



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: STARRETT 721

Description: CALIPER

Serial No: 03031512

Asset No: 010085

Procedure: CALIPERS, JUN 02

Work Order: 444052305

Date Issued: Feb 7, 2003

Calibration Date: Feb 7, 2003

****Calibration Due:** Feb 7, 2004

Calibration Location: Bldg. 64

Environment: Temp. 68.0°F Hum. 40 %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/NCSL 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
006465	STARRETT	SS81A1	GAGE BLOCK SET	Jun 29, 04



Approved by: Walt Hill

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



Measurements by: Perry Carpenter

Metrology Technician

Southwest Research Institute
Calibration Laboratory
Calibration Data sheet.

Work Order	444051158	Mfr	STARRETT	Tech:	Perry Carpenter
Asset No.	003068	Model	721	Procedure:	<u>CALIPERS, JUN/02</u>
Serial No.	7031660	Type	Caliper	Cal Date:	10-Feb-03
Remarks:					

RANGE	Test Point	Indicated Difference		+/- Limits	Uncertainty	Found/Left
9.000	Inch	Inch	Inch	Inch	Inch	Results
OUTSIDE SCALE	2.2500	2.2500	0.0000	0.0010	0.0003	Pass
	4.5000	4.5000	0.0000	0.0010	0.0003	Pass
	6.7500	6.7500	0.0000	0.0010	0.0003	Pass
	9.0000	9.0000	0.0000	0.0010	0.0003	Pass
INSIDE SCALE	0.5000	0.4995	-0.0005	0.0010	0.0003	Pass
DEPTH SCALE	1.0000	1.0000	0.0000	0.0010	0.0003	Pass



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Certificate #

0972-01

Certificate of Calibration

Submitted By: DIV20

Address: B57

Contact: DARRELL DUNN

Manufacturer Model: STARRETT 721

Description: CALIPER

Serial No: 03031512

Asset No: 010085

Procedure: CALIPER, JUN/02

Work Order: 444057796

Date Issued: Mar 10, 2004

Calibration Date: Mar 10, 2004

****Calibration Due:** Mar 10, 2005

Calibration Location: Bldg. 64

Environment: Temp. 68.0°F Hum. 44 %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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**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
006465	STARRETT	SS81A1	GAGE BLOCK SET	Jun 29, 04

Approved by: Walt Hill
Metrology Group Leader

Measurements by: Perry Carpenter
Metrology Technician

Southwest Research Institute
Calibration Laboratory
Calibration Report

Work Order	444057796	Mfr	Starrett	Tech:	PWC
Asset No.	010085	Model	721		
Serial No.	03031512	Type	Caliper	Cal Date:	10-Mar-04
Remarks:					

RANGE	Test Point	Indicated	Difference	+/-Limit	+/-Uncertainty	Found/Left
9.000	Inch	Inch	Inch	Inch	Inch	Results
OUTSIDE SCALE	2.2500	2.2500	0.0000	0.0010	0.00065	Pass
	4.5000	4.5000	0.0000	0.0010	0.00065	Pass
	6.7500	6.7500	0.0000	0.0010	0.00065	Pass
	9.0000	9.0000	0.0000	0.0010	0.00065	Pass
INSIDE SCALE	0.5000	0.5000	0.0000	0.0010	0.00065	Pass
DEPTH SCALE	1.0000	1.0000	0.0000	0.0010	0.00065	Pass
END OF REPORT						



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Certificate #

0972-01

Certificate of Calibration

Submitted By: DIV20

Address: B57

Contact: DARRELL DUNN

Manufacturer Model: STARRETT 721

Description: CALIPER, 6 INCH

Serial No: 03031512

Asset No: 010085

Procedure: CALIPERS, APR/04

Work Order: 303063396

Date Issued: Mar 24, 2005

Calibration Date: Mar 24, 2005

****Calibration Due:** Mar 24, 2006

Calibration Location: Bldg. 64

Environment: Temp. 68.0°F Hum. 44 %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. See Remarks or attached Calibration Report with the same Work Order number for calibration data.

*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
007705	STARRETT	SS8A1X	GAGE BLOCK SET	Jan 15, 06
006465	STARRETT	SS81A1	GAGE BLOCK SET	Aug 18, 07

Approved by: Walt Hill
Metrology Group Leader

m:\a2la1.rpt Rev date 11, May 04

Measurements by: Curtis Laurence
Metrology Technician

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Southwest Research Institute
Calibration Laboratory
Measurement Report

Work Order	303063396	Mfr	Starrett	Tech:	WCL
Asset No.	010085	Model	721		
Serial No.	03031512	Type	Caliper, 9"	Cal Date:	24-Mar-05
Remarks:					

RANGE	Test Point	Indicated	Difference	+/-Limit	+/-Uncertainty	Found/Left
	Inch	Inch	Inch	Inch	Inch	Results
OUTSIDE SCALE	2.2500	2.2500	0.0000	0.001	0.00066	Pass
	4.5000	4.4995	-0.0005	0.001	0.00066	Pass
	6.7500	6.7500	0.0000	0.001	0.00066	Pass
	9.0000	8.9995	-0.0005	0.001	0.00066	Pass
INSIDE SCALE	1.0000	1.0000	0.0000	0.001	0.00066	Pass
DEPTH SCALE	1.0000	1.0000	0.0000	0.001	0.00066	Pass
STEP FUNCTION	1.0000	0.9995	-0.0005	0.001	0.00066	Pass
END OF REPORT						