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

34-1
TIME OF TEST: 12/19/2007 7:46:43 AM

POS#1 FWD
CAM ECCEN R (MICRONS) = 2203.43
ROTARY POT GAIN = 344.50
POT OFFSET (DEG) = 60.44
DEVIATION RMS (MICRONS) = 11.36
DEVIATION MAX (MICRONS) = 28.23
DEVIATION MIN (MICRONS) = -25.25

POS#1 BWD
CAM ECCEN R (MICRONS) = 2207.51
ROTARY POT GAIN = 344.50
POT OFFSET (DEG) = 60.44
DEVIATION RMS (MICRONS) = 8.19
DEVIATION MAX (MICRONS) = 25.72
DEVIATION MIN (MICRONS) = -15.79

POS#2 FWD
CAM ECCEN R (MICRONS) = 2204.17
ROTARY POT GAIN = 344.50
POT OFFSET (DEG) = 60.44
DEVIATION RMS (MICRONS) = 11.06
DEVIATION MAX (MICRONS) = 28.50
DEVIATION MIN (MICRONS) = -25.24

POS#2 BWD
CAM ECCEN R (MICRONS) = 2207.41
ROTARY POT GAIN = 344.50
POT OFFSET (DEG) = 60.44
DEVIATION RMS (MICRONS) = 8.26
DEVIATION MAX (MICRONS) = 25.88
DEVIATION MIN (MICRONS) = -17.36

POS#3 FWD
CAM ECCEN R (MICRONS) = 2202.26
ROTARY POT GAIN = 344.50
POT OFFSET (DEG) = 60.44
DEVIATION RMS (MICRONS) = 10.72
DEVIATION MAX (MICRONS) = 28.67
DEVIATION MIN (MICRONS) = -22.12

POS#3 BWD
CAM ECCEN R (MICRONS) = 2206.33
ROTARY POT GAIN = 344.50
POT OFFSET (DEG) = 60.44
DEVIATION RMS (MICRONS) = 7.99
DEVIATION MAX (MICRONS) = 25.74
DEVIATION MIN (MICRONS) = -18.30

=== TEST PASS! ===
--- END OF TEST ---

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

34-2
TIME OF TEST: 12/18/2007 11:48:34 AM

POS#1 FWD
CAM ECCEN R (MICRONS) = 1524.21
ROTARY POT GAIN = 344.28
POT OFFSET (DEG) = 59.53
DEVIATION RMS (MICRONS) = 13.82
DEVIATION MAX (MICRONS) = 31.67
DEVIATION MIN (MICRONS) = -38.08

POS#1 BWD
CAM ECCEN R (MICRONS) = 1527.95
ROTARY POT GAIN = 344.28
POT OFFSET (DEG) = 59.53
DEVIATION RMS (MICRONS) = 14.87
DEVIATION MAX (MICRONS) = 29.99
DEVIATION MIN (MICRONS) = -40.38

POS#2 FWD
CAM ECCEN R (MICRONS) = 1527.02
ROTARY POT GAIN = 344.28
POT OFFSET (DEG) = 59.54
DEVIATION RMS (MICRONS) = 13.82
DEVIATION MAX (MICRONS) = 28.03
DEVIATION MIN (MICRONS) = -34.47

POS#2 BWD
CAM ECCEN R (MICRONS) = 1527.59
ROTARY POT GAIN = 344.28
POT OFFSET (DEG) = 59.54
DEVIATION RMS (MICRONS) = 14.62
DEVIATION MAX (MICRONS) = 26.07
DEVIATION MIN (MICRONS) = -41.57

POS#3 FWD
CAM ECCEN R (MICRONS) = 1526.69
ROTARY POT GAIN = 344.28
POT OFFSET (DEG) = 59.54
DEVIATION RMS (MICRONS) = 14.02
DEVIATION MAX (MICRONS) = 27.98
DEVIATION MIN (MICRONS) = -35.87

POS#3 BWD
CAM ECCEN R (MICRONS) = 1526.89
ROTARY POT GAIN = 344.28
POT OFFSET (DEG) = 59.54
DEVIATION RMS (MICRONS) = 14.74
DEVIATION MAX (MICRONS) = 29.21
DEVIATION MIN (MICRONS) = -41.38

=== TEST PASS! ===
--- END OF TEST ---

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

34-3
TIME OF TEST: 12/18/2007 11:33:40 AM

POS#1 FWD
CAM ECCEN R (MICRONS) = 1554.92
ROTARY POT GAIN = 345.63
POT OFFSET (DEG) = 60.77
DEVIATION RMS (MICRONS) = 7.14
DEVIATION MAX (MICRONS) = 18.17
DEVIATION MIN (MICRONS) = -17.84

