Vaiseshika®
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PRODUCT INFORMATION BULLETIN
NABL C-0329 1234 & 1235
ISO 9001 : 2008 Certified Quality Management System Swiss Certification

Editorial

Whenever you think of Calibration Standards; Think of Vaiseshika

Vaiseshika Electron Devices has acquired expertise and established a niche position in the production, installation and commissioning of Calibration Standards. Our Calibration and Measurement Capabilities (CMC) conform to ISO/IEC 17025:2005 International Standards and Protocols.

In the domain of DC Resistance we command a CMC of ±0.015% (at 0.0001 Ohm), 0.0065% (at 10 Megaohm) and ±3 to 5% (at 1 Teraohm). Likewise in the domain of DC Voltage our CMC stands 0.002% and 0.007% (between 1 mV to 1000 Volt).

We offer World Class Force Calibration Standards from 0.1 LBF (0.5 Newton to 2,250,000 LBF (10 Million Newton) and these Force Calibration Instruments namely Load Cells, Torque Cells, Digital Proving Rings, Force Gauges and Dead Weight Force Calibrators are calibrated at Dead Weight Primary Standards of capacity 120,000 LBF (534 kN) for Force calibration and primary Torque Standard accurate to 0.002% of applied torque to 17,770 IN-lbf (2kN-m) .

450 Ton Morehouse Load Cell Calibration Facility (having 0.025% uncertainty) installed & commissioned by Vaiseshika at Solid Motor Performance and Environmental Test facility, SHAR Centre, Sriharikota.

In the domain of Hardness, our CMCs are: HRA ±0.63, HRBW ±1.22 and HRC ±0.56 and subsequently we offer a host of Digital Rockwell Hardness Testers and Metallurgical Microscopes for material testing and micro structure analysis.

In the domain of Pressure Calibration our CMCs stands at ±0.69 bar at the range 0 to 300 bar.

We maintain Calibration Standards in our Metrology Laboratory which enable us to offer accurate calibrations and lower your measurement uncertainties. Vaiseshika Calibration Standards mean greater customer confidence and lesser consumer risk. We are producing DC Standard Resistors on Primary Calibration Standards which have shown stability ranging from 0.004% to 0.0002% and drift of ±0.0002% during a period of 18 years. Thus we ensure precision and reproducibility of calibrations in our Metrology Laboratory. We have been recognized by the National Accreditation Board for Testing and Calibration Laboratories (NABL), Department of Science and Technology, Government of India, New Delhi for DC Resistance, Voltage, Current, AC Voltage and Current, Temperature, Pressure and Hardness conforming to ISO 17025 Accreditation Standards.

Satish Dhawan Space Centre, (SHAR), Sriharikota Satellite Launch

Credibility and Credentials of our Calibration Capability:

Vaiseshika has proven its calibration competence by installing and commissioning Vaiseshika Calibration Standards at the most challenging and crucial projects of National Eminence in India.

Our Resistance Standards have proven credentials in the most stringent and rigorous applications at the Master Calibration Facility in Vikram Sarabhai Space Centre, Thiruvananthapurm and Satish Dhawan Space Centre, Sriharikota; at the Sukhoi-30, Jaguar, MIG and Light Combat Aircraft Test Beds, Engine Divisions and the Aircraft Design Bureau of the Hindustan Aeronautics Limited and the Base Repair Depots of the Indian Air Force; Agni-III and Agni-IV Missile Test Beds at Integrated Test Range, Chandipur. Our standards have been approved at National Metrology Laboratories in United States, Italy, Singapore, Saudi Arabia, United Arab Emirates and Belgrade.

Morehouse Force Calibration Standards : Vaiseshika have established 50 kN Morehouse Dead Weight Calibrator at the National Physical Laboratory, New Delhi-the National Metrology Institute (NMI) of India in 2001 having stainless steel dead weights with combined uncertainty of 30 ppm (0.003%) and providing an accuracy of better than 0.002% in the 50kN Dead Weight Calibrator as a Master National Calibration Standards for the calibration of Load Cells. This machine has been working at the

Continue on next page.....

Brought forward from 1st page.....

Indian NMI to the total satisfaction of the NPL for the last 16 years.

Performance at the Indian Space Mission: Vaiseshika have established 450 Ton Morehouse Load Cell Calibration Facility at the Satish Dhawan Space Centre, Sriharikota in 2010 for the calibration of Load Cells at the Solid Motor Performance and Environmental Test Facility. This machine provides calibration accuracy better than 0.025%. This machine has been working to the complete satisfaction of the Space Centre for the last six years and is the only such Calibration Facility in the whole of Asia. Likewise another similar Morehouse Load Cell Calibration Machine of 60,000 LBF capacity has been established at the Rocket System Test Division (RSTD) of the Vikram Sarabhai Space Centre (VSSC), Thiruvananthapuram.

Calibration Instruments Support to AGNI-V Missile

We have contributed technical and engineering expertise in the designing, production, fabrication, testing, standardization, installation and commissioning of our Calibration Standards and instruments in various laboratories of the Defense Research and Development Organization in India for the successful test firing of Indias' first Intercontinental Ballistic Missile AGNI-V. Our Calibration Standards for voltage, current and resistance; the Thermocouples and Sensors for sensing high temperatures upto 1600 degree Celsius; electronic software for the microstructure examinations and hardness testing of materials and propellants

Whenever you think of Calibration Standards.....

and Load Cell Calibration Systems for the testing and calibration of pressure transducers, used to measure the thrust capacity of the motor and engine of the Missile.

Vaiseshika Calibration Standards for AGNI-V Missile Calibration Labs

Vaiseshika Calibration Standards have been successfully installed and commissioned at the Defense Laboratories associated with the design, development and launching of AGNI-V Missile like Integrated Test Range, Dr. Abdul Kalam Dweep, Balasore, Orrisa; Terminal Ballistics Research Laboratory, Ramgarh Range , Chandigarh, High Energy Materials Research Laboratory , Pune & Nasik, Defense Research and Development Laboratory , Jagdalpur and Hyderabad, National Physical Laboratory, New Delhi, Director General of Quality Assurance , Bhandara & Nilgris & Aerial Delivery Research and Development Laboratory, Agra..

- Anil Jain,
Ph.D. (BITS Pilani)
President
aniljain2007@gmail.com

Message of
Hon'ble Prime Minister
Shri Narendra Modi
on
World Standards Day

"Standards are practical tools for the industry to attain higher levels of excellence & contribute to national growth. On the occasion of the World Standards Day, I take this opportunity to urge upon our Industry to adopt this common language of Standards.

I am happy that the Bureau of Indian Standards is providing yeoman services in formulating standards, keeping pace with national priorities."

- 14th October 2015

Vaiseshika Defines Real Meaning of Calibration

Vaiseshika Electron Devices manufacture & produce a wide range of Resistance Calibration Standards from 1 micro ohm to 10 tera ohm. Vaiseshika Resistance Calibration Standards are also provided with ISO 17025 : 2005 Calibration Certificates issued by the Vaiseshika Metrology Laboratory - fully equipped with in-house Master Calibration Standards.

Calibration is a process wherein your instrument is inspected, assessed and evaluated for its present measurement capability/accuracy. In the process of calibration, we compare the values of measurements of your artefact against a Reference Calibration Standard. If there are deviations (beyond specified accuracy) in your instrument, our engineers adjust, compare and standardize your instrument against our Master Reference Calibration Standards.

Vaiseshika Master Reference Calibration Standards are calibrated at the Government Electronics Research and Testing Laboratories and maintained in our Metrology Laboratory according to ISO 17025 : 2005 (NABL) protocols. Further our own laboratory is NABL approved.

In ordinary circumstances and with a large number of so called Private Calibration Shops, you only obtain Status Report of your instruments. This means, most of the time, these Makeshift Calibration Shops give you only the results reported in your instrument against casually maintained instrument / makeshift / portable laboratory (sometimes on the back of a bicycle / motorcycle / three wheeler).

Vaiseshika Electron Devices Metrology Laboratory is ISO 17025 : 2005 compliant. Our laboratory has been accredited by the National Accreditation Board for Testing and Calibration Laboratory (NABL), Government of India, Department of Science & Technology, New Delhi.

