

The Cincinnati Steel Treating Co
5701 Mariemont Ave.
Cincinnati, Ohio 45227 (513) 271-3173

Certification ID
36895

Order ID
98261

CERTIFICATION OF COMPLIANCE

CUSTOMER

Metalex Mfg., Inc.
5750 Cornell Road

Cincinnati OH
Blkt Ord # 45242

Purchase Order 72563

Customer Cust

Qty Part No / Description

4 L1430401-100400
SUPPORT GIRDER

Material

A36

REV #05V S/N 7A-08198-25 THRU 7A-08198-28

STRESS RELIEVE PER AWS D1.1 REV. 2004.
NOTE: SUPPORT TO PREVENT DISTORTION.
HEAT TREAT CHARTS REQUIRED.
CERTIFICATIONS REQUIRED.

METALEX	M:TX
Q. A. DEPT	QC 20
ACCEPTED	
DATE 9/18/07	
BY Tc	

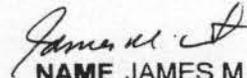
Hi-Tech 7558

RESULTS

THE ABOVE PARTS HAVE BEEN HEAT TREATED TO THE FOLLOWING:

HEAT TREATMENT STRESS RELIEVED AT 1150F
PER AWS D1.1 REV 2004

WE HEREBY CERTIFY THAT THE ABOVE PARTS WERE PROCESSED IN ACCORDANCE WITH THE SPECIFICATIONS AND INSTRUCTIONS SPECIFIED ON THE ABOVE PURCHASE ORDER AND THAT THE RESULTS AND REPORT THEREOF ARE AS STATED. ALL TESTING AND INSPECTION PROCEDURES EMPLOYED WERE IN ACCORDANCE WITH THE APPLICABLE SPECIFICATIONS AND THE RESULTS THEREOF ARE ON FILE.



NAME JAMES M. HUNT

TITLE QA MANAGER

DATE 9/12/2007

09-13-07 P04:20 OUT



Precision Steel Services, Inc.

CERTIFICATE OF CONFORMANCE

TO: METALEX MANUFACTURING INC.

FROM: PRECISION STEEL SERVICES, INC.
31 E. SYLVANIA AVE.
TOLEDO, OH 43612

DATE OF SHIPMENT: 5/24/07

QUANTITY SHIPPED: 4 PCS

PURCHASE ORDER NUMBER: 71069-BL

DESCRIPTION: ASTM A-36 REV. 05 3/4" BURN 22.3" x 151.20"
• ITEM# 1
• JOB# 7558
• HT# T7257

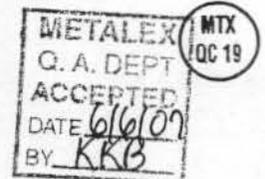
THIS MATERIAL HAS BEEN PRODUCED IN ACCORDANCE WITH APPLICABLE COMMERCIAL STANDARDS AND/OR SPECIFICATIONS THAT MAY BE DESIGNATED ON PURCHASE ORDERS AND/OR BY DRAWING SUPPLIED ON THE DATE ON WHICH THE INQUIRY AND/OR ORDER WAS PLACED. WE HAVE DOCUMENTATION ON FILE AND IS AVAILABLE FOR REVIEW.

AUTHORIZED SIGNATURE:

Laura Epps

Laura Epps
INSIDE SALES

Job# *Hi-tech*
7558
Part# *L1430401-100400*
P.O # *71069-BL*





INSPECTION PLANNING & REPORT FORM

Metalex Mfg.
5750 Cornell Rd • Cincinnati, OH 45242 • (513) 489-0507

Job No.
2007-7558

Qty
1

Inspection Origin		Vendor (Sub-Tier Source) Identification		Customer Identification		
<input type="checkbox"/> Receiving	Vendor Name	Part No.	REV	P.O. Number		
<input type="checkbox"/> In-Process	N/A	L1430401-100400	6	16185		
<input checked="" type="checkbox"/> Final	Date Rec'd	P.O. No.	Part Name			
<input type="checkbox"/> Rework/Repair	N/A	N/A	Undulator Support Girder			
<input type="checkbox"/> First Article	Serial Numbers:		Customer Name			
At Oper. 170	25		Hi-Tech Manufacturing			
SPECIFICATION	B/P ZONE	INSPECTION METHOD / GAGE NO.	ACTUAL DIMENSION / GAGE VERIFICATION (Range of Readings or Accept Status)	QTY ACC	QTY REJ	

**** ALL DIMENSIONS TO BE RECORDED IN MILLIMETERS ****

**** ALL TEMPERATURES TO BE RECORDED IN CELSIUS ****

ALL DIMENSIONS APPLY AT A TEMPERATURE OF 20 DEGREES CELSIUS. PART MUST BE IN THERMAL EQUILIBRIUM DURING MEASUREMENTS AND AT THE SAME TEMPERATURE AT THE BEGINNING AND CONCLUSION OF THE MEASUREMENTS WITHIN +/-2 DEG. CELSIUS.

PART TEMPERATURE BEFORE INSPECTION (Record in Celsius)	SOW 4.5.4	CONTACT THERMOMETER MX1794	20.32° C	MTX QC 8
PART TEMPERATURE DURING INSPECTION (Record in Celsius)	SOW 4.5.4	CONTACT THERMOMETER MX1794	20.35° C	MTX QC 8
PART TEMPERATURE AFTER INSPECTION (Record in Celsius)	SOW 4.5.4	CONTACT THERMOMETER MX1794	20.35° C	MTX QC 8

CRITICAL DIMENSIONS PER SECTION 4.5.2.2 OF DOC. # L143-00093

SHEET 2 - TOP VIEW

A) Flatness of Datum B of .030 [.001]	N/A	CMM MX1269	.025	MTX QC 8
B) Perpendicularity of Datum B to Datum C .25 [.010] A C	E8	CMM MX1269	.024	MTX QC 8
C) Flatness of datum A of .030 [.001]	N/A	CMM MX1269	.024	MTX QC 8
D) Perpendicularity of Datum A to Datum C .25 [.010] C	D8	CMM MX1269	.026	MTX QC 8
E) 9X Ø 6.338 - 6.350 marked "D1", "D2" & "D3"	E7 E6 E3	CMM MX1269	6.339 - 6.344 Ø (9x)	MTX QC 8
F) True position of "D3" holes 2X ⊕ .1 [.004] A B C ⊕ .03 [.0012] B C	E3	CMM MX1269	.035 ± .016 .016	MTX QC 8
F) True position of "D2" holes 2X ⊕ .1 [.004] A B C ⊕ .03 [.0012] B C	E6	CMM MX1269	.038 ± .041 .002	MTX QC 8
F) Locations of "D1" holes 444.50 [17.500]	E7	CMM MX1269	444.560	MTX QC 8

STAMP MTX QC 8	INSPECTED BY THOMAS G COOK	DATE 1/12/08	PAGE 1 OF 2	QTY ACC 1	QTY REJ 0
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INSPECTION PLANNING & REPORT FORM
 Metalex Mfg.
 5750 Cornell Rd • Cincinnati, OH 45242 • (513) 489-0507