POS#1 BWD
CAM ECCEN R (MICRONS) = 1551.90
ROTARY POT GAIN = 345.63
POT OFFSET (DEG) = 60.77
DEVIATION RMS (MICRONS) = 6.60
DEVIATION MAX (MICRONS) = 19.39
DEVIATION MIN (MICRONS) = -18.61

POS#2 FWD
CAM ECCEN R (MICRONS) = 1554.70
ROTARY POT GAIN = 345.63
POT OFFSET (DEG) = 60.77
DEVIATION RMS (MICRONS) = 6.68
DEVIATION MAX (MICRONS) = 16.60
DEVIATION MIN (MICRONS) = -16.89

POS#2 BWD
CAM ECCEN R (MICRONS) = 1552.02
ROTARY POT GAIN = 345.63
POT OFFSET (DEG) = 60.77
DEVIATION RMS (MICRONS) = 5.95
DEVIATION MAX (MICRONS) = 14.21
DEVIATION MIN (MICRONS) = -15.33

POS#3 FWD
CAM ECCEN R (MICRONS) = 1554.44
ROTARY POT GAIN = 345.63
POT OFFSET (DEG) = 60.77
DEVIATION RMS (MICRONS) = 7.07
DEVIATION MAX (MICRONS) = 18.42
DEVIATION MIN (MICRONS) = -16.20

POS#3 BWD
CAM ECCEN R (MICRONS) = 1551.08
ROTARY POT GAIN = 345.63
POT OFFSET (DEG) = 60.77
DEVIATION RMS (MICRONS) = 6.31
DEVIATION MAX (MICRONS) = 16.15
DEVIATION MIN (MICRONS) = -17.91

=== TEST PASS! ===
--- END OF TEST ---

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

34-4
TIME OF TEST: 12/18/2007 12:39:41 PM

POS#1 FWD
CAM ECCEN R (MICRONS) = 1529.96
ROTARY POT GAIN = 345.94
POT OFFSET (DEG) = 61.00
DEVIATION RMS (MICRONS) = 5.46
DEVIATION MAX (MICRONS) = 17.62
DEVIATION MIN (MICRONS) = -14.72

POS#1 BWD
CAM ECCEN R (MICRONS) = 1532.37
ROTARY POT GAIN = 345.94
POT OFFSET (DEG) = 61.00
DEVIATION RMS (MICRONS) = 6.16
DEVIATION MAX (MICRONS) = 19.47
DEVIATION MIN (MICRONS) = -20.43

POS#2 FWD
CAM ECCEN R (MICRONS) = 1530.43
ROTARY POT GAIN = 345.94
POT OFFSET (DEG) = 61.00
DEVIATION RMS (MICRONS) = 5.24
DEVIATION MAX (MICRONS) = 16.66
DEVIATION MIN (MICRONS) = -19.44

POS#2 BWD
CAM ECCEN R (MICRONS) = 1534.08
ROTARY POT GAIN = 345.94
POT OFFSET (DEG) = 61.00
DEVIATION RMS (MICRONS) = 6.07
DEVIATION MAX (MICRONS) = 19.26
DEVIATION MIN (MICRONS) = -18.91

POS#3 FWD
CAM ECCEN R (MICRONS) = 1529.48
ROTARY POT GAIN = 345.94
POT OFFSET (DEG) = 61.00
DEVIATION RMS (MICRONS) = 5.25
DEVIATION MAX (MICRONS) = 16.22
DEVIATION MIN (MICRONS) = -17.94

POS#3 BWD
CAM ECCEN R (MICRONS) = 1532.24
ROTARY POT GAIN = 345.94
POT OFFSET (DEG) = 61.00
DEVIATION RMS (MICRONS) = 5.90
DEVIATION MAX (MICRONS) = 19.34
DEVIATION MIN (MICRONS) = -20.93

=== TEST PASS! ===
--- END OF TEST ---

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

34-5
TIME OF TEST: 12/18/2007 1:25:33 PM

POS#1 FWD
CAM ECCEN R (MICRONS) = 1526.78
ROTARY POT GAIN = 345.17
POT OFFSET (DEG) = 60.79
DEVIATION RMS (MICRONS) = 5.38
DEVIATION MAX (MICRONS) = 20.16
DEVIATION MIN (MICRONS) = -12.06

POS#1 BWD
CAM ECCEN R (MICRONS) = 1529.44
ROTARY POT GAIN = 345.17
POT OFFSET (DEG) = 60.79
DEVIATION RMS (MICRONS) = 6.33
DEVIATION MAX (MICRONS) = 18.74
DEVIATION MIN (MICRONS) = -18.61

POS#2 FWD
CAM ECCEN R (MICRONS) = 1527.87
ROTARY POT GAIN = 345.17
POT OFFSET (DEG) = 60.79
DEVIATION RMS (MICRONS) = 5.42
DEVIATION MAX (MICRONS) = 19.89
DEVIATION MIN (MICRONS) = -15.02