Scope of Accreditation for Temperature, Pressure and Hardness

Quantity Measured / Instrument	Range/ Frequency	Calibration Measurement Capability (±)	Remarks
Thermal Parameter			
RTD, Digital Thermometers , Thermocouple with & without Indicator, Controllers/ Recorder, Temperature Gauges	25°C to 200°C 200°C to 600°C	1.70°C 3.87°C	By Comparison method
Temperature Indicator of Bath, Dry Block	25°C to 200°C 200°C to 600°C	1.79°C 4.03°C	By Comparison method
Mechanical Parameter			
Hydraulic Pressure Digital/ Analog Pressure Gauges/ Indicators, Pressure Transmitter/Transducer	0 to 300 bar	0.69 bar	By Comparison method As per DKD-R6-1 Standard
Hardness Rockwell Hardness Tester	HRA HRB HRC	0.63 HRA 1.22 HRBW 0.56 HRC	Using Standard Hardness Blocks as per IS-1586 (Part 2: 2012) (Indirect Method)

Scope of Accreditation for Electro-technical Parameters

Quantity Measured/ Instrument	Range/ Frequency	Calibration Measurement Capability (±)	Remarks
Source Mode	**Electro Technical Parameter**		
DC Resistance	0.0001 Ω 0.001 Ω 0.01 Ω 0.1 Ω 1 Ω 10 Ω 100 Ω 1 kΩ 10 kΩ 100 kΩ 1 MΩ 10 MΩ	0.015 % 0.015 % 0.015 % 0.01 % 0.004 % 0.004 % 0.004 % 0.004 % 0.004 % 0.004 % 0.004 % 0.0065 %	By Direct method
DC Resistance	0.01 Ω to 100 kΩ 100 kΩ to 1 GΩ 1 GΩ to 1 TΩ	2.8 to 0.06 0.06 to 1.7 1.7 to 6.0	By Direct method
Temperature Simulation T/C K-Type J-Type T-Type R-Type S-Type RTD (PT 100)	 -200°C to 1368°C -200°C to 1108°C -168°C to 369°C -40.00°C to 1760°C 0°C to 1760°C -190°C to 830°C	 2.5°C to 2.1°C 1.1°C to 2°C 1.5°C to 2.1°C 1.5°C to 2.1°C 3.7°C 0.7°C to 1.6°C	By Direct method
Measure Mode			
DC Resistance	0.00001 Ω	3.6 %	By Direct method
DC Resistance	0.0001 Ω to 1 kΩ 1 kΩ to 10 MΩ	0.9 % to 0.0007 % 0.004 % to 0.009 %	By Direct method
DC High Resistance	0.1 MΩ to 500 GΩ 500 GΩ to 1 TΩ	0.1 % to 2.1 % 3.0 % to 5.0 %	By V/I Method
DC Voltage	1 mV to 10 V 10 V to 1000 V 1 kV to 5 kV	0.01 % to 0.002 % 0.02 % to 0.007 % 1.0 %	By Direct method
AC Voltage (50 Hz)	1 mV to 100 V 100 V to 750 V	0.9 % to 0.09 % 0.09 % to 0.04 %	By Direct method
DC Current	10 µA to 1 mA 1 mA to 1 A	2.1 % to 0.03 % 0.03 % to 0.12 %	By Direct method
AC Current (50 Hz)	1 mA to 1 A	0.15 % to 0.3 %	By Direct method

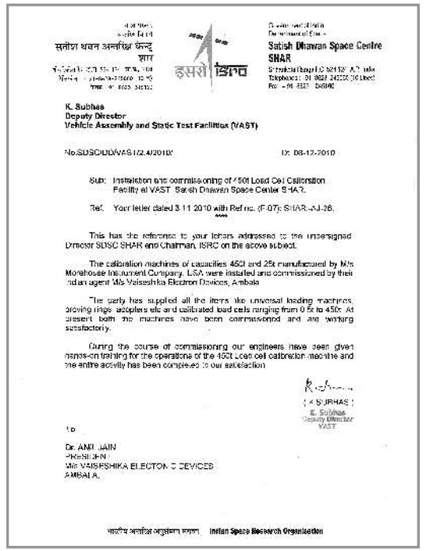
Morehouse A2LA Scope of Accreditation
(Refer www.mhforce.com for details)

Certificate No. : 1398.01 Dt. 04/18/2016

I. Electrical – DC/Low Frequency			
Parameter/Equipment	Range	CMC[2]	Comments
DC Voltage - Electrical Calibration of Load Indicators	(0 to 4.4) mV/V	0.00002 mV/V	Load Cell simulator
II. Mechanical			
Parameter/Equipment	Range	CMC[2, 3 (±)]	Comments
Force – Dead Weight Primary Standards Tension and Compression	(0.1 to 10) lbf [(0.44 to 44) N] (10 to 100) lbf [(44 to 444) N] (100 to 12 0000) lbf [(444 to 53 378) N] (12 000 to 120 000) lbf [(53 378 to 533 786) N]	0.0025 % 0.0016 % 0.0016 % 0.0016 %	Force calibration including ASTM E74, ISO 376, and other methods
Force (cont) – N.I.S.T Calibrated Transfer/Secondary Standards Tension and Compression Compression Tension	(120 000 to 1 000 000) lbf [(533 to 4448) kN] (1 000 000 to 2 250 000) lbf [(4.4 to 10) MN] (1 000 000 to 1 125 000) lbf [(4.4 to 5) MN]	(1.3 x 10-5)(Force Applied in lbf) + 8.6 [(9 through 22) lbf] [(40 through 98) N] (5.3 x 10-5)(Force Applied in lbf) + 120 [71 through 150 lbf] [(320 through 650) N] 110 lbf [480 N]	Force calibration including ASTM E74, ISO 376, and other methods
Aircraft Scales/Truck Scales (Portable)	(0 to 25 000) lbf (25 001 to 60 000) lbf	2.5 lbf 4.7 lbf	Force
Torque – Dead Weight Primary Standards Clockwise & Counter-clockwise	(0.74 to 73.75) lbf·ft (1 to 100) N·m (14.75 to 1475) lbf·ft (20 to 2000) N·m	0.005 % 0.003 %	Primary torque standard, ASTM E2428, BS7882, and other methods.

Morehouse Instrument Co. & Vaiseshika Electron Devices are Engineering Partners for Morehouse Calibration Standards in India

SHAR Space Centre, Sriharikota



इसरो भवन अलंकृत सिन्दु शार
Satish Dhawan Space Centre SHAR

K. Subhas
Deputy Director
Vehicle Assembly and Static Test Facilities (VAST)

No.SDSC/DD/VAST/2.4/2010/ Dt: 08-12-2010

Sub: Installation and commissioning of 450t and 25t Load Cell Calibration Facility at VAST, Satish Dhawan Space Center SHAR.

Ref: Your letter dated 3.11.2010 with Ref no. (F-07): SHAR-JU-28.

This has the reference to your letters addressed to the undersigned Director SDSC SHAR and Chairman, ISRO on the above subject.

The calibration machines of capacities 450t and 25t manufactured by M/s Morehouse Instrument Company, USA were installed and commissioned by their Indian agent M/s Vaiseshika Electron Devices, Ambala.

The party has supplied all the items like universal loading machines, proving rings, adapters etc and calibrated load cells ranging from 0.5t to 450t. At present both the machines have been commissioned and are working satisfactory.

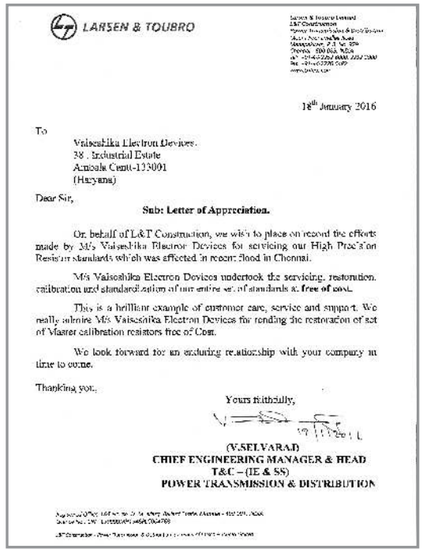
During the course of commissioning our engineers have been given hands-on training for the operations of the 450t Load cell calibration machine and the entire activity has been completed to our satisfaction.

(K.SUBHAS)
K. Subhas
Deputy Director
VAST

To
Dr. ANIL JAIN
CHAIRMAN
M/s VAISESHIKA ELECTRON DEVICES
AMBALA.

भारतीय अंतरिक्ष अनुसंधान संगठन Indian Space Research Organisation

LARSEN & TOUBRO



LARSEN & TOUBRO

18th January 2016

To
Vaiseshika Electron Devices.
38 , Industrial Estate
Ambala Cantt-133001
(Haryana)

Dear Sir,

Sub: Letter of Appreciation.