Job No.
2007-7558

Qty
1

Inspection Origin <input type="checkbox"/> Receiving <input type="checkbox"/> In-Process <input checked="" type="checkbox"/> Final <input type="checkbox"/> Rework/Repair <input type="checkbox"/> First Article		Vendor (Sub-Tier Source) Identification Vendor Name N/A Date Rec'd N/A		Customer Identification Part No. L1430401-100400 Part Name Undulator Support Girder		REV 6	P.O. Number 16185
At Oper. 170	Serial Numbers: 25		Customer Name Hi-Tech Manufacturing				

SPECIFICATION	B/P ZONE	INSPECTION METHOD / GAGE NO.	ACTUAL DIMENSION / GAGE VERIFICATION (Range of Readings or Accept Status)	QTY ACC	QTY REJ
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1968.50 [77.500]	E4	CMM MX1269	1968.468		
3492.50 [137.500]	E2	CMM MX1269	3492.424		
2X 523.6 [20.61]	E1	CMM MX1269	523.552 523.545 523.579		
3185.26 [125.404]	D2	CMM MX1269	3185.194		
845.29 [33.179]	D6	CMM MX1269	845.286		
2X 95.10 [3.744]	D8	CMM MX1269	95.100 95.087		

SHEET 2 - SIDE VIEW

A) .030 [.0012] 2X Surface "J"	C8	CMM MX1269	.028		
B) .05 [.002]	C8	CMM MX1269	.045		

SHEET 2 - BOTTOM VIEW

A) 2X 749.78 ± .15	C7	CMM MX1269	749.815 749.812		
B) 2X 2340.00 ± .15	C5	CMM MX1269	2339.939 2339.907		
C) 4X .05 [.002] B	B2	CMM MX1269	.001 .005 .002 .002		
D) 4X .030 [.0012] A	B7	CMM MX1269	.002 .005 .003 .002		

SHEET 3 - SECTION B-B

E) .07 [.003] C	C2	CMM MX1269	^{TC} 1/12/08 .008 .065		
F) 4X 109.47 ± .08	C2	CMM MX1269	109.423 - 109.488		

ALL OTHER FEATURES ARE ACCEPTED PER METALEX OPERATOR ACCEPTANCE PROGRAM (OAP) MXWI17001 & OPERATOR SIGNOFF OF ROUTER OPERATIONS FOR COMPLIANCE TO ALL DRAWING FEATURES GENERATED WITHIN THAT DEFINED OPERATION.	ROUTER SIGNOFF MX5009	CONFORMS	
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STAMP 	INSPECTED BY THOMAS G COOK	DATE 1/12/08	PAGE 2 OF 2	QTY ACC 1	QTY REJ 0
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Metalex Manufacturing
L1430401-100400 Girder Support
Hi-Tech Purchase Order No. 16185

Visual Weld Inspection Report

Metalex Job: 2007-7558

Serial Number:

7A-08198- (25)

Welding and Visual Welding Inspection Requirements:

Per SOW L143-00093 Section 4.1.4.2: For all welded parts, the welding practice shall conform to the Structural Welding Code, ANSI/AWS D1.1-D1.1M:2004..

Per SOW L143-00093 Section 4.1.4.2.2: All structural welds shall be visually inspected as defined in section 6.9 of the Structural Welding Code. The contractor shall certify that the welds were inspected and were acceptable.

Part Print L1430401-100400 sheet 1 of 3.

Fabrication Stage#1

Features: W1 and W2

Acceptable (Y/N) ACCEPT

Initial: B.H.



Date: 8/28/07

Fabrication Stage#2

Features: W3, W4 and W5

Acceptable (Y/N) ACCEPT

Initial: B.H.



Date: 8/28/07

Fabrication Stage#3

Features: W6, W7, W8, W9, W10, W11 and W12

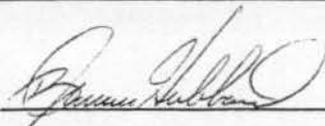
Acceptable (Y/N) ACCEPT

Initial: B.H.



Date: 9/7/07

Verification of completion of weld visual inspection:

Completed By: 



Date: 9/7/07

METALEX WELD CERTIFICATION

MX JOB #: 07-7558 QTY 4 CUSTOMER: Hi-Tech Manufacturing, Inc.

PART NAME: Support Girder

PART NUMBER: L1430401-100400 REVISION: 6

S/N: (if applicable) 7A-08198-25 thru
7A-08198-28

METALEX PROCEDURE # WPS 146 (K. Ballard)

CUST. SPECIFICATION # AWS D1.1

WELD WIRE SPEC AWS A5.20

TYPE E71T-1

HEAT 81192

DIAMETER 1/16"

SERIAL NUMBER WELDER

7A-08198-25 Ken Ballard

7A-08198-26 Ken Ballard

7A-08198-27 Ken Ballard

7A-08198-28 Ken Ballard

THE ABOVE PARTS LISTED WERE WELDED IN ACCORDANCE WITH THE REFERENCED WELDING SPECIFICATION.

Katrina Black
Metalex Quality Control

1/21/08
Date

Metalex PO# 171829-BL-7558

Certificate of Conformance

Customer: Metalex Mfg. Inc.
Address: 5750 Cornell Rd.
Cincinnati, Oh: 45242
Attention: Quality Engineering Dept.

METALEX
Q. A. DEPT
ACCEPTED
DATE 7/16/07
BY: TC
MTX
QC 20

Item	Qty.	Part Number	Rev. Part Name	Job #
<u>1</u>	<u>5</u>	<u>B62WZ111</u>	<u>BATCH# 061637L</u> <u>TILE CIAD H.S. SW4026</u> <u>Shelf life 36 months</u>	<u>7558</u>

Starwin Williams certifies that all materials, processes, etc. furnished to
Supplier Name

Metalex, for the purchase order number stated above, comply with all conditions stated in the P.O. for the items shown.

Signed/Dated:  7.16-0
Supplier Quality Rep.

Metalex PO# 70777-IG-7558

ATTN: JAMES GRIFFIN

Certificate of Conformance

Hi-Tech Job# 7558

METALEX
Q. A. DEPT
ACCEPTED
DATE: 6/5/07
BY: KKB

MTX QC 19

Customer: Metalex Mfg. Inc.
 Address: 5730 Cornell Rd.
 Cincinnati, Oh. 45242
 Attention: Quality Engineering Dept.

KKB 6/5/07

MTX QC 19

Shelf life ID# 2835 thru 2839

Item	Qty.	Part Number	Rev. Part Name	Job #
1.	5	B6242111	TILE CLAD H.S. EW. MC-56	36 MONTH OPEN
2.	5	B60V270	TILE CLAD H.S. HARDNER	36 MONTH OPEN
3.	1	R7K54	SI REDUCER	3 YEARS
L Shelf life ID# 2834				

MX Shelf Life ID# 2841 thru 2844

KKB 6/5/07

MTX QC 19

KKB 6/5/07 MTX QC 19

SHERWIN WILLIAMS certifies that all materials, processes, etc. furnished to

Metalex, for the purchase order number stated above, comply with all conditions stated in the P.O. for the items shown.

Signed/Dated:

Vendor Quality Rep.

INSPECTION / ACCEPTANCE REPORT OF COMPONENTS FOR AS-BUILT DRAWINGS

VENDOR: METALEX, INC.

