



NABL ACCREDITATION
CERTIFICATE No.: CC-2323



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CALIBRATION CERTIFICATE OF GAUGE BLOCK	CALIBRATION CERTIFICATE NO. KCP/01/19~20/3755.	
	ULR No: CC2323 19 0 00008156 F	
DATE OF CALIBRATION: 08-09-2019	PAGE: 01 of 04	NO.OF PAGES: 04

NAME & ADDRESS OF THE CUSTOMER : **M/s. S.EXPERT ENGINEERS**
C-144,M.I.D.C.,Waluj,
AURANGABAD – 431 136.

CUSTOMER'S REFERENCE : D.C. NO-60

DATE OF RECEIPT : 03-09-2019

ITEM FOR CALIBRATION : Tungsten Carbide Gauge Block Set, Type: M-88/1, Gr: '0',
Sr. No: 10526, Make: KCP

CONDITION OF ITEM : OK
DISCIPLINE: Mechanical-Dimension.
GROUP: Basic Measuring Instruments, Gauges etc.

LAB WORK ORDER NO. : 19-20/269
CALIBRATION PROCEDURE : Determination of center deviation & parallelism
of gauge block by comparison method as per
Procedure No.KCP/PCD/07-01 & as per IS 2984:2003

EQUIPMENTS / REFERENCE CALIBRATION STANDARDS : Used standards are traceable to National standards
(direct/thro' NABL accredited Lab.)

Sr.No.	Type of Master equipments	I.D. No.	Calibration Report No.	Valid Up to
1.	Gauge Block set, M122/1, Gr. 'K' Material: Carbide, $\alpha = 4.7 \times 10^{-6}/^{\circ}C$	110	18/53/01/352-L/3/129	27-11-2020
2.	Gauge Block Comparator	991	KCP/04/17~18/3003	12-09-2019

ENVIRONMENTAL CONDITION : $20^{\circ} \pm 1^{\circ} C$

UNCERTAINTY OF MEASUREMENT : $\pm 0.08 \mu m$ for 0.5 to 25 mm length
 $\pm 0.09 \mu m$ for 25 to 50 mm length
 $\pm 0.10 \mu m$ for 50 to 100 mm length

The Uncertainty stated is the expanded uncertainty of measurement obtained by multiplying the standard uncertainty by the coverage factor K=2 corresponds to confidence level of 95.45%

Note:

- 'ln'=Nominal length, 'lc'=Central length
- α = Coefficient of Thermal Expansion ($\alpha = 4.7 \times 10^{-6}/^{\circ}C$)

CALIBRATED BY V.V.SIMANT (Inspector)	 K.C.PRECISION CALIBRATION LABORATORY WALUJ AURANGABAD	AUTHORISED SIGNATORY T.V.JAMKHEDKAR (Technical Manager)
<ul style="list-style-type: none"> • This certificate refers only to the particular item(s) submitted for calibration. • The calibration results reported in this certificate are valid at the time of & under the stated condition of measurement. • This certificate shall not be reproduced except in full, unless written permission of Quality Manager (Calibration Lab) 		



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CALIBRATION RESULTS

ITEM FOR CALIBRATION: Tungsten Carbide Gauge Block Set

TYPE: M 88/1

MAKE: KCP

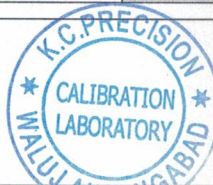
SR.NO: 10526

LAB WORK ORDER NO: 19-20/269

Nominal Length (1n) 'mm'	Dev. of central Length from Nominal Length (1c-1n) 'µm'	Extreme Deviation from central length 'µm'		Nominal Length (1n) 'mm'	Dev. of central Length from Nominal Length (1c-1n) 'µm'	Extreme Deviation from central length 'µm'	
		fo (+ve)	fu (-ve)			fo (+ve)	fu (-ve)
1.0005	+0.06	0.02	0.03	1.13	-0.07	0.06	0.03
0.5	+0.03	0.01	0.02	1.14	+0.03	0.05	0.00
1.0	-0.03	0.04	0.02	1.15	+0.02	0.04	0.02
1.001	+0.03	0.02	0.05	1.16	+0.05	0.03	0.01
1.002	-0.02	0.04	0.02	1.17	-0.03	0.06	0.00
1.003	-0.04	0.05	0.03	1.18	+0.07	0.04	0.03
1.004	+0.03	0.04	0.02	1.19	-0.07	0.02	0.02
1.005	0.00	0.05	0.01	1.20	-0.03	0.03	0.01
1.006	-0.02	0.04	0.01	1.21	-0.03	0.04	0.00
1.007	-0.07	0.08	0.00	1.22	+0.01	0.07	0.02
1.008	-0.06	0.07	0.00	1.23	-0.08	0.02	0.04
1.009	+0.01	0.07	0.01	1.24	-0.07	0.04	0.03
1.01	+0.06	0.04	0.01	1.25	+0.08	0.03	0.02
1.02	0.00	0.07	0.01	1.26	+0.01	0.04	0.01
1.03	+0.04	0.02	0.02	1.27	-0.03	0.04	0.01
1.04	-0.04	0.04	0.03	1.28	-0.02	0.04	0.02
1.05	-0.06	0.04	0.01	1.29	+0.01	0.04	0.02
1.06	0.00	0.06	0.01	1.30	+0.01	0.06	0.02
1.07	+0.05	0.04	0.02	1.31	+0.03	0.02	0.02
1.08	+0.08	0.01	0.04	1.32	+0.01	0.02	0.01
1.09	-0.10	0.06	0.00	1.33	+0.06	0.04	0.03
1.10	+0.02	0.05	0.02	1.34	+0.07	0.03	0.04
1.11	-0.03	0.02	0.03	1.35	+0.06	0.03	0.02
1.12	+0.02	0.06	0.00	1.36	+0.04	0.04	0.01