On behalf of L&T Construction, we wish to place on record the efforts made by M/s Vaiseshika Electron Devices for servicing our High Precision Resistor standards which was effected in recent flood in Chennai.

M/s Vaiseshika Electron Devices undertook the servicing, restoration, calibration and standardization of our entire set of standards at **free of cost.**

This is a brilliant example of customer care, service and support. We really admire M/s Vaiseshika Electron Devices for rending the restoration of set of Master calibration resistors free of Cost.

We look forward for an enduring relationship with your company in time to come.

Thanking you.

Yours faithfully,

(V.SELVARAJ)
CHIEF ENGINEERING MANAGER & HEAD
T&C – (IE & SS)
POWER TRANSMISSION & DISTRIBUTION

What the Eminent Experts say about us

Prof. S.G. Damle
Vice Chancellor,
Maharishi Markandeshwar University,
Mullana, Ambala

It is an immense pleasure to visit Vaiseshika Metrology Laboratory, Ambala Cantt. Really it is an amazing experience to notice the devotion, dedication and commitment of the organization. They have designed indigenous technology, which is of superb quality & also of international standard. All the equipment are standardized following the standardized norms and parameters. The scientific equipments, devices of Vaiseshika organization will be really boon to research professional in technical and health science stream (researchers). I extend my congratulations & best wishes to their efforts.

Dr. S.K. Mahajan
Former Scientist,
National Physical Laboratory,
New Delhi

The Vaiseshika Electron Devices is very well known for manufacturing of Standard Resistors from 10μΩ to 1TΩ. They have their own NABL Accredited Metrological Laboratory which is used for in-house calibration as well as for outside. I am happy that they have created their own slot in Metrology. This is no mean achievement.

Dr. B. Murali
United Nations Development Programme,
New Delhi

Having visited Vaiseshika's old facilities, to come here is a pleasure for two reasons. One - to see an institution so devoted to quality and high standards. Two -to see the personal development of Dr. Anil Jain to become a leading & highly respected entrepreneur. We can only say "God Speed" & "Good Luck" and look forward to visiting your "international class" facility in the near future !

Mr. Ram Venuprasad
Adviser & Head
Enterprise & Agriculture
Commonwealth Secretariat
London, UK

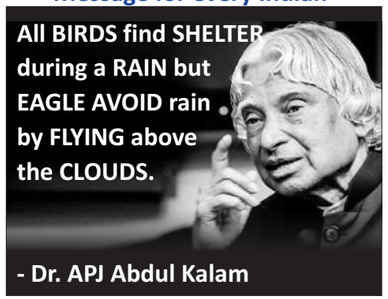
On the occasion of the XI Commonwealth India Small Business Programme, I had the pleasure of visiting the unit along with a lot delegation of 70+ delegations from 35 commonwealth countries. We were inspired by the work and leadership of this company. Dr. Anil Jain is a true embodiment of Jai Ho !

People like Dr. Anil Jain make me proud to be an Indian.
Jai Hind.

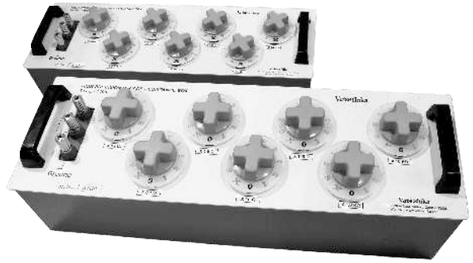
Mr. Krishnendu Jana
Scientist 'F'
Group Director (HR & QA) & MR
Integrated Test Range (ITR),
Chandipur, Balasore (Orissa)

I am really happy for the hospitality and co-cooperativeness by the management & staff of Vaiseshika Electron Devices. The quality of standards for ITR which are checked were found excellent. It is neat and clean organization and doing excellent work for the service of the Nation. I also came to know that the organization is dedicated and by their innovative ideas have achieved great success in the field of Calibration and making standards for Calibration.

Message for every Indian



High Precision Decade Resistance Box, Type : 7400



Features:

- Calibration & Precision obtained through High Stability and Low Drift Reference Standards.
- Calibration verification on 18 years stability data of the Master Calibration Standards
- High Precision Calibration and Measurement Capability of the order of 0.0007% with NABL approval
- Construction: Portable in metallic cabinet

Applications:

- RTD / Temperature Sensors, Simulation and Calibration.
- Load Cell and Strain Gauge Calibration.
- Meter Calibrations.
- NABL Accredited Laboratories compliant to ISO 17025:2005 for Electro Technical Parameter
- More than 1,000 installations in India, United States of America, Europe, Gulf and Asia Pacific National Metrology Accredited Laboratories.

Description:

"Vaiseshika" High Precision Decade Resistance Box Type-7400 has been designed and fabricated to meet the standard calibration requirements. This Decade Resistance Box can serve the purpose of Precision Resistance Simulation and substitution in electrical circuits, Sensors calibrations in Test & Calibration Laboratories.

Specifications:

Function	:	Calibrated Resistance Simulation
Resistance Range	:	0.01 ohm to 111.1111Kohms in Seven decades
Resolution	:	0.01 ohm
Switches	:	Silver to Silver or Gold plated switches
Switch Resistance	:	≤ milli ohms per decade
Construction/Housing Case	:	Portable in metallic cabinet
Maximum Voltage to Case	:	2000 volt
Low Reference Standard Drift	:	+ 0.0002% (Documented)
Reference Calibration Standard Stability	:	+ 0.004% to 0.0002% (During 18 Years Span)

18 Years Graphical Data on Stability and Drift available on demand.

Technical Description

Decade	Resistance per Step	Total Resistance	Max. Current	Max. Voltage	Max. Watts	Accuracy 7400 Precision	NABL* Compliant CMC	Temp. Coefficient
Ist	0.01 Ω	0.1 Ω	4 A	0.04V	0.16 W	±1%	1.3% to 0.004%	10ppm
IInd	0.1 Ω	1.0 Ω	1.6 A	0.16V	0.256 W	±0.2%		
IIIrd	1.0 Ω	10.0 Ω	800 mA	0.8V	0.64 W	±0.02%		
IVth	10.0 Ω	100.0 Ω	250 mA	2.5V	0.625 W	±0.02%		
Vth	100.0 Ω	1.0 K Ω	80 mA	8V	0.64 W	±0.02%		
VIth	1.0 K Ω	10.0 K Ω	23 mA	23V	0.53 W	±0.02%		
VIIth	10.0 K Ω	100 K Ω	7 mA	70V	0.49 W	±0.02%		

High Stability Decade Megohm Box, Type : 8400 HV

Features:

- Calibration & Precision obtained through High Stability and Low Drift Reference Standards.
- Calibration verification on 18 years stability data of the Master Calibration Standards
- High Precision Calibration and Measurement Capability of the order of 0.0002% to 0.2% of Measuring Device and 0.045% to 0.096% of supporting device with NABL approval
- Construction: Portable in metallic cabinet

Applications:

For the calibration of;

- Meggers
- Megohm Meters
- Insulation Testers
- Digital Meters
- Insulation Bridges
- Components comparison

Description:

"Vaiseshika" Decade Megohm Box has been designed and fabricated for the First Time in India to provide Calibration Standard for High Resistance Substitution. This instrument employs silver alloy silver plated and silver alloy gold plated switches mounted on high insulation ceramic wafers / phenolic material.