PART NAME: UNDULATOR GIRDER ASSY

DRAWING #: L1430401-100400 (05)

SERIAL #: 25

P.O. #: 7A-08189

DATE: 01-22-08

ACCEPTANCE CRITERIA

1. Visually inspect for damage. Accept/Reject

CRITICAL DIMENSIONS (mm)

FEATURE	TARGET	TOLERANCE	MEASURED VALUE	
Perpendicularity of Datum B to C	$\leq .025$	$\leq .025$	$\angle = .025$	<u>Accept</u> /Reject
Perpendicularity of Datum A to C	$\leq .025$	$\leq .025$	$\angle = .025$	<u>Accept</u> /Reject
True position of 2 D2 hole to 2 D3 holes	$\leq .03$	$\leq .03$	$\angle = .03$	<u>Accept</u> /Reject
Parallelism of support pad surface to Datum C	$\leq .07$	$\leq .07$	#1 $\angle = .07$	<u>Accept</u> /Reject
			#2 $\angle = .07$	
			#3 $\angle = .07$	
			#4 $\angle = .07$	
Distance from Datum C to support pad surface	109.50	+.2/- .2	#1 109.4	<u>Accept</u> /Reject
			#2 109.4	
			#3 109.4	
			#4 109.5	

INSPECTOR: Simon

QA Supervisor: Mullage

TEST EQUIPMENT USED: feeler gage, dial indicator, micrometer, precision square.

COMMENTS:

**The Sherwin-Williams Co.
3143 EAST KEMPER RD
CINCINNATI, OHIO 45241**

METALEX
Q. A. DEPT
ACCEPTED
DATE 6/24/07
BY TC

MTX
QC 20

2.6 7558

**CERTIFICATE OF COMPLIANCE
STATEMENT OF QUALITY**

METALEX

PURCHASE ORDER 71261-JG
DATE OF MFG
SHELF LIFE
PART

QUANTITY
BATCH

IT IS HEREBY CERTIFIED THAT ALL MATERIAL USED IN THE
MANUFACTURE OF PARTS IN THE QUALITY CALLED FOR ON
THE SUBJECT PURCHASE ORDER, CONFORM TO THE MATERIALS
AND/OR MANUFACTURING SPECIFICATIONS INDICATED IN
DRAWINGS OF SPECIFICATIONS AS CALLED FOR ON SAID
PURCHASE ORDER.

THE SHERWIN-WILLIAMS CO
3143 EAST KEMPER RD
CINCINNATI OHIO 45241



AUTHORIZED SIGNATURE
CUSTOMER SERVICE ADM

Shelf life 36 months
OX2696S
batch date OX2716S B67V5
OX2785S
OX0275C B67H5
OX2005Z

CERTIFICATE OF CONFORMANCE

Date:	<u>01/21/08</u>	Metalex Job#	<u>2007-7558</u>
Customer:	<u>Hi-Tech Manufacturing, Inc.</u>	Purchase Order #	<u>16185</u>
	<u>4637 N. 25th Ave.</u>	MX Packing List #	<u>41667</u>
	<u>Schiller Park, IL 60176</u>		
Attention:	<u>Simon Sorsher</u>		

Metalex certifies that all material, processes, procedures, and dimensions are as called for on the purchase order, drawings, and/or amendments supplied by you.
 All information concerning this part or parts, units and/or assemblies are on file at Metalex Manufacturing, Inc.

ITEM	QTY	PART NUMBER	REV	PART NAME	ID # *
001	4	L1430401-100400	6	Support Girder	See Below

*IDENTIFICATION NUMBER INCLUDES SERIAL #, HEAT #, AND/OR LOT #.

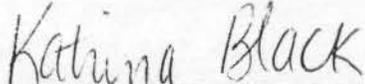
COMMENTS: "FIRST ARTICLE" submitted on Metalex Shipper # 40858, dated 08/13/07 (S/N: 7A-08198-01).

Applicable serial numbers of this shipment are 7A-08198-25 thru 7A-08198-28.

Some internal documents in this quality package may contain documents certifying to revision level "5" or "5V". Metalex certifies these documents and processes conform to the rev 6 revision level and the parts conform to revision level "6".

Metalex is in compliance with Statement of Worksopce Document No. L143-00093, Revision New, dated 12/12/06.

Manufactured from Metalex purchased material. Reference heat numbers: T7257, T7232, T7130, T7141, U9728, 0129862, X25899, J62810, JF6843, J70358, and 478765.

 <u>Metalex Representative Signature</u>	<u>Katrina Black</u> <u>Print Name</u>	<u>1/21/08</u> <u>Date</u>
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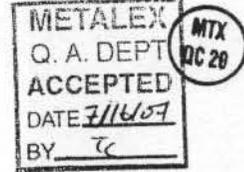
"The Complete Steel Service Center"
Since 1933

200 W. North Bend Rd.
Cincinnati, Ohio 45216-1725

(513) 821-8400
FAX (513) 821-6915
U.S.A. 1-800-543-4922

CERTIFICATE OF CONFORMANCE

CUSTOMER METALEX MFG INC
PO# 71070BL7558
DATE: 5/22/07



<u>QUANTITY</u>	<u>DESCRIPTION</u>	<u>SPECIFICATION</u>	<u>HEAT #</u>
13 PCS	STRUCTURAL TUBING 10 X 6 X 3/8 X 40'	A500-03A GrCB	0129862
3 PCS	1-1/4 ID SCH 40 X 21'	A-500-03	X25899
7 PC	HOT ROLL FLATS 3/4 X 8 X 20'	A-529-50	J62810
3 PCS	1/4 X 5 X 20'	A-36 rev5	JF6843
26 PCS	3/8 X 7 X 20'	A-36 rev5	J70358
26 PCS	8x3x3/8x 40'	A500B rev03a GrCB	478765

THIS MATERIAL TO THE BEST OF OUR KNOWLEDGE WAS PRODUCED
IN ACCORDANCE WITH APPLICABLE ASTM STANDARDS.

Due Stone



Mill and Warehouse located on 75 acres and served by B & O siding

HOT & COLD ROLLED BARS • STRUCTURALS • MESH • PLATE • SHEETS
REINFORCING BARS ROLLED IN OUR OWN MILL



Bodycote Taussig Inc.
Metallurgical & Materials Engineers



AWS WELDER AND WELDING OPERATOR QUALIFICATION TEST RECORD

WELDER OR WELDING OPERATOR'S NAME: Tadeusz Sutowski I.D. #39
 WELDING PROCESS: GMAW MANUAL SEMIAUTO XXX MACHINE
 POSITION: 4G - Overhead PROGRESSION: N/A
 WPS NO.: AWS Prequalified TYPE OF JOINT TESTED: Single V Groove
 BASE METAL SPECIFICATION: ASTM A36, Qualifies All Groups
 PIPE DIAMETER: N/A JOINT THICKNESS: 3/8"
 QUALIFICATION RANGES: 3/4" Max. Groove/Unlimited Fillet, Flat, Horiz., Overhead

FILLER METAL

SPECIFICATION NO.: AWS A5.18 CLASSIFICATION: ER80S-D2 F NO.: N/A
 DIAMETER: .035" FLUX/SHIELDING GAS: AR/O₂ - 92/8 FLOW RATE: 25 cfh
 BACKING OR BACK GOUGING METHOD: None

