481
Hydrogen Content	51.0000	PPM
Metallographic		SATISFACTORY
Tensile	1166.0000	MPa
Fatigue	55.8600	KC AV
Fillet Rolling		SATISFACTORY
Final Inspection		SATISFACTORY
Flaw Detect	32.0000	SATISFACTORY
Plating Cert No		KG 12944

micro

Linread Northbridge certify that the above batch is in accordance with the appropriate specification. S.Hannah 17/02/10

SATAIR 100012687 1



DYNAMET
A Carpenter Company

SOLD TO

Linread Northbridge Redditch
PO Box 28
Crossgate Road
Redditch, B98 7TD
England

195 Museum Road
Washington, PA 15301
Phone 724.228.1000
Fax 724.229.4195

PRODUCT CERTIFICATION

WORK ORDER
072230

SALES ORDER / RLS
028936 / 8

[Signature] 07/12/09

LOT NO.
27339

Quality System is registered
to ISO 9001:2000 and AS9100:2001

CUSTOMER P.O. 45780	CUSTOMER PART 6AL4V/C/2560/70	QUANTITY 269 lbs	COILS/TAGS 1	LADING NO 00039543	SHIPMENT DATE 11/06/2009
PART INFORMATION: 111DB3BDJ02560 TI 6AL 4V Fastener Quality Dynalube Coil - 0.256" Dia. Specifications: 2TA 11 Rev: 74; AMS 4967 Rev: J Size: 0.256" Dia. +0.001" / -0"					
Chemical Report (Wt.%)					
Heat K19N	Al 6.14	V 3.86	C .020	Fe .16	N .014
				O .17	Y <.001
				Ti BAL	Ot E <.05
					TOE <.30
Hydrogen (As Shipped)					
Hydrogen (%) 0.0046					
As Shipped Properties					
UTS #1 (Mpa) 1075	YS 0.2% #1 (Mpa) 896	EL #1 (%) 18.3	RA #1 (%) 46		
UTS #2 (Mpa) 1034	YS 0.2% #2 (Mpa) 842	EL #2 (%) 20.8	RA #2 (%) 46		
Hardness (HRC) 32					
Capability@1750°F (954°C) 1hr WQ +1000°F (538°C) 4hrs AC					
UTS #1 (Mpa) 1278	YS 0.2% #1 (Mpa) 1166	EL #1 (%) 13.6	RA #1 (%) 52		
UTS #2 (Mpa) 1276	YS 0.2% #2 (Mpa) 1144	EL #2 (%) 14.2	RA #2 (%) 51		
Hardness (HRC) 40					
Metallography Results					
Microstructure Alpha/Beta					

Traveler(s)
71384 A

Heat #
K19N

CERTIFICATE OF TEST

Page 1 of 4

ATI Allvac
P.O. Box 5030 2020 Ashcraft Ave.
Monroe, NC 28111-5030
Phone (704) 289-4511

Customer Name
BOEING COMPANY
6811 South 204th Street Suite 400
Kent, WA

Purchase Order
TZ-589983-TI4903

Size
34.000" Rd.

Alloy
ALIVAC 6-4

PCS
1

Weight
17.530#

Date: 08/24/2009

Quality Auditor:

O.E. Smith

O.E. Smith

SPECIFICATIONS

AMS 4928	R	AMS 4967	J
DL-4426	FW	D6-81628	B
D6-82479	C	DL-1002	R

ALL MATERIAL SPECIFICATIONS ARE CERTIFIED AS "CHEMISTRY ONLY".

HEADER REMARKS

TXN Part #826421
Boeing P.O. BCA-65325-1194
Purchased for: Dynamet
Customer PO: 020192 ITEM 022
TXN NO#: Z84583
Customer P/N: 111PX1-34.000
Orig: Z76102 / TI4366 SO# 71384
Boeing used on: 000671537

This ingot meets the chemistry requirements of the referenced specifications. Allvac assumes no responsibility for subsequent processing performed by the purchaser or other vendor(s).

LOT NO.
27339

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ATI Allvac P.O. Box 6030 2020 Aurora Ave. Monroe, NC 28111-6030 Phone (704) 288-4511

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HEADER REMARKS

This material is capable of and complies with the applicable requirements of DI-1002H; AMS 4528R; AMS 4967H

		CHEMISTRY							CR EQ = Chromium Equiv			Cb = Nb	
		C	Si	Mn	Mo	Ti	Al	Ti+Al	V	Fe	Cu		
TOP		.019	<.01	<.01	<.01	BAL.	6.06	-	3.93	.17	<.01		
BOT		.020	<.01	<.01	<.01	BAL.	6.21	-	3.78	.14	<.01		
		B	Zr	Y	O	N	Sn	Cr	Cb	Ta	Ni		
TOP		<.001	<.01	<.001	.17	.013	<.01	.02	-	-	.01		
BOT		<.001	<.01	<.001	.17	.014	<.01	.02	-	-	<.01		

CHEMISTRY METHOD

ELEMENTS TESTED BY METHOD

CS-C-ONLY	C
XRF-TI(TBAL)-CU	MO,SN,CR,NIFE,ZR,MN,V,AL,SI,TI
GAS-O/N	O,N
WET-Y	Y
WET-B	B
WET-CU	CU
GAS-H	H

CHEMISTRY REMARKS

Chemistry tested at ATI ALLVAC unless otherwise noted.

CHEMISTRY ANALYTICAL METHODS

CS = Combustion/IR Detection

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07/12/09

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				O .17	Y <.001
				Ti BAL	Other <.05
					TOE <.30
Hydrogen (As Shipped)					
Hydrogen (%) 0.0046					
As Shipped Properties					
UTS #1 (Mpa) 1075	YS 0.2% #1 (Mpa) 896	EL #1 (%) 18.3	RA #1 (%) 46		
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Redditch, Worcestershire B98 7TD
Phone: 01527 525719
Fax: 01527 526881

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Customer part no	ASNA2001VN4-12		
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FE	0.16000	%	N
H	0.00460	%	Y<
TOE<	0.30000	%	TI
			BAL
			C
			O
			OT<
			Results
			0.02000
			0.17000
			0.05000
			Units
			%
			%
			%

Laboratory test results

Test	Unit
Fabrication	HF
Thermal Treatment 1	T67382
Thermal Treatment 2	E7481
Hydrogen Content	SATISFACTORY
Metallographic	SATISFACTORY
Tensile	SATISFACTORY
Fatigue	SATISFACTORY
Fillet Rolling	SATISFACTORY
Final Inspection	SATISFACTORY
Flaw Detect	SATISFACTORY
Plating Cert No	KG 12944
	51.0000
	PPM
	1166.0000
	MPa
	55.8600
	KC AV
	32.0000

micro

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71384 A

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ATI Allvac P.O. Box 5030 2020 Aircraft Ave. Monroa, NC 28111-5030 Phone (704) 288-4511

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CHEMISTRY REMARKS

GAS = Inert Gas Fusion
OES = Spark Optical Emission
XRF = X-Ray Fluorescence
WET = Inductively Coupled Plasma Emission
Others Each = < .05%
Others Total = < .30%

METALLOGRAPHY

Beta Transus (Calculated)
TOP = 1814F
BOT = 1826F

CONDITION SHIPPED

As shipped surface condition: As cast

REMARKS

Material has been produced, sampled, inspected, and tested in accordance with the customer purchase order and referenced specifications and conforms to the requirements unless otherwise noted in this certificate of test.

Any deviations to specification or customer purchase order requirements relative to testing, test values, hot working fixed practices, have been resolved in writing with customer prior to shipment.

The recording of false, fictitious, or fraudulent statements or entries on this document may violate Federal statutes, including but not limited to Title 18, Chapter 47 of the United States Code, and may be punishable as a felony.

If customer purchase order does not specifically reference a revision to a specification, Allvac will work to the latest revision on file and in effect at time of order placement.

Test methods are per the latest ASTM Standards, currently recognized industry practices; or as agreed upon between Allvac and customer.

Any chemical elements analyzed and found to have values below the actual limits of detection may be reported as < less than or reported at the detection level.

LOT NO.
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1000012687 1

Traveler(s)
71384 A

Heat #
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ATI Allvac P.O. Box 5030 2020 Ashcraft Ave. Monroe, NC 28111-5030 Phone (704) 289-4511

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When values are reported to the significant places called for in the specifications, rounding will be done in accordance with ASTM E-29.

This is to certify that during manufacturing, handling, testing and inspection, this material did not come in direct contact with mercury or any device employing a single boundary of containment.
This Certificate of Test shall not be reproduced except in full, without the written approval of Allvac Quality.

No weld repair has been performed on this material.

Material Safety Data Sheets (MSDS) - View or print from our site: www.allvac.com. Printed copies available on request from the Allvac Sales Department.

Allvac products have not come in contact with radioactive, fertile or fissionable materials during manufacturing or processing.

Melt source in compliance with DPM 252.225-7014, Alternate 1.

SPECIAL REMARKS

Material melted and manufactured in the United States of America.

TEST METHODS: C = ASTM E1941 (2004); O/N = ASTM E1409 (2005); H = ASTM E1447 (2005); Plasma Emission = ASTM E2371 (2004); ASTM E1097 (2007) (Wah Chang only); XRF = ASTM E539 (2007); RTT = ASTM E8 (2008); ETT = ASTM E21 (2005); Creep = ASTM E139 (2006); Fracture Toughness = ASTM E399 (2006*1); Rockwell Hardness = ASTM E18 (2007); Brinell Hardness = ASTM E10 (2007*1); Grain Size = ASTM E112 (1996/2004*1)

Melt Source: ATI-ALLVAC

Melt Method: Double VAR

LOT NO.
27339

1000126871

Certificate of Conformity

SATA

1000126821



Satair A/S
Amager Landevej
147A DK-2770
Kastrup
Denmark

429516*9



Page 1 of 1

Linread Northbridge
Crossgate Road
Park Farm
Redditch, Worcestershire B98 7TD
Phone: 01527 525719
Fax: 01527 526881

BSI Approval No. FM257

Your reference. 4500021825

Date. 17/02/10

Order Line	Part / Description	Batch & Material Specification	Quantity	Unit of Measure	No of Cartons
40	ASNA2001VN4-12 Issue No. U NAS 621 PRIORITY3*****WK3***	562399 6 AL4V/TA28 Rod	1000.0	EA	1

FULL CERTS ON ALL JOBS

Linread Northbridge is a trading name of Linread Limited, registered in England and Wales, Registered No 207655.
Registered Office:
Crossgate Road, Park farm, Redditch, Worcestershire. B98 7TD.

APPLIED FOR.

Certified that the supplies detailed hereon have been inspected and tested in accordance with the conditions and requirements of the contract or purchase order and unless otherwise noted above, conform in all respects to the specification(s) drawing(s) relevant thereto. The quality control arrangements adopted in respect of these supplies have accorded with the conditions of our BSI registration.

Signed



Date 17/2/10



Boeing Distribution Services Inc.

P.O. Box 025263, Miami, FL 33102-5263 • Tel: 305.925.2600 • Fax: 305.507.7191
Plant Location: 3760 W. 108th Street, Miami, FL 33018 • SITA: MIAMMCR
www.BoeingDistribution.com

Shipped From: Boeing Distribution Services Inc, CHARLES AVENUE, BURGESS HILL, WEST SUSSEX RH15 9UF, UK

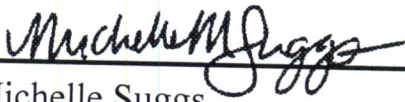
Material Certification

The items set forth on the purchase order referred to below have been visually inspected and the dimensions thereof have been measured by us, and based on the aforesaid, as well as the representation made to us by the manufacturers of the items subject of such purchase order, we hereby certify that such items are in conformity with all current governmental and manufacturer's requirements, specifications, drawings, and conform to the purchase order requirements. Said items are in new condition and have not been obtained from any U.S. Government or Military source and are traceable to Boeing Distribution Services.

FIRM: AJ WALTER AVIATION LTD

PURCHASE ORDER#: CPE134190

QUANTITY	U/M	PART-NUMBER	CUST REF#	LOT-NUMBER	MANUFACTURER	CCODE	MFR	DTE	EXP DATE
14	EA	ASNA2001VN4-12	ASNA2001VN4-12	562399	HOWMET/ALCOA/ARCONIC	K8753			
BDSI CTRL/LOT # :2010B18372									


Michelle Suggs
Quality Leader

11/03/21

Inv # 11/03/21