Specifications:

Function	:	Calibrated Resistance Simulation
Resistance Range	:	0.1 M ohm to 11.111111 Tohms in Eight decades
Resolution	:	100 K ohm
Switches	:	Silver to Silver or Gold plated switches
Switch Resistance	:	≤ 0.1 ohms per decade
Construction/Housing Case	:	Portable in metallic cabinet
Maximum Voltage to Case	:	1000 Volt for 8400 & 5000 Volt for 8400HV
Low Reference Standard Drift	:	+ 0.0004% (Documented)
Reference Calibration Standard Stability	:	0.0002% to 0.2% of Measuring Device and 0.045% to 0.096% of supporting device (During 18 Years Span)

18 Years Graphical Data on Stability and Drift available on demand.

Technical Description

Decade	Resistance Step	Total Resistance	Max. Current	Max. Voltage	Max. Watts	Accuracy 8400 HV (PR)	NABL* Compliant CMC	Temp. Coefficient in ppm
Ist	100.0 K Ω	1.0 M Ω	10-1 mA	1000V	10W	±0.5%	0.1% to 5.0%	25
IInd	1.0 M Ω	10.0 M Ω	1-0.1 mA	1000V	1W	±0.5%		25
IIIrd	10.0 M Ω	100.0 M Ω	0.5-0.05 mA	5000V	0.5W	±0.5%		25
IVth	100.0 M Ω	1000.0 M Ω	0.05-0.005mA	5000V	50 mW	±0.5%		25
Vth	1.0 G Ω	10.0 G Ω	5-0.5µA	5000V	5 mW	±1%		100
VIth	10.0 G Ω	100.0 G Ω	0.5-0.05 µA	5000V	0.5 mW	±2%		100
VIIth	100.0 G Ω	1.0 T Ω	0.05-0.005 µA	5000V	0.05 mW	±5%		100
VIIIth	1.0 T Ω	10.0 T Ω	5-0.5 nA	5000V	0.005 mW	±6%		200

Milli & Micro - Ohm Meter Calibrator Type: 9409 CAL

Description :

Multivalue Calibrator, Type: 9409 CAL is an accurate and reliable calibration instrument suitable for calibration of Kelvin Bridges, Ductor Testers and Micro-Ohmmeter. It employees various of high current standard resistors that ensure precision and reliable calibrations.

The instrument consists to two potential terminals and two current terminals. High quality Gold / Silver plated terminals are used to achieve very low contact resistance and thermal EMF. The instrument employees high stability manganin resistance wire and strips to provide precision calibration & stability to the instrument.

The whole instrument is housed in a portable cabinet for safe working and onsite calibrations.

Specifications:

- Function : Calibration Resistance Standard
- Resistance Range : 0.000001 ohm to 2.0 ohms
- Temperature Coefficient : ≤10 ppm/°C
- Construction/Housing Case : Portable in metallic cabinet
- Maximum Voltage to Case : 2000 volts
- Dielectric Voltage : 500 volt AC for one minute
- Low Reference Drift : 0.0005 %
- Reference Calibration Standard Stability : 0.003 % to 0.0005 %
- 7-18 Years Graphical Data on Stability & Drift available on demand.

Accuracy & Related Parameters:

Resistance (Ω)	Maximum Current (A)	Accuracy (±)	Temperature Coefficient	Maximum Voltage to Case	NABL* COMPLIANT CMC
0.000001	200	5%	10ppm/°C	2000 Volts	5.0% to 0.07%
0.00001	200	2%			
0.0001	200	0.5%			
0.001	31.6	0.1%			
0.01	10	0.05%			
0.1	3.16	0.02%			
1.0	1.0	0.02%			
2.0	1.0	0.02%			

Applications :

Vaiseshika Ductor Tester, Kelvin Bridge and Micro-Ohmmeter Calibrator, Type: 9409 CAL has been designed and fabricated to meet the precision calibration requirements. These resistors are used with transducers to check the performance of the transducers with high accuracy. Calibration of micro-ohm meters, current-limiting applications, in voltage divider and for scaling down the nominal resistance values.

Standard Resistor (First Time in India)
Type: 9409 (Oil Filled)

Description:

"Vaiseshika" DC STANDARD RESISTOR 9409 has been designed and fabricated to meet the standard calibration requirements. These Standard Resistors can be used for calibration.

To ensure stringent accuracy, high degree of stability and utmost reliability, the Manganin wire and strips have been used to construct Standard resistors. These Standards incorporates the manganin coils which have been subjected to prolonged ageing and heat treatment, to improve stability and to reduce temperature coefficient. Joints are silver soldered with copper being used for connection to terminals. Resistance elements are sealed in aluminium container having moisture free oil. Use of oil improves cooling effect which in turn imparts greater stability to resistance.

Specifications:

Function	:	Calibration Resistance Standard
Resistance Range	:	0.000001 ohm to 100.0 T ohms
Temperature Coefficient	:	10 ppm/°C (0.001 to 100K) 25-500 ppm /C (100K to 100 Tera)
Voltage Coefficient	:	< 2 to 5 ppm/volt
Maximum Voltage to Case	:	2000 volt
Dielectric Voltage	:	500 volt AC for one minute
Low Reference Drift	:	0.0002 %
Reference Calibration Standard Stability	:	0.003 % to 0.0002 %

7-18 Years Graphical Data on Stability & Drift available on demand.

Type	Resistance (Ω)	Maximum Current	Max. Power Dissipitation (Watts)	Accuracy	Stability	Calibration & Measurement Capabilities	Certificate of Traceability Drift of 7-18 Years
9409HP	0.000001	2000	4.0	+ 5.0 %	0.5%	5.0%	0.003% to 0.0004%
9409HP	0.00001	2000	40.0	+ 1.0 %	0.1%	3.6%	
9409HP	0.0001	1000	100.0	+ 0.5 %	0.05%	0.9% to0.0007%	
9409A	0.001	31.6	1.0	+ 0.1 %	0.01%		
9409B	0.01	10	1.0	+ 0.05 %	0.005%		
9409C	0.1	3.16	1.0	+ 0.02 %	0.002%		
9409D	1	1.0	1.0	+ 0.01 %	0.001%		
9409E	10	0.316	1.0	+ 0.01 %	0.001%		
9409F	100	0.1	1.0	+ 0.01 %	0.001%		
9409G	1 K	0.0316	1.0	+ 0.01 %	0.001%		
9409H	10 K	0.01	1.0	+ 0.01 %	0.001%	0.004%	
9409I	100 K	3.16 m	1.0	+ 0.05 %	0.005%	0.009%	
9409J	1 Meg	1.0 m	1.0	+ 0.1 %	0.01%	0.1 % to 2.1 % upto 500 Giga & 3% to 5.0% from 500 G to 1 Tera Ω	Measuring Device:0.008 % to 0.0004% Supporting Device:0.0036 % to 0.096
9409K	10 Meg	0.5 m	2.5	+ 0.5 %	0.05%		
9409L	100 Meg	0.05 m	0.25	+ 1.0 %	0.1%		
9409M	1 Giga	5µ	0.25	+ 2.0 %	0.2%		
9409N	10 Giga	0.5µ	0.2 m	+ 5.0 %	0.5%		
9409O	100 Giga	0.05µ	0.02 m	+ 5.0 %	0.5%		
9409P	1 Tera	5n	0.02 m	+ 5.0 %	0.5%		
9409Q	10 Tera	0.5n	0.02 n	+ 10 %	1%	6.0 % Non NABL	0.2%

Element : Strain free, Manganin coil/Wire immersed in Oil
Terminals : Brass/Copper
Abbreviation : m = milli, µ = micro, n = nano

Vaiśeshika®

Fixed Value Insulation Tester Calibration System
Type : 9409 FV

- Resistance from 100 K Ohm to 10 Tera Ohm.
- Available in Discrete values and 5kV operations.
- Hermetic sealing to provide complete protection against moisture and corona discharge.
- Continuous connection : Gold / Silver plated contacts with Teflon insulation.
- Fully shrouded safety connectors : Completely shielded.

Description :

Vaiseshika has designed a Fixed Value Insulation Tester Calibration System which can be suitably used for the purpose of calibration & testing of Insulation testers and megohm meters with impressed test voltages upto 5000 volt. This instrument provides single point fixed high resistance values anywhere between 100 Kohm to 10 Tera ohm. The fixed point values can be selected by the customer. Custom built instrument can also be designed and manufactured, by Vaiseshika, for the calibration laboratory. The instrument is constructed in metallic / rugged high strength polymer case, for field calibration.

Specifications :

- Fixed value : (Any value / values from 100 K ohm to 10 Tera ohm. (The user can select the set of values according to his requirement)
- Resistance Accuracy :

100 K Ohm to 1 Meg Ohm	:	±0.1%
1.1 Meg Ohm to 10 Meg Ohm	:	±0.5%
11 Meg Ohm to 100 Meg Ohm	:	±1%
101 Meg Ohm to 1 Giga Ohm	:	±2%
1.1 Giga Ohm to 1 Tera Ohm	:	±5%
1.1 Tera Ohm to 10 Tera Ohm	:	±10%

- Resistance Temperature Coefficient : 25ppm/^{o}C from 0^{o} to 89^{o}C available.
- Safety Connection Leads : A set of 3 nos. of high quality robust shielded connection cable with strong grip clip on one side and banana plugs on the other side.

⚠ Your Attention Please !
The user engineer must specify the fixed/discrete resistance values required by him, at the time of inviting Budgetory Quotation from us.