VISUAL INSPECTION RESULTS

APPEARANCE: Satisfactory UNDERCUT: None POROSITY: None

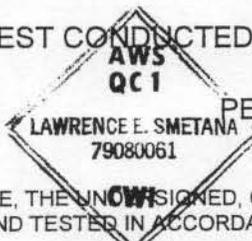
GUIDED BEND TEST RESULTS

TYPE	RESULTS	TYPE	RESULTS
FACE	PASS	ROOT	PASS

FILLET TEST RESULTS

SIZE: N/A FRACTURE TEST: N/A MACROETCH: N/A
 LOCATION, NATURE, SIZE OF DISCONTINUITIES N/A
 NOTED: _____

TEST CONDUCTED BY: BODYCOTE TAUSSIG, INC. LABORATORY NO.: 134477



PER: Lawrence E. Smetana, CWI TEST DATE: March 20, 1997

WE, THE UNDERSIGNED, CERTIFY THAT THIS RECORD IS CORRECT AND THAT THE WELDS WERE PREPARED AND TESTED IN ACCORDANCE WITH AWS D1.1- 1996

MANUFACTURER OR CONTRACTOR: Hi-Tech Manufacturing
 AUTHORIZED BY/DATE: _____

THIS CERTIFICATE OR REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN APPROVAL OF BODYCOTE TAUSSIG, INC.

Where quality is an ongoing commitment

Weld Certificate



HI-TECH

Manufacturing, Inc.

ISO 9001:2000
certified

This certificate is presented to

Argonne National Laboratory

Per PO # 7A-08189, part #L1430802-200030 quantity of 76pcs

Procedure: #PQR101

Customer Specification: #AWS D1.1

Weld wire Spec: #AWS A5.28, Type: ER80S-D2, Heat: 83479, Dia: .045

Welder: Tadeusz Sutowski

Have been welded in accordance with the referenced welding specification.

Murphy A. Frawley

Q.C. Supervisor

11-17-07

Date



AMERICAN GRINDING & MACHINE CO.

2000 N. MANGO AVE. CHICAGO, IL 60639
773-889-4343 toll free: 877-988-4343
FAX 773-889-3781

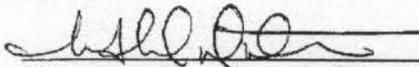
CERTIFICATE OF COMPLIANCE

Customer: Hi-Tech Mfg PHONE: (847) 678-1616
4637 N. 25th Ave. FAX: (847) 678-1716
Schiller Park, IL
60176

RE: PURCHASE ORDER 16845

PRINT NUMBER(S) (if applicable) L143 0802-200030

This is to certify that the services and /or material furnished by American Grinding & Machine Company on this order meets the requirements of listed purchase order and any prints furnished to us for that purchase order.


Signature of American Grinding Representative

7/19/07
Date



Material Safety Data Sheet

Z-Maxx Lube – Heavy Duty Grease

SECTION 1

Technical Phone: 651-784-1250 Date Prepared: 6 July 2004
MSDS# 4-4.3-12-1-180 Rev A

SECTION 2 - INGREDIENTS

Complex Mixture – Petroleum Hydrocarbons Plus Additives. This material is not known to contain greater than 0.1% of any carcinogen required to be listed under the OSHA Hazard Communication Standard (29CFR 1910.1200).

This product is considered non-hazardous when handled properly and used for intended purpose.

*This product does not contain any chemical subject to the reporting requirements of the Superfund Amendments and Reauthorization Act of 1986 (SARA), Title III, Section 313 and 40 CFR Part 372.

SECTION 3 – PHYSICAL DATA

Appearance and Odor: Amber grease, mild mineral odor
Boiling Point: N/A
Specific Gravity: .945
Vapor Pressure (mm Hg): N/A
Vapor Density (air = 1): N/A
Water Solubility: Nil

SECTION 4 – FIRE AND EXPLOSION DATA

Flash Point **Method used** **LEL%** **UEL%**
>200°C (392°F) Cleveland open cup Unknown Unknown
Extinguisher Media: CO₂ Dry chemical, Foam or Sand/Earth
Fire Fighting: NIOSH/MSHA approved, self-contained, pressure demand respirator recommended; water may spread fire.
Fire and Explosion Hazards: Containers not on fire may be cooled with water.

SECTION 5 – REACTIVITY DATA

Material is: Stable
Hazardous polymerization: Will not occur.
Conditions to avoid: Strong acids and direct open flames.
Incompatibility: Excessive heat. Avoid conditions that could generate an oil mist.
Hazardous decomposition product: Oxides of Carbon, Sulphur, Nitrogen

SECTION 6 – HEALTH HAZARDS

Acute: Unknown.
Chronic: May cause eye or skin irritation.
Signs and symptoms of exposure: Eye, skin irritation.
Medical conditions generally aggravated by exposure: Unknown
Carcinogenic status: OSHA: N/A I.A.R.C. N/A N.T.P. N/A

Emergency and first aid procedures:

Inhalation: Move to fresh air.
Eyes: Flush with water for 15 minutes, if film or irritation persists, seek medical attention.
Skin: Wipe off excess and wash with soap and water.
Ingestion: Do not induce vomiting. Consult physician.

SECTION 7 – SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

Handling and storage: Store in a dry, cool environment.
Other precautions: Keep away from open flames.
Spill or release: Scoop up and place in metal container. Use inert absorbent to clean residue and place in metal container. U.S. Coast Guard 1-800-424-8802.
Disposal methods: Dispose of in accordance with all applicable federal, state and local regulations.
Emergency Phone: Chemtrec 1-800-424-9300

SECTION 8 – EXPOSURE CONTROLS/PERSONAL PROTECTION

Respiratory protection: Not required at normal use temperatures.
Ventilation Procedures: Local exhaust: recommended to maintain oil mist below TLV limit. Mechanical: to maintain below TLV limits. Special: N/A Other: N/A
Protective gloves: Oil resistant gloves.
Eye protection: Safety glasses (goggles).
Other protective equipment: N/A
Work/hygienic practices: Practice good housekeeping.
N/A = Not Applicable

(May be used to comply with OSHA's Hazard Communications Standard, 29CFR 1910.1200. Standard must be consulted for specific requirements.)

NORTHERN TECHNOLOGIES

INTERNATIONAL CORPORATION

6680 North Highway 49 * Lino Lakes MN 55014
Toll Free: 800-328-2433 * Phone: 651-784-1250 * Fax: 651-784-2902
URL: www.ntic.com * American Stock Exchange Symbol: NTI

BLUE 1a/1

E.360

KeelerLong

Keeler & Long/PPG
856 Echo Lake Road
Watertown, CT
1-800-238-8596

Product Data Sheet

Kolor-Poxy™ Enamel
KLJ Series

PPG PPG High Performance Coatings

Product Information

Product Code: KLJ1XXXX Part A
KLJ2XXXX Part A
Where XXXX is a color designation.
KLJ1B Curing Agent Part B

Product: Polyamide Epoxy

Suggested Use: A two component, polyamide epoxy enamel formulated to provide excellent chemical abrasion and direct impact resistance for interior exposures.

Use as a topcoat for interior steel, concrete and masonry surfaces, especially in alkaline environments.

Not Recommended: Exterior exposures; areas subject to splash and spillage of strong acids; immersion in strong acids.

