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Editorial

Dr. Aswal, Director NPL visits Vaiseshika Calibration Facility

17th February 2018 was a Red Letter Day in the history of Vaiseshika Electron Devices, Ambala Cantt. **Dr. Dinesh Kumar Aswal, Director, National Physical Laboratory, New Delhi** visited ISO /IEC 17025 :2005 Accredited Vaiseshika Metrology Laboratory and Manufacturing Facility. Dr. Aswal was received at Vaiseshika by Dr. Anil Jain, President; Mr. Praveen Jain, Chief Executive and the entire staff.

Subsequently Dr. Aswal witnessed various Calibration Standards and their live demonstration and performance were made by the Quality Assurance Team. The 15 Ton Morehouse Load Cell Calibration Facility was a special demonstration. It is a matter of great pride and honour for Vaiseshika that our engineering experts had successfully installed a 450 Ton Morehouse Load Cell Calibration Facility at Satish Dhawan Space Centre, Sriharikota in 2010 and 50 kN Morehouse Dead Weight Calibrator at the National Physical Laboratory, New Delhi in 2001.

Thereafter Dr. Aswal was taken around the Optical Instruments Laboratory and he was satisfied to see the various sophisticated Hardness Testers and Stereo Zoom Microscopes for material microstructure examination and testing system with measurement software.

Vaiseshika Electro - Technical Metrology Laboratory has world class calibration standards comprising of 0.0001 ohm Standard Resistor having uncertainty of 20 ppm and Precision Reference Resistors upto 10 Tera ohm having traceability to the National Metrology Institute. **Thereafter Dr. Aswal inaugurated and released a new Resistance Calibration Standard having range from 10 micro-ohm to 10 Tera ohm having uncertainty of 1.6 %.** This Micro ohm Resistor Standard Calibrator has been indigenously designed at Vaiseshika and Dr. Aswal was appreciative of the fact that such a Calibration Standard will go a long way in serving the needs of defence, research, calibration Laboratories and industries.

Vaiseshika Resistance and Load Cell Calibration Standards and Material Testing and Examination Microscopes have been extensively used and accepted across the most Prestigious Space and Defence Projects of the country like **the Satellite Launch Missions Laboratories of the Indian Space Research Organisation at Sriharikota, Trivandrum, Alwaye, Mahendragiri and Valiamala and Missile Testing & Research Laboratories at Chandipur, