

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

WORK ORDER

CERTIFICATE # 24192 ASSET # 002186 DATE 03 Feb. 97

ITEM DATA:
Manufacturer West. Precision Model 25mm
Description Micrometer Serial # 20-M-1
Accessories _____

ACTION REQUESTED cal

CUSTODIAN Div. 20, Darrell Dunn

Turned in by: _____ Phone 6090

CHARGE # 20-5708-561 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
_____ Realibility code

ACTION TAKEN: (Calibration/Repair/Parts) _____

CAL ENVIRONMENT: Temperature 70 °F Humidity 29 %RH

CALIBRATED/REPAIRED:
By 8114 Cal Procedure WI930MS03
Date 2-11-97 Accuracy .01mm
Cal Interval 6m Time to complete:
Next Cal due 8-11-97 Cal 7 Repair _____
Standards used (Asset#) 002180

DATE COMPLETED 2-11-97
DATE PICKED UP 2/17/97 PICKED UP BY [Signature]

24192

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

WORK ORDER

CERTIFICATE # 26578 ASSET # 002106 DATE 25 Aug 97

ITEM DATA:

Manufacturer West Germany Model 25x 0.0/mm
Description Manufacturer Serial # 20-1-1
Accessories _____

ACTION REQUESTED ROI

CUSTODIAN DIV. 20 David Damm

Turned in by: _____ Phone 6090

CHARGE # 20.5708.501 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) _____

Calibrated

CAL ENVIRONMENT:
Temperature 70 °F Humidity 66 %RH

CALIBRATED/REPAIRED:
By 8114 Cal Procedure W1930MS03
Date 9-9-97 Accuracy .01 mm
Cal Interval 3-9-97 6M Reliability Code: 7
Next Cal due 3-9-97 Cal Time 1 Repair Time _____
Standards used (Asset#) 002171

DATE COMPLETED 9-9-97
DATE PICKED UP 9/30/97 PICKED UP BY [Signature]

26578

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

WORK ORDER

CERTIFICATE # 28698 ASSET # 002186 DATE 19 FEB 98

ITEM DATA:

Manufacturer West Point Model 25-0.01mm
Description MIC Serial # 20-M-1
Accessories WSP

ACTION REQUESTED Cal

CUSTODIAN Dr. P. D. D.

Turned in by: max Phone 6090

CHARGE # 10-5 11402-541 Date Required _____

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

COPY OF CALIBRATION CERTIFICATE 3-5 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) Calibrated per procedure

CAL ENVIRONMENT:
Temperature 69 °F Humidity 40 %RH

CALIBRATED/REPAIRED:
By [Signature] Cal Procedure CLCP-MS-023
Date 23 FEB 98 Accuracy [Signature]
Cal Interval 6 mo Reliability Code: 8
Next Cal due 23 AUG 98 Cal Time 1.5 Repair Time _____
Standards used (Asset#) 271

DATE COMPLETED 23 FEB 98
DATE PICKED UP 2/25/98 PICKED UP BY [Signature]

28698

CALIBRATION CHECK FORM

Date Calibrated 23 FEB 98 Work Order 28698
 Technician 8216 CAL. PROCEDURE: CLCP-45-003
 Unit Under Test MICROMETER, 0-1" 0.02
 Manufacturer _____ Model 25x0.01mm SN 20-1-1 ASN 3186

| STEP | FUNCTION OR RANGE | APPLIED | TOLERANCE | | MEASURED VALUES | | F |
|------|------------------------|----------|-------------------------|-----------|------------------------|----------|---|
| | | | MIN | MAX | AS FOUND | RELEASED | |
| 1 | ZERO | N/A | 0 | P() F() | | | |
| 2 | FLATNESS | N/A | 50 x 10 ⁻⁶ " | | | | |
| | ANVIL FACE | | | | 1 x 10 ⁻⁶ " | | |
| | SPINDLE FACE | | | | 1 x 10 ⁻⁶ " | | |
| 3 | PARALLELISM | | ± 0.20mm | | | | |
| | | (3.55mm) | | | | | |
| | FIRST READING | 0.1400" | | | 3.55mm | | |
| | SECOND READING | | | | 3.56mm | | |
| | THIRD READING | | | | 3.56mm | | |
| | FOURTH READING | | | | 3.56mm | | |
| | | (5.08mm) | | | | | |
| | FIRST READING | 0.2000" | | | 5.08mm | | |
| | SECOND READING | | | | 5.08mm | | |
| | THIRD READING | | | | 5.08mm | | |
| | FOURTH READING | | | | 5.08mm | | |
| 4 | MICROMETER GRADUATIONS | | ± 0.01mm | | | | |
| | 25% RANGE | 6.20mm | | | 6.21mm | | |
| | 50% RANGE | 12.50mm | | | 12.51mm | | |
| | 75% RANGE | 18.75mm | | | 18.75mm | | |
| | 100% RANGE | 25.00mm | | | 25.01mm | | |

2/23/98

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

WORK ORDER

CERTIFICATE # 31065 ASSET # 002186 DATE 31 Aug 98

ITEM DATA:

Manufacturer Made in West Germany Model 25 x 0.01 mm
Description micrometer Serial # 20-M-1
Accessories ISO

ACTION REQUESTED cal

CUSTODIAN D. D. Darrell Dunn

Turned in by: _____ Phone 6090

CHARGE # 20-1402-511 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 M.R.D. Date 08-31-98

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) Calibrated per procedure

CAL ENVIRONMENT:
Temperature 68 °F Humidity 48 %RH

CALIBRATED/REPAIRED:
By [Signature] Cal Procedure CLIP-45-003
Date 3-5-98 Accuracy [Signature]
Cal Interval 6 mo Reliability Code: 9
Next Cal due 3-1-99 Cal Time 1.5 Repair Time _____
Standards used (Asset#) 6465

DATE COMPLETED 3-5-98
DATE PICKED UP 4/22/98 PICKED UP BY [Signature]

31065

CALIBRATION CHECK FORM

WI-9-30-
 Rev _____ Chg _____
 Page 1 of 1

Date Calibrated 3-25-98 3E198 Work Order 31265
 Technician 82/6 CAL. PROCEDURE: SSCP-43-103
 Unit Under Test MICROMETER, 0-25MM
 Manufacturer MADE IN GERMANY Model 25x0.01MM SN 0-4-1 ASN 3/86

| STEP | FUNCTION OR RANGE | APPLIED | TOLERANCE | | MEASURED VALUES | | P/T |
|------|---------------------|---------|------------|-----|-----------------|----------|-----|
| | | | MIN | MAX | AS FOUND | RELEASED | |
| | ZERO | | ± 0.0002" | | | | P |
| | FLATNESS | | ± 0.00005" | | | | |
| | ANVIL | | | ↓ | 0.00003" | | P |
| | SPINDLE | | | ↓ | 0.00003" | | P |
| | PARALLELISM | | ± 0.00005" | | | | |
| | OPTICAL FLAT | 0.0000" | | ↓ | 0.00002" | | |
| | | 0.0125" | | ↓ | 0.00001" | | P |
| | FIRST READING | .1400" | | | | | |
| | SECOND READING | ↓ | | | | | |
| | THIRD READING | | | | | | |
| | FOURTH READING | ↓ | | | | | |
| | FIRST READING | .2100" | | | | | |
| | SECOND READING | ↓ | | | | | |
| | THIRD READING | | | | | | |
| | FOURTH READING | ↓ | | | | | |
| | GRADUATION ACCURACY | | ± 0.0004" | | | | |
| | 25% RANGE | 0.2560" | | | 0.2563" | | P |
| | 50% RANGE | 0.5120" | | | 0.5122" | | P |
| | 75% RANGE | 0.7680" | | | 0.7681" | | P |
| | 100% RANGE | 0.9990" | | | 0.9994" | | P |

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

WORK ORDER

CERTIFICATE # 33571 ASSET # 002186 DATE 08 March 99

ITEM DATA:

Manufacturer Unknown Model 25 x 0.01mm
Description micrometer Serial # 20-M-1
Accessories MSF

ACTION REQUESTED Cal

CUSTODIAN Dr. D. Durr

Turned in by: _____ Phone 6096

CHARGE # 20-408-57104 03/2 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 MDJ Date 03/05/99

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) Calibrated by Durr

CAL ENVIRONMENT:
Temperature 69 °F Humidity 40 %RH

CALIBRATED/REPAIRED:
By MDJ Cal Procedure F.O. 3316-4-15-1, A6626
Date 11 March 99 Accuracy MSF
Cal Interval 6 mos Reliability Code: 10
Next Cal due 16 Sep 99 Cal Time 1.5 Repair Time _____
Standards used (Asset#) 6179, 6465

DATE COMPLETED 16 March 99
DATE PICKED UP 3/18/99 PICKED UP BY Durr

33571

CALIBRATION CHECK FORM

Date Calibrated 11/10/99 Work Order 33571
 Technician 8216 Cal. Procedure: 666-1115-0003, F.O. 33K6-1-15-1, A696
 Unit Under Test MICROMETER, 25mm OD
 Manufacturer WILSON Model 25 x 0.01mm SN RD-N-1 ASN _____

| STEP | FUNCTION OR RANGE | APPLIED | TOLERANCE | | MEASURED VALUES | | P/F |
|------|---------------------|---------|-----------|-----|-----------------|----------|-----|
| | | | MIN | MAX | AS FOUND | RELEASED | |
| | ZERO | 0.00mm | ± 0.00mm | | 0.00mm | | P |
| | FLATNESS | | ± 0.0005" | | | | |
| | AXIS | | | ↓ | 0.0001" | | P |
| | SPINDLE | | | ↓ | 0.0001" | | P |
| | PARALLELISM | | ± 0.01mm | | | | |
| | FIRST READING | 3.55mm | | ↓ | 3.56mm | | |
| | SECOND READING | " | | | 3.56mm | | |
| | THIRD READING | " | | | 3.56mm | | |
| | FOURTH READING | " | | | 3.56mm | | |
| | SECOND READING | 5.08mm | | ↓ | 5.08mm | | |
| | FIRST READING | " | | | 5.08mm | | |
| | THIRD READING | " | | | 5.08mm | | |
| | FOURTH READING | " | | | 5.08mm | | |
| | GRADUATION ACCURACY | | ± 0.01mm | | | | |
| | 25% RANGE | 6.25 | | ↓ | 6.25mm | | P |
| | 50% RANGE | 12.50 | | | 12.50mm | | P |
| | 75% RANGE | 18.75 | | | 18.75mm | | P |
| | 100% RANGE | 25.00 | | | 25.01mm | | P |
| | | 3.05mm | | ↓ | 3.05mm | | P |

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

WORK ORDER

CERTIFICATE # 35949 ASSET # 004186 DATE 09 Sept. 99

ITEM DATA:

Manufacturer UNKNOWN Model 25 x 0.01mm
Description MIC Serial # 20-M-1
Accessories CASE

ACTION REQUESTED cal

CUSTODIAN Div. 20, Darrell Dunn

Turned in by: _____ Phone 6090

CHARGE # 20-04 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 MAP Date 09-09-99

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) Calibrated by Louchen

CAL ENVIRONMENT:
Temperature 68 °F Humidity 72 %RH

CALIBRATED/REPAIRED:
By [Signature] Cal Procedure CL-10, 11/2/99
Date 15 SEV 1999 Accuracy 1/2
Cal Interval 6 Mths Reliability Code 11
Next Cal due 15 MAR 2000 Cal Time 1.5 Repair Time _____
Standards used (Asset#) 6178, 6179, 6465

DATE COMPLETED 15 SEV 1999
DATE PICKED UP 9/25/99 PICKED UP BY [Signature]

35949

CALIBRATION WORKSHEET

Date Calibrated 15 SEP 1999 Work Order 35949 Cal By J216

Procedure No./Date CL-10, 14 May 99 Unit Under Test MICROMETER, 0-25 MM

Mfg. CalKorand Model 25 x 0.01 mm SN 20-141 AN 2186

| STEP | FUNCTION OR RANGE | APPLIED mm | TOLERANCE | | MEASURED VALUES | | P/F |
|------|---------------------|---------------|-------------|-----|-----------------|----------|-----|
| | | | MIN | MAX | AS FOUND | RELEASED | |
| 4.5 | ZERO | 0.00 | ± 0.00 mm | | 0.00 | | P |
| 4.1 | FLATNESS | | ± 0.0012 mm | | | | |
| | ANVIL | | ↓ | | 0.0000 mm | | P |
| | SPINDLE | | | | 0.0000 mm | | P |
| 4.2 | PARALLELISM | | ↓ | | | | |
| | OPTICAL FIBER | 0.000 mm | | | 0.000 | | P |
| | | 0.32 mm | | | 0.000 | | P |
| 4.6 | GRADUATION ACCURACY | | ± 0.01 | | | | |
| | | 3.05 | ↓ | | 3.05 | | P |
| | 25% RANGE | 6.25 | | | 6.25 | | P |
| | 50% RANGE | 12.50 | | | 12.50 | | P |
| | 75% RANGE | 18.75 | | | 18.75 | | P |
| | 100% RANGE | 24.85 | | | 24.96 | | P |

25997

WORK ORDER 38594

Date Received 4/10/00

Asset No. 002186 Manufacturer UNKNOWN Model 25 X 0.01MM
 Description MICROMETER Serial Number 20-M-1
 Accessory Received/Required CASE
 Div/CC ID NONE Accessory to Asset No. N/A Accuracy .01MM
 Div/CC DIV20 Location B57 Custodian DARRELL DUNN Tel. 6090
 Charge/Project No. 20.00751.006 Proprietary/Confidential N Date Required ROUTINE
 Work Requested CALIBRATION
 Receiving Inspection O.K.
 Delivered By DARRELL DUNN Tel. 6090

WORK HISTORY

| Date | Start Time | Stop Time | Notes |
|------|------------|-----------|-------|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

PARTS

| Part Name | Part Number | Cost | Failure Description |
|-----------|-------------|------|---------------------|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

38594

WORK SUMMARY

Failure Description _____

Repair Action _____

Cal Procedure CL-10, 5/99 Temp 68 F Hum 44 %

Tech 8216 Cal Hrs. 1.5 Repair Hrs. _____ Part Cost _____

Action Taken Calibrated per procedure

Standards Used 6178, 6179, 6465

Date Cal 20 APR 00 Int. 6 Mo. Date Due 20 OCT 00 Reliability Code 12

Date Picked Up 3/2/00 Picked Up By [Signature]

CALIBRATION CHECK FORM

Date Calibrated 20 APR 00 Work Order 38594 Cal By 8216

Procedure No./Date CL-10, MAR 99 Unit Under Test MICROMETER, 25MM

Mfg. UNIKORN Model 25 x 0.01MM SN 20-4-1 AN 2/86

| STEP | FUNCTION OR RANGE | APPLIED mm | TOLERANCE | | MEASURED VALUES | | P/F |
|------|-------------------|---------------|------------|-----|-----------------|----------|-----|
| | | | MIN | MAX | AS FOUND | RELEASED | |
| 4.5 | ZERO | 0.00 | ± 0.00 mm | | 0.00 | | P |
| 4.1 | FLATNESS | | ± 0.001 mm | | | | |
| | ANVIL | | | | 0.0000 mm | | P |
| | SAMPLE | | | | 0.0000 mm | | P |
| 4.2 | PARALLELISM | | | | | | |
| | OPTICAL FLAT | 0.000 | ± 0.001 mm | | 0.00 | | P |
| | | 0.320 | | | 0.00 | | P |
| 4.6 | LOADING RANGE | | ± 0.01 mm | | | | |
| | | 3.25 | | | 3.25 | | P |
| | 25% RANGE | 6.25 | | | 6.25 | | P |
| | 50% RANGE | 12.50 | | | 12.50 | | P |
| | 75% RANGE | 18.75 | | | 18.75 | | P |
| | 100% RANGE | 24.95 | | | 24.96 | | P |



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

Certificate of Calibration

20 April 2000

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: UNKNOWN 25 X 0.01MM
Description: MICROMETER
Serial Number: 20-M-1
Asset Number: 002186

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: 68.0 Degrees Fahrenheit Humidity: 44 % RH

Calibration Date: 20 Apr 00 **Calibration Procedure:** CL-10, 5/99

Condition as Received: LIMITED CALIBRATION

Condition as Released: LIMITED CALIBRATION

Remarks: MFG. IS UNKNOWN. UNIT MEETS SPECIFICATIONS FOR UNITS OF THIS TYPE, RANGE AND RESOLUTION.

Approved by:


Jim Patterson, Supervisor or Walt Hill, Metrologist

Certificate # 38594

m:\nona21a.rpt Rev date 13 Apr 99

Measurements performed by:


Ken Harp, Technician

Page 1 of 1

SOUTHWEST RESEARCH INSTITUTE

Calibration Laboratory

WORK ORDER

Processed by RCRUZ at 8:44:40AM on 10/24/00

I4213

1 10001 0001 0001 0001 0001 0001 0001

Work Order No 444041095

Arrived 10/24/00

Asset No. 002186 Manufacturer UNKNOWN

Model 25 X 0.01MM

Instrument Type/Class MICROMETER

Serial No. 20-M-1

Accessory No.

Calibration Procedure CL-10, 5/99

Location B57

Div/Client DIV20

Custodian DARRELL DUNN

Mail Stop B57

Tel. 6090

Charge/Project No. 20.00751.006

Delivered By / Telephone DARRELL DUNN

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 CL-10, May 99 Temp 68 F Hum. 42 %

Tech 8216 Totals Cal Hours 1 Repair Hours _____ Parts Cost _____

Standards Used 6178, 6179, 6165

Date Picked Up 11/6/2000

Picked Up By Darrell Dunn

41095

CALIBRATION CHECK FORM

Date Calibrated 6 Nov 00 Work Order 744041095 Cal By 8216

Procedure No./Date: CL-10, May99 Unit Under Test: Micrometer, 25mm

Mfg H.S. Brown Model 25 x 0.01mm SN 20-11-1 AN 2186

| STEP | FUNCTION OR RANGE | APPLIED | TOLERANCE | MEASURED VALUES | | P/F |
|------|-------------------------------|------------------|----------------------------|-----------------|----------|-----|
| | | Inches <u>mm</u> | MIN - MAX | AS FOUND | RELEASED | |
| 4.5 | Zero | 0.0000 | +/- 0.0000" | <u>0.000 mm</u> | | P |
| 4.1 | Flatness | | +/- 0.007 ¹² mm | | | |
| | Anvil | | ↓ | 0.000" | | P |
| | Spindle | | ↓ | 0.000" | | P |
| 4.2 | Parallelism | | +/- 0.012 mm | | | |
| | Optical Flat | 0.0000 | ↓ | 0.001 mm | | P |
| | | 0.0125 | ↓ | 0.001 mm | | P |
| | First Reading | ___ .14000 | | | | |
| | Second Reading | " | | | | |
| | Third Reading | " | | | | |
| | Fourth Reading | " | | | | |
| | First Reading | ___ .20000 | | | | |
| | Second Reading | " | | | | |
| | Third Reading | " | | | | |
| | Fourth Reading | " | | | | |
| 4.6 | Graduation Accuracy | | +/- 0.004 mm | | | |
| | (3.250) ___ .12000 | | | 3.250 mm | | P |
| | 25% Range (6.500) ___ .25000 | | | 6.50 mm | | P |
| | 50% Range (9.750) ___ .51200 | | | 9.750 mm | | P |
| | 75% Range (19.500) ___ .76800 | | | 19.57 mm | | P |



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

6 November 2000

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: UNKNOWN 25 X 0.01MM
Description: MICROMETER
Serial Number: 20-M-1
Asset Number: 002186

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: 68.0 Degrees Fahrenheit Humidity: 42 % RH


Calibration Date: 6 Nov 00 **Calibration Procedure:** CL-10, 5/99

Condition as Received: WITHIN LIMITED CALIBRATION

Condition as Released: LIMITED CALIBRATION

Remarks: MANUFACTURER IS UNKNOWN. UNIT MEETS FED. SPEC GGG-C-105C, JUL 87 FOR UNITS OF THIS TYPE, RANGE AND RESOLUTION.

Approved by:



Jim Patterson, Supervisor, or Walt Hill, Metrologist

Certificate # 444041095

m\A2la.rpt Rev date 22 May 00

Measurements performed by:



Ken Harp, Technician

Page 1 of 1

CALIBRATION CHECK FORM

Date Calibrated 1 May 99 Work Order 44443359 Cal By 8216

Procedure No./Date : CL-10, May99 Unit Under Test: Micrometer, 25mm PD

Mfg W. Schmidt Model 25 X 0.01mm S/N 2041-1 A/N 2186

| STEP | FUNCTION OR RANGE | APPLIED | TOLERANCE | | MEASURED VALUES | | P/ F | |
|------|---------------------|--|--------------|-----|-----------------|----------|---------|--|
| | | Inches | MIN | MAX | AS FOUND | RELEASED | | |
| 4.5 | Zero | 0.0000 | +/- 0.0000" | | 0.000mm | | P | |
| 4.1 | Flatness | | +/- 0.001 mm | | | | | |
| | Anvil | | ↓ | | 0.000mm | | P | |
| | Spindle | | | | 0.000mm | | P | |
| 4.2 | Parallelism | | +/- 0.002 mm | | | | | |
| | Optical Flat | 0.0000 | ↓ | | 0.000mm | | P | |
| | | 0.0125 | | | 0.000mm | | P | |
| | First Reading | ___14000 | / | | | | | |
| | Second Reading | " | | | | | | |
| | Third Reading | " | | | | | | |
| | Fourth Reading | " | | | | | | |
| | First Reading | ___20000 | / | | | | | |
| | Second Reading | " | | | | | | |
| | Third Reading | " | | | | | | |
| | Fourth Reading | " | | | | | | |
| 4.6 | Graduation Accuracy | | +/- 0.01 mm | | | | | |
| | 25% Range | 3.25 mm 12000 6.50 mm 25600 | ↓ | | 3.25 mm | | P | |
| | 50% Range | 13.00 mm 51200 19.51 mm 76800 | | | 6.50 mm | | P | |
| | | | | | 13.01 mm | | P | |
| | | | | | 19.51 mm | | P | |



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

1 May 2001

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: UNKNOWN 25 X 0.01MM
Description: MICROMETER
Serial Number: 20-M-1
Asset Number: 002186
Work Order Number: 444043359

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: 68.0 Degrees Fahrenheit Humidity: 43 % RH

Calibration Date: 1 May 01 **Calibration Procedure:** CL-10, 5/99

Condition as Received: IN TOLERANCE

Condition as Released: IN TOLERANCE

Remarks:

Approved by:

Walt Hill, Supervisor
Institute Calibration Laboratory

Measurements performed by:

Ken Harp, Technician

SOUTHWEST RESEARCH INSTITUTE

Calibration Laboratory

WORK ORDER

Received by RCRUZ, 12/6/01 2:25:38PM

Arrived 12/6/01

Work Order **444046375**

Asset No. 002186 Manufacturer UNKNOWN

Model 25 X 0.01MM

Equipment Type MICROMETER

Serial No. 20-M-1

Accessory No.

Interval 6 M

Calibration Procedure CL-10, 5/99

Location B57

Div/Client DIV20

Custodian DARRELL DUNN

Mail Stop B57

Tel 6090

IN4CAL

Special Instructions 20.00751.006

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

Charge/Project No. 00751.006 1.20

Requester / Telephone

This information 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 _____

Tech 824 Cal Hrs. 1 Repair Hrs _____ Parts Cost _____ Temp 68 F Hum. 33 %

Standards Used 6179, 6465

Date Picked Up 1/7/2002

Picked Up By Dunn

444046375



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

Certificate of Calibration

3 January 2002

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: UNKNOWN 25 X 0.01MM
Description: MICROMETER
Serial Number: 20-M-1
Asset Number: 002186
Work Order Number: 444046375

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: 68.0 Degrees Fahrenheit Humidity: 33 % RH

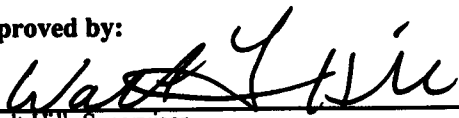
Calibration Date: 3 Jan 02 **Calibration Procedure:** CL-10, 5/99

Condition as Received: IN TOLERANCE

Condition as Returned: IN TOLERANCE

Remarks:

Approved by:


Walt Hill, Supervisor
Institute Calibration Laboratory

Measurements performed by:


Ken Harp, Technician

CALIBRATION CHECK FORM

Date Calibrated 3-Jan-02 Work Order 444446375 Cal By 8216

Procedure No./Date : CL-10, May99 Unit Under Test: Micrometer. 25MM01D

Mfg W. Kamm Model 25x0.01mm SN 20-M-1 AN 2186

| STEP | FUNCTION OR RANGE | APPLIED Inches | TOLERANCE | MEASURED VALUES | | P/F | |
|------|---------------------|---------------------|----------------------|-----------------|------------|-----|---|
| | | | MIN - MAX | AS FOUND | RELEASED | | |
| 4.5 | Zero | 0.0000 | +/- 0.0000" | 0.0000 | | P | |
| 4.1 | Flatness | | +/- 0.00005" 0.001mm | | | | |
| | Anvil | | " | 0.000 | | P | |
| | Spindle | | " | 0.000 | | P | |
| 4.2 | Parallelism | | +/- 0.0001" 0.002mm | | | | |
| | Optical Flat | 0.0000 | ↓ | 0.000 | | P | |
| | | 0.0125 | | 0.000 | | P | |
| | First Reading | .14000 | | / | | | |
| | Second Reading | " | | | | | |
| | Third Reading | " | | | | | |
| | Fourth Reading | " | | | | | |
| | First Reading | .20000 | | | | | |
| | Second Reading | " | | | | | |
| | Third Reading | " | | | | | |
| | Fourth Reading | " | | | | | |
| 4.6 | Graduation Accuracy | MM 3.05 12000 | +/- 0.01/mm | | MM 3.05 | | P |
| | 25% Range | 4.50 15600 | ↓ | | 6.50 | | P |
| | 50% Range | 7.50 51200 | | | 12.21 | | P |
| | 75% Range | 10.50 76800 | | | 19.51 | | P |

SOUTHWEST RESEARCH INSTITUTE

Calibration Laboratory

WORK ORDER

Received by AANDERSON, 7/3/02 10:42:34AM

Arrived 7/3/02

Work Order **444049291**

Asset No. 002186 Manufacturer UNKNOWN

Model 25 X 0.01MM

Equipment Type MICROMETER

Serial No. 20-M-1

Accessory No.

Interval 6 M

Calibration Procedure CL-10, 5/99

Location B57

Div/Client DIV20

Custodian DARRELL DUNN

Mail Stop B57

Tel 6090

IN LINE

Special Instructions 20.00751.006

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. _____

WORK NOTES

Date Hours Remarks/Notes

July 8, 2002 Calibrate

Date Hours Part Name Part Number Failure Description Cost

444049291

WORK SUMMARY

Failure Description _____

Repair Action _____

Tech _____ Cal Hrs. 1.10 Repair Hrs _____ Parts Cost _____ Temp 68 F Hum. 76 %

Standards Used 61579, 6465

Date Picked Up 7/17/02

Picked Up By Darrell Dunn



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

Certificate of Calibration

15 July 2002

Issued to: DARRELL DUNN DIV20 B57
Manufacturer/Model: UNKNOWN 25 X 0.01MM
Description: MICROMETER
Serial Number: 20-M-1
Asset Number: 002186
Work Order Number: 444049291

This certifies the above item was calibrated in compliance with MIL-STD-45662A and ANSI/NCCL 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: 68.0 Degrees Fahrenheit Humidity: 76 % RH


Calibration Date: 8 Jul 02 **Calibration Procedure:** CL-10, 5/99

Condition as Received: IN TOLERANCE

Condition as Returned: IN TOLERANCE

Remarks:

Approved by:


Walt Hill, Metrology Group Leader
Institute Calibration Laboratory

Measurements performed by:


Tom Hannon, Technician

Southwest Research Institute
 Calibration Laboratory
 Calibration Data sheet.

Found/Left

| | | |
|-----------------------------|------------------------------|--------------------------------|
| Work Order 444049291 | Mfr Unknown | Tech: Hannon |
| Asset No. 002186 | Model 25 X 0.01MM | Procedure: CL-10 May 99 |
| Serial No. 20-M-1 | Type Micrometer 25 mm | Cal Date: July 8, 2002 |

Remarks: (1) The Difference is equal to Standard - TI Reading.
 (2) If no value is listed the uncertainty is >4/1
 The results (TI Reading) are provided, it is up to the end user to determine if results meet their need.

Parameter: Length (mm)

| Function/Range | Test Point | TI Reading | Difference (1) | Test Limits+/- | Uncertainty (2) | Results |
|----------------|------------|------------|----------------|----------------|-----------------|---------|
| Flatness | Anvil | | | | | Pass |
| | Spindle | | | | | Pass |
| Parallelism | | | | | | Pass |

| Linearity | Test Point | TI Reading | Difference (1) | Test Limits+/- | Uncertainty (2) | Results |
|-----------|------------|------------|----------------|----------------|-----------------|---------|
| | 3.048 | 3.049 | 0.001 | 0.001 | 0.002 | |
| | 6.250 | 6.250 | 0.000 | 0.001 | 0.002 | |
| | 12.500 | 12.500 | 0.000 | 0.001 | 0.002 | |
| | 18.750 | 18.750 | 0.000 | 0.001 | 0.002 | |
| | 23.750 | 23.750 | 0.000 | 0.001 | 0.002 | |