Product Description

Color: A full range of colors is available

Gloss 60°: KLJ1XXXX 85 minimum
KLJ2XXXX 35 - 65

VOC: 3.47 lbs./gal. (416 g/L) mixed, unthinned

Method: Calculated

In Service Heat

Limitations: 250° F (121° C) dry heat

Weight/Gallon: 10.2 ± 0.5 lbs./gal. *

Flash Point: Part A 82°F (27.7°C)
Part B 104°F (40°C)

Package: Part A is available in one gallon containers filled at 0.80 gallons (3.03 liters) and five gallon containers filled at 4.00 gallons (15.1 liters).
KLJ1B Part B is available in quart containers filled at 25.6 fluid ounces (767 mL) and full filled gallon containers.

Percent Solids by Volume: 53.9 ± 3.0% *

Percent Solids by Weight: 66.1 ± 3.0% *

Drying Schedule

Air Dry @ 77°F (25°C) ASTM D5895

Dry to Touch: 4 hours

Dry to Handle: 8 hours

Drying Schedule (continued)

Dry to Recoat: 24 hours

Drying times listed may vary depending on temperature, humidity and air movement.

Application Data

Substrate: Metal or masonry

Substrate Preparation: The service life of the coating is directly related to the surface preparation. The surface to be coated must be dimensionally stable, properly prepared and primed, dry, clean and free of all contamination including oil, dirt, grease and rust.

Basecoats: Kolorane™ Aluminum Primer, Kolorane™ Zinc Rich Primer, Kolor-Poxy™ Primers and Enamels, Kolor-Poxy™ Surfacer

Application Method: Apply by spray, brush or roller application.

Air Spray: DeVilbiss MBC gun, 704 or 777 air cap with "E" or "F" tip and needle or equivalent equipment. Atomization Pressure: 30 - 60 psi.

Airless Spray: Equipment capable of maintaining a minimum of 2500 psi at the tip without surge. 0.011" (0.279 mm) to 0.017" (0.432 mm) orifice.

Brush: Use a high quality natural bristle brush.

Roller: Use a 3/8" nap polyester nylon roller cover with a solvent resistant core.

Refer to Application Guide APG-3 for additional information.

Parts Base by Volume: 4 parts A

Parts Catalyst by Volume: 1 part KLJ1B Part B

Digestion Time: 1 hour @ 77°F (25°C)

Pot Life @ 72°F: 8 hours @ 77°F (25°C)

Thinner Code & Percent: Thin up to 5% by volume with KL3700 as needed for application.

Coverage Sq. Ft./Gal. @ 25 mils: 346 sq. ft./gal. *

Wet Film Per Coat: 4.6 to 7.4 mils*

Dry Film Per Coat: 2.5 to 4.0 mils

1 to 1 ratio

The statement and methods presented in this bulletin are based upon the best available data and practices known to PPG Architectural Finishes, Inc. at the present time. They are not representations or warranties of performance, results or comprehensiveness of such data. Since PPG Architectural Finishes, Inc. is constantly improving its coatings and paint formulas, future technical data may vary somewhat from what was available when this bulletin was printed. Contact your PPG Sales Representative, Distributor of Pittsburgh Paints or the Pittsburgh Paints Information Center for the most up-to-date information. E.360 Mgr., 2004

BLUE 1/2

E.360

KeelerLong

PPG High Performance Coatings

Keeler & Long/PPG
856 Echo Lake Road
Watertown, CT
1-800-238-8596

Product Data Sheet

Kolor-Poxy™ Enamel
KLJ Series

Application Data (continued)

Mixing Instructions: Thoroughly mix Part A before blending. Add KLJ1B Part B to Part A. Mix until uniform. Allow to digest 1 hour before use.

Clean Up Solvent: KL3700

Additional Information

Apply only when air, product and surface temperatures are at least 50°F (10°C) and the surface temperature is at least 5°F (3°C) above the dew point. Curing is retarded below 60°F (15.6°C).

Store materials at temperatures between 50°F (10°C) and 95°F (35°C).

Permissible substrate temperature during application is 50°F (10°C) and 120°F (48.9°C).

*Values are calculated using KLJ16002 White, Part A mixed 4:1 by volume with KLJ1B, Curing Agent, Part B. Values will vary with color.

Read all label and Material Safety Data Sheet (MSDS) information prior to use. MSDS are available by calling 1-800-238-8596.

Not intended for residential use.

Spray equipment must be handled with due care and in accordance with manufacturer's recommendation.

High-pressure injection of coatings into the skin by airless equipment may cause serious injury, requiring immediate medical attention at a hospital.

WARNING! If you scrape, sand, or remove old paint, you may release lead dust or fumes. LEAD IS TOXIC. EXPOSURE TO LEAD DUST OR FUMES CAN CAUSE SERIOUS ILLNESS, SUCH AS BRAIN DAMAGE, ESPECIALLY IN CHILDREN. PREGNANT WOMEN SHOULD ALSO AVOID EXPOSURE. Wear a properly fitted NIOSH-approved respirator and prevent skin contact to control lead exposure. Clean up carefully with a HEPA vacuum and a wet mop. Before you start, find out how to protect yourself and your family by contacting the USEPA National Lead Information Hotline at 1-800-424-LEAD or log on to www.epa.gov/lead. In Canada contact a regional Health Canada office. Follow these instructions to control exposure to other hazardous substances that may be released during surface preparation.

The statement and methods presented in this bulletin are based upon the best available data and practices known to PPG Architectural Finishes, Inc. at the present time. They are not representations or warranties of performance, results or comprehensiveness of such data. Since PPG Architectural Finishes, Inc. is constantly improving its coatings and paint formulas, future technical data may vary somewhat from what was available when this bulletin was printed. Contact your PPG Sales Representative, Distributor of Pittsburgh Paints or the Pittsburgh Paints Information Center for the most up-to-date information. E.360 May, 2004

Primer 1 of 2

E.140

KeelerLong

Keeler & Long/PPG
856 Echo Lake Road
Watertown, CT 06795
1-800-238-8596

Product Data Sheet

Kolor-Poxy™ Primer
KL3200 Series

PPG PPG High Performance Coatings

Product Information

Product Code: KL3200 White Part A
KL32004279 Red Oxide Part A
KL3200B Curing Agent Part B

Product Type: Polyamide-Epoxy

Suggested Use: Use where a high build primer/topcoat is required that provides abrasion, impact and chemical resistance when applied to steel and concrete surfaces exposed to a wide range of conditions. May be used in Nuclear Coating Service areas Level II, balance of plant, and certain Level III areas.

Not Recommended: Immersion in strong solvents.

Compatible Topcoats: Acrythane™ Enamels, Hydro-Poxy™ Enamels, Kolorane™ Enamels, Kolor-Poxy™ Hi-Build Enamels, Kolor-Poxy™ Primers and Enamels, Kolor-Sil™ Enamels, Poly-Silicone Enamels

Product Description

Color: White and light colors, Red Oxide

Gloss 60°: Flat

VOC: 2.50 lbs./gal. (302 g/L) *

Method: Calculated (mixed)

Weight/Gallon: 13.6 +/- 0.5 lbs./gal. (mixed) *

In Service Heat Limitations: 250°F (121°C) maximum, dry heat
150°F (66°C) maximum, immersion.

Flash Point: KL3200 Part A 78°F (26°C)
KL3200B Part B 123°F (51°C)

Package: KL3200 Part A is available in short filled gallon and five gallon containers.
KL3200B Part B is available in short filled quart and full filled gallon containers.

Percent Solids by Volume: 66.2% +/- 3.0% (mixed) *

Percent Solids by Weight: 81.5% +/- 3.0% (mixed) *

Application Data

Substrate: Ferrous metal or masonry

Substrate Preparation: The service life of the coating is directly related to the surface preparation. The surface to be coated must be properly prepared, dry, clean and free of contamination.

Minimum surface preparation is SSPC-SP6 (NACE #3) Commercial Blast Cleaning for ferrous substrates.

Brush blasting or acid etching is required for masonry.

Stabilizers on the surface of hot dipped galvanized steel must be removed by either brush blasting, sanding or chemical treatment.

Near White Metal Blast Cleaning per SSPC-SP10 (NACE #2) is minimum surface preparation for immersion service.

Basecoat: Self priming when used on recommended substrates.

Application Method: Apply by spray, brush or roller application.

Air Spray: DeVilbiss MBC gun, 704 or 777 air cap with "E" tip and needle or equivalent equipment. Atomizing pressure 30-60 psi.

Airless Spray: Equipment capable of maintaining a minimum of 2500 psi at the tip without surge. 0.015" (0.38 mm) to 0.019" (0.48 mm) orifice.

Brush: Use a high quality natural bristle brush.

Roller: Use a 3/8" nap polyester-nylon roller cover with a solvent resistant core.

Refer to Application Guide AGP-3 for additional information.

Parts Base by Volume: 4 parts KL3200 Part A

Parts Catalyst by Volume: 1 part KL3200B Part B

Thinner Code & Percent: Thin up to 5% by volume with KL3700 as needed for application.

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E.140 March, 2005

PRIMER 2of2

E.140

Keeler Long

Keeler & Long/PPG
856 Echo Lake Road
Watertown, CT 06795
1-800-238-8596

Product Data Sheet
Kolor-Poxy™ Primer
KL3200 Series

PPG PPG High Performance Coatings

Application Data (continued)

Digestion Time: 45 minutes
Pot Life: 8 hours at 77°F (25°C).
Wet Film Per Coat: 3.8 to 9.1 mils *
Dry Film Per Coat: 2.5 to 6.0 mils
Coverage Sq. Ft./Gal.
@ 1 mil: 1062 sq/ft./gal *
Mixing Instructions: Under mechanical agitation, mix Part A thoroughly. Add KL3200B Part B and mix until uniform. Allow to digest for 45 minutes before use.
Clean Up Solvent: KL3700

Drying Schedule

Drying Schedule: Per ASTM D5895, air dry @ 77°F (25°C) and 50% relative humidity
Dry to Touch: 2.5 hours
Dry Through: 6 hours
Dry to Recoat: 24 hours
Immersion Service: 10 days
Drying time may vary depending on temperature, humidity and air movement.

Additional Information

Apply only when air, product and surface temperatures are above 50°F (10°C) and surface temperature is at least 5°F (3°C) above the dew point. Curing is retarded below 60°F (15.5°C) without the addition of accelerator.

Permissible substrate temperature during application is 50°F (10°C) to 120°F (49°C).

Store materials at temperatures between 50°F (10°C) and 95°F (35°C).

Read all label and Material Safety Data Sheet (MSDS) information prior to use. MSDS are available by calling 1-800-238-8596.

*Values are calculated for KL3200 White mixed with KL3200B. Values will vary with color.

Spray equipment must be handled with due care and in accordance with manufacturer's recommendation.

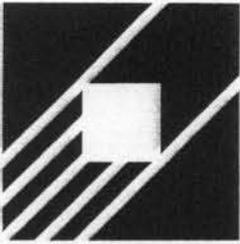
High-pressure injection of coatings into the skin by airless equipment may cause serious injury, requiring immediate medical attention at a hospital.

Not intended for residential use.

WARNING! If you scrape, sand, or remove old paint, you may release lead dust or fumes. LEAD IS TOXIC, EXPOSURE TO LEAD DUST OR FUMES CAN CAUSE SERIOUS ILLNESS, SUCH AS BRAIN DAMAGE, ESPECIALLY IN CHILDREN. PREGNANT WOMEN SHOULD ALSO AVOID EXPOSURE. Wear a properly fitted NIOSH-approved respirator and prevent skin contact to control lead exposure. Clean up carefully with a HEPA vacuum and a wet mop. Before you start, find out how to protect yourself and your family by contacting the USEPA National Lead Information Hotline at 1-800-424-LEAD or log on to www.epa.gov/lead. In Canada contact a regional Health Canada office. Follow these instructions to control exposure to other hazardous substances that may be release during surface preparation.

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E.140 March, 2005



Hi-Tech Manufacturing, Inc.

CNC Milling & Turning
Prototypes & Special Machinery
General Machining & Heliarc Welding Facilities
ISO 9002 Registered
4637 N. 25th Ave., Schiller Park, IL 60176
Phone (847) 678-1616, Fax (847) 678-1617

Visual Weld Inspection Report.

Per Statement of Work # L143-00093 Section 4.1.4.2, Motion System Assembly ## L1430401-100396 and L1430802-200000, contract # 7A-08189, for all welded parts, the welding practice shall conform to the Structural Welding Code, ANSI/AWS D1.1-D1.1 M:2004.

Part Print L1430802-200030 sheet 1 of 2.

Quantity: 76 pcs

Fabrication Stage #1

Features: # 1, 4, 2, 3

Acceptable (Y/N) Y Initials: S.S. Date: 11-16-07

Verification of completion of weld visual inspection:

Completed by: Samuel Sosa Date: 11-17-07

Certificate of Inspection

This certificate is presented to

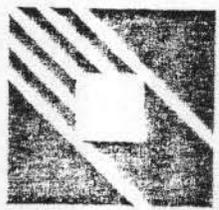
Argonne National Laboratory

Per PO # 7A-08189, part # #
L1430401-100101 (PF-381-000-13) quantity of 114pcs
L1430401-100201 (PF-381-000-23) quantity of 38pcs
Have been inspected and met all drawing requirements.

Q.C. Supervisor

Mudroza

09-07-07
Date



THE MANUFACTURER
IS IN FULL COMPLIANCE WITH
THE REQUIREMENTS OF
ISO 9001:2000
CERTIFIED

Certificates of Inspections

This certificate is presented to

Argonne National Laboratory

Per PO # 7A-08189, part # #

L1430401-100103 (PF-381-000-15) quantity of 16pcs

L1430401-100303 (PF-381-002-15) quantity of 4pcs

Have been inspected and met all drawing requirements.



INSPECTORS

MEMBER OF THE SOCIETY OF QUALITY CONTROL ENGINEERS

ISO 9001:2000
REGISTERED

Q.C. Supervisor

M. Delgado

09-07-07
Date

INSPECTION / ACCEPTANCE REPORT OF COMPONENTS FOR AS-BUILT DRAWINGS

VENDOR: HI-TECH MANUFACTURING, INC.