Air Cooled DC Shunt : 9410

Description:

"Vaiseshika" DC Shunt 9410 has been designed and fabricated to meet the standard calibration requirements.

To ensure stringent accuracy, high degree of stability and utmost reliability, the Manganin wire and strips have been used to construct DC Shunts. These Standards incorporates the manganin coils which have been subjected to prolonged ageing and heat treatment, to improve stability and to reduce temperature coefficient. Joints are silver soldered with copper being used for connection to terminals. Resistance elements is sealed in aluminium container having moisture free oil. Use of oil improves cooling effect which inturn imparts greater stability to resistance.

Specifications:

- Construction: Portable, Compact and sturdy construction designed in metallic cabinet for easy operation and storage.
- Well- aged, Heat-treated & insulated manganin strips.
- Current Range: 1.5 Amp. to 5000 Amp.
- High Accuracy of Resistance between 0.05% to + 1% (depending upon value).
- NABL compliant Calibration Certificate is provided.
- High Precision Calibration and Measurement Capability of the order of 5% to 0.0007% with NABL approval.
- Maintainability of DC Shunt up to 10 years.
- Excellent performance versus cost.
- Low Reference Drift : 0.0002 %
- Reference Calibration Standard Stability: 0.003 % to 0.0004 %
- 7-18 Years Graphical Data on Stability & Drift available on demand.

Technical Description

Current (Amps)	Resistance (Ohms)	Voltage Drop (Volts)	Wattage (Watts)	Accuracy	Stability	NABL* COMPLIANT CMC	Temperature Coefficient
1.5	1.0	1.5	2.25	± 0.05 %	0.017%	0.9% to 0.0007%	10ppm
5	0.2	1.0	5.0	± 0.05 %	0.017%		
15	0.1	1.5	22.5	± 0.05 %	0.017%		
15	0.01	0.15	2.25	± 0.05 %	0.017%		
50	0.01	0.5	25.0	± 0.05 %	0.017%		
50	0.02	1.0	50.0	± 0 05 %	0.017%		
75	0.002	0.15	11.25	± 0.05 %	0.017%		
150	0.01	1.5	225.0	± 0.5 %	0.17%		
150	0.001	0.15	22.5	± 0.5 %	0.17%		
300	0.001	0.3	90.0	± 0.5 %	0.17%		
500	0.0002	0.10	50.0	± 0.5 %	0.17%		
750	0.0002	0.15	112.5	± 1.0 %	0.3%		
1000	0.0001	0.1	100.0	± 1.0 %	0.3%		
1500	0.0001	0.15	225.0	± 1.0 %	0.3%		
2000	0.00005	0.1	200.0	± 1.0 %	0.3%	3.6%	
5000	0.00002	0.1	500.0	± 1.0 %	0.3%		
5000	0.000001	0.005	25.0	± 5.0 %	1.7%	% Non NABL	

Applications :

- For Charging & discharging the batteries.
- For use as current flow source at selected resistance.
- Measurement of precise current.
- Quality Assurance and Calibration laboratories.
- Load testing of batteries & transformers.

Vaiśeshika®

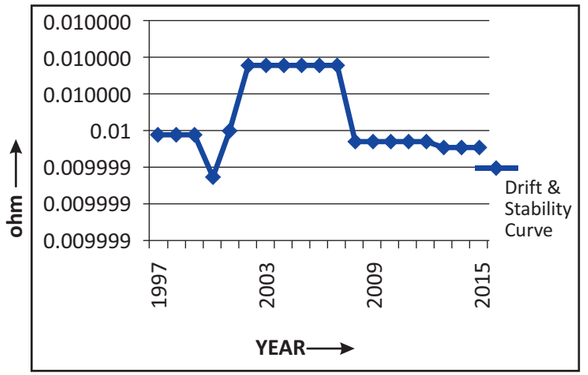
What is the Uniqueness of Vaiseshika Calibration Standards?

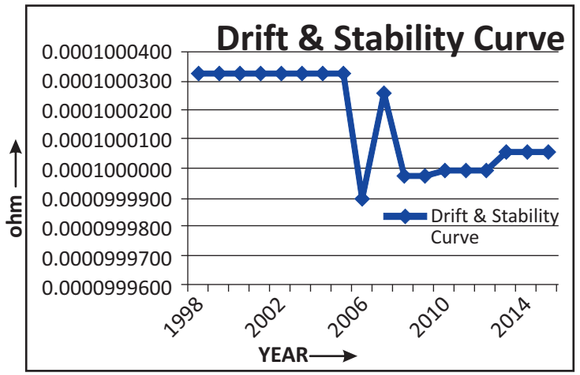
Whenever you wish to purchase & establish a Master Reference Calibration Standard for your ISO 17025 Accredited Calibration Laboratory, we request you to study the Uniqueness of Vaiseshika Calibration Standards against any other Manufacturer. Vaiseshika provides you the calibration confidence through a Measurement Protocol, documented records & following systematic manner:

1. **Maintaining Low Drift (18 years span) for Reference Calibration Standards:**
   Vaiseshika Metrology Laboratory has been maintaining Master Calibration Standards which have shown Low Drifts of the order of 0.0002 % over a period of 18 years. This low drift of our reference standards have provided high stability to the measurement values thereby ensuring precision & reproducibility of calibrations in Vaiseshika metrology Laboratory.
2. **Documented Records of Low Drift:**
   Vaiseshika Metrology Laboratory has documented the entire record of drift & stability through a system of regular periodic calibrations of its reference standards at Echelon-II Electronics Regional Test laboratory, Goverment of India, New Delhi. Further the performance of these Master Standards has been shown & demonstrated to the NABL assessors during their visits on audits at Vaiseshika Metrology Laboratory.
3. **Calibration is a passion at Vaiseshika & it is your Lifeline:**
   The world of science of measurement and calibration is based on the data that has been collated and gathered by our experts through a well established system of calibration & measurement capability. We ensure precision, repeatability, reproducibility & stability in measurements in our laboratory through a chain of reference calibration standards traceable to the National Physical laboratory, New Delhi.
4. Vaiseshika Resistance Calibration Standards fulfills **"Make-in-India"** Dream of our Hon'ble Prime Minister Narendra Modi by providing World Class Calibration Standards at affordable prices.

MASTER CALIBRATION STANDARD DRIFT & STABILITY CURVE

Low Drift and High Stability Curve of our Master Calibration Standards.





- Drift = + 0.0002 %
- Ensuring Precision & Reproducibility of Calibrations (Year 1997 to 2016)
- Demonstrated during all Vaiseshika NABL Certification Audit

Spectrum of Prestigious Projects, Organizations and Institutions using Vaiseshika Resistance Calibration Standards

SUKHOI SU-30 & PRESTIGIOUS AVIONICS PROJECTS

- SU-30 Sukhoi Aircraft, Jaguar Aircraft, MIG Aircraft, Light Combat Aircraft (LCA) and Advanced Jet Trainer (AJT), Advanced Light Helicopter (ALH) Projects of the Hindustan Aeronautics Limited at their factories at Bangalore, Barrackpore, Hyderabad, Korwa, Kanpur, Koraput, Lucknow and Nasik.

POLAR SATELLITE & SPACE RESEARCH PROJECTS

- Polar Satellitte Launch Vehicle, Geosynchronous Launch Vehicle and National Satellite Projects at the Space Research Stations of Vikram Sarabhai Space Centres at Ahmedabad, Thiruvananthapuram, Mahendragiri and Sriharikota.

NUCLEAR POWER PROJECTS

- Nuclear Power Generation Projects and Research Centres at Kota (Rawatbhatta), Surat (Vyara), Mysore, Bulandshar (Narora), Thane (Boisar) & Bhabha Atomic Research Center at Mumbai.

INDIAN AIR FORCE, INDIAN NAVY & INDIAN ARMY

- Base Repair Depots of Indian Airforce at Chandigarh, Coimbatore (Sullur), Jabalpur, and Tughlakabad and Indian Airlines Limited, Kolkatta and Mumbai. Indian Navy, Port Blair and Army Base Workshop, Agra etc.

NATIONAL, REGIONAL, STATE & NABL/ISO 17025 ACCREDITED CALIBRATION LABORATORIES IN INDIA & OVERSEAS COUNTRIES

- Electronics Regional Test Laboratory, (ERTL), at Kolkata and Thiruvananthapuram.
- More than 50 NABL Accredited Laboratories in India and ISO 17025 laboratories in Bulgaria, Dubai, Saudi Arabia & Singapore. ctronics Test and Development Centres (ETDC) at Aurangabad, Chennai, Goa, Guwahati, Hyderabad, Mohali, Mumbai, Pune and Solan.