POS#2 BWD
CAM ECCEN R (MICRONS) = 1528.08
ROTARY POT GAIN = 345.17
POT OFFSET (DEG) = 60.79
DEVIATION RMS (MICRONS) = 6.26
DEVIATION MAX (MICRONS) = 20.04
DEVIATION MIN (MICRONS) = -20.60

POS#3 FWD
CAM ECCEN R (MICRONS) = 1526.86
ROTARY POT GAIN = 345.17
POT OFFSET (DEG) = 60.79
DEVIATION RMS (MICRONS) = 5.26
DEVIATION MAX (MICRONS) = 19.22
DEVIATION MIN (MICRONS) = -12.21

POS#3 BWD
CAM ECCEN R (MICRONS) = 1529.04
ROTARY POT GAIN = 345.17
POT OFFSET (DEG) = 60.79
DEVIATION RMS (MICRONS) = 6.20
DEVIATION MAX (MICRONS) = 16.90
DEVIATION MIN (MICRONS) = -18.14

=== TEST PASS! ===
--- END OF TEST ---

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
4637 N. 25th Ave.
Schiller Park, IL
60176

PHONE: (847) 678-1616
FAX: (847) 678-1716

RE: PURCHASE ORDER 18320

PRINT NUMBER(S) (if applicable) L143 0802-200030
76 PCS.

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

11/19/07
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
4637 N. 25th Ave.
Schiller Park, IL
60176

PHONE: (847) 678-1616
FAX: (847) 678-1716

RE: PURCHASE ORDER 18320

PRINT NUMBER(S) (if applicable) L143 0802-200021
76 PCS.

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

11/19/07
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
4637 N. 25th Ave.
Schiller Park, IL
60176

PHONE: (847) 678-1616
FAX: (847) 678-1716

RE: PURCHASE ORDER 18320

PRINT NUMBER(S) (if applicable) L143 0802-200011
76 PCS.

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

11/19/07
Date

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 Muelaz 09-07-07
Date

Certificate of Inspection

HI-LINE

Manufacturing

ISO 9001:2000 CERTIFIED

This certificate is presented to

Argonne National Laboratory

Per PO # 7A-08189, part ##
L1430401-100103 (PF-381-000-15) quantity of 136pcs
L1430401-100303 (PF-381-002-15) quantity of 34pcs
Have been inspected and met all drawing requirements.

Q.C. Supervisor

09-07-07
Date

INSPECTION / ACCEPTANCE REPORT OF COMPONENTS FOR AS-BUILT DRAWINGS

VENDOR: **METALEX, INC.**

PART NAME: **UNDULATOR GIRDER ASSY**

DRAWING #: **L1430401-100400 (05)**

SERIAL #: 34

P.O. #: **7A-08189**

DATE: 02-28-08

ACCEPTANCE CRITERIA

1. Visually inspect for damage.	Accept/Reject

CRITICAL DIMENSIONS (mm)

FEATURE	TARGET	TOLERANCE	MEASURED VALUE	
Perpendicularity of Datum B to C	</=.025	</=.025	<=.025	Accept/Reject
Perpendicularity of Datum A to C	</=.025	</=.025	<=.025	Accept/Reject
True position of 2 D2 hole to 2 D3 holes	</=.03	</=.03	<=.03	Accept/Reject
Parallelism of support pad surface to Datum C	</=.07	</=.07	#1 <=.05 #2 <=.05 #3 <=.05 #4 <=.05	Accept/Reject
Distance from Datum C to support pad surface	109.50	+.2/-.2	#1 109.39 #2 109.39 #3 109.47 #4 109.45	Accept/Reject

INSPECTOR: Smow

QA Supervisor: Muelaz

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

COMMENTS:

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 #: 34

P.O. #: **7A-08189**

DATE: 08-24-07

ACCEPTANCE CRITERIA

1. Visually inspect for damage.	Accept/Reject

CRITICAL DIMENSIONS (mm)

FEATURE	TARGET	TOLERANCE	MEASURED VALUE	
Flatness of Datum A	</=.02	</=.02	<=.02	Accept/Reject
Perpendicularity of Datum B to A	</=.02	</=.02	<=.02	Accept/Reject
Parallelism of upper edge on lower Cam Block C to B	</=.02	</=.02	<=.01	Accept/Reject
Parallelism of lower edge on upper Cam Block C to B	</=.02	</=.02	<=.01	Accept/Reject
Parallelism of upper edge on upper Cam Block C to B	</=.02	</=.02	<=.01	Accept/Reject
Width of mounting surface on lower Cam Block	142.01	+.02/-.0	142.02	Accept/Reject
Width of mounting surface on upper Cam Block	142.01	+.02/-.0	142.02	Accept/Reject
Separation of inner edges of Cam Bocks	457.43	+0.08/-.08	457.47	Accept/Reject

INSPECTOR: Simon

QA Supervisor: Mustafa

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

COMMENTS:

LCLS Linac Coherent Light Source Stanford Synchrotron Radiation Laboratory Stanford Linear Accelerator Center

Procedure Number: L143-00093
Revision: 01
Issue Date: February 13, 2007

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 #: 34

P.O. #: **7A-08189**

DATE: 08-28-07

ACCEPTANCE CRITERIA

1. Visually inspect for damage.	Accept/Reject

CRITICAL DIMENSIONS (mm)

FEATURE	TARGET	TOLERANCE	MEASURED VALUE	
Flatness of Datum A	<=.02	<=.02	<=.01	Accept/Reject
Perpendicularity of Datum B to A	<=.02	<=.02	<=.01	Accept/Reject
Parallelism of inner edge on Cam Block A to B	<=.02	<=.02	<=.01	Accept/Reject
Parallelism of inner edge on Cam Block B to B	<=.02	<=.02	<=.01	Accept/Reject
Parallelism of outer edge on Cam Block B to B	<=.02	<=.02	<=.01	Accept/Reject
Width of mounting surface on Cam Block B	142.01	+.02/-.0	142.02	Accept/Reject
Width of mounting surface on Cam Block A	254.00	+.02/-.0	254.01	Accept/Reject
Separation of outer edges of Cam Bocks	685.42	+0.08/-.08	685.48	Accept/Reject

INSPECTOR: Simon

QA Supervisor: Miyaga

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

COMMENTS:

Metalex Manufacturing Inc.
5750 Cornell Road • Cincinnati, OH 45242
Phone (513) 489-0507 • Fax (513) 489-1020
EMAIL: metalex@metalexmfg.com

Metalex
Customized Machinery and Parts
ISO 9001:2000 and AS9100 CERTIFIED
Veteran Owned Business 30 Plus Years

METALEX WELD CERTIFICATION

MX JOB #: 07-7558 QTY 3 CUSTOMER: Hi-Tech Manufacturing, Inc.

PART NAME: Support Girder

PART NUMBER: L1430401-100400 REVISION: 6

S/N: (if applicable) 7A-08198-33, 7A-08198-34, & 7A-08198-37

METALEX PROCEDURE # WPS 146 (K. Ballard)

CUST. SPECIFICATION # AWS D1.1

WELD WIRE SPEC AWS A5.20

TYPE E71T-1

HEAT 81192 & 81571

DIAMETER 1/16"

SERIAL NUMBER	WELDER
7A-08198-33	Ken Ballard
7A-08198-34	Ken Ballard
7A-08198-37	Ken Ballard

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

Katrina Black
Metalex Quality Control

2/26/08
Date

MX1025 (9/98)

Metalex Customized Machinery and Parts — CERTIFIED ISO 9001 QUALITY MANAGEMENT	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		
☐ Receiving ☐ In-Process x Final ☐ Rework/Repair ☐ First Article	Vendor Name N/A		Part No. L1430401-100400	REV 6	P.O. Number 16185
	Date Rec'd N/A	P.O. No. N/A	Part Name Undulator Support Girder		
At Oper. 170	Serial Numbers: 34		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
**** 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	20.50° C	MTX QC 8	
PART TEMPERATURE ***DURING*** INSPECTION (Record in Celsius)	SOW 4.5.4	CONTACT THERMOMETER MX1794	20.50° C	MTX QC 8	
PART TEMPERATURE ***AFTER*** INSPECTION (Record in Celsius)	SOW 4.5.4	CONTACT THERMOMETER MX1794	20.48° 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	.010	MTX QC 8	
B) *Perpendicularity of Datum B to Datum C* ⊥ | .25 [.010]|A|C	E8	CMM MX1269	.013	MTX QC 8	
C) Flatness of datum A of .030 [.001]	N/A	CMM MX1269	.008	MTX QC 8	
D) *Perpendicularity of Datum A to Datum C* ⊥ | .25 [.010]|C	D8	CMM MX1269	.009	MTX QC 8	
E) 9X ∅ 6.338 – 6.350 *marked "D1", "D2" & "D3"*	E7 E6 E3	CMM MX1269	6.338 – 6.348 9 PLACES	MTX QC 8	
F) *True position of "D3" holes* 2X ⊕ | .1 [.004]|A|B|C ⊕ | .03 [.0012]B|C	E3	CMM MX1269	.034 AND .098 .025	MTX QC 8	
F) *True position of "D2" holes* 2X ⊕ | .1 [.004]|A|B|C ⊕ | .03 [.0012]B|C	E6	CMM MX1269	.041 AND .050 .013	MTX QC 8	
F) *Locations of "D1" holes* 444.50 [17.500]	E7	CMM MX1269	444.500	MTX QC 8	

STAMP	INSPECTED BY	DATE	PAGE	QTY ACC	QTY REJ
MTX QC 8	THOMAS G COOK	2/13/08	1 OF 2	1	0

Metalex Customized Machinery and Parts — CERTIFIED ISO 9001 QUALITY MANAGEMENT	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		
☐ Receiving ☐ In-Process x Final ☐ Rework/Repair ☐ First Article	Vendor Name N/A		Part No. L1430401-100400	REV 6	P.O. Number 16185
	Date Rec'd N/A	P.O. No. N/A	Part Name Undulator Support Girder		
At Oper. 170	Serial Numbers: 34		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
1968.50 [77.500]	E4	CMM MX1269	1968.459	MTX QC 8	
3492.50 [137.500]	E2	CMM MX1269	3492.449	MTX QC 8	
2X 523.6 [20.61]	E1	CMM MX1269	523.572 523.586 523.582	MTX QC 8	
3185.26 [125.404]	D2	CMM MX1269	3185.238	MTX QC 8	
845.29 [33.179]	D6	CMM MX1269	845.289	MTX QC 8	
2X 95.10 [3.744]	D8	CMM MX1269	95.114 95.118	MTX QC 8	
SHEET 2 – SIDE VIEW					
A) -C- ⏥ .030 [.0012] 2X Surface "J"	C8	CMM MX1269	.028	MTX QC 8	
B) -C- ⏥ .05 [.002]	C8	CMM MX1269	.037	MTX QC 8	
SHEET 2 – BOTTOM VIEW					
A) 2X 749.78 ± .15	C7	CMM MX1269	749.798 749.809	MTX QC 8	
B) 2X 2340.00 ± .15	C5	CMM MX1269	2339.965 2339.949	MTX QC 8	
C) 4X // .05 [.002] B	B2	CMM MX1269	.004 .009 .005 .003	MTX QC 8	
D) 4X // .030 [.0012] A	B7	CMM MX1269	.004 .006 .001 .006	MTX QC 8	
SHEET 3 – SECTION B-B					
E) // .07 [.003] C	C2	CMM MX1269	.068	MTX QC 8	
F) 4X 109.47 ± .08	C2	CMM MX1269	109.395 - 109.463	MTX QC 8	
ALL OTHER FEATURES ARE ACCEPTED PER METALEX OPERATOR ACCEPTANCE PROGRAM (OAP) MXW117001 & OPERATOR SIGNOFF OF ROUTER OPERATIONS FOR COMPLIANCE TO ALL DRAWING FEATURES GENERATED WITHIN THAT DEFINED OPERATION.		ROUTER SIGNOFF MX5009	CONFORMS	MTX QC 8	

STAMP	INSPECTED BY	DATE	PAGE 2 OF 2	QTY ACC	QTY REJ
MTX QC 8	THOMAS G COOK	2/13/08		1	0

MX1010 (7/98)

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

Certification ID
37990

Order ID
980599

CERTIFICATION OF COMPLIANCE

CUSTOMER

Metalex Mfg., Inc.
5750 Cornell Road

Cincinnati OH
Blkt Ord # 45242

Hi-Tech
906#7558

METALEX
Q. A. DEPT
ACCEPTED
DATE 2/20/08
BY KKB
MTX QC 19

Purchase Order 74470 **Customer Cust**

Qty	Part No / Description	Material
4	L1430401-100400 SUPPORT GIRDER	A36

REV 5V S/N 7A-08198-33 THRU 7A-08198-36

STRESS RELIEVE PER AWS D1.1 REV. 2004. SECTION 5.8, TABLE 5.2.
NOTE: SUPPORT TO PREVENT DISTORTION.
HEAT TREAT CHARTS REQUIRED.
CERTIFICATIONS REQUIRED.

RESULTS

THE ABOVE PARTS HAVE BEEN HEAT TREATED TO THE FOLLOWING:

HEAT TREATMENT STRESS RELIEVED AT 1150° F

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.

James M. Hunt

NAME JAMES M. HUNT
TITLE QA MANAGER
DATE 1/29/2008

Metalex Manufacturing Inc.
5750 Cornell Road · Cincinnati, OH 45242
Phone (513) 489-0507 · Fax (513) 489-1020
EMAIL: metalex@metalexmfg.com

Metalex
Customized Machinery and Parts
ISO 9001:2000 and AS9100 CERTIFIED
Veteran Owned Business 30 Plus Years

CERTIFICATE OF CONFORMANCE

Date: 02/26/08
Customer: Hi-Tech Manufacturing, Inc.
4637 N. 25th Ave.
Schiller Park, IL 60176

Attention: Simon Sorsher

Metalex Job# 2007-7558
Purchase Order # 16185
MX Packing List # 41864

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	3	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-08198-33, 7A-08198-34, & 7A-08198-37.