PART NAME: INTERFACE PLATE (SINGLE CAM)

DRAWING #: L1430802-200021 (03)

SERIAL #: 25

P.O. #: 7A-08189

DATE: 08-21-07

ACCEPTANCE CRITERIA

1. Visually inspect for damage. Accept/Reject

CRITICAL DIMENSIONS (mm)

FEATURE	TARGET	TOLERANCE	MEASURED VALUE	
Flatness of Datum A	≤ 0.02	≤ 0.02	≤ 0.02	Accept/Reject
Perpendicularity of Datum B to A	≤ 0.02	≤ 0.02	≤ 0.01	Accept/Reject
Parallelism of upper edge on lower Cam Block C to B	≤ 0.02	≤ 0.02	≤ 0.01	Accept/Reject
Parallelism of lower edge on upper Cam Block C to B	≤ 0.02	≤ 0.02	≤ 0.01	Accept/Reject
Parallelism of upper edge on upper Cam Block C to B	≤ 0.02	≤ 0.02	≤ 0.01	Accept/Reject
Width of mounting surface on lower Cam Block	142.01	+0.02/-0	142.02	Accept/Reject
Width of mounting surface on upper Cam Block	142.01	+0.02/-0	142.02	Accept/Reject
Separation of inner edges of Cam Blocks	457.43	+0.08/-0.08	457.48	Accept/Reject

INSPECTOR: Simon

QA Supervisor: Mu'taze

TEST EQUIPMENT USED: CMM, gage blocks, dial indicator.

COMMENTS:

INSPECTION / ACCEPTANCE REPORT OF COMPONENTS FOR AS-BUILT DRAWINGS

VENDOR: HI-TECH MANUFACTURING, INC.

PART NAME: INTERFACE PLATE (DOUBLE CAM)

DRAWING #: L1430802-200011 (03)

SERIAL #: 25

P.O. #: 7A-08189

DATE: 08-21-07

ACCEPTANCE CRITERIA

1. Visually inspect for damage.	Accept/Reject
---------------------------------	---------------

CRITICAL DIMENSIONS (mm)

FEATURE	TARGET	TOLERANCE	MEASURED VALUE	
Flatness of Datum A	≤ 0.02	≤ 0.02	0.01	Accept/Reject
Perpendicularity of Datum B to A	≤ 0.02	≤ 0.02	0.01	Accept/Reject
Parallelism of inner edge on Cam Block A to B	≤ 0.02	≤ 0.02	0.01	Accept/Reject
Parallelism of inner edge on Cam Block B to B	≤ 0.02	≤ 0.02	0.01	Accept/Reject
Parallelism of outer edge on Cam Block B to B	≤ 0.02	≤ 0.02	0.01	Accept/Reject
Width of mounting surface on Cam Block B	142.01	+0.02/-0	142.02	Accept/Reject
Width of mounting surface on Cam Block A	254.00	+0.02/-0	254.01	Accept/Reject
Separation of outer edges of Cam Blocks	685.42	+0.08/-0.08	685.45	Accept/Reject

INSPECTOR:

Simon

QA Supervisor:

Muraza

TEST EQUIPMENT USED: CMM, gage blocks, dial indicator.

COMMENTS:

LCLS UNDULATOR SUPPORT CAM TEST DATA
ADVANCED PHOTON SOURCE
ARGONNE NATIONAL LAB

25-1

TIME OF TEST: 11/14/2007 3:35:23 PM

POS#1 FWD

CAM ECCEN R (MICRONS) = 2171.34
ROTARY POT GAIN = 346.06
POT OFFSET (DEG) = 60.70
DEVIATION RMS (MICRONS) = 6.16
DEVIATION MAX (MICRONS) = 16.89
DEVIATION MIN (MICRONS) = -12.39

POS#1 BWD

CAM ECCEN R (MICRONS) = 2174.05
ROTARY POT GAIN = 346.06
POT OFFSET (DEG) = 60.70
DEVIATION RMS (MICRONS) = 8.34
DEVIATION MAX (MICRONS) = 21.54
DEVIATION MIN (MICRONS) = -20.01

POS#2 FWD

CAM ECCEN R (MICRONS) = 2173.25
ROTARY POT GAIN = 346.06
POT OFFSET (DEG) = 60.70
DEVIATION RMS (MICRONS) = 7.56
DEVIATION MAX (MICRONS) = 20.49
DEVIATION MIN (MICRONS) = -15.78

POS#2 BWD

CAM ECCEN R (MICRONS) = 2173.93
ROTARY POT GAIN = 346.06
POT OFFSET (DEG) = 60.70
DEVIATION RMS (MICRONS) = 9.02
DEVIATION MAX (MICRONS) = 22.36
DEVIATION MIN (MICRONS) = -21.53

POS#3 FWD

CAM ECCEN R (MICRONS) = 2169.93
ROTARY POT GAIN = 346.06
POT OFFSET (DEG) = 60.70
DEVIATION RMS (MICRONS) = 6.75
DEVIATION MAX (MICRONS) = 18.19
DEVIATION MIN (MICRONS) = -14.15

POS#3 BWD

CAM ECCEN R (MICRONS) = 2173.67
ROTARY POT GAIN = 346.06
POT OFFSET (DEG) = 60.70
DEVIATION RMS (MICRONS) = 8.85
DEVIATION MAX (MICRONS) = 21.43
DEVIATION MIN (MICRONS) = -20.47

=== TEST PASS! ===

--- END OF TEST ---

LCLS UNDULATOR SUPPORT CAM TEST DATA
ADVANCED PHOTON SOURCE
ARGONNE NATIONAL LAB

25-2

TIME OF TEST: 11/14/2007 4:07:10 PM

POS#1 FWD

CAM ECCEN R (MICRONS) = 1539.48
ROTARY POT GAIN = 344.62
POT OFFSET (DEG) = 127.54
DEVIATION RMS (MICRONS) = 10.69
DEVIATION MAX (MICRONS) = 27.66
DEVIATION MIN (MICRONS) = -24.99

POS#1 BWD

CAM ECCEN R (MICRONS) = 1544.48
ROTARY POT GAIN = 344.62
POT OFFSET (DEG) = 158.95
DEVIATION RMS (MICRONS) = 9.87
DEVIATION MAX (MICRONS) = 25.25
DEVIATION MIN (MICRONS) = -20.65

POS#2 FWD

CAM ECCEN R (MICRONS) = 1538.92
ROTARY POT GAIN = 344.62
POT OFFSET (DEG) = 127.54
DEVIATION RMS (MICRONS) = 10.16
DEVIATION MAX (MICRONS) = 24.30
DEVIATION MIN (MICRONS) = -26.49

POS#2 BWD

CAM ECCEN R (MICRONS) = 1545.44
ROTARY POT GAIN = 344.62
POT OFFSET (DEG) = 146.39
DEVIATION RMS (MICRONS) = 9.72
DEVIATION MAX (MICRONS) = 27.54
DEVIATION MIN (MICRONS) = -20.45

POS#3 FWD

CAM ECCEN R (MICRONS) = 1539.85
ROTARY POT GAIN = 344.62
POT OFFSET (DEG) = 70.99
DEVIATION RMS (MICRONS) = 11.47
DEVIATION MAX (MICRONS) = 30.44
DEVIATION MIN (MICRONS) = -28.42

POS#3 BWD

CAM ECCEN R (MICRONS) = 1545.48
ROTARY POT GAIN = 344.62
POT OFFSET (DEG) = 165.24
DEVIATION RMS (MICRONS) = 9.53
DEVIATION MAX (MICRONS) = 25.94
DEVIATION MIN (MICRONS) = -21.90