NATIONAL HYDEL & SUPER THERMAL POWER PROJECTS

- Bhakra Dam, Bhakra Beas Project; Korba Super Thermal Power Project, Korba; Koyna Dam Maintenance Division, Satara; National Thermal Power Corporation Limited, New Delhi; National Hydroelectric Power Corporation Limited, Chamera (Himac
- Elehal Pradesh); Super Thermal Power Project, Kahalgaon; Thermal Power Project, Dhenkanal (Orissa); Vindhyachal Super Thermal Power Project, Sindhiand Karnataka Power Corporation Limited.

Morehouse Load Cell Tester

Features:

- Speeds Trouble Shooting of Load Cell Scale System
- Compatible with Most Load Cells
- No Need to Disconnect Load Cell to Test
- Stand-Alone, Portable, Battery Operated
- Clear Screen Messages

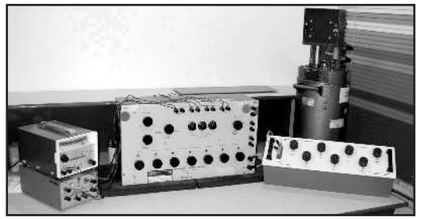
Description: The Load Cell Tester is a portable device designed to help analyze the condition of strain gage–based load cells in scale and industrial applications. It works with most common types and ranges of load cells found in industry. The unit's 3 operating keys and concise messages guide the user through testing in a step-by-step process. The Load Cell Tester provides the user with essential data on the condition of the load cell, such as physical condition (including distortions possibly caused by overloading, shock loads, or metal fatigue) and electrical conditions (such as bridge resistance and possible ground faults).

Load Cell Tester Video can be seen at http://www.youtube.com/watch?v=pACtHRYK1AQ

Vaiseshika Master Calibration Standards

Vaiseshika Electron Devices have installed and commissioned the World Class Calibration Standards to Calibrate your Instruments At Vaiseshika Metrology Laboratory

1. Stabaumatic Potentiometer, Validated at the National Physical Laboratory, Teddington (United Kingdom)



Resistance Range : 0 to 10 Megohm CMC : ±0.008 to 1.0 %
Voltage : 0 to 2 Volts CMC : ±0.002 to 0.07 %
Traceability : National Physical Laboratory, New Delhi

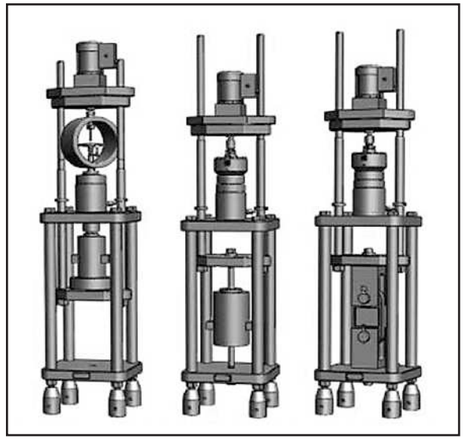
2. Weston Cadmium Standards Cell, Validated at the National Physical Laboratory Teddington (United Kingdom)

Calibrated CMC : ±0.00002 V
Traceability : National Physical Laboratory, New Delhi

3. Morehouse Proving Ring, York, Pennsylvania (USA)

Capacity : 5000 kgf
Uncertainty : 0.05%
Sensitivity : 0.005% of full scale

4. Universal Calibrating Machine with Proving Rings and Ultra Precision Calibration Grade Load Cells from Morehouse Instruments Company, York, Pennsylvania United States of America for Load Cell Calibration



Load Cells Calibration Set-ups both in Compression and Tension Modes

Range : 0 to 1000 kgf
Calibrated CMC : ±0.327 kgf to 0.481 kgf
Traceability : National Institute of Standards and Technology, Gaithersburg, Washington, United States of America

CMC stands for Calibration and Measurement Capability

5. 8½ Digits Digital Multimeter, from Agilent Technologies, USA.

		Range	CMC
DC Voltage	:	10nV to 1000 V	0.005% to 0.0005%
Resistance	:	10 micro Ohm to 1 G ohm	0.003% to 0.002%
DC Current	:	1 pA to 1 A	0.2 nA to 0.001 A
AC Voltage	:	10n V to 1000 V	0.01% to 0.005%
AC Current	:	100 pA to 1 A	0.006 uA to 0.0004 A
Frequency / Period	:	1 Hz to 10 MHZ	0.0009% to 0.007%
Traceability	:	National Physical Laboratory, New Delhi	

6. Standard Resistor, Validated at the National Physical Laboratory, Teddington (United Kingdom)

Resistance Range : 0.0001Ohm to 10 Mohm
Calibrated CMC : ±0.002@ to 1%
Traceability : National Physical Laboratory, New Delhi

7. Power Supplies, from Applied Electronics Limited (APLAB), Thane, India.

Range : 0 to 5000 Volt / 20 mA
Calibrated CMC : ±1% Load Regulation
Traceability : National Physical Laboratory, New Delhi

8. Picoammeter, from Scientific Equipments & Services, Roorkee, India

Range : 1 to 199.9 uA
Calibrated CMC : ±0.1 nA to 0.6 uA
Traceability : National Physical Laboratory, New Delhi

9. Pressure Calibrator from SIKA Dr. Siebert & Kuhn GmbH & Co. Kg, Germany

Range : 10 to 300 bars
Calibrated CMC : ±0.1% f.s.d.
Traceability : National Physical Laboratory, New Delhi

10. Dry Block Temperature Calibrator, from Dr. Siebert & Kuhn GmbH & Co. Kaufungen, Germany

Temperature Range : Ambient Temperature to 600°C
Calibrated CMC : ±0.3% or 1.0°C whichever is greater
Traceability : National Physical Laboratory, New Delhi

Agri - Electronic Instrument

Digital Iodine Value Meter
(CSIO, Chandigarh Know-how)

Micro-controller based design Iodine Number of oils like Sunflower Oil, Mustard Oil and other similar edible Oils

Digital Cereal Grain Analyzer
(CSIO, Chandigarh Know-how)

For Oil, Moisture & Protein Determination

Fruit Firmness Tester

Range: upto 20 kg

Tensiometer

Monitor the available moisture in availability of Soil.

Refractometer

Reading sugar level in fruits

Small Fruit Sizer

Range: 15 to 28 mm

Banana Caliper

Length of Banana

Soil Moisture Meter

Measuring range:
0 -200 centibars/-50°C to +150°C

Environmental & Temperature Instrumentation

Infrared Thermometer

Digital Thermometer

Digital Thermo Hygrometer

Multi Function Meter

Wood Moisture Meter

Precision Thermocouples & RTDs

Industrial Thermocouples

Lux Meter

Spectrum of Vaiseshika Material Inspection & Testing Instruments Calibration Standards

METALLURGICAL MICROSCOPE

STEREO ZOOM MICROSCOPE

SAMPLING POLISHING MACHINE

SURFACE ROUGHNESS TESTER

SAMPLE MOUNTING PRESS

ROCKWELL HARDNESS TEST

MICRO VICKERS HARDNESS TESTER

LEEB HARDNESS TESTER

FIBRE OPTICS COLD LIGHT ILLUMINATION SYSTEM

MAGNASCOPE

QUARTZ/LED MACHINE LIGHTING SYSTEM

Vaiseshika Calibration Laboratory

Panoramic View of Vaiseshika Metrology Laboratory Compliant to ISO 17025 : 2005 Protocols

The Press on the contribution of Vaiseshika Calibration Capabilities

Ambala enterprise installs cell calibration machine at Sriharikota

MANISH SIRHINDI
TRIBUNE NEWS SERVICE

AMBALA, NOVEMBER 20
An Ambala-based small-scale industrial enterprise has contributed its engineering and technical expertise to support the prestigious Mars Orbiter Mission (MOM) of the country by installing and commissioning a 450-tonne load cell calibration machine and system at Satish Dhawan Space Centre, Sriharikota, to assist ISRO in the successful launch of the orbiter.

