



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: B57

Contact: DARRELL DUNN

Manufacturer Model: SARTORIUS ME215S

Description: BALANCE

Serial No: 12809099

Asset No: 008780

Procedure: CLCP-WT-001, 12/99

Work Order: 444051176

Date Issued: Nov 18, 2002

Calibration Date: Nov 15, 2002

****Calibration Due:** May 15, 2003

Calibration Location: B57 LAB III

Environment: Temp. 72.0°F Hum. 35 %RH

***As Found:** IN TOLERANCE

***As Left:** IN TOLERANCE

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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.

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Remarks: None

Standards Used

Asset	Manufacturer	Model	Description	Cal Due
005117	RICE LAKE	200G	WEIGHT, CLASS E2	Jun 14, 03
001711	RICE LAKE	50G	WEIGHT, CLASS S	Jun 14, 03

Approved by: Walt Hill

Metrology Group Leader

m:\Nona21a1.rpt Rev date 15, August 02

Measurements by: Mark Romero

Metrology Technician

Southwest Research Institute

Calibration Laboratory

Calibration Data Sheet

Work Order 444051176	Mfr. Sartorius	Technician Mark A. Romero
Asset No. 008780	Model ME215S	Procedure CLCP-WT-001, 12/99
Serial No. 12809099	Type Balance	Cal Date 15-Nov-02

Location: Bldg. 57/ Lab III

Ambient Conditions: 72 F 35 %RH 14.23 PSIA

Operational Check: Limits +/- : 0.00041 g **Uncertainty:** 0.00044 g

STD Mass Load	As Found Indication	Instrument Error
200.00000 g	199.99956 g	-0.00044 g

Post Calibration Check:

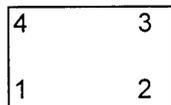
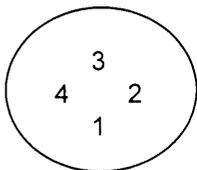
STD Mass Load	Post calibration Indication	Instrument Error	Results
200.00000 g	200.00002 g	0.00002 g	Pass

Repeatability Check: Mass Load: 200.00000 g

1	200.00002 g	6	200.00000 g
2	200.00002 g	7	200.00001 g
3	200.00005 g	8	200.00002 g
4	200.00003 g	9	200.00002 g
5	200.00002 g	10	200.00005 g

Std Deviation	Tolerance
0.00002 g	0.00003 g

Off-Centerline Check: Mass Load: 200.00000 g **Uncertainty:** 0.00044 g



	Indication	Instrument Error	+/- Limits	Results
1	-0.00007 g	-0.00007 g	0.00015	Pass
2	0.00003 g	0.00003 g	0.00015	Pass
3	0.00007 g	0.00007 g	0.00015	Pass
4	-0.00008 g	-0.00008 g	0.00015	Pass

Non-Linearity Check: Range: 200.00000 g **Uncertainty:** 0.00044 g

STD Mass Load	Indication	Instrument Error	+/- Limits	Results
0.00000 g	0.00000 g	0.00000 g	0.00010	Pass
50.00000 g	50.00008 g	0.00008 g	0.00010	Pass
100.00000 g	50.00006 g	0.00006 g	0.00010	Pass
150.00000 g	50.00007 g	0.00007 g	0.00010	Pass
200.00000 g	50.00005 g	0.00005 g	0.00010	Pass

Remarks: Readability 0.01mg. Standards used 5117 and 1711.



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Certificate of Calibration

Submitted By: DIV20
Address: B57
Contact: DARRELL DUNN
Manufacturer Model: SARTORIUS ME215S
Description: BALANCE
Serial No: 12809099
Asset No: 008780
Procedure: CLCP-WT-001, DEC/99

Work Order: 444053802
Date Issued: May 19, 2003
Calibration Date: May 15, 2003
****Calibration Due:** Nov 15, 2003
Calibration Location: B57
Environment: Temp. 68.0°F Hum. 56 %RH
***As Found:** IN TOLERANCE
***As Left:** IN TOLERANCE

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Remarks: None

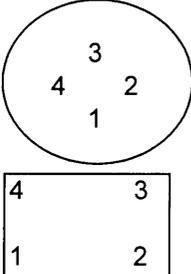
Standards Used

Asset	Manufacturer	Model	Description	Cal Due
005117	RICE LAKE	200G	WEIGHT, CLASS E2	Jun 14, 03
001711	RICE LAKE	50G	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 444053802	Mfr. Sartorius	Technician Vmorales		
Asset No. 008780	Model ME215S	Procedure CLCP-WT-001, 12/99		
Serial No. 12809099	Type Balance	Cal Date 15-May-03		
Location: Bldg. 57/ Lab III				
Ambient Conditions: 68 F 56 %RH 14.16 PSIA				
Operational Check: Limits +/- : 0.00055 g Uncertainty: 0.00044 g				
STD Mass Load	As Found Indication	Instrument Error		
200.00000 g	199.99992 g	-0.00008 g		
Post Calibration Check:				
STD Mass Load	Post calibration Indication	Instrument Error	Results	
200.00000 g	199.99992 g	-0.00008 g	Pass	
Repeatability Check: Mass Load: 200.00000 g				
1	199.99993 g	6	199.99996 g	
2	199.99993 g	7	199.99994 g	
3	199.99995 g	8	199.99994 g	
4	199.99995 g	9	199.99991 g	
5	199.99995 g	10	199.99993 g	
Std Deviation		Tolerance		
0.00001 g		0.00003 g		
Off-Centerline Check: Mass Load: 200.00000 g Uncertainty: 0.00044 g				
	Indication	Instrument Error	+/- Limits	Results
1	0.00000 g	0.00000 g	0.00015	Pass
2	0.00012 g	0.00012 g	0.00015	Pass
3	0.00012 g	0.00012 g	0.00015	Pass
4	-0.00004 g	-0.00004 g	0.00015	Pass
Non-Linearity Check: Range: 200.00000 g Uncertainty: 0.00044 g				
STD Mass Load	Indication	Instrument Error	+/- Limits	Results
0.00000 g	0.00000 g	0.00000 g	0.00010	Pass
50.00000 g	50.00004 g	0.00004 g	0.00010	Pass
100.00000 g	50.00006 g	0.00006 g	0.00010	Pass
150.00000 g	50.00008 g	0.00008 g	0.00010	Pass
200.00000 g	50.00009 g	0.00009 g	0.00010	Pass
Remarks: <i>Readability 0.01mg. Standards used 5117 and 1711.</i>				
END OF REPORT				



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Certificate #
0972-01

Certificate of Calibration

Submitted By: DIV20
Address: B57
Contact: DARRELL DUNN
Manufacturer Model: SARTORIUS ME215S
Description: BALANCE
Serial No: 12809099
Asset No: 008780
Procedure: CLCP-WT-001, DEC/99

Work Order: 444056308
Date Issued: Nov 14, 2003
Calibration Date: Nov 14, 2003
****Calibration Due:** May 14, 2004
Calibration Location: B57
Environment: Temp. 73.0°F Hum. 36 %RH
***As Found:** IN TOLERANCE
***As Left:** IN TOLERANCE

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Remarks: None

Standards Used

Asset	Manufacturer	Model	Description	Cal Due
005117	RICE LAKE	200G	WEIGHT, CLASS E2	Jun 20, 04
001711	RICE LAKE	50G	WEIGHT, CLASS S	Jun 23, 04

Approved by: Walt Hill
Metrology Group Leader
m:\a21a1.rpt Rev date 15, August 02

Measurements by: Tom Hannon
Metrology Technician

Southwest Research Institute
 Calibration Laboratory
 Calibration Data Sheet

Work Order 444056308	Mfr. Sartorius	Technician TJH
Asset No. 008780	Model ME215S	Procedure CLCP-WT-001, 12/99
Serial No. 12809099	Type Balance	Cal Date 14-Nov-03

Location: Bldg. 57/ Lab III

Ambient Conditions: 73 F 36 %RH 14.37 PSIA

Operational Check: Limits +/- : 0.00055 g Uncertainty: 0.00044 g

STD Mass Load	As Found Indication	Instrument Error
200.00000 g	200.00000 g	0.00000 g

Post Calibration Check:

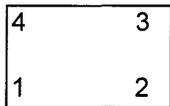
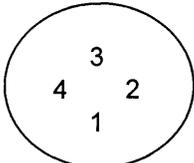
STD Mass Load	Post calibration Indication	Instrument Error	Results
200.00000 g	200.00000 g	0.00000 g	Pass

Repeatability Check: Mass Load: 200.00000 g

1	199.99998 g	6	199.99999 g
2	199.99999 g	7	200.00000 g
3	199.99999 g	8	200.00001 g
4	200.00000 g	9	200.00001 g
5	200.00000 g	10	200.00001 g

Std Deviation	Tolerance
0.00001 g	0.00003 g

Off-Centerline Check: Mass Load: 200.00000 g Uncertainty: 0.00044 g



	Indication	Instrument Error	+/- Limits	Results
1	0.00000 g	0.00000 g	0.00015	Pass
2	0.00006 g	0.00006 g	0.00015	Pass
3	0.00000 g	0.00000 g	0.00015	Pass
4	-0.00005 g	-0.00005 g	0.00015	Pass

Non-Linearity Check: Range: 200.00000 g Uncertainty: 0.00044 g

STD Mass Load	Indication	Instrument Error	+/- Limits	Results
0.00000 g	0.00000 g	0.00000 g	0.00010	Pass
50.00000 g	50.00000 g	0.00000 g	0.00010	Pass
100.00000 g	50.00004 g	0.00004 g	0.00010	Pass
150.00000 g	50.00007 g	0.00007 g	0.00010	Pass
200.00000 g	50.00006 g	0.00006 g	0.00010	Pass

Remarks: Readability 0.01mg. Standards used 5117 and 1711.

END OF REPORT



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Certificate #
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Certificate of Calibration

Submitted By: DIV20
Address: B57
Contact: DARRELL DUNN
Manufacturer Model: SARTORIUS ME215S
Description: BALANCE
Serial No: 12809099
Asset No: 008780
Procedure: CLCP-WT-001, DEC/99

Work Order: 444058988
Date Issued: May 14, 2004
Calibration Date: May 14, 2004
****Calibration Due:** Nov 14, 2004
Calibration Location: B57
Environment: Temp. 81.0°F Hum. 35 %RH
***As Found:** IN TOLERANCE
***As Left:** IN TOLERANCE

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Remarks: None

Standards Used

Asset	Manufacturer	Model	Description	Cal Due
005117	RICE LAKE	200G	WEIGHT, CLASS E2	Jun 20, 04
001711	RICE LAKE	50G	WEIGHT, CLASS S	Jun 23, 04

Approved by: Walt Hill
Metrology Group Leader
m:\a2la1.rpt Rev date 11, May 04

Measurements by: Tom Hannon
Metrology Technician

Southwest Research Institute
 Calibration Laboratory
 Calibration Data Sheet
 Found / Left

Work Order 444058988	Mfr. Sartorius	Technician TJH
Asset No. 008780	Model ME215S	Procedure CLCP-WT-001, 12/99
Serial No. 12809099	Type Balance	Cal Date 14-May-03

Location: Bldg. 57/ Lab III

Ambient Conditions: 81 F 35 %RH 14.31 PSIA

Operational Check: Limits +/- : 0.00055 g Uncertainty: 0.00044 g

STD Mass Load	As Found Indication	Instrument Error
200.00000 g	199.99945 g	-0.00055 g

Post Calibration Check:

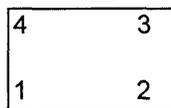
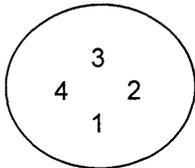
STD Mass Load	Post calibration Indication	Instrument Error	Results
200.00000 g	199.99999 g	-0.00001 g	Pass

Repeatability Check: Mass Load: 200.00000 g

1	199.99999 g	6	199.99998 g
2	199.99999 g	7	199.99999 g
3	199.99998 g	8	199.99999 g
4	200.00000 g	9	199.99998 g
5	199.99999 g	10	199.99999 g

Std Deviation	Tolerance
0.00001 g	0.00003 g

Off-Centerline Check: Mass Load: 200.00000 g Uncertainty: 0.00044 g



	Indication	Instrument Error	+/- Limits	Results
1	-0.00002 g	-0.00002 g	0.00015	Pass
2	0.00009 g	0.00009 g	0.00015	Pass
3	0.00001 g	0.00001 g	0.00015	Pass
4	0.00003 g	0.00003 g	0.00015	Pass

Non-Linearity Check: Range: 200.00000 g Uncertainty: 0.00044 g

STD Mass Load	Indication	Instrument Error	+/- Limits	Results
0.00000 g	0.00000 g	0.00000 g	0.00010	Pass
50.00000 g	49.99995 g	-0.00005 g	0.00010	Pass
100.00000 g	50.00001 g	0.00001 g	0.00010	Pass
150.00000 g	50.00001 g	0.00001 g	0.00010	Pass
200.00000 g	50.00001 g	0.00001 g	0.00010	Pass

Remarks: Readability 0.01mg.

END OF REPORT



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



Certificate of Calibration

Submitted By: DIV20

Address: B57

Contact: DARRELL DUNN

Manufacturer Model: SARTORIUS ME215S

Description: BALANCE

Serial No: 12809099

Asset No: 008780

Procedure: CLCP-WT-001, DEC/99

Work Order: 444061602

Date Issued: Nov 10, 2004

Calibration Date: Nov 10, 2004

****Calibration Due:** May 10, 2005

Calibration Location: B57

Environment: Temp. 69.0°F Hum. 45 %RH

***As Found:** IN TOLERANCE

***As Left:** IN TOLERANCE

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Remarks: None

Standards Used

Asset	Manufacturer	Model	Description	Cal Due
001711	RICE LAKE	50G	WEIGHT, CLASS S	Jun 23, 05
001713	RICE LAKE	200G	WEIGHT, CLASS S	Jun 23, 05

Approved by: Walt Hill
Metrology Group Leader
m:\a2la1.rpt Rev date 11, May 04

Measurements by: Jerry White
Metrology Technician

Southwest Research Institute
Calibration Laboratory
Measurement Report

Work Order:	444061602	Mfr.	Sartorius	Technician	jaw
Asset No.	008780	Model	ME215S	Cal Date.	10-Nov-04
Serial No.	12809099	Type.	Balance		

Remarks:

Ambient Conditions 69 deg F 45 % RH 14.30 PSIA

Function/Range	Test Point	TI Reading	Difference	+/-Limit	+/-Uncertainty	Found/Left
Repeatability Check	grams	grams	grams	grams	grams	Result
1	200.00000	199.99995				
2	200.00000	199.99994				
3	200.00000	199.99995				
4	200.00000	199.99995				
5	200.00000	199.99994				
6	200.00000	199.99994				
7	200.00000	199.99994				
8	200.00000	199.99994				
9	200.00000	199.99994				
10	200.00000	199.99994				
		Std Deviation	0.000007	0.00003		Pass
Offcenter Check						
Front	200.00000	199.99995	-0.00005	0.00015	0.000060	Pass
Right	200.00000	200.00005	0.00005	0.00015	0.000060	Pass
Rear	200.00000	200.00004	0.00004	0.00015	0.000060	Pass
Left	200.00000	199.99995	-0.00005	0.00015	0.000060	Pass
Nonlinearity Check						
0	0.00000	0.00000	0.00000	0.00010	0.000050	Pass
50	49.99995	50.00000	0.00005	0.00010	0.000050	Pass
100	50.00001	50.00001	0.00000	0.00010	0.000056	Pass
150	50.00001	50.00002	0.00001	0.00010	0.000056	Pass
200	50.00001	50.00002	0.00001	0.00010	0.000060	Pass

End of Report