Some internal documents in this quality package may contain documents certfiying 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 Workscope 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.

Katrina Black	Katrina Black	2/26/08
Metalex Representative Signature	Print Name	Date

MX1011 (05/05)

NTI

ZERUST Material Safety Data Sheet

Z-Maxx Lube – Heavy Duty Grease

SECTION 1

MSDS# 4-4.3-12-1-180 Rev A

Technical Phone: 651-784-1250 Date Prepared 6 July 2004

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 (29CRF 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:	CO^2 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 termperatures.
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 1 of 1

E.360

Product Data Sheet

KeelerLong

PPG High Performance Coatings

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

Kolor-Poxy™ Enamel KLJ Series

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 (757 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"~~ 1 to 1 ratio

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. @ 2.5 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

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

BLUE 1/2

E.360

Product Data Sheet

KeelerLong

PPG High Performance Coatings

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

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.

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Primer 1 of 2

E.140

Product Data Sheet

Kolor-Poxy™ Primer KL3200 Series

KeelerLong

PPG High Performance Coatings

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

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.

The statement and methods presented in this bulletin are based upon the best available data and practices known to PPG/Keeler & Long at the present time. They are not representations or warranties of performance, results or comprehensiveness of such data. Since PPG /Keeler & Long 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/Keeler & Long Sales Representative for the most up-to-date information.

Primer 2of2

E.140

Product Data Sheet

Keeler & Long

PPG High Performance Coatings

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

Kolor-Poxy™ Primer KL3200 Series

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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Bodycote Taussig Inc.
Metallurgical & Materials Engineers

ISO 9002 ACCREDITED NADCAP

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/O_2 - 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 NOTED: N/A

TEST CONDUCTED BY: **BODYCOTE TAUSSIG, INC.** LABORATORY NO.: 134477
PER: **Lawrence E. Smetana, CWI** TEST DATE: March 20, 1997

AWS QC1 LAWRENCE E. SMETANA 79080061 CWI

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.

CERTIFIED MILL TEST REPORT

For additional copies call (800) 637-3227

CMC Steel - Alabama
P.O. Box 321188
Birmingham, AL 35232-1188
www.smi-al.com

CMC Steel - South Carolina
Box 2005
Cayce, SC 29171-2005
www.smi-sc.com

We hereby certify that the test results presented here are accurate and conform to the reported grade specification.

John F. Powell

John F. Powell - CMC Steel AL
Quality Assurance Manager

HEAT NO.: J62810
SECTION: F 8X3/4
GRADE: ASTM A529-05-50/A529-05-55
ASTM A529M-05-345/A529M-05-380

SOLD TO:

SHIP TO:

SHIP#:
BOL #:
INV #:
CUST PO#:
CUST P/N:

CHEMICAL ANALYSIS	%
C	0.25
Mn	0.96
P	0.012
S	0.035
Si	0.22
Cu	0.39
Cr	0.13
Ni	0.09
Mo	0.031
Cb	0.014
V	0.002
Sn	0.011
B	0.0003
Ti	0.001
C.Eq.	0.47
AL	0.001
N	0.006

PROPERTIES

MECHANICAL	TEST 1 IMPERIAL	TEST 1 METRIC	TEST 2 IMPERIAL	TEST 2 METRIC	TEST 3 IMPERIAL	TEST 3 METRIC
Yield Strength	60.1 KSI	414.3 MPA	60.0 KSI	413.5 MPA		
Tensile Strength	86.2 KSI	594.7 MPA	88.4 KSI	609.5 MPA		
Elongation	19 %	19 %	20 %	20 %		
Gauge Length	8 INS	203 MM	8 INS	203 MM		
Reduction of Area						
Bend Test						
Diameter						
Charpy Impact						
Test Temp						
Sample Size						
Orientation						
Hardness						

Job # 7558
P/N: 1143041-100400
PO# 71070-BL

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

JOMINY RESULTS - Rockwell C hardness at 1/16th inch increments											
1	2	3	4	5	6	7	8	9	10	11	12
13	14	15	16	18	20	22	24	26	28	30	32

GRAIN SIZE
METHOD
RESULT

INCLUSION RATING

METHOD				
TYPE				
SIZE	T H	T H	T H	T H

100% MELTED AND MANUFACTURED IN THE USA AND FREE OF MERCURY CONTAMINATION IN THE PROCESS

REMARKS:

EXCEEDS THE PHYSICAL REQUIREMENTS OF ASTM A36.

FREDERICK STEEL CO

"The Complete Steel Service Center"
Since 1933

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

(513) 821-6400
FAX (513) 821-6915
U.S.A. 1-800-543-4922

CERTIFICATE OF CONFORMANCE

METALEX Q. A. DEPT ACCEPTED DATE 7/16/07 BY TC MTX QC 28

CUSTOMER METALEX MFG INC

PO# 71070BL7558

DATE: 5/22/07

QUANTITY	DESCRIPTION	SPECIFICATION	HEAT #
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.

Dee 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

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

Hi-tech
Job# 7558
Part# L143040/-100400
P.O# 71069-BL

METALEX Q.A. DEPT ACCEPTED DATE 6/6/07 BY KKB
MTX QC 19

31 E. Sylvania Ave.
Toledo, Ohio
43612
(419) 476-5702
(419) 476-5512 Fax

ATTN: JAMES GRIFFIN

Metalex PO# 70722-JG-7558

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: 5750 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 # / SHELF LIFE
1.	5	B62WZ111		TILECLAD H.S. EW. MC-56	36 MONTH (IN OPEN)
2.	5	B60VZ70		TILECLAD H.S. HARDNER	36 MONTH (IN OPEN)
3.	1	R7K54		SI REDUCER	3 YEARS

Shelf Life ID# 2834
KKB 6/5/07 MTX QC 19

MX Shelf Life ID# 2841 thru 2844 KKB 6/5/07 MTX QC 19

SHERWIN 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: _____
Vendor Quality Rep.

cc: Hardcopy P.O. Books

MX4012 (3/93)

Metalex PO# 71829-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 #
				BATCH# OE 16376	
1	5	B62WZ111		TILECIAD H.S. SW4026	7558
				Shelf life 36 months	

SHERWIN 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.

cc: Hardcopy P.O. Books
MX4012 (5/95)

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

METALEX
Q. A. DEPT
ACCEPTED
DATE 6/29/07
BY TC
MTX QC 20

Job 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
batch date 0X26965
0X2716S
0X2785S B67US
0X0275C B67HS
0X2905Z

Metalex Manufacturing
L1430401-100400 Girder Support
Hi-Tech Purchase Order No. 16185

Visual Weld Inspection Report

Metalex Job: 2007-7558 Serial Number: 7A-08198-(34)

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) Initial: B.H. Date: 10/3/07

Fabrication Stage#2

Features: W3, W4 and W5

Acceptable (Y/N) Initial: B.H. Date: 10/3/07

Fabrication Stage#3

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

Acceptable (Y/N) Initial: B.H. Date: 1/9/08

Verification of completion of weld visual inspection:

Completed By: [signature] Date: 1/9/08

5750 Cornell Road • Blue Ash Industrial Park • Cincinnati, OH 45242
Phone (513) 489-0507 • Fax (513) 489-1020

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 completeon of weld visual inspection:

Completed by: Sanjan Sos **Date:** 11-17-07

Certificate of Inspection

HI-TECH
Manufacturing, LLC.
ISO 9001:2000 certified

This certificate is presented to

Argonne National Laboratory

Per PO # 7A-08189, part ##
L1430401-100424
serial ## A00742008, A00744021, A00740013, A00738019, A00751026
L1430401-100425
serial ## A00736014, A00735028, A00733003, A00733012, A00803009
*have been reworked to the HEIGHT DIM **3.706+/-.0005**".*

Q.C. Supervisor _____ 02-06-08
Date

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 **76**pcs*

Procedure: #PQR101
Customer Specification: #AWS D1.1
Weld wire Spec: #AWS A5.28, Type: ER80S-D2, Heat: 83479, Dia: .04
Welder: Tadeusz Sutowski

Have been welded in accordance with the referenced welding specification.

Q.C. Supervisor Mustafa A. Farooqi 11-17-07
Date

LCLS Linac Coherent Light Source Stanford Synchrotron Radiation Laboratory Stanford Linear Accelerator Center

QA Records Checklist

The purpose of this form is to verify the presence of the appropriate quality assurance records for hardware shipments being installed at SLAC. [redacted].