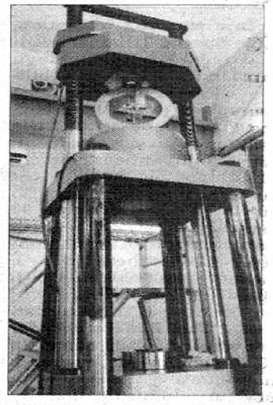
Vaiseshika Electron Devices provided its engineering and technical expertise to support an important laboratory metrology evaluation of the motor and engine capability of the spaceship carrying the orbiter into the outer space and with the successful launch of the spaceship, it established itself as a prominent member among the team of scientists working on the mission.

MARS ORBITER MISSION

Dr Anil Jain, president of Vaiseshika, said the 450-tonne load cell calibration machine and system was used for the calibration of load cells at the static test-bed facility of the space centre. He said every motor and engine on the spaceship was evaluated for the estimation of the thrust generated by the motor and engine at the static test-bed facility through a series of load cells.

The design of the engine of the spaceship was then optimised and approved for its thrust capacity with the help of load cells.

The calibration facility installed by Vaiseshika at the space centre is the only such facility in the entire Asia and is versatile and useful in checking and calibrating load cells. Earlier, Vaiseshika had installed and commissioned a similar facility at the High Energy Materials Research Laboratory at Nasik for AGNI-III Missile.



The 450-tonne load cell calibration machine and system installed at Sriharikota.
A TRIBUNE PHOTOGRAPH >>

The Tribune, 21 November 2013

The Tribune, 14 April 2007

Agni-III has parts made in Ambala

RAHUL DAS
TRIBUNE NEWS SERVICE

AMBALA, APRIL 13
Agni-III, intermediate range ballistic missile, which was successfully test-fired yesterday, has a critical component manufactured by a local firm.

Vaiseshika Electron Devices, located at Industrial Estate, Ambala cantt, commissioned the force calibration system, which is crucial in testing, evaluation and caliberation of load cells in the missile. The load cell is a sensor, which is used to check and evaluate the thrust of the missile at the time of its launch.

Dr Anil Jain, president of the firm, said they had installed and commissioned "a 250-tonne Morehouse universal caliberating machine along with three proving rings of capacities 5 tonne, 50 tonne and 250 tonne." The Morehouse load cell caliberation system was installed at the static test bed facility of the project at Jagdalpur in Chhattisgarh.

"Our engineers had installed and commissioned the complete caliberation machine at the site over a period of one year. The machine can make all measurements with a precision of 99.975 per cent," he added.

Jain pointed out that the manufacturing and production of the system, along with the accessories, involved multilateral technical collaboration with the Morehouse Instrument Co., York, the United States. The tension tiebars for the load cells had been indigenously designed and fabricated by Mukand Limited, Mumbai, with the help of Vaiseshika technical consultancy.

Vaiseshika had installed and commissioned the Morehouse load cell caliberation system at the Defence Research and Development Organisation, Hyderabad, Vikram Sarabhai Space Research Centre, Thiruvananthapuram, and High Energy Material Research Laboratory, Pune.

The company has established an ISO 17025:2005 compliant meteorology laboratory at Ambala cantt. It is recognised by the national accreditation board for testing and caliberation laboratories, department of science and technology, Jain added.

The Hindustan Times, 22 November 2013

Ambala-built machine used in Mangalyaan launch

HT Live Correspondent
hterschd@hindustantimes.com

AMBALA: Ambala-based small scale enterprise Vaiseshika Electron Device — Load Cell Calibration Machine and System — was used for the recent launching of spaceship 'Mangalyaan', India's mission to Mars.

Scientist and president Anil Jain while talking to Hindustan Times claimed that it was heartening to see that indigenously built calibration machine of his firm had been used in several spaceship programmes.

He said despite of not having government research facilities, the local science industry conforms to international standards adding that the instruments developed here were being used in defence, space, marine, aeronautics including leading research laboratories.

Jain said that he has installed and commissioned a 450-tonne load cell calibration machine and system at Satish Dhawan Space Centre in Sriharikota four years ago thus contributing to its engineering and technical expertise to support an important laboratory metrology evaluation of the motor and engine capability of the spaceship.

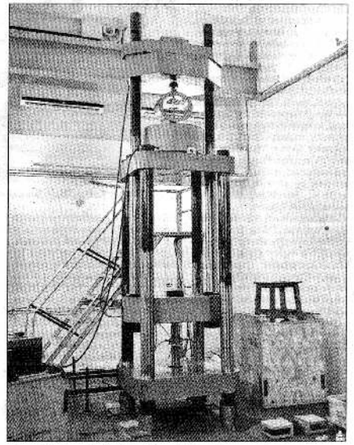
Jain said that this machine is used for the calibration of load cells at the Static Test Bed Facility (STBF) of the Space Centre adding that every motor and engine, pertaining to a spaceship, is evaluated for the estimation of the thrust generated by the motor and engine at the STBF through a series of load cells.

The design of the engine of the spaceship was optimised and approved for its thrust capacity only with the help of load cells and thereafter these load cells were required to be standardised and calibrated for their accuracies, he said.

He said that the 450-tonne system installed by Vaiseshika at Sriharikota was the only such facility in the entire Asia and is versatile and useful to check and calibrate the load cells adding that this Load Cell Calibration System is compliant to international standards ISO 17025: 2005 for Testing and Calibration Laboratories.

Jain claimed that earlier Vaiseshika had installed and commissioned a similar facility at the high energy materials research laboratory at Nasik also for AGNI-III Missile.

He said that repeatability, uncertainty and accuracies of this calibration system is world class and proven even at NASA Space Centre at Houston, Texas in USA adding that it was a nice feeling to be a part of space exploration.



A machine used in the launching of Mangalyaan.

Vaiseshika Calibration Standards for AGNI-V Missile

दैनिक भास्कर
28 December 2016

उपलब्धि | मिसाइल को बनाने में अम्बाला में बने साइंस उपकरण से किया गया परीक्षण, विशिशिखा ने 7 लेबोरेट्री में दिए थे उपकरण

अग्नि-5 के सफल परीक्षण में अम्बाला का भी रहा योगदान

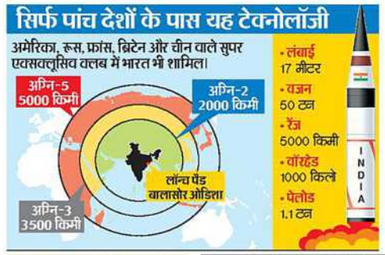
प्रवेंद्र सिंह | अम्बाला

सोमवार को ओडिशा के अब्दुल कलाम द्वीप से अग्नि-5 मिसाइल के सफल परीक्षण में अम्बाला का भी सहयोग रहा है। अम्बाला की विशिशिखा द्वारा बनाए गए उपकरणों से अग्नि-5 मिसाइल में लगने वाले उपकरणों का परीक्षण किया गया है। इसके लिए विशिशिखा ने देश की 7 लैबों को उपकरण दिए हैं जिसमें मिसाइलों से जुड़े कलपुर्जों का निर्माण किया जाता है। अम्बाला से लैबों को परीक्षण व अंशशोधन से जुड़े उपकरण दिए गए हैं। इससे कलपुर्जों को मिसाइल में लगने से पहले उनका परीक्षण किया जाता है। इससे यह पता चल पाता है कि जो कलपुर्जे मिसाइल में लगाने के लिए बनाए जा रहे हैं, वह लगने लायक हैं या नहीं।

अम्बाला से यह उपकरण भेजे गए थे लैब में : अम्बाला से मिसाइल में लगने वाले कलपुर्जों के लिए 6 तरह के उपकरण भेजे गए थे जिसमें रजिस्टेंस कैलिबेटर, करंट कैलिबेटर, वोल्टेज कैलिबेटर, प्रेशर कैलिबेटर, लोड एंड सेल कैलिब्रेशन सिस्टम व थर्मोकप्पल शामिल है। विशिशिखा कंपनी के प्रेजिडेंट अनिल जैन ने बताया कि इन उपकरणों से मिसाइल में लगने वाले कलपुर्जों को जांचा जाता है। इसी के बाद ही इन्हें मिसाइल में लगाया जाता है।

सिर्फ पांच देशों के पास यह टेक्नोलॉजी

अमेरिका, रूस, फ्रांस, ब्रिटेन और चीन वाले सुपर एक्सक्लूसिव क्लब में भारत भी शामिल।



अग्नि 5 में लगने वाले कलपुर्जों की जांच करने वाले उपकरण बारे बताते अनिल जैन। (दाएं) मंगलयान के प्रक्षेपण से पहले दबाव की जानकारी देने वाले सेंसर की जांच करने वाला उपकरण

