

S O U T H W E S T R E S E A R C H I N S T I T U T E

Department of Quality Assurance
Calibration Laboratory

CERTIFICATE OF CALIBRATION

Issued to: DIV20 B57 RON GREEN

Device No: 2478

Manufacturer: METTLER

Model: PM 480

Nomenclature: ELECTRONIC BALANCE

Serial Number: N45601

SwRI No: NONE

Cal interval 6 Mo.

Remarks

Accuracy: MFGR

Procedure: SWRI

ENVIRONMENT

Temperature:

Humidity:

Location: SWRI DIV20 BLDG. 57

CONCLUSION

Tolerance/Remarks: Received in tolerance, no adjustments made

Room temperature.

Calibration was in accord with requirements of MIL-STD-45662A. Measurements are traceable to the National Institute of Standards and Technology. Inspection and test data are on file and available for inspection.

Signed _____

Calibration Date: 01/06/94

Cal interval: 6 Months

Record Number: 00013088

Next Calibration Due: 07/06/94

S O U T H W E S T R E S E A R C H I N S T I T U T E

Department of Quality Assurance
Calibration Laboratory

Device Serial No: N45601

Calibration Date: 01/06/94

STANDARDS

Standard No: 1704	Manufacturer: RICE LAKE	Model: 1 GRAM
Nomenclature: WEIGHT STANDARD		
Serial No: C859	Cal.Due: 06/30/94	Cal.Rec.No: 00011756
Standard No: 1708	Manufacturer: RICE LAKE	Model: 10 GRAM
Nomenclature: WEIGHT STANDARD		
Serial No: C863	Cal.Due: 06/30/94	Cal.Rec.No: 00011760
Standard No: 1711	Manufacturer: RICE LAKE	Model: 50 GRAM
Nomenclature: WEIGHT STANDARD		
Serial No: C866	Cal.Due: 06/30/94	Cal.Rec.No: 00011763
Standard No: 1712	Manufacturer: RICE LAKE	Model: 100 GRAM
Nomenclature: WEIGHT STANDARD		
Serial No: C867	Cal.Due: 06/30/94	Cal.Rec.No: 00011764
Standard No: 1713	Manufacturer: RICE LAKE	Model: 200 GRAM
Nomenclature: WEIGHT STANDARD		
Serial No: C868	Cal.Due: 06/30/94	Cal.Rec.No: 00011765
Standard No: 1714	Manufacturer: RICE LAKE	Model: 200 GRAM
Nomenclature: WEIGHT STANDARD		
Serial No: C869	Cal.Due: 06/30/94	Cal.Rec.No: 00011766

BALANCE CALIBRATION VERIFICATION FORM

DATE: 6 JAN 94

M-FGR: METTLER

MODEL: PM480

SER. NO. 445601 RANGE: 450

CALIBRATION DATES

TEMPERATURE: Room HUMIDITY: Room

LAST: 0 JUL 93

NEXT: 6 JUL 94

CALIBRATED BY: Terry A. White

BALANCE TOLERANCES

BALANCE CAL #: 0013088 0013085 KLH

LINE. TOL.: _____

REP. TOL.: _____

	RANGE #1			RANGE #2			RANGE #3		
	CALIBRATION POINTS			CALIBRATION POINTS			CALIBRATION POINTS		
DATA PTS.	1	2	3	1	2	3	1	2	3
RUN #1	400g	200g	100g	50g	10g	1g			
MEAN	400.00	200.00	100.00	50.000	10.000	1.000			
STD. DEV.	100.00	200.00	100.00	50.000	10.000	1.000			

SHIFT VERIFICATION

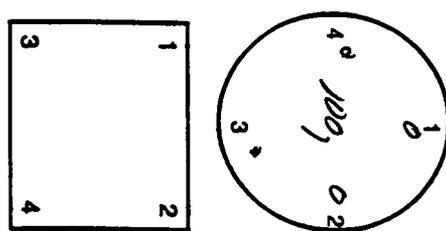
SELF CALIBRATION Y/N INTERNAL: _____ EXTERNAL: 100g

WEIGHT VALUE	PAN POSITION			
	1	2	3	4
<u>100g</u>	<u>100.00</u>	<u>100.00</u>	<u>100.00</u>	<u>100.00</u>

COMMENTS:

SIGNATURE: [Signature]

POSITION GUIDE



S O U T H W E S T R E S E A R C H I N S T I T U T E

Department of Quality Assurance
Calibration Laboratory

CERTIFICATE OF CALIBRATION

Issued to: DIV20 B57 RON GREEN

Device No: 2478

Manufacturer: METTLER

Model: PM 480

Nomenclature: ELECTRONIC BALANCE

Serial Number: N45601

SwRI No: NONE

Cal interval 6 Mo.

Remarks

Accuracy: MFGR

Procedure: SWRI

ENVIRONMENT

Temperature:

Humidity:

Location: SWRI DIV20 BLDG. 51

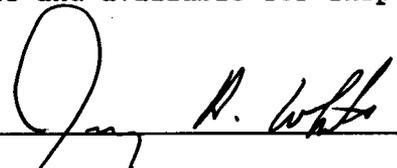
CONCLUSION

Tolerance/Remarks: Received in tolerance, no adjustments made

Room Temperature.

Calibration was in accord with requirements of MIL-STD-45662A. Measurements are traceable to the National Institute of Standards and Technology. Inspection and test data are on file and available for inspection.

Signed



Calibration Date: 06/23/94

Cal interval: 6 Months

Record Number: 00014470

Next Calibration Due: 12/23/94

S O U T H W E S T R E S E A R C H I N S T I T U T E

Department of Quality Assurance
Calibration Laboratory

Device Serial No: N45601

Calibration Date: 06/23/94

STANDARDS

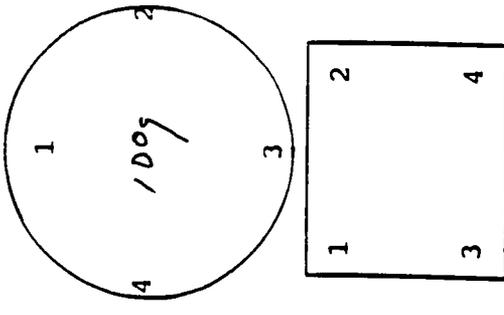
Standard No: 1704	Manufacturer: RICE LAKE	Model: 1 GRAM
Nomenclature: WEIGHT STANDARD		
Serial No: C859	Cal.Due: 06/30/94	Cal.Rec.No: 00011756
Standard No: 1708	Manufacturer: RICE LAKE	Model: 10 GRAM
Nomenclature: WEIGHT STANDARD		
Serial No: C863	Cal.Due: 06/30/94	Cal.Rec.No: 00011760
Standard No: 1710	Manufacturer: RICE LAKE	Model: 20 GRAM
Nomenclature: WEIGHT STANDARD		
Serial No: C865	Cal.Due: 06/30/94	Cal.Rec.No: 00011762
Standard No: 1711	Manufacturer: RICE LAKE	Model: 50 GRAM
Nomenclature: WEIGHT STANDARD		
Serial No: C866	Cal.Due: 06/30/94	Cal.Rec.No: 00011763
Standard No: 1712	Manufacturer: RICE LAKE	Model: 100 GRAM
Nomenclature: WEIGHT STANDARD		
Serial No: C867	Cal.Due: 06/30/94	Cal.Rec.No: 00011764
Standard No: 1713	Manufacturer: RICE LAKE	Model: 200 GRAM
Nomenclature: WEIGHT STANDARD		
Serial No: C868	Cal.Due: 06/30/94	Cal.Rec.No: 00011765
Standard No: 1714	Manufacturer: RICE LAKE	Model: 200 GRAM
Nomenclature: WEIGHT STANDARD		
Serial No: C869	Cal.Due: 06/30/94	Cal.Rec.No: 00011766

BALANCE CALIBRATION VERIFICATION FORM

DATE: 23 JUN 94 MFGR.: METTLER MODEL: PM480
 SER. NO. N45601 RANGE: 410/90g CALIBRATION DATES
 TEMPERATURE: Room HUMIDITY: R. LAST: 6 JAN 94 NEXT: 23 DEC 94
 CALIBRATED BY: Jerrey A. White PRINT NAME
 BALANCE CAL #: 14470 LIN. TOL.: .01/.002 BALANCE TOLERANCES
 REP. TOL.: .003/.001

RANGE VERIFICATION

	RANGE #1			RANGE #2			RANGE #3		
	1	2	3	1	2	3	1	2	3
DATA PTS.	4005	2005	1003	605	205	15			
RUN #1	397.97	200.00	100.00	60.000	20.001	1.001			
RUN #2	399.57	200.00	100.00	60.000	20.001	1.001			
RUN #3	398.59	200.00	100.00	60.000	20.001	1.001			
MEAN									
STD. DEV.									



SHIFT VERIFICATION

SELF CALIBRATION Y/N INTERNAL: _____ EXTERNAL: Y001

WEIGHT VALUE	PAN POSITION			
	1	2	3	4
<u>100g</u>	<u>101.00</u>	<u>100.00</u>	<u>100.01</u>	<u>100.00</u>

COMMENTS: _____

SIGNATURE: _____

[Handwritten Signature]

S O U T H W E S T R E S E A R C H I N S T I T U T E

Department of Quality Assurance
Calibration Laboratory

CERTIFICATE OF CALIBRATION

Issued to: DIV20 B51 RANDALL MANTUEFEL

Device No: 2478

Manufacturer: METTLER

Model: PM 480

Nomenclature: ELECTRONIC BALANCE

Serial Number: N45601

SwRI No: NONE

Cal interval 6 Mo.

Remarks

Accuracy: MFGR

Procedure: SWRI

ENVIRONMENT

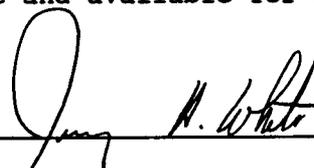
Temperature: 0 Humidity: 0 Location: SWRI BLDG. 51

CONCLUSION

Tolerance/Remarks: Received into the system, introduced or reactivated

Calibration was in accord with requirements of MIL-STD-45662A. Measurements are traceable to the National Institute of Standards and Technology. Inspection and test data are on file and available for inspection.

Signed



Calibration Date: 07/08/93

Cal interval: 6 Months

Record Number: 00011705

Next Calibration Due: 01/08/94



S O U T H W E S T R E S E A R C H I N S T I T U T E

Department of Quality Assurance
Calibration Laboratory

Device Serial No: N45601

Calibration Date: 07/08/93

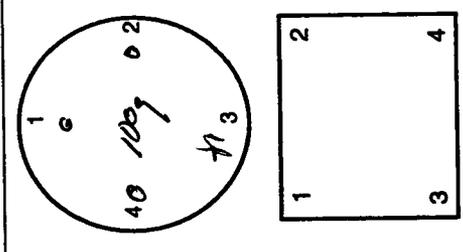
STANDARDS

Standard No: 1704	Manufacturer: RICE LAKE	Model: 1 GRAM
Nomenclature: WEIGHT STANDARD		
Serial No: C859	Cal.Due: 07/08/93	Cal.Rec.No: 00000000
Standard No: 1709	Manufacturer: RICE LAKE	Model: 20 GRAM
Nomenclature: WEIGHT STANDARD		
Serial No: C864	Cal.Due: 07/08/93	Cal.Rec.No: 00000000
Standard No: 1711	Manufacturer: RICE LAKE	Model: 50 GRAM
Nomenclature: WEIGHT STANDARD		
Serial No: C866	Cal.Due: 07/08/93	Cal.Rec.No: 00000000
Standard No: 1712	Manufacturer: RICE LAKE	Model: 100 GRAM
Nomenclature: WEIGHT STANDARD		
Serial No: C867	Cal.Due: 07/08/93	Cal.Rec.No: 00000000
Standard No: 1713	Manufacturer: RICE LAKE	Model: 200 GRAM
Nomenclature: WEIGHT STANDARD		
Serial No: C868	Cal.Due: 07/08/93	Cal.Rec.No: 00000000
Standard No: 1714	Manufacturer: RICE LAKE	Model: 200 GRAM
Nomenclature: WEIGHT STANDARD		
Serial No: C869	Cal.Due: 07/08/93	Cal.Rec.No: 00000000

BALANCE CALIBRATION VERIFICATION FORM

DATE: 8 JUL 93 MFGR: METTLER MODEL: PM480
 SER. NO. N 45601 RANGE: 410g/80g CALIBRATION DATES
 TEMPERATURE: ✓ HUMIDITY: ✓ LAST: NEW NEXT: 8 JAN 94
 CALIBRATED BY: [Signature] BALANCE TOLERANCES
 BALANCE CAL #: 11705 LINE. TOL.: 0.002 REP. TOL.: 0.001/0.001

	RANGE VERIFICATION												POSITION GUIDE				
	RANGE #1 410			RANGE #2 80g			RANGE #3			CALIBRATION POINTS							
	CALIBRATION POINTS	1	2	3	1	2	3	1	2	3	1	2		3			
DATA PTS.	400g	100g	1g	50	20	1g											
RUN #1	410.00	100.00	1.000	50.000	20.000	1.000											
RUN #2	400.00	100.00	1.000	50.000	20.000	1.000											
RUN #3	400.00	100.00	1.000	50.000	20.000	1.000											
MEAN	400.00	100.00	1.000	50.000	20.000	1.000											
STD. DEV.																	



SHIFT VERIFICATION
 SELF CALIBRATION YN INTERNAL: ✓ EXTERNAL 100g
 COMMENTS:
 SIGNATURE: [Signature]

WEIGHT VALUE	PAN POSITION			
	1	2	3	4
100g	100.000	100.000	100.001	100.000

SOUTHWEST RESEARCH INSTITUTE

**Department of Quality Assurance
Calibration Laboratory**

**CERTIFICATE OF CALIBRATION
12/22/94**

Issued to: **RON GREEN** **DIV20 ,B57**
Manufacturer: **METTL**
Nomenclature: **ELECTRONIC BALANCE**
Serial Number: **N45601**

Asset Number: **002478**
Model Number: **PM 480**
SwRI Capital Number: **NONE**

ENVIRONMENTAL CONDITIONS

Temperature: **75.0F**

Relative Humidity: **41 %**

CALIBRATION INFORMATION

Location: **B57**
Procedure Number: **SWRI**
Remarks:

Technician: **7213**
Accuracy: **MFRG SPECS**
Received IN Tolerance

**Calibration was in accordance with requirements of MIL-STD-45662A.
Measurements are traceable to the National Institute of Standards and Tech-
nology. Inspection and test data are on file and available for inspection.**

STANDARDS USED FOR CERTIFICATION

Asset #	Serial #	Mfg	Model #	Nomenclature	Cal Date	Int.	Cal Due
001714	C869	RICE	200 GRAM	WEIGHT STANDARD	07/20/94	12	07/20/95
001713	C868	RICE	200 GRAM	WEIGHT STANDARD	07/20/94	12	07/20/95
001712	C867	RICE	100 GRAM	WEIGHT STANDARD	07/20/94	12	07/20/95
001711	C866	RICE	50 GRAM	WEIGHT STANDARD	07/20/94	12	07/20/95
001710	C865	RICE	20 GRAM	WEIGHT STANDARD	07/20/94	12	07/20/95
001708	C863	RICE	10 GRAM	WEIGHT STANDARD	07/20/94	12	07/20/95
001704	C859	RICE	1 GRAM	WEIGHT STANDARD	07/20/94	12	07/20/95

Certified by : 

Certificate#: **16067**

Calibration Date: **12/21/94**
Interval: **6 months**
Next Calibration Due: **06/21/95**

BALANCE CALIBRATION VERIFICATION FORM

DATE: 21 Dec 94 MFGR: METTLER MODEL: PM 480

SER. NO. N45601 RANGE: 400g CALIBRATION DATES

TEMPERATURE: 75° HUMIDITY: 41% LAST: 23 JUN 94 NEXT: 21 JUN 95

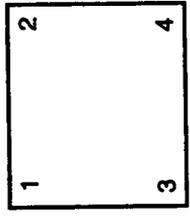
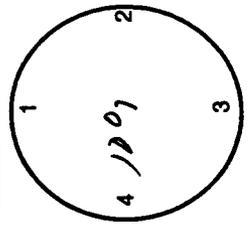
CALIBRATED BY: Jerry P. White

BALANCE CAL #: 16067 LINE. TOL.: .01/02 REP. TOL.: 003/001

BALANCE TOLERANCES

	RANGE #1			RANGE #2			RANGE #3		
	CALIBRATION POINTS								
DATA PTS.	400	200g	100g	50	20	15			
RUN #1	399.99	199.99	100.00	50.000	20.000	1.000			
RUN #2	399.99	200.00	100.00	50.000	20.000	1.000			
RUN #3	399.99	199.99	100.00	50.000	20.000	1.000			
MEAN									
STD. DEV.									

(100.02)



POSITION GUIDE

COMMENTS: End is 66.57

SELF CALIBRATION YN INTERNAL: _____ EXTERNAL LDG

WEIGHT VALUE	PAN POSITION			
	1	2	3	4
100g	100.00	100.00	100.00	100.00

SIGNATURE: [Signature]

SOUTHWEST RESEARCH INSTITUTE

**Department of Quality Assurance
Calibration Laboratory**

**CERTIFICATE OF CALIBRATION
05/04/95**

Issued to: RON GREEN DIV20 ,B57
Manufacturer: METTL
Nomenclature: ELECTRONIC BALANCE
Serial Number: N45601

Asset Number: 002478
Model Number: PM 480

SwRI/Div. I.D. #: NONE

ENVIRONMENTAL CONDITIONS

Temperature: 79.0F

Relative Humidity: 48%

CALIBRATION INFORMATION

Procedure Number: SWRI
Remarks: SCALE WAS REPAIRED BY METTLER. HAD CORRECT
READING HOWEVER IS WAS UNSTABLE.

Accuracy: MFGR SPECS
Received IN Tolerance

**Calibration was in accordance with requirements of MIL-STD-45662A.
Measurements are traceable to the National Institute of Standards and Tech-
nology. Inspection and test data are on file and available for inspection.**

STANDARDS USED FOR CERTIFICATION

Asset #	Serial #	Mfg	Model #	Nomenclature	Cal Date	Int.	Cal Due
001714	C869	RICE	200 GRAM	WEIGHT STANDARD	07/20/94	12	07/20/95
001713	C868	RICE	200 GRAM	WEIGHT STANDARD	07/20/94	12	07/20/95
001712	C867	RICE	100 GRAM	WEIGHT STANDARD	07/20/94	12	07/20/95
001711	C866	RICE	50 GRAM	WEIGHT STANDARD	07/20/94	12	07/20/95
001710	C865	RICE	20 GRAM	WEIGHT STANDARD	07/20/94	12	07/20/95
001708	C863	RICE	10 GRAM	WEIGHT STANDARD	07/20/94	12	07/20/95
001704	C859	RICE	1 GRAM	WEIGHT STANDARD	07/20/94	12	07/20/95

Certified by :



Certificate#: 17009

Calibration Date: 05/04/95
Interval: 6 months
Next Calibration Due: 11/04/95

BALANCE CALIBRATION VERIFICATION FORM

DATE: 4 MAY 95 MFGR: METTLER MODEL: PM480
 SER. NO. 145601 RANGE: 400g CALIBRATION DATES
 TEMPERATURE: 77 HUMIDITY: 40% LAST: 21 DEC 94 NEXT: 1 NOV 95
 CALIBRATED BY: Ferry A. White
 BALANCE CAL #: 17009 LINE. TOL.: 0.0007 REP. TOL.: 0.001

BALANCE TOLERANCES

RANGE VERIFICATION

	RANGE #1			RANGE #2			RANGE #3		
	CALIBRATION POINTS			CALIBRATION POINTS			CALIBRATION POINTS		
DATA PTS.	1	2	3	1	2	3	1	2	3
RUN #1	400	200	100g	50	20	10			
RUN #2	400.01	200.00	100.00	50.000	20.000	10.000			
RUN #3	400.01	200.00	100.00	50.000	20.000	10.000			
MEAN				50.000	20.000	10.000			
STD. DEV.				OK					

SHIFT VERIFICATION

SELF CALIBRATION Y/N INTERNAL: _____ EXTERNAL: _____

WEIGHT VALUE	PAN POSITION			
	1	2	3	4
100g	100.00	100.00	100.00	100.00

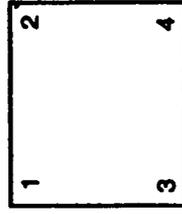
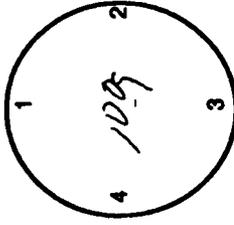
COMMENTS:

Cal after Mettler replaced mechanical parts within balance.

SIGNATURE:

Ferry A. White

POSITION GUIDE



SOUTHWEST RESEARCH INSTITUTE

**Department of Quality Assurance
Calibration Laboratory**

**CERTIFICATE OF CALIBRATION
02/14/96**

Issued to: **RON GREEN** **DIV20** **,B57**
Manufacturer/Model: **METTL/PM 480**
Nomenclature: **ELECTRONIC BALANCE**
Serial Number: **N45601**
Asset Number: **002478**
Notes:

ENVIRONMENTAL CONDITIONS

Temperature: **72.0F**

Relative Humidity: **23%**

CALIBRATION INFORMATION

Procedure Number: **WI-9-33-WT01**
Remarks:

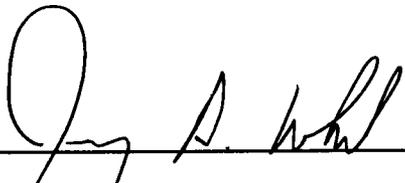
Accuracy: **MFR SPECS**
Received IN **Tolerance**

**Calibration was in accordance with requirements of MIL-STD-45662A.
Measurements are traceable to the National Institute of Standards and Tech-
nology. Inspection and test data are on file and available for inspection.**

STANDARDS USED FOR CERTIFICATION

Asset #	Serial #	Mfg	Model #	Nomenclature	Cal Date	Int.	Cal Due
001714	C869	RICE	200 GRAM	WEIGHT STANDARD	06/23/95	12	06/23/96
001713	C868	RICE	200 GRAM	WEIGHT STANDARD	06/23/95	12	06/23/96
001712	C867	RICE	100 GRAM	WEIGHT STANDARD	06/23/95	12	06/23/96
001711	C866	RICE	50 GRAM	WEIGHT STANDARD	06/23/95	12	06/23/96
001710	C865	RICE	20 GRAM	WEIGHT STANDARD	06/23/95	12	06/23/96
001708	C863	RICE	10 GRAM	WEIGHT STANDARD	06/23/95	12	06/23/96
001704	C859	RICE	1 GRAM	WEIGHT STANDARD	06/23/95	12	06/23/96

Certified by :



Calibration Date: **02/13/96**
Interval: **6 months**
Next Calibration Due: **08/13/96**

Certificate#: **20204**

BALANCE CALIBRATION VERIFICATION FORM

DATE: 13 Feb 96 MFR: METTLER MODEL: PM480

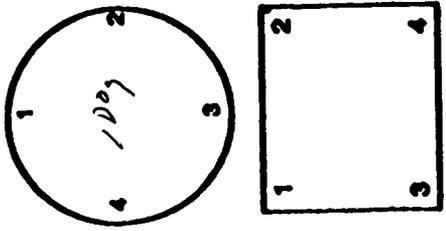
SER. NO. A45601 RANGE: 400g CALIBRATION DATES

TEMPERATURE: 72 HUMIDITY: 23 LAST: 4 May 95 NEXT: 13 AUG 96

CALIBRATED BY: Terry A. White BALANCE TOLERANCES

BALANCE CAL #: 20204 LINE. TOL.: 0.01/0.002 REP. TOL.: 0.01/0.01

	RANGE VERIFICATION								
	RANGE #1			RANGE #2			RANGE #3		
	CALIBRATION POINTS			CALIBRATION POINTS			CALIBRATION POINTS		
	1	2	3	1	2	3	1	2	3
DATA PTS.	400	200	100	50	20	10			
RUN #1	400.00	200.00	100.00	49.999	20.000	10.000			
RUN #2	400.00	200.00	100.00	49.999	20.000	10.000			
RUN #3	400.00	200.00	100.00	49.999	20.000	10.000			
MEAN									
STD. DEV.									



COMMENTS:

SIGNATURE: [Signature]

WEIGHT VALUE	PAN POSITION			
	1	2	3	4
100g	100.00	100.00	100.00	100.00

SOUTHWEST RESEARCH INSTITUTE
Department of Quality Assurance
Calibration Laboratory • 522-5215

WORK ORDER

CERTIFICATE # 24229 ASSET # 2478 DATE 5 FEB 97

ITEM DATA:

Manufacturer METTLER Model PM480
Description BALANCE Serial # N 45601
Accessories _____

ACTION REQUESTED RECAL

CUSTODIAN DIV 20 RON GREEN (BU)

Turned in by: _____ Phone _____

CHARGE # _____ Date Required _____

INSTRUMENT USED ON: NUCLEAR DOD NASA GLP SPPE
 OTHER _____

COPY OF CALIBRATION CERTIFICATE Yes No

CONDITION RECEIVED: _____ Out of tolerance, repaired to specifications
_____ In tolerance, minor adjustments/repairs made
_____ In tolerance, no adjustments/repairs
_____ Out of tolerance, adjusted to specifications
_____ Received into system, introduced or reactivated
_____ Calibration internal
_____ Reliability code

ACTION TAKEN: (Calibration/Repair/Parts) cal

CAL ENVIRONMENT:
Temperature 74 °F Humidity 31 %RH

CALIBRATED/REPAIRED:
By [Signature] Cal Procedure QACP-WR-007
Date 5 FEB 97 Accuracy ML
Cal Interval 6 Time to complete:
Next Cal due 5 AUG 97 Cal _____ Repair _____
Standards used (Asset#) 1714 13 12 11 10 04

DATE COMPLETED _____
DATE PICKED UP cal PICKED UP BY [Signature]
SwRI Form QA-169-2

24229

BALANCE CALIBRATION VERIFICATION FORM

DATE: 5 Feb 97 MFGR: METTLER MODEL: PM480

SER. NO. N45601 RANGE: 480g CALIBRATION DATES

TEMPERATURE: 73 HUMIDITY: 31 LAST: 13 AUG 96 NEXT: 5 AUG 97

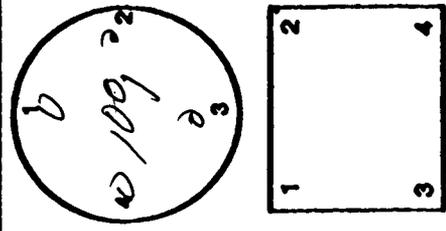
CALIBRATED BY: Tracy A. White BALANCE TOLERANCES

BALANCE CAL #: 24229 LINE. TOL.: _____ REP. TOL.: _____

RANGE VERIFICATION

	RANGE #1			RANGE #2			RANGE #3		
	1	2	3	1	2	3	1	2	3
DATA PTS.	400	200	100	50	20	1			
RUN #1	400.00	200.00	100.00	49.999	20.000	1.000			
RUN #2	400.00	200.00	100.00	49.999	20.000	1.000			
RUN #3	400.00	200.00	100.00	49.999	20.000	1.000			
MEAN									
STD. DEV.									

POSITION GUIDE



SHIFT VERIFICATION

SELF CALIBRATION Y/N INTERNAL: _____ EXTERNAL: N/A

WEIGHT VALUE	PAN POSITION			
	1	2	3	4
100g	100.00	100.00	100.00	100.00

COMMENTS: _____

SIGNATURE: _____

[Handwritten Signature]

SOUTHWEST RESEARCH INSTITUTE
Department of Quality Assurance
Calibration Laboratory • 522-5215

WORK ORDER

CERTIFICATE # 28354 ASSET # 2478 DATE 22 Jan 98

ITEM DATA:

Manufacturer METTLER Model PM480
Description Balance Serial # 145601
Accessories _____

ACTION REQUESTED cal

CUSTODIAN Dir 20 857 P. Green

Turned in by: _____ Phone _____

CHARGE # _____ Date Required _____

INSTRUMENT USED ON: DOD/NASA NUCLEAR GLP SPPE ISO
 OTHER _____

COPY OF CALIBRATION CERTIFICATE Yes No

NEW WORK Yes No If yes, an evaluation shall be made to verify capabilities.

By _____ Date _____

CONDITION RECEIVED: _____ (F) Out of tolerance, repaired to specifications
_____ (G) In tolerance, minor adjustments/repairs made
_____ (J) In tolerance, no adjustments/repairs
_____ (K) Out of tolerance, adjusted to specifications
_____ (S) Received into system, introduced or reactivated

ACTION TAKEN: (Calibration/Repair/Parts) cal

CAL ENVIRONMENT:
Temperature 73 °F Humidity 31 %RH

CALIBRATED/REPAIRED
By M. Wolf Cal Procedure CCP-115-001
Date 22 Jan 98 Accuracy m5
Cal Interval L Reliability Code: _____
Next Cal due 22 JUL 98 Cal Time 1.5 Repair Time _____
Standards used (Asset#) _____

DATE COMPLETED _____
DATE PICKED UP cal PICKED UP BY S. H

28354

BALANCE CALIBRATION VERIFICATION FORM

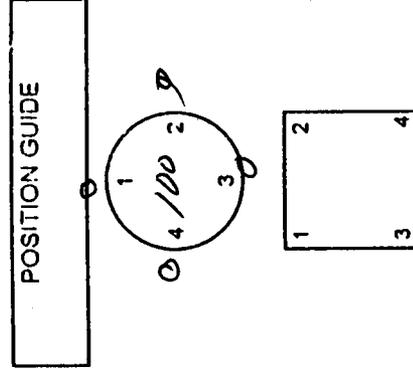
DATE: 22 Jan 08
 BALANCE CAL NO.: _____
 TEMPERATURE: 70
 HUMIDITY: 36
 BARO. PRESSURE: 29.26

MFGR: METTLER
 MODEL: PM480
 SERIAL NO.: N45601
 ASSET NO.: 2477
 RANGE: 500g
 MASS UNCERTAINTY (U_m): _____

MFGR BALANCE TOLERANCES
 LINEARITY: _____
 ECCENTRICITY: _____
 REPRODUCIBILITY: _____
 TEMP. DRIFT/°C: _____
 COMBINED MFR SPECS (U_{mfr}): _____

CALIBRATION DATES
 LAST CAL: 5 AUG 07
 NEXT CAL: 22 JUL 08
 TUR = Comb. MFR Specs (U_{mfr}) = : 1
 U_{m-std}

If TUR < 4:1, U_b = _____



	RANGE VERIFICATION			
	RANGE 1	RANGE 2		RANGE 3
	CALIBRATION POINTS		CALIBRATION POINTS	
DATA POINTS	400	100	50	20
RUN #1	400.01	200.00	100.00	50.00
RUN #2	400.01	200.00	100.00	50.00
RUN #3	400.01	200.00	100.00	50.00
MEAN				
STD. DEV.				

SHIFT VERIFICATION				
SELF CALIBRATION Y/N		INTERNAL: _____ EXTERNAL: _____		
	PAN POSITION			
ACTUAL WEIGHT IN CENTER	1	2	3	4
DIFF.				

COMMENTS: _____

 SIGNATURE: [Signature]

MEASURED UNCERTAINTY:
 Linearity ± _____ g
 Eccentricity ± _____ g
 Comb. Uncertainty ± _____ g
 Rep. (σ) ± _____ g
 Mass tol. (2σ) ± _____ g
 Comb. Uncertainty ± _____ g

Std. Uncertainty ± _____ g
 Std. Uncertainty ± _____ g
 (σ) ± _____ g
 (linearity, eccentricity, reproducibility, mass)

Expanded Unc. (k = 2) ± _____ g



Southwest Research Institute
6220 Culebra Road
San Antonio, TX 78238
Department of Quality Assurance
Calibration Laboratory

Certificate of Calibration

23 January 1998

Issued to: RON GREEN DIV20 B57
Manufacturer/Model: METTLER PM 480
Description: ELECTRONIC BALANCE
Serial Number: N45601
Asset Number: 002478

Environmental Conditions

Temperature: 73.00 Deg. F Humidity: 36 % RH

Calibration Information

Calibration was in accordance with requirements of MIL-STD-45662A and ANSI/NCSL Z540-1-1994. Measurements are traceable to the National Institute of Standards and Technology (NIST). This report may not be reproduced except in full without written approval of the originator. Inspection and test data are on file and available for inspection.

The uncertainty of the calibration was sufficient to determine that the instrument met the manufacturer's specifications.

Calibration Date: 22 Jan 98 Calibration Procedure: CLCP-WT-001

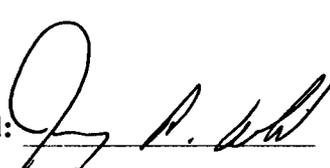
Interval: 6 months

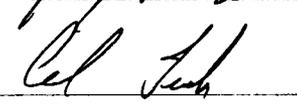
Next Calibration Due: 22 Jul 98 Received: In Tolerance

Remarks:

Standards Used

Asset	MFR	Model	Description	Serial No.	Due Cal
001705	RICE LAKE	2G	WEIGHT STANDARD	C860	21 Jul 98
001710	RICE LAKE	20G	WEIGHT STANDARD	C865	21 Jul 98
001712	RICE LAKE	100G	WEIGHT STANDARD	C867	21 Jul 98
001713	RICE LAKE	200G	WEIGHT STANDARD	C868	21 Jul 98
001714	RICE LAKE	200G	WEIGHT STANDARD	C869	21 Jul 98

Signed: 

Title: 

LAST PAGE OF REPORT
Total Pages Printed: 1

Certificate # 28354

SOUTHWEST RESEARCH INSTITUTE
Department of Quality Assurance
Calibration Laboratory • 522-5215

WORK ORDER

CERTIFICATE # 30530 ASSET # 2478 DATE 20 JUL 98

ITEM DATA:

Manufacturer METTLER Model PM 480
Description BALANCE Serial # N 45601
Accessories _____

ACTION REQUESTED Oil

CUSTODIAN DN 20 RON GREEN

Turned in by: _____ Phone _____

CHARGE # _____ Date Required _____

INSTRUMENT USED ON: (DOD/NASA) (NUCLEAR) (GLP) (SPPE) (ISO)
 OTHER _____

COPY OF CALIBRATION CERTIFICATE (Yes) (No)

NEW WORK Yes No If yes, an evaluation shall be made to verify capabilities.

By _____ Date _____

Work involves proprietary/confidential information or equipment (Yes) (No)

CONDITION RECEIVED: _____ (F) Out of tolerance, repaired to specifications
_____ (G) In tolerance, minor adjustments/repairs made
 (J) In tolerance, no adjustments/repairs
_____ (K) Out of tolerance, adjusted to specifications
_____ (S) Received into system, introduced or reactivated

30530

ACTION TAKEN: (Calibration/Repair/Parts) Oil

CAL ENVIRONMENT:

Temperature 73 °F Humidity 53 %RH

CALIBRATED/REPAIRED:

By [Signature] Cal Procedure ELCP-WT-001

Date 20 JUL 98 Accuracy M

Cal Interval 6 Reliability Code: _____

Next Cal due 20 JAN 99 Cal Time 1.5 Repair Time _____

Standards used (Asset#) 1714 1715 1712 1711 1710 1703

DATE COMPLETED _____
DATE PICKED UP Oil on site PICKED UP BY _____

BALANCE CALIBRATION VERIFICATION FORM

DATE: 20 JUL 98
 BALANCE CAL NO.: 30530
 TEMPERATURE: 23
 HUMIDITY: 53
 BARO. PRESSURE: 14

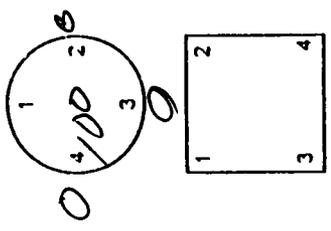
MFGR: Mettler
 MODEL: PM40
 SERIAL NO.: 425601
 ASSET NO.: 2478
 RANGE: 400g
 MASS UNCERTAINTY (U_m): _____

MFGR BALANCE TOLERANCES
 LINEARITY: _____
 ECCENTRICITY: _____
 REPRODUCIBILITY: _____
 TEMP. DRIFT/°C: _____
 COMBINED MFR SPECS (U_{mfr}): _____

CALIBRATION DATES
 LAST CAL: 22 JAN 98
 NEXT CAL: 20 JAN 99
 TUR = Comb. MFR Specs (U_{mfr}) = _____ : 1
 U_{m-stc}

If TUR < 4:1, U_b = _____

RANGE VERIFICATION					POSITION GUIDE <u>5</u>
RANGE 1	RANGE 2	RANGE 3			
CALIBRATION POINTS	CALIBRATION POINTS	CALIBRATION POINTS			
DATA POINTS	400 200 100 50	20 2			
RUN #1	400.01 200.00 100.00 50.000	20.000 2.000			
RUN #2	<u>f f f f</u>	<u>f</u>			
MEAN					
STD. DEV.					



SHIFT VERIFICATION				
SELF CALIBRATION Y/N		PAN POSITION		
INTERNAL	EXTERNAL	1	2	3
ACTUAL WEIGHT IN CENTER				
DIFF.				

COMMENTS: _____
 SIGNATURE: [Signature]

MEASURED UNCERTAINTY:

Linearity = _____ g
 Eccentricity = _____ g
 Comb. Uncertainty = _____ g
 Rep (σ) = _____ g
 Mass tol. (2σ) = _____ g
 Comb. Uncertainty = _____ g

Std Uncertainty = _____ g
 Std Uncertainty = _____ g
 (σ) = _____ g
 (linearity, eccentricity, reproducibility, mass)

Expanded Unc (k = 2) = _____ g



Southwest Research Institute
6220 Culebra Road
San Antonio, TX 78238
(210) 522-5215
Department of Quality Assurance
Calibration Laboratory

Accredited



Certificate #
0972-01

Certificate of Calibration

13 July 1999

Issued to: RON GREEN DIV20 B57
Manufacturer/Model: METTLER PM 480
Description: ELECTRONIC BALANCE
Serial Number: N45601
Asset Number: 002478

This certifies the above item was calibrated in compliance with MIL-STD-45662A and ANSI/NCSL Z540-1-1994. Standards used in this calibration, described in the referenced calibration procedure with associated uncertainties or tolerances, are traceable to the National Institute of Standards and Technology (NIST). Supporting documentation relative to traceability is on file and is available for examination upon request. This certificate is not to be reproduced, except in full, without the written approval of the Southwest Research Institute Department of Quality Assurance Calibration Laboratory.

This laboratory is accredited by the American Association for Laboratory Accreditation (A2LA) and the results of this calibration certificate were determined in accordance with the terms of accreditation unless stated otherwise below.

The uncertainty of the calibration was sufficient to determine that the item met the manufacturer's published specifications unless stated otherwise below.

Ambient Conditions: Temperature: 72.0 Degrees Fahrenheit Humidity: 56 % RH

Calibration Date: 13 Jul 99 **Calibration Procedure:** CLCP-WT-001 AUG 97

Condition as Received: IN TOLERANCE

Condition as Released: IN TOLERANCE

Remarks:

Approved by:

Jim Patterson, Supervisor or Walt Hill, Metrologist

Certificate # 35146

m:\a2la.rpt Rev date 10 Mar 99

Measurements performed by:

Jerry White, Technician

Page 1 of 1

SOUTHWEST RESEARCH INSTITUTE
Department of Quality Assurance
Calibration Laboratory • 522-5215

WORK ORDER

CERTIFICATE # 32186 ASSET # 2478 DATE 12 Jan 99

ITEM DATA:

Manufacturer METTLER Model PM480
Description Balance Serial # N45601
Accessories _____

ACTION REQUESTED enl

CUSTODIAN DIV 20 RON GALVIN

Turned in by: _____ Phone _____

CHARGE # _____ Date Required _____

INSTRUMENT USED ON: (DOD/NASA) (NUCLEAR) (GLP) (SPPE) (ISO)
 OTHER _____

COPY OF CALIBRATION CERTIFICATE (Yes) (No)

NEW WORK Yes No If yes, an evaluation shall be made to verify capabilities.

By _____ Date _____

Work involves proprietary/confidential information or equipment (Yes) (No)

CONDITION RECEIVED: _____ (F) Out of tolerance, repaired to specifications
_____ (G) In tolerance, minor adjustments/repairs made
 (J) In tolerance, no adjustments/repairs
_____ (K) Out of tolerance, adjusted to specifications
_____ (S) Received into system, introduced or reactivated

ACTION TAKEN: (Calibration/Repair/Parts) enl

CAL ENVIRONMENT:
Temperature 25 °F Humidity 55 %RH

CALIBRATED/REPAIRED:
By [Signature] Cal Procedure QACP-WT-001
Date 12 Jan 99 Accuracy u1
Cal Interval L Reliability Code: _____
Next Cal due 12 Jul 99 Cal Time 1.5 Repair Time _____
Standards used (Asset#) 1714 1713 517 516 1710 1701

DATE COMPLETED _____
DATE PICKED UP enl PICKED UP BY [Signature]

BALANCE CALIBRATION VERIFICATION FORM

DATE: 12 Jan 98
 BALANCE CAL NO: 32886
 TEMPERATURE: 23.5
 HUMIDITY: 85
 BARO. PRESSURE: 428

MFGR: METTLER
 MODEL: Phys 10
 SERIAL NO: 245201
 ASSET NO: 2478
 RANGE:
 MASS UNCERTAINTY (U_m):
 TUR = Comb. MFR Specs (U_{mfr}) = : 1
 U_{m-side}

MFGR BALANCE TOLERANCES
 LINEARITY: _____
 ECCENTRICITY: _____
 REPRODUCIBILITY: _____
 TEMP. DRIFT/°C: _____
 COMBINED MFR SPECS (U_{mfr}): _____
 If TUR < 4:1, U_b = _____

DATA POINTS	RANGE VERIFICATION		
	RANGE 1	RANGE 2	RANGE 3
	CALIBRATION POINTS		
RUN # 1	<u>400</u>	<u>200</u>	<u>100</u>
RUN # 2	<u>200</u>	<u>100</u>	<u>50</u>
MEAN	<u>400.00</u>	<u>200.00</u>	<u>100.00</u>
STD. DEV.	<u>0.000</u>	<u>0.000</u>	<u>0.000</u>

SHIFT VERIFICATION			
SELF CALIBRATION Y/N	INTERNAL	EXTERNAL	PAN POSITION
			1
			2
			3
			4



COMMENTS: _____

 SIGNATURE: [Signature]

S&W CALIBRATION LAB
 (210) 522-5218
 CAL. 20702 98 BY CMW
 DUE 20702 98 BY CMW
 SN 245201

MEASURED UNCERTAINTY:
 Linearity ± _____ g
 Eccentricity ± _____ g
 Comb. Uncertainty ± _____ g
 Rep. (σ) ± _____ g
 Mass tol. (2σ) ± _____ g
 Comb. Uncertainty ± _____ g

Std. Uncertainty ± _____ g
 Std. Uncertainty ± _____ g
 (σ) ± _____ g
 (linearity, eccentricity, reproducibility, mass)

Expanded Unc. (k = 2) ± _____ g



Southwest Research Institute
6220 Culebra Road
San Antonio, TX 78238
(210) 522-5215
Department of Quality Assurance
Calibration Laboratory

Accredited



Certificate #
0972-01

Certificate of Calibration

13 January 1999

Issued to: RON GREEN DIV20 B57
Manufacturer/Model: METTLER PM 480
Description: ELECTRONIC BALANCE
Serial Number: N45601
Asset Number: 002478

This certifies the above item was calibrated in compliance with MIL-STD-45662A and ANSI/NCSL Z540-1-1994. Standards used in this calibration, described in the referenced calibration procedure with associated uncertainties or tolerances, are traceable to the National Institute of Standards and Technology (NIST). Supporting documentation relative to traceability is on file and is available for examination upon request. This certificate is not to be reproduced, except in full, without the written approval of the Southwest Research Institute Department of Quality Assurance Calibration Laboratory.

This laboratory is accredited by the American Association for Laboratory Accreditation (A2LA) and the results of this calibration certificate were determined in accordance with the terms of accreditation unless stated otherwise below.

The uncertainty of the calibration was sufficient to determine that the item met the manufacturer's published specifications unless stated otherwise below.

Ambient Conditions: Temperature: 75. Degrees Fahrenheit Humidity: 55 % RH

Calibration Date: 12 Jan 99 **Calibration Procedure:** CLCP-WT-001

Condition as Received: IN TOLERANCE

Condition as Released: IN TOLERANCE

Remarks:


Jerry White / Technician

B51
12 Jul 99

WORK ORDER

WORK ORDER # 35146 ASSET # 2478 DATE 09 July 99

ITEM DATA:

Manufacturer METTLER Model PM480
Description BALANCE Serial # N45601
Accessories _____

ACTION REQUESTED cal on site

CUSTODIAN RON GREEN

Turned in by: _____ Phone 530

CHARGE # 20-DH Date Required _____

INSTRUMENT USED ON: (DOD/NASA) (NUCLEAR) (GLP) (SPPE) (ISO)
 OTHER _____

COPY OF CALIBRATION CERTIFICATE (Yes) (No)

NEW WORK Yes No If yes, an evaluation shall be made to verify capabilities.

By R. Green Date 09 July 99

Work involves proprietary/confidential information or equipment (Yes) (No)

CONDITION RECEIVED: _____ Out of tolerance
_____ In tolerance
_____ Damaged (Contact customer)
_____ Contact _____ Date _____
_____ Received into system, introduced or reactivated

ACTION TAKEN: (Calibration/Repair/Parts) cal

CAL ENVIRONMENT:
Temperature 72 °F Humidity 56 %RH

CALIBRATED/REPAIRED:
By R. Green Cal Procedure QCIP-WT-001 00657
Date 13 JUL 99 Accuracy 1%
Cal Interval 6 Reliability Code _____
Next Cal Due 13 JAN 00 Cal Time _____ Repair Time _____
Standards used (Asset #) 1714 1713 1712 1711 1710 1708

DATE COMPLETED 13 JUL 99

DATE PICKED UP _____ PICKED UP BY _____

35146

WORK ORDER 37453

Arrive Date 1/18/00

Asset No. 002478 Manufactruer METTLER Model PM 480
 Description ELECTRONIC BALANCE Serial Number N45601
 Accessory Received/Required NONE
 Div/CC ID NONE Accessory to Asset No. N/A Accuracy MFG SPECS
 Div/CC DIV20 Bldg. B57 Custodian RON GREEN Tel. 5305
 Charge/Project No. 20.00751.006 Proprietary/Confidential N Date Required ROUTINE
 Work Requested ONSITE CALIBRATION
 Receiving Inspection _____
 Delivered By _____ Tel. 5305

WORK HISTORY

Date	Start Time	Stop Time	Remarks

REPLACED PARTS

Part name	Part number	Cost	Failure Description

37453

WORK ORDER SUMMARY

Failure description _____

Repair action _____

Cal Procedure CEP-WF-001 Dec 99 Temp. 75 F Hum. 54 % 14 25

Tech JW Cal hrs. 1.3 Repair hrs. _____ Part Cost _____

Action Taken enl

Standards Used 5117 5116 1712

Date Cal 14 Jan 00 Int. 6 Mo Date Due 18 Jul 00 Reliability Code _____

Date Picked Up _____ Picked Up By _____

cal m [signature]

ELECTRONIC BALANCE CALIBRATION DATA SHEET

WORK ORDER _____ DATE 18 JAN 00 TECHNICIAN JM
 MODEL PM410 SERIAL NO. N#5601 ASSET NO. 247Y
 LOCATION 51
 AMBIENT: TEMP 75 HUMIDITY 54 BARO PRESS 24.45

1) CALIBRATION CHECK

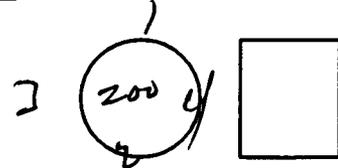
AS FOUND FULL-CAPACITY INDICATION 400.01
 POST-CALIBRATION INDICATION 400.01 TOLERANCE _____ P/F _____

2) REPEATABILITY

1	200.00	6	200.00
2	200.00	7	200.00
3	200.00	8	200.00
4	200.00	9	200.00
5	200.00	10	200.00

5117
 5116
 1712

S.D. _____ TOLERANCE _____ P/F _____



3) OFF-CENTER ERROR

1	200.00	3	200.00
2	200.00	4	200.00

TOLERANCE _____ P/F _____

4) NON-LINEARITY

TEST POINT	INDICATION	NON-LIN ERROR	TEST WEIGHT S/N
0	0.000	---	---
25%	100.00		
50%	100.00		
75%	100.00		
100%	100.00		

TOLERANCE _____ P/F _____

5) COMMENTS:

SOUTHWEST RESEARCH INSTITUTE

Calibration Laboratory

6220 CULEBRA ROAD POST OFFICE DRAWER 28510 SAN ANTONIO, TEXAS 78226-0510 TEL (210) 522-5215 FAX (210) 522-3692

Receipt for work order number 37453 Date received 1/18/00

Asset no. 002478 Manufacturer METTLER Model PM 480

Description ELECTRONIC BALANCE Serial number N45601

Accessory Received/Required NONE

Div/CC ID NONE Accessory to asset no. N/A Accuracy MFG SPECS

Div/CC DIV20 Bldg. B57 Custodian RON GREEN Tel. 5305

Charge/Project No. 20.00751.006 Proprietary/confidential N Date required ROUTINE

Work requested ONSITE CALIBRATION

Receiving inspection

Delivered by _____ Tel. 5305

CUSTOMER COMMENTS REQUESTED

The Calibration Laboratory staff is committed to good laboratory practice and providing our customers quality calibration services. Please rate how well we are meeting our goal and provide us with your recommendations for improvement.

Quality of service provided	_____	Rating Scale
Turn-around time	_____	4 = Excellent
Certificates	_____	3 = Good
Calibration labels	_____	2 = Acceptable
Out-of-tolerance reports	_____	1 = Needs improvement
Recall notification	_____	
Condition of returned equipment	_____	
Overall service	_____	

IF WE PLEASE YOU, TELL OTHERS; IF NOT, TELL US.

Comments _____

Name _____ Tel _____



Southwest Research Institute
6220 Culebra Road
San Antonio, TX 78238
(210) 522-5215
Department of Quality Assurance
Calibration Laboratory

Certificate of Calibration

18 January 2000

Issued to: RON GREEN DIV20 B57
Manufacturer/Model: METTLER PM 480
Description: ELECTRONIC BALANCE
Serial Number: N45601
Asset Number: 002478

This certifies the above item was calibrated in compliance with MIL-STD-45662A and ANSI/NCSL Z540-1-1994. Standards used in this calibration, described in the referenced calibration procedure with associated uncertainties or tolerances, are traceable to the National Institute of Standards and Technology (NIST). Supporting documentation relative to traceability is on file and is available for examination upon request. This certificate is not to be reproduced, except in full, without the written approval of the Southwest Research Institute Department of Quality Assurance Calibration Laboratory.

The uncertainty of the calibration was sufficient to determine that the item met the manufacturer's published specifications unless stated otherwise below.

Ambient Conditions: Temperature: 75.0 Degrees Fahrenheit Humidity: 54 % RH

Calibration Date: 18 Jan 00 **Calibration Procedure:** CLCP-WT-001 DEC 99

Condition as Received: IN TOLERANCE

Condition as Released: IN TOLERANCE

Remarks:

Approved by:



Jim Patterson, Supervisor or Walt Hill, Metrologist

Certificate # 37453

m:\none21a.rpt Rev date 13 Apr 99

Measurements performed by:



Jerry White, Technician

Page 1 of 1

WORK ORDER 39720

Date Received 7/11/00

Asset No. 002478 Manufacturer METTLER Model PM 480
 Description ELECTRONIC BALANCE Serial Number N45601
 Accessory Received/Required NONE
 Div/CC ID NONE Accessory to Asset No. N/A
 Div/CC DIV20 Location B57 Custodian RON GREEN Tel. 5305
 Charge/Project No. 20.00751.006 Proprietary/Confidential N Date Required ROUTINE
 Work Requested ONSITE CALIBRATION
 Receiving Inspection _____
 Delivered By RON GREEN Tel. 5305

WORK HISTORY

Date	Start Time	Stop Time	Notes
			Hold

PARTS

Part Name	Part Number	Cost	Failure Description

39720

WORK SUMMARY

Failure Description _____

Repair Action _____

Cal Procedure CLCP-WT-001, 12/99 Temp 74 F Hum 62 %

Tech Qmw Cal Hrs. 1.5 Repair Hrs. _____ Part Cost _____

Action Taken enl

Standards Used 1714 13 12

Date Cal 14 Sep 2000 Int. 6 Mo. Date Due 14 Mar 2006 Reliability Code _____

Date Picked Up _____ Picked Up By _____

enl on set

SOUTHWEST RESEARCH INSTITUTE

CALIBRATION LABORATORY

6220 CULEBRA ROAD POST OFFICE DRAWER 28510 SAN ANTONIO, TEXAS 78228-0510 TEL (210) 522-5215 FAX (210) 522-3692

Receipt for Work Order 39720 Date Received 7/11/00

Asset No. 002478 Manufacturer METTLER Model PM 480

Description ELECTRONIC BALANCE Serial Number N45601

Accessory Received/Required NONE

Div/CC ID NONE Accessory to Asset No. N/A Accuracy MFG SPECS

Div/CC DIV20 Location B57 Custodian RON GREEN Tel. 5305

Charge/Project No. 20.00751.006 Proprietary/Confidential N Date Required ROUTINE

Work Requested ONSITE CALIBRATION

Receiving Inspection

Delivered By RON GREEN Tel. 5305

CUSTOMER COMMENTS REQUESTED

The Calibration Laboratory staff is committed to good laboratory practice and providing our customers quality calibration services. Please rate how well we are meeting our goal and provide us with your recommendations for improvement.

Quality of service provided	_____	Rating Scale
Turn-around time	_____	4 = Excellent
Certificates	_____	3 = Good
Calibration labels	_____	2 = Acceptable
Recall notification	_____	1 = Needs improvement
Condition of returned equipment	_____	
Overall service	_____	

Please check all that apply: Equipment user _____ Delivery person _____ Custodian _____

IF WE PLEASE YOU, TELL OTHERS; IF NOT, TELL US.

COMMENTS: _____

Name _____ Tel. _____



Southwest Research Institute
6220 Culebra Road
San Antonio, TX 78238
(210) 522-5215
Department of Quality Assurance
Calibration Laboratory



Certificate #
0972-01

Certificate of Calibration

15 September 2000

Issued to: RON GREEN DIV20 B57
Manufacturer/Model: METTLER PM 480
Description: ELECTRONIC BALANCE
Serial Number: N45601
Asset Number: 002478

This certifies the above item was calibrated in compliance with MIL-STD-45662A and ANSI/NCSL Z540-1-1994. The results of this calibration relate only to the individual item as described above. Standards used in this calibration, described in the referenced calibration procedure with associated uncertainties or tolerances, are traceable to the National Institute of Standards and Technology (NIST). Supporting documentation relative to traceability is on file and available for examination upon request. This certificate is not to be reproduced, except in full, without the written approval of the Southwest Research Institute Department of Quality Assurance Calibration Laboratory.

This laboratory is accredited by the American Association for Laboratory Accreditation (A2LA) and the results of this calibration certificate were determined in accordance with the terms of accreditation unless stated otherwise below.

The uncertainty of the calibration was sufficient to determine that the item met the manufacturer's published specifications unless stated otherwise below.

Ambient Conditions: Temperature: 74.0 Degrees Fahrenheit Humidity: 62 % RH

Calibration Date: 14 Sep 00 **Calibration Procedure:** CLCP-WT-001, 12/99

Condition as Received: IN TOLERANCE

Condition as Released: IN TOLERANCE

Remarks:

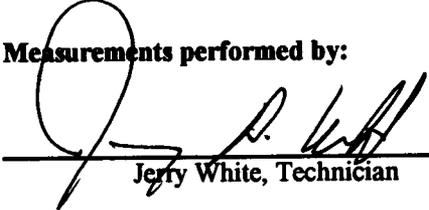
Approved by:



Jim Patterson, Supervisor, or Walt Hill, Metrologist

Certificate # 39720
m:\a2la.rpt Rev date 22 May 00

Measurements performed by:



Jerry White, Technician

ELECTRONIC BALANCE CALIBRATION DATA SHEET

WORK ORDER 39720 DATE 14 Sept 2000 TECHNICIAN QNW

MODEL PM 480 SERIAL NO. N45601 ASSET NO. 2478

LOCATION B51

AMBIENT: TEMP 74 HUMIDITY 62% BARO PRESS 14.26

1) CALIBRATION CHECK

AS FOUND FULL-CAPACITY INDICATION 399.99

POST-CALIBRATION INDICATION 399.99 TOLERANCE _____ P/F _____

2) REPEATABILITY

1	199.99	6	199.99
2	199.99	7	199.99
3	199.99	8	199.99
4	199.99	9	199.99
5	199.99	10	199.99

1714
1713
1712

SWRI CALIBRATION LAB
(210) 522-5275
CAL 253.00 BY QNW
DUE 1/15/00 ID
SN 111850387

S.D. _____ TOLERANCE _____ P/F _____



3) OFF-CENTER ERROR

1		3	
2		4	

TOLERANCE _____ P/F _____

4) NON-LINEARITY

TEST POINT	INDICATION	NON-LIN ERROR	TEST WEIGHT S/N
0	0.00	—	—
25%	100.00		
50%	100.00		
75%	100.00		
100%	100.00		

TOLERANCE _____ P/F _____

5) COMMENTS:

SOUTHWEST RESEARCH INSTITUTE

Calibration Laboratory

WORK ORDER

Processed by WHILL at 11:11:05AM on 3/1/01

1 0000 0000 0000 0000 0000 0000 0000

Work Order 444042616

Arrived 3/1/01

Asset No. 002478 Manufacturer METTLER

Model PM 480

Instrument Type/Class BALANCE

Serial No. N45601

Accessory No. Calibration Procedure CLCP-WT-001, 12/99

Location B57

Div/Client DIV20

Custodian RON GREEN

Mail Stop B57

Tel. 5305

Charge/Project No. 20.00751.006

Delivered By / Telephone

IN4CAL

Special Instructions _____

WORK NOTES

Date	Hours	Remarks/Notes
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

REPAIR PARTS

Date	Hours	Part Name	Part Number	Failure Description	Cost
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

WORK SUMMARY

Failure Description _____

Repair Action _____

Calibration Procedure CLCP-WT-001, 12/99 Temp 68.7F Hum. 41 %

Tech R Dijkstra Totals Cal Hours 1.5 Repair Hours _____ Parts Cost _____

Standards Used 00171A, 001713, 001712

Date Picked Up _____

Picked Up By _____

42616



Southwest Research Institute
6220 Culebra Road
San Antonio, TX 78238
(210) 522-5215
Department of Quality Assurance
Calibration Laboratory



Certificate #
0972-01

Certificate of Calibration

19 March 2001

Issued to: RON GREEN DIV20 B57
Manufacturer/Model: METTLER PM 480
Description: BALANCE
Serial Number: N45601
Asset Number: 002478
Work Order Number: 444042616

This certifies the above item was calibrated in compliance with MIL-STD-45662A and ANSI/NC SL Z540-1-1994. The results of this calibration relate only to the individual item as described above. Standards used in this calibration, described in the referenced calibration procedure with associated uncertainties or tolerances, are traceable to the National Institute of Standards and Technology (NIST). Supporting documentation relative to traceability is on file and available for examination upon request. This certificate is not to be reproduced, except in full, without the written approval of the Southwest Research Institute Department of Quality Assurance Calibration Laboratory.

This laboratory is accredited by the American Association for Laboratory Accreditation (A2LA) and the results of this calibration certificate were determined in accordance with the terms of accreditation unless stated otherwise below.

The uncertainty of the calibration was sufficient to determine that the item met the manufacturer's published specifications unless stated otherwise below.

Ambient Conditions: Temperature: 69.7 Degrees Fahrenheit Humidity: 41 % RH

Calibration Date: 19 Mar 01 **Calibration Procedure:** CLCP-WT-001, 12/99

Condition as Received: IN TOLERANCE

Condition as Released: IN TOLERANCE

Remarks:

Approved by:

Walt Hill, Supervisor
Institute Calibration Laboratory

Measurements performed by:

Roger Dykstra, Technician

ELECTRONIC BALANCE CALIBRATION DATA SHEET

WORK ORDER 444042616 DATE _____ TECHNICIAN R Dykstra

MODEL PM480 SERIAL NO. N45601 ASSET NO. 002478

LOCATION BSI Environmental Chamber

AMBIENT: TEMP 69.7 °F HUMIDITY 41.6% BARO PRESS 14.46 PSIA

1) CALIBRATION CHECK 400g AN 1714: 1713

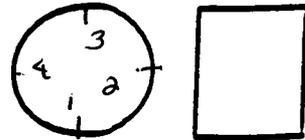
AS FOUND FULL-CAPACITY INDICATION 400.01 g

POST-CALIBRATION INDICATION 400.00 g TOLERANCE +/- 9mg P/F Pass

2) REPEATABILITY 200g AN 1713

1	200.00 g	6	200.00 g
2	200.00 g	7	200.00 g
3	200.00 g	8	200.00 g
4	200.00 g	9	200.00 g
5	200.00 g	10	200.00 g

S.D. 0.00 TOLERANCE +/- 0.3mg P/F Pass



3) OFF-CENTER ERROR 200g

1	-0.002 g	3	0.002 g
2	-0.001 g	4	0.001 g

TOLERANCE +/- 3mg P/F Pass

4) NON-LINEARITY

TEST POINT	INDICATION	NON-LIN ERROR	TEST WEIGHT S/N
0	0.000 g	—	—
25%	100.00 g	0.00	1710
50%	200.00 g	0.00	1712
75%	300.00 g	0.00	1713: 1712
100%	400.00 g	0.00	1713: 1714

TOLERANCE +/- 5mg P/F Pass

5) COMMENTS:

SOUTHWEST RESEARCH INSTITUTE

Calibration Laboratory

WORK ORDER

Received by MROMERO, 8/17/01 3:54:34PM

1 10000 0000 0000 0000 0000 0000 0000

Arrived 8/17/01

Work Order **444044858**

Asset No. 002478 Manufacturer METTLER

Model PM 480

Instrument Type/Class BALANCE

Serial No. N45601

Accessory No. _____

Calibration Procedure CLCP-WT-001, 12/99

Location B57

Div/Client DIV20

Custodian RON GREEN

Mail Stop B57

Tel. 5305

IN4CAL

Special Instructions _____

Notify before making adjustments or repairs. (Provide measurement readings ()

Charge/Project No. 00751.006 1.20

Requested By / Telephone _____

The above is correct for the work requested. _____

WORK NOTES

Date	Hours	Remarks/Notes
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Date	Hours	Part Name	Part Number	Failure Description	Cost
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

WORK SUMMARY

Failure Description _____

Repair Action _____

Calibration Procedure _____ Temp 67 F Hum. 59 %

Tech Mr Anthony Dancer Totals Cal Hours 1.5 Repair Hours _____ Parts Cost _____

Standards Used 1712, 1713, 1714

Date Picked Up _____

Picked Up By _____

44858

WORK ORDER 44404985 DATE 17 August 2001 TECHNICIAN Walter Anthony Doves

MODEL PM400 SERIAL NO. N45601 ASSET NO. 2498

LOCATION b 51

AMBIENT: TEMP 61 HUMIDITY 59 BARO PRESS 14.32

SWRI CALIBRATION LAB
(210) 522-5215
CAL PM400 BY R. D. Smith
DUE 19 Sept 01 ID 2478
SN N45601

1) CALIBRATION CHECK

AS FOUND FULL-CAPACITY INDICATION 400.01

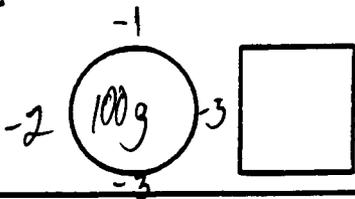
POST-CALIBRATION INDICATION TOLERANCE P/F

2) REPEATABILITY

1	<u>100.00 g</u>	6	
2		7	
3		8	
4		9	
5		10	

1712
1713
1714

S.D. TOLERANCE 3 P/F



3) OFF-CENTER ERROR

1		3	
2		4	

TOLERANCE 5 P/F

4) NON-LINEARITY

TEST POINT %FS or value	INDICATION	NON-LIN ERROR	TEST WEIGHT S/N
	<u>0</u>	<u>—</u>	<u>—</u>
	<u>100.00 g</u>		
	<u>100.00 g</u>		
	<u>100.01 g</u>		
	<u>100.01 g</u>		

TOLERANCE 3 P/F

5) COMMENTS:



Southwest Research Institute
6220 Culebra Road
San Antonio, TX 78238
(210) 522-5215
Department of Quality Assurance
Calibration Laboratory



Certificate #
0972-01

Certificate of Calibration

17 August 2001

Issued to: RON GREEN DIV20 B57
Manufacturer/Model: METTLER PM 480
Description: BALANCE
Serial Number: N45601
Asset Number: 002478
Work Order Number: 444044858

This certifies the above item was calibrated in compliance with MIL-STD-45662A and ANSI/NCCL Z540-1-1994. The results of this calibration relate only to the individual item as described above. Standards used in this calibration, described in the referenced calibration procedure with associated uncertainties or tolerances, are traceable to the National Institute of Standards and Technology (NIST). Supporting documentation relative to traceability is on file and available for examination upon request. This certificate is not to be reproduced, except in full, without the written approval of the Southwest Research Institute Department of Quality Assurance Calibration Laboratory.

This laboratory is accredited by the American Association for Laboratory Accreditation (A2LA) and the results of this calibration certificate were determined in accordance with the terms of accreditation unless stated otherwise below.

The uncertainty of the calibration was sufficient to determine that the item met the manufacturer's published specifications unless stated otherwise below.

Ambient Conditions: Temperature: 67.0 Degrees Fahrenheit Humidity: 59 % RH

Calibration Date: 17 Aug 01 **Calibration Procedure:** CLCP-WT-001, 12/99

Condition as Received: IN TOLERANCE

Condition as Released: IN TOLERANCE

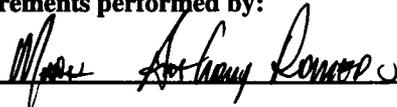
Remarks:

Approved by:



Walt Hill, Supervisor
Institute Calibration Laboratory

Measurements performed by:



Mark Romero, Technician

SOUTHWEST RESEARCH INSTITUTE

Calibration Laboratory

WORK ORDER

Received by MROMERO, 2/15/02 11:17:56AM

Arrived 2/15/02

Work Order **444047258**

Asset No. 002478 Manufacturer METTLER

Model PM 480

Equipment Type BALANCE

Serial No. N45601

Accessory No.

Interval 6 M

Calibration Procedure CLCP-WT-001, 12/99

Location B57

Div/Client DIV20

Custodian RON GREEN

Mail Stop T1

Tel 5305

QUEUE

Special Instructions _____

Notify before adjustments or repairs. () Provide data with certificate () Certificate Type _____

Charge/Project No. 00751.006 1.20

Requester / Telephone _____

This information is correct for the work requested. _____

SWRI CALIBRATION LAB
(210) 522-5215
CAL 17 Aug 01 BY WLR
DUE 17 Feb 02 ID 752978
S/N N45601

WORK NOTES

Date	Hours	Remarks/Notes
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Date	Hours	Part Name	Part Number	Failure Description	Cost
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

WORK SUMMARY

Failure Description _____

Repair Action _____

Tech MOL Cal Hrs. 2.0 Repair Hrs _____ Parts Cost _____ Temp 74 F Hum. 37 %

Standards Used M12, M15, M14

Date Picked Up 15 Feb 2002

Picked Up By PAK ONSITE

444047258

Southwest Research Institute
Calibration Laboratory
 Calibration Data Sheet

Work Order 444047258	Mfr. Mettler	Technician Mark A. Romero
Asset No. 2478	Model PM480	Procedure CLCP-WT-001, 12/99
Serial No. N45601	Type Balance	Cal Date 15-Feb-02

Location: Bldg. 51

Ambient Conditions: 74 F 37 %RH 14.40 PSIA

Operational Check: Limits +/- : 0.01 g

STD Mass Load	As Found Indication	Instrument Error
400.00 g	400.09 g	0.09 g

Post Calibration Check:

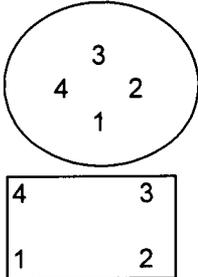
STD Mass Load	Post calibration Indication	Instrument Error	Results
400.00 g	400.00 g	0.00 g	Pass

Repeatability Check: Mass Load: 200.00 g

1	200.00 g	6	200.00 g
2	200.00 g	7	200.00 g
3	200.00 g	8	200.00 g
4	200.00 g	9	200.00 g
5	200.00 g	10	200.00 g

Std Deviation	Tolerance
0.000	0.003 g

Off-Centerline Check: Mass Load: 200.00 g



	Indication	Instrument Error	+/- Limits	Results
1	0.000 g	0.00 g	0.003	Pass
2	0.001 g	0.00 g	0.003	Pass
3	0.002 g	0.00 g	0.003	Pass
4	-0.001 g	0.00 g	0.003	Pass

Non-Linearity Check: Range: 400.00 g

STD Mass Load	Indication	Instrument Error	+/- Limits	Results
0.00 g	0.00 g	0.000 g	0.005	Pass
100.00 g	100.00 g	0.000 g	0.005	Pass
200.00 g	100.00 g	0.000 g	0.005	Pass
300.00 g	100.00 g	0.000 g	0.005	Pass
400.00 g	100.00 g	0.000 g	0.005	Pass

Remarks: Readability is 0.001g (80g) and 0.01g (410g). Standards used 1712, 1713, and 1714.

Southwest Research Institute
Calibration Laboratory
Uncertainty Budget

Mettler PM480 (T1)	Units	Range	Acc. +/- (1)	Resolution
		g	410	0.01
Source of Uncertainty	Value	Distribution	Divisor	Std. Uncertainty
Standard weight (2)	0.00075	Rectangular	Sqrt 3	0.000433
Resolution	0.01	Rectangular	Sqrt 3	0.00577
Air buoyancy (3)	0.00041	Rectangular	Sqrt 3	0.000237
Combined Uncertainty	RSS			0.00579
Expanded Uncertainty	$k=2$			0.01
Test Accuracy Ratio (TAR)	TI Acc./STD Acc.			
	12	to 1		
Test Uncertainty Ratio (TUR)	TI Acc./Muk=2			
	0.8	to 1		
<p>(1) Combined Uncertainty (2 sigma) of mfg std dev. (3mg), linearity (5mg), corner load (3mg), & Class S1 100g (0.25mg) internal check weight tolerance.</p> <p>(2) RSS of combined tolerances for standard wghts [(2) Class S1 200g (0.5mg) and S1 100g (0.25mg)].</p> <p>(3) No correction is made for air buoyancy. As the span of the weighing machine was adjusted before calibration, the uncertainty limits were estimated to be 1 ppm of the nominal value ie= 0.41 mg.</p>				

Mettler PM480 (T1)	Units	Range	Acc. +/- (1)	Resolution
		mg	80 000	5
Source of Uncertainty	Value	Distribution	Divisor	Std. Uncertainty
Standard weight (2)	0.150	Rectangular	Sqrt 3	0.0864
Resolution	1	Rectangular	Sqrt 3	0.577
Air buoyancy (3)	0.08	Rectangular	Sqrt 3	0.0462
Combined Uncertainty	RSS			0.586
Expanded Uncertainty	$k=2$			1.17
Test Accuracy Ratio (TAR)	TI Acc./STD Acc.			
	33.4	to 1		
Test Uncertainty Ratio (TUR)	TI Acc./Muk=2			
	4.3	to 1		
<p>(1) Combined Uncertainty (2 sigma) of mfg std dev. (1mg), linearity (2mg), corner load (3mg), & Class S1 100g (0.25mg) internal check weight tolerance.</p> <p>(2) RSS of combined tolerances for standard wghts [Class S1 50g (0.12mg), 20g (0.074mg), and 10g (0.05mg)].</p> <p>(3) No correction is made for air buoyancy. As the span of the weighing machine was adjusted before calibration, the uncertainty limits were estimated to be 1 ppm of the nominal value ie= 0.08 mg.</p>				



Southwest Research Institute
6220 Culebra Road
San Antonio, TX 78238
(210) 522-5215
Department of Quality Assurance
Calibration Laboratory

Certificate of Calibration

18 February 2002

Issued to: RON GREEN DIV20 T1
Manufacturer/Model: METTLER PM480
Description: BALANCE
Serial Number: N45601
Asset Number: 002478
Work Order Number: 444047258

This certifies the above item was calibrated in compliance with MIL-STD-45662A and ANSI/NCSL Z540-1-1994. Standards used in this calibration, described in the referenced calibration procedure with associated uncertainties or tolerances, are traceable to the National Institute of Standards and Technology (NIST). Supporting documentation relative to traceability is on file and is available for examination upon request. This certificate is not to be reproduced, except in full, without the written approval of the Southwest Research Institute Department of Quality Assurance Calibration Laboratory.

The uncertainty of the calibration was sufficient to determine that the item met the manufacturer's published specifications unless stated otherwise below.

Ambient Conditions: Temperature: 74.0 Degrees Fahrenheit Humidity: 37 % RH

Calibration Date: 15 Feb 02 **Calibration Procedure:** CLCP-WT-001, 12/99

Condition as Received: IN TOLERANCE

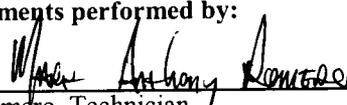
Condition as Returned: IN TOLERANCE

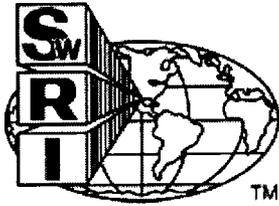
Remarks:

Approved by:


Walt Hill, Supervisor
Institute Calibration Laboratory

Measurements performed by:


Mark Romero, Technician



Southwest Research Institute
6220 Culebra Road
San Antonio, TX 78238
(210) 522-5215
Department of Quality Assurance
Calibration Laboratory

Certificate of Calibration

6 August 2002

Issued to: RON GREEN DIV20 T1
Manufacturer/Model: METTLER PM480
Description: BALANCE
Serial Number: N45601
Asset Number: 002478
Work Order Number: 444049725

This certifies the above item was calibrated in compliance with MIL-STD-45662A and ANSI/NCSL Z540-1-1994. Standards used in this calibration, described in the referenced calibration procedure with associated uncertainties or tolerances, are traceable to the National Institute of Standards and Technology (NIST). Supporting documentation relative to traceability is on file and is available for examination upon request. This certificate is not to be reproduced, except in full, without the written approval of the Southwest Research Institute Department of Quality Assurance Calibration Laboratory.

The uncertainty of the calibration was sufficient to determine that the item met the manufacturer's published specifications unless stated otherwise below.

Ambient Conditions: Temperature: 77.0 Degrees Fahrenheit Humidity: 48 % RH

Calibration Date: 5 Aug 02 **Calibration Procedure:** CLCP-WT-001, 12/99

Condition as Received: IN TOLERANCE

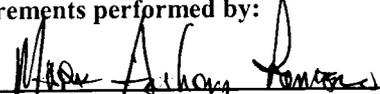
Condition as Returned: IN TOLERANCE

Remarks:

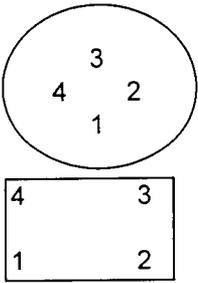
Approved by:


Walt Hill, Metrology Group Leader
Institute Calibration Laboratory

Measurements performed by:


Mark Romero, Technician

Southwest Research Institute
 Calibration Laboratory
 Calibration Data Sheet

Work Order 444049725	Mfr. Mettler	Technician Mark A. Romero		
Asset No. 002478	Model PM480	Procedure CLCP-WT-001, 12/99		
Serial No. N45601	Type Balance	Cal Date 05-Aug-02		
Location: Bldg. 51				
Ambient Conditions: 77 F 48 %RH 14.23 PSIA				
Operational Check: Limits +/- : 0.01 g				
STD Mass Load	As Found Indication	Instrument Error		
100.00 g	100.04 g	0.04 g		
Post Calibration Check:				
STD Mass Load	Post calibration Indication	Instrument Error	Results	
100.00 g	100.00 g	0.00 g	Pass	
Repeatability Check: Mass Load: 100.00 g				
1	100.00 g	6	100.00 g	
2	100.00 g	7	100.00 g	
3	100.00 g	8	100.00 g	
4	100.00 g	9	100.00 g	
5	100.00 g	10	100.00 g	
	Std Deviation	Tolerance		
	0.000 g	0.003 g		
Off-Centerline Check: Mass Load: 200.00 g				
	Indication	Instrument Error	+/- Limits	Results
1	0.000 g	0.00 g	0.003	Pass
2	0.000 g	0.00 g	0.003	Pass
3	0.001 g	0.00 g	0.003	Pass
4	-0.001 g	0.00 g	0.003	Pass
Non-Linearity Check: Range: 400.00 g				
STD Mass Load	Indication	Instrument Error	+/- Limits	Results
0.00 g	0.00 g	0.000 g	0.005	Pass
100.00 g	100.00 g	0.000 g	0.005	Pass
200.00 g	100.00 g	0.000 g	0.005	Pass
300.00 g	100.00 g	0.000 g	0.005	Pass
400.00 g	100.00 g	0.000 g	0.005	Pass
Remarks: Readability is 0.001g (80g) and 0.01g (410g). Standards used 1712, 1713, and 1714.				



SOUTHWEST RESEARCH INSTITUTE™

6220 Culebra Road, P.O. Drawer 28510
Institute Quality Systems
Institute Calibration Laboratory
Phone: 210-522-5215 Fax 210-522-3692

Certificate of Calibration

Submitted By: DIV20
Address: T1
Contact: RON GREEN
Manufacturer Model: METTLER PM480
Description: BALANCE
Serial No: N45601
Asset No: 002478
Procedure: CLCP-WT-001, 12/99

Work Order: 444052332
Date Issued: Feb 10, 2003
Calibration Date: Feb 7, 2003
****Calibration Due:** Aug 7, 2003
Calibration Location: B51
Environment: Temp. 71.0°F Hum. 29 %RH
***As Found:** IN TOLERANCE
***As Left:** IN TOLERANCE

This certificate documents traceability to the National Institute of Standards and Technology (NIST) and the International System of Units (SI). The Laboratory quality system conforms to ISO/IEC 17025, 1999 and ANSI/NCCL Z540-1-1994 which are equivalent to relevant requirements of the ISO 9000-1994 series of standards. This certificate may not be reproduced, except in full, without the written approval of the Southwest Research Institute Calibration Laboratory. The results of this calibration relate only to the individual instrument described above. This certificate shall not be used to claim product endorsement by the American Association for Laboratory Accreditation (A2LA) or any agency of the U. S. Government.

Uncertainty evaluation includes the item under test and is calculated in accordance with the ISO "Guide to the Expression of Uncertainty in Measurement" (GUM). The uncertainty represents an expanded uncertainty using a coverage factor of $k=2$ to approximate a 95% confidence level. The calibration process provides a Test Uncertainty Ratio (TUR) of less than or equal to 25% (4:1) of the test limit unless otherwise stated in remarks or an attachment.

*The client has sole responsibility for determination of in/out of tolerance or compliance/noncompliance. An in/out of tolerance opinion is provided for your convenience based only on the Test Instrument (TI) reading(s) and limits as reported. The reported uncertainty relates only to the results at the time of calibration and does not imply any short or long term stability of the TI.

**Calibration interval is determined by the client and does not assure the instrument will remain within tolerance until this date. Any number of factors may cause the instrument to be out of tolerance before the next calibration date.

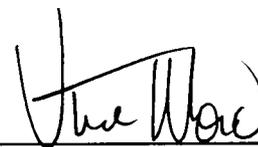
Remarks: None

Standards Used

Asset	Manufacturer	Model	Description	Cal Due
001713	RICE LAKE	200G	WEIGHT, CLASS S	Jun 14, 03
001714	RICE LAKE	200G	WEIGHT, CLASS S	Jun 14, 03
001712	RICE LAKE	100G	WEIGHT, CLASS S	Jun 14, 03



Approved by: Walt Hill
Metrology Group Leader
m:\Nona21a1.rpt Rev date 15, August 02



Measurements by: Vince Morales
Metrology Technician

Southwest Research Institute
Calibration Laboratory
 Calibration Data Sheet

Work Order 444052332	Mfr. Mettler	Technician Vincent Morales
Asset No. 002478	Model PM480	Procedure CLCP-WT-001, 12/99
Serial No. N45601	Type Balance	Cal Date 07-Feb-03

Location: Bldg. 51

Ambient Conditions: 71 F 29 %RH 14.46 PSIA

Operational Check: Limits +/- : 0.02 g **Uncertainty:** 0.01 g

STD Mass Load	As Found Indication	Instrument Error
100.00 g	100.00 g	0.00 g

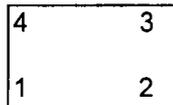
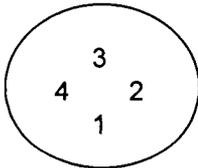
Post Calibration Check:

STD Mass Load	Post calibration Indication	Instrument Error	Results
100.00 g	100.00 g	0.00 g	Pass

Repeatability Check: Mass Load: 100.00 g

1	100.00 g	6	100.00 g
2	100.00 g	7	100.00 g
3	100.00 g	8	100.00 g
4	100.00 g	9	100.00 g
5	100.00 g	10	100.00 g
	Std Deviation	Tolerance	
	0.000 g	0.006 g	

Off-Centerline Check: Mass Load: 200.00 g **Uncertainty:** 0.001 g



	Indication	Instrument Error	+/- Limits	Results
1	0.002 g	0.00 g	0.006	Pass
2	-0.003 g	0.00 g	0.006	Pass
3	0.002 g	0.00 g	0.006	Pass
4	0.000 g	0.00 g	0.006	Pass

Non-Linearity Check: Range: 400.00 g **Uncertainty:** 0.01 g

STD Mass Load	Indication	Instrument Error	+/- Limits	Results
0.00 g	0.00 g	0.00 g	0.01	Pass
100.00 g	100.00 g	0.00 g	0.01	Pass
200.00 g	100.00 g	0.00 g	0.01	Pass
300.00 g	100.00 g	0.00 g	0.01	Pass
400.00 g	100.00 g	0.00 g	0.01	Pass

Remarks: *Readability is 0.001g (80g) and 0.01g (410g). Standards used 1712, 1713, and 1714.*



SOUTHWEST RESEARCH INSTITUTE™

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Institute Quality Systems
Institute Calibration Laboratory
Phone: 210-522-5215 Fax 210-522-3692

Certificate of Calibration

Submitted By: DIV20
Address: TI
Contact: RON GREEN
Manufacturer Model: METTLER PM480
Description: BALANCE
Serial No: N45601
Asset No: 002478
Procedure: CLCP-WT-001, DEC/99

Work Order: 444054871
Date Issued: Aug 7, 2003
Calibration Date: Aug 7, 2003
****Calibration Due:** Feb 7, 2004
Calibration Location: B51
Environment: Temp. 77.0°F Hum. 54 %RH
***As Found:** IN TOLERANCE
***As Left:** IN TOLERANCE

This certificate documents traceability to the National Institute of Standards and Technology (NIST) and the International System of Units (SI). The Laboratory quality system conforms to ISO/IEC 17025, 1999 and ANSI/NC SL Z540-1-1994 which are equivalent to relevant requirements of the ISO 9000-1994 series of standards. This certificate may not be reproduced, except in full, without the written approval of the Southwest Research Institute Calibration Laboratory. The results of this calibration relate only to the individual instrument described above. This certificate shall not be used to claim product endorsement by the American Association for Laboratory Accreditation (A2LA) or any agency of the U. S. Government

Uncertainty evaluation includes the item under test and is calculated in accordance with the ISO "Guide to the Expression of Uncertainty in Measurement" (GUM). The uncertainty represents an expanded uncertainty using a coverage factor of k=2 to approximate a 95% confidence level. The calibration process provides a Test Uncertainty Ratio (TUR) of less than or equal to 25% (4:1) of the test limit unless otherwise stated in remarks or an attachment

*The client has sole responsibility for determination of in/out of tolerance or compliance/noncompliance. An in/out of tolerance opinion is provided for your convenience based only on the Test Instrument (TI) reading(s) and limits as reported. The reported uncertainty relates only to the results at the time of calibration and does not imply any short or long term stability of the TI.

**Calibration interval is determined by the client and does not assure the instrument will remain within tolerance until this date. Any number of factors may cause the instrument to be out of tolerance before the next calibration date.

Remarks: None

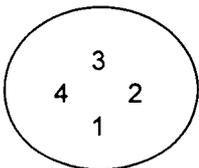
Standards Used

Asset	Manufacturer	Model	Description	Cal Due
001712	RICE LAKE	100G	WEIGHT, CLASS S	Jun 23, 04
001713	RICE LAKE	200G	WEIGHT, CLASS S	Jun 20, 04
001714	RICE LAKE	200G	WEIGHT, CLASS S	Jun 20, 04

Approved by: Walt Hill
Metrology Group Leader
m:\Nona2\al.rpt Rev date 15, August 02

Measurements by: Vince Morales
Metrology Technician

Southwest Research Institute
Calibration Laboratory
Calibration Data Sheet

Work Order 444054871	Mfr. Mettler	Technician Vincent Morales		
Asset No. 002478	Model PM480	Procedure CLCP-WT-001, 12/99		
Serial No. N45601	Type Balance	Cal Date 07-Aug-03		
Location: Bldg. 51				
Ambient Conditions: 77 F 54 %RH 14.23 PSIA				
Operational Check: Limits +/- : 0.02 g Uncertainty: 0.01 g				
STD Mass Load	As Found Indication	Instrument Error		
100.00 g	100.00 g	0.00 g		
Post Calibration Check:				
STD Mass Load	Post calibration Indication	Instrument Error	Results	
100.00 g	100.00 g	0.00 g	Pass	
Repeatability Check: Mass Load: 100.00 g				
1	100.00 g	6	100.00 g	
2	100.00 g	7	100.00 g	
3	100.00 g	8	100.00 g	
4	100.00 g	9	100.00 g	
5	100.00 g	10	100.00 g	
Std Deviation	Tolerance			
0.000 g	0.006 g			
Off-Centerline Check: Mass Load: 200.00 g Uncertainty: 0.001 g				
 	Indication	Instrument Error	+/- Limits	Results
1	-0.001 g	0.00 g	0.006	Pass
2	-0.001 g	0.00 g	0.006	Pass
3	0.001 g	0.00 g	0.006	Pass
4	0.000 g	0.00 g	0.006	Pass
Non-Linearity Check: Range: 400.00 g Uncertainty: 0.01 g				
STD Mass Load	Indication	Instrument Error	+/- Limits	Results
0.00 g	0.00 g	0.00 g	0.01	Pass
100.00 g	100.00 g	0.00 g	0.01	Pass
200.00 g	100.00 g	0.00 g	0.01	Pass
300.00 g	100.00 g	0.00 g	0.01	Pass
400.00 g	100.00 g	0.00 g	0.01	Pass
Remarks: Readability is 0.001g (80g) and 0.01g (410g). Standards used 1712, 1713, and 1714.				
END OF REPORT				