CALIBRATED BY

V.V.SIMANT
(Inspector)



AUTHORISED SIGNATORY

T.V.JAMKHEDKAR
(Technical Manager)

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TYPE: M-88/1

SR.NO:10526

MAKE: KCP

LAB WORK ORDER NO: 19-20/269

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		fo (+ve)	fu (-ve)			fo (+ve)	fu (-ve)
1.37	-0.01	0.04	0.02	5.0	+0.02	0.02	0.01
1.38	-0.03	0.04	0.03	5.5	-0.04	0.02	0.01
1.39	-0.04	0.04	0.02	6.0	-0.02	0.06	0.02
1.40	+0.03	0.03	0.03	6.5	-0.02	0.04	0.02
1.41	+0.03	0.01	0.04	7.0	+0.01	0.03	0.01
1.42	-0.01	0.06	0.00	7.5	-0.02	0.02	0.01
1.43	+0.01	0.04	0.01	8.0	+0.06	0.06	0.00
1.44	+0.05	0.04	0.02	8.5	-0.02	0.05	0.01
1.45	+0.06	0.02	0.03	9.0	-0.08	0.05	0.00
1.46	+0.02	0.03	0.02	9.5	-0.05	0.03	0.02
1.47	+0.05	0.04	0.01	10.0	-0.04	0.07	0.00
1.48	+0.04	0.04	0.02	20.0	+0.04	0.03	0.01
1.49	-0.02	0.03	0.01	30.0	+0.03	0.03	0.02
1.50	+0.01	0.03	0.04	40.0	+0.09	0.03	0.02
2.00	+0.04	0.01	0.06	50.0	+0.01	0.04	0.02
2.50	+0.04	0.04	0.02	60.0	+0.07	0.07	0.00
3.00	+0.06	0.04	0.00	70.0	+0.03	0.06	0.01
3.50	+0.06	0.04	0.01	80.0	+0.08	0.04	0.03
4.00	+0.06	0.03	0.00	90.0	+0.15	0.03	0.02
4.50	+0.10	0.01	0.02	100.0	+0.10	0.05	0.00

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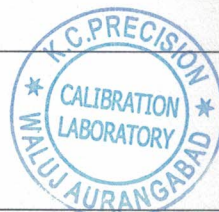
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Specifications as per IS 2984 (2003) and ISO 3650 (1998):-

Nominal length l_n mm	Calibration Grade K		Grade 0		Grade 1		Grade 2	
	limit deviation of length at any point from nominal length $\pm t_e$ μm	tolerance for the variation in length t_v μm	limit deviation of length at any point from nominal length $\pm t_e$ μm	tolerance for the variation in length t_v μm	limit deviation of length at any point from nominal length $\pm t_e$ μm	tolerance for the variation in length t_v μm	limit deviation of length at any point from nominal length $\pm t_e$ μm	tolerance for the variation in length t_v μm
$0.5 \leq l_n \leq 10$	0.2	0.05	0.12	0.1	0.2	0.16	0.45	0.3
$10 < l_n \leq 25$	0.3	0.05	0.14	0.1	0.3	0.16	0.6	0.3
$25 < l_n \leq 50$	0.4	0.06	0.2	0.1	0.4	0.18	0.8	0.3
$50 < l_n \leq 75$	0.5	0.06	0.25	0.12	0.5	0.18	1	0.35
$75 < l_n \leq 100$	0.6	0.07	0.3	0.12	0.6	0.2	1.2	0.35
$100 < l_n \leq 150$	0.8	0.08	0.4	0.14	0.8	0.2	1.6	0.4
$150 < l_n \leq 200$	1	0.09	0.5	0.16	1	0.25	2	0.4
$200 < l_n \leq 250$	1.2	0.1	0.6	0.16	1.2	0.25	2.4	0.45
$250 < l_n \leq 300$	1.4	0.1	0.7	0.18	1.4	0.25	2.8	0.5
$300 < l_n \leq 400$	1.8	0.12	0.9	0.2	1.8	0.3	3.6	0.5
$400 < l_n \leq 500$	2.2	0.14	1.1	0.25	2.2	0.35	4.4	0.6
$500 < l_n \leq 600$	2.6	0.16	1.3	0.25	2.6	0.4	5	0.7
$600 < l_n \leq 700$	3	0.18	1.5	0.3	3	0.45	6	0.7
$700 < l_n \leq 800$	3.4	0.2	1.7	0.3	3.4	0.5	6.5	0.8
$800 < l_n \leq 900$	3.8	0.2	1.9	0.35	3.8	0.5	7.5	0.9
$900 < l_n \leq 1000$	4.2	0.25	2	0.4	4.2	0.6	8	1

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