मंगलयान व अग्नि-3 में भी हो चुका उपयोग

अम्बाला से बने साइंस उपकरण का उपयोग मंगलयान व मिसाइल अग्नि-3 को बनाने के लिए हो चुका है। अनिल जैन ने बताया कि मंगलयान के लिए विशिशिखा द्वारा बनाया गया यूनिवर्सल कैलिब्रेटिंग मशीन एंड डेड वेट लोड सेल कैलिब्रेटर उपकरण का उपयोग हो चुका है। यह उपकरण यान के प्रक्षेपण से पहले बनने वाले दबाव की जानकारी देने वाले सेंसर की जांच करता है। यह सेंसर यान के उड़ने से पहले सही दबाव बनने की जानकारी देते हैं। इसके बद ही यान का प्रक्षेपण संभव हो पात है।

यह हैं वह लेबोरेट्री जहां भेजे गए थे उपकरण

- ओडिसा के बालासुर में इंटीग्रेटेड टेस्ट रेंज में उपकरण भेजे गए थे। लेकिन अब इस लैब का नाम बदलकर अब्दुल कलाम द्वीप रख दिया गया है। यहां से मिसाइल का प्रक्षेपण किया जात है।
- चंडीगढ़ के रामगढ़ में टर्मिनल बैलेस्टिक रिसर्च लेबोरेट्री है। इसमें मिसाइल पर रिसर्च का काम किया जात है।
- नासिक व पुणे में हाई एनर्जी मेटेरियल्स रिसर्च लेबोरेट्री है जोकि प्रक्षेपण करने वाले ईंधन की जांच करती है।
- छत्तीसगढ़ के जगदलपुर व हैदराबाद में डिफेंस रिसर्च एंड डेवलपमेंट लेबोरेट्री है। इस लेबोरेट्री में मिसाइल को बनाने की नींव रखी जाती है।
- तमिलनाडु के नीलगिरी व महाराष्ट्र के अंजरा में डायरेक्टर जनरल ऑफ क्वालिटी एश्योरेंस लेबोरेट्री है। इसमें मिसाइल में लगने वाले कलपुर्जों के गुणवता की जांच होती है।
- दिल्ली में नेशनल फिजिकल लेबोरेट्री है इसमें मिसाइल की फिजिकल तौर पर जांच की जाती है।
- यूपी के आगरा में एरियल डिलीवरी रिसर्च एंड डेवलपमेंट लेबोरेट्री है यहां पर भी मिसाइल से जुड़ी चीजों पर काम किया जाता है। इन सभी लेबोरेट्री में विशिशिखा द्वारा उपकरण भेजे जाते हैं।

अम्बाला साइंस उपकरण बनाने में विश्व में प्रसिद्ध

अम्बाला में बनने वाले साइंस उपकरण पूरे विश्व में प्रसिद्ध है। यहां बनने वाला सामान देश में ही नहीं, विदेशों में भी पसंद किया जाता है। अम्बाला में लगभग 2 हजार से अधिक साइंस के उपकरण बनाने वाली इंडस्ट्रियां हैं। इसके अलावा साइंस के कारोबार में लगभग 1 हजार करोड़ का सालाना टर्नओवर है।

इन देशों में भेजे जाते हैं साइंस उपकरण

अम्बाला में बनने वाले साइंस उपकरण इंग्लैंड, यूरोप, अमेरिका, केन्या, इथोपिया, यूगांडा, दुबई, सउदी अरेबिया, इरान, इराक, सिंगापुर, मलेशिया, इंडोनेशिया व फिलिपींस सहित कई देशों में भेजे जाते हैं।

अम्बाला में बनाया जा रहा साइंस म्यूजियम

अम्बाला को साइंस सिटी के नाम से भी जाना जाता है, इसी को आगे रखते हुए सरकार की ओर से जिले में साइंस म्यूजियम खोलने की तैयारी की जा रही है। मंगलवार को नगर निगम की हुई बैठक में भी इस योजना को मंजूरी दे दी गई है। इस म्यूजियम को कोलकाता के साइंस म्यूजियम के तर्ज पर बनाए जाने का प्रावधन है। स्वास्थ्य मंत्री अनिल विज ने पिछले दिनों कोलकाता के दौरे के बद इस बत की पुष्टि भी थी। साइंस म्यूजियम बनने के बाद अम्बाला के अलावा प्रदेश के लोगों के लिए भी साइंस से जुड़ी जानकारी ले सकेंगे।

The Tribune
28 December 2016 →

Ambala firm gives technical support to Agni-V project

NITISH SHARMA
TRIBUNE NEWS SERVICE

AMBALA, DECEMBER 27
A small-scale industrial unit has provided its technical and engineering support to the successful launch of Agni-V, an inter-continental ballistic missile which was test-fired yesterday.

Vaiseshika Electron Devices, a local firm, has designed, produced, installed and commissioned the electrical calibration standards for voltage, current and resistance, thermocouples and sensors for sensing high temperatures upto 1,600 degree Celsius, electronic software for the microstructure examinations and hardness testing of materials and propellants and load cell calibration systems for testing and calibration of pressure transducers, used to measure the thrust capacity of the motor and engine of the missile.

> "It was a proud moment for us as we have contributed to such a prestigious project. By using indigenous products, we have not only managed to keep the cost of project down but also provided jobs to over 100 people, directly or indirectly."
>
> Dr Anil Jain, PRESIDENT, VAISESHIKA ELECTRON DEVICES

Scientist and president of the firm Dr Anil Jain said: "It was a proud moment for us as we have contributed to such a prestigious project. By using indigenous products, we have not only managed to keep the cost of project down but also provided jobs to over 100 people, directly or indirectly."

"Our engineers had successfully installed and commissioned the instruments in defence laboratories associated with the design, development and launching of the missile," he added.

Dr Jain claimed that the firm had earlier contributed its engineering and technical expertise to support the Mars Orbiter Mission (MOM) by installing and commissioning a 450-tonne load cell calibration machine and system to assist ISRO in the successful launch of the orbiter. Besides this, the firm had installed and commissioned the force calibration system in the Agni-III missile.

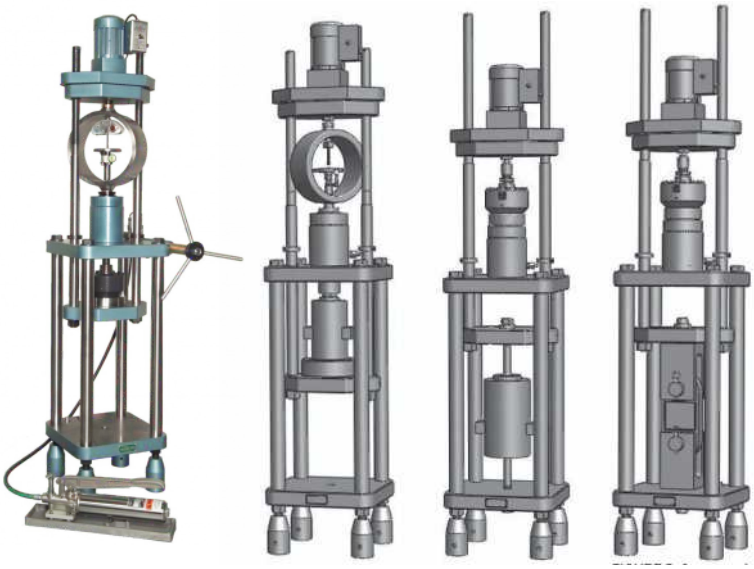
Dr Jain the firm had been conferred with national award twice in recognition of its efforts.

Vaiśeshika®

Morehouse Force and Load Cell Calibration Standards from Morehouse Instruments Co. Inc. York, Pennsylvania, USA. (www.mhforce.com)

Morehouse Digital Proving Ring (For the First Time in the World)
(Uncertainty 0.0125%, 0.025% & 0.05% of full scale)

Morehouse Ultra Precision Load Cells
Class 00, 0, 0.5 & 1



Morehouse Universal Calibrating Machine capable to undertake calibrations according to ISO 376 Load Cell Calibration Protocols & Morehouse Ultra Precision Master Load Cell in the Compression Mode placed on the Upper Platen of the Machine

Morehouse Dead Weight Calibrator 1,20,000 lbf with CMC 0.0016% (Primary Force Calibration Reference Standard Installed at Morehouse Laboratory)

For further information on all the products in this Bulletin, please write us on :

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