System or Component Name: LCLS Fixed Support Assembly

Date: 03-08-08

Part/Drawing Number: L143-143080-200000

Serial Numbers: 34

Supplier Name: Hi-Tech Manufacturing Inc

PO Number: 7A-08189

Responsible LCLS Technical Lead: M. White

Reponsible Engineer(s): E. Trakhtenberg

No.	Record Name	Document number	Origin	Comments	Present (Y, N, NA)
1.	ANL Component Acceptance Record	LCLS	ANL	ANL Acceptance record of ANL acceptance date and applicable drawing revisions.	Y
2.	Dynamic CAM test results		ANL		Y
3.	Certificates of Conformance for Vibratory Stress Relief	NA	American Grinding	L1430802-200030, L1430802-200021, L1430802-200011	Y
4.	Certificates of Inspection	NA	Hi-Tech	L1430401-100101, L1430401-100201,	Y
5.	Certificates of Inspection	NA	Hi-Tech	L1430401-100103, L1430401-100303,	Y
6.	Copies of the ANL Inspection/Acceptance Report of Components for As-Built Drawings	L143-00093	Hi-Tech	Undulator Girder	Y
7.	Copies of the ANL Inspection/Acceptance Report of Components for As-Built Drawings	L143-00093	Hi-Tech	Interface Plate (Double CAM)	Y
8.	Copies of the ANL Inspection/Acceptance Report of Components for As-Built Drawings	L143-00093	Hi-Tech	Interface Plate (Single CAM)	Y
9.	Weld Certification	NA	~~Hi-Tech~~ Metalex	Support Girder (L1430401-10040)	Y
10.	Inspection Planning & Report Form	NA	Metalex	Undulator Support Girder	Y
11.	Certificate of compliance – Stress Test	NA	Cincinnati Steel Treating Co.	Support Girder	Y
12.	Certificate of Conformance	NA	Metalex	Support Girder	Y
13.	Calibration Certificate – CMM metric & inches	TG13480 & TG13482	American Calibration Inc.	Unit is in working condition	Present in SM #1 QA
14.	Various MSDS for Paint & Oil and Concrete Epoxy Grease	NA	NA	MSDS for chemicals used.	Y
15.	Welding Operator Qualification Test Record	NA	Bodycote Taussig Inc.	Welders qualifications	Y
16.	Certificates of Conformance for Support Girder raw materials	NA	Metalex	Precision Steel Services Inc., Frederick Steel Co., CMC Steel	Present in SM #1 QA
17.	Certificate of Compliance /Statement of Quality	NA	The Sherwin-Williams Co.		Y
18.	Visual Weld Inspection Report	NA	Metalex	Girder Support	Y
19.	Visual Weld Inspection Report	NA	HiTech	Girder Support	Y

No.	Record Name	Document number	Origin	Comments	Present (Y, N, NA)
20.	Gearhead Inspection Report		GAM	In Folder	Y
21.	Certification of Single Axis Table		Lintech		Present in SM #1 QA
22.	Certificate of Conformance for CAM Motors		Animatics	Motors – In Folder	Y
23.	Shipping Crate Design Approval Record	NA	Hi-Tech		Y
24.	Misc. Photographs	NA	Hi-Tech		

Optional notes or Comments:

The Mill Certificates for the steel dimensions, chemical composition, and tensile properties are present for Girder serial number 1 only because the material for all of the girder assemblies was purchased at one time.

Additional Certificate of Inspection added for the rework of the 3.706 ±.0005" dimension

Signature of person that completed this checklist: Yelder Ftmer Date: 3/7/08

Concurrence signatures of the contents of this checklist:

Responsible ANL LCLS Engineer: [signature] Date: 03/19/08

Responsible ANL QA Coordinator: Yelder Ftmer Date: 3/7/08

Responsible ANL LCLS Technical Lead: [signature] Date: 21 March 08

ANL LCLS Project Manager: _____ Date: _____

Distribute this completed form to: ANL Records package. ANL LCLS QA. ANL LCLS Technical Lead

LCLS Linac Coherent Light Source — Stanford Synchrotron Radiation Laboratory, Stanford Linear Accelerator Center

Component Acceptance Record

THE PURPOSE OF THIS FORM IS TO PROVIDE A RECORD OF THE ACCEPTANCE OF LCLS COMPONENTS DELIVERED BY ANL, AS WELL AS ANY ISSUES THAT MAY ARISE FROM THE ACCEPTANCE PROCESS.

System or Component Name	*Part/ Drawing Number*	*Rev.*	*Qty*	*Serial No.*	Supplier Name	ANL Purchase Order Number
Fixed Support General Assembly	*L1430802-200000*	*07*	5	34,35,36, 37 & 38	Hi- Tech Manufacturing	7A-08189
Undulator Girder Assembly	*L1430401-100396*	*04*	5	34,35,36, 37 & 38	Hi- Tech Manufacturing	7A-08189

The components appearing above are being delivered to SLAC and have been deemed to meet the requirements defined in the ANL Statement of Work Document # L143-00093-03/ SLAC No.SP-381-004-26.

ANL Approval Signatures:

LCLS Quality Assurance Coordinator at ANL — Date: 4/2/08

Responsible or Chief Engineer at ANL — Date: 04/02/08

LCLS Technical Lead at ANL — Date: 2 April 08

LCLS Project Manager at ANL — Date: 04/02/08

The components appearing above have been accepted by SLAC and have been deemed to have met the requirements defined in the ANL Statement of Work Document # L143-00093-03/ SLAC No.SP-381-004-26.

SLAC Acceptance Signatures:

LCLS Quality Assurance Manager at SLAC — Date

LCLS Chief Engineer at SLAC — Date

LCLS Project Director at SLAC — Date

The LCLS Quality Assurance Manager at SLAC is responsible for retaining the original completed and for forwarding copies of the completed form to all who have signed the form