=== TEST PASS! ===

--- END OF TEST ---

LCLS UNDULATOR SUPPORT CAM TEST DATA
ADVANCED PHOTON SOURCE
ARGONNE NATIONAL LAB

25-3

TIME OF TEST: 11/14/2007 3:50:56 PM

POS#1 FWD

CAM ECCEN R (MICRONS) = 1561.18
ROTARY POT GAIN = 344.88
POT OFFSET (DEG) = 67.81
DEVIATION RMS (MICRONS) = 7.07
DEVIATION MAX (MICRONS) = 21.77
DEVIATION MIN (MICRONS) = -17.00

POS#1 BWD

CAM ECCEN R (MICRONS) = 1561.12
ROTARY POT GAIN = 344.88
POT OFFSET (DEG) = 74.10
DEVIATION RMS (MICRONS) = 7.27
DEVIATION MAX (MICRONS) = 15.19
DEVIATION MIN (MICRONS) = -17.09

POS#2 FWD

CAM ECCEN R (MICRONS) = 1560.48
ROTARY POT GAIN = 344.88
POT OFFSET (DEG) = 61.53
DEVIATION RMS (MICRONS) = 7.77
DEVIATION MAX (MICRONS) = 18.80
DEVIATION MIN (MICRONS) = -18.70

POS#2 BWD

CAM ECCEN R (MICRONS) = 1560.12
ROTARY POT GAIN = 344.88
POT OFFSET (DEG) = 61.53
DEVIATION RMS (MICRONS) = 7.25
DEVIATION MAX (MICRONS) = 17.83
DEVIATION MIN (MICRONS) = -15.86

POS#3 FWD

CAM ECCEN R (MICRONS) = 1560.60
ROTARY POT GAIN = 344.88
POT OFFSET (DEG) = 67.81
DEVIATION RMS (MICRONS) = 7.50
DEVIATION MAX (MICRONS) = 20.06
DEVIATION MIN (MICRONS) = -16.68

POS#3 BWD

CAM ECCEN R (MICRONS) = 1561.12
ROTARY POT GAIN = 344.88
POT OFFSET (DEG) = 74.10
DEVIATION RMS (MICRONS) = 6.56
DEVIATION MAX (MICRONS) = 17.09
DEVIATION MIN (MICRONS) = -15.43

=== TEST PASS! ===

--- END OF TEST ---

LCLS UNDULATOR SUPPORT CAM TEST DATA
ADVANCED PHOTON SOURCE
ARGONNE NATIONAL LAB

25-4

TIME OF TEST: 11/14/2007 4:22:09 PM

POS#1 FWD

CAM ECCEN R (MICRONS) = 1544.94
ROTARY POT GAIN = 344.58
POT OFFSET (DEG) = 59.46
DEVIATION RMS (MICRONS) = 10.19
DEVIATION MAX (MICRONS) = 26.22
DEVIATION MIN (MICRONS) = -25.47

POS#1 BWD

CAM ECCEN R (MICRONS) = 1550.38
ROTARY POT GAIN = 344.58
POT OFFSET (DEG) = 59.46
DEVIATION RMS (MICRONS) = 10.94
DEVIATION MAX (MICRONS) = 25.74
DEVIATION MIN (MICRONS) = -24.33

POS#2 FWD

CAM ECCEN R (MICRONS) = 1548.14
ROTARY POT GAIN = 344.58
POT OFFSET (DEG) = 59.46
DEVIATION RMS (MICRONS) = 11.34
DEVIATION MAX (MICRONS) = 24.95
DEVIATION MIN (MICRONS) = -25.45

POS#2 BWD

CAM ECCEN R (MICRONS) = 1550.79
ROTARY POT GAIN = 344.58
POT OFFSET (DEG) = 59.46
DEVIATION RMS (MICRONS) = 11.56
DEVIATION MAX (MICRONS) = 27.15
DEVIATION MIN (MICRONS) = -24.36

POS#3 FWD

CAM ECCEN R (MICRONS) = 1548.20
ROTARY POT GAIN = 344.58
POT OFFSET (DEG) = 59.46
DEVIATION RMS (MICRONS) = 11.05
DEVIATION MAX (MICRONS) = 25.73
DEVIATION MIN (MICRONS) = -24.48

POS#3 BWD

CAM ECCEN R (MICRONS) = 1551.44
ROTARY POT GAIN = 344.58
POT OFFSET (DEG) = 59.46
DEVIATION RMS (MICRONS) = 11.38
DEVIATION MAX (MICRONS) = 24.77
DEVIATION MIN (MICRONS) = -25.78

=== TEST PASS! ===

--- END OF TEST ---

LCLS UNDULATOR SUPPORT CAM TEST DATA
ADVANCED PHOTON SOURCE
ARGONNE NATIONAL LAB

25-5

TIME OF TEST: 11/14/2007 4:38:23 PM

POS#1 FWD

CAM ECCEN R (MICRONS) = 1555.49
ROTARY POT GAIN = 345.42
POT OFFSET (DEG) = 59.75
DEVIATION RMS (MICRONS) = 6.97
DEVIATION MAX (MICRONS) = 16.52
DEVIATION MIN (MICRONS) = -14.98

POS#1 BWD

CAM ECCEN R (MICRONS) = 1557.65
ROTARY POT GAIN = 345.42
POT OFFSET (DEG) = 59.76
DEVIATION RMS (MICRONS) = 6.56
DEVIATION MAX (MICRONS) = 18.38
DEVIATION MIN (MICRONS) = -14.96

POS#2 FWD

CAM ECCEN R (MICRONS) = 1553.38
ROTARY POT GAIN = 345.42
POT OFFSET (DEG) = 59.75
DEVIATION RMS (MICRONS) = 7.14
DEVIATION MAX (MICRONS) = 17.17
DEVIATION MIN (MICRONS) = -15.70

POS#2 BWD

CAM ECCEN R (MICRONS) = 1557.88
ROTARY POT GAIN = 345.42
POT OFFSET (DEG) = 59.76
DEVIATION RMS (MICRONS) = 6.95
DEVIATION MAX (MICRONS) = 16.39
DEVIATION MIN (MICRONS) = -18.25

POS#3 FWD

CAM ECCEN R (MICRONS) = 1554.19
ROTARY POT GAIN = 345.42
POT OFFSET (DEG) = 59.75
DEVIATION RMS (MICRONS) = 6.92
DEVIATION MAX (MICRONS) = 15.08
DEVIATION MIN (MICRONS) = -17.60

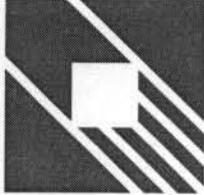
POS#3 BWD

CAM ECCEN R (MICRONS) = 1558.17
ROTARY POT GAIN = 345.42
POT OFFSET (DEG) = 59.75
DEVIATION RMS (MICRONS) = 6.49
DEVIATION MAX (MICRONS) = 19.70
DEVIATION MIN (MICRONS) = -16.23

=== TEST PASS! ===

--- END OF TEST ---

Certificate of Inspection



HI-TECH

Manufacturing, Inc.

ISO 9001:2000
certified

This certificate is presented to

Argonne National Laboratory

Per PO # 7A-08189, part ##

L1430401-100424

Serial ## A00740011, A00751029, A00740010, A00741005

L1430401-100425

Serial ## A00740015, A00803013, A00740012, A00737014

have been reworked to the HEIGHT DIM 3.706+/-0.0005".

Q.C. Supervisor

Mudrye

02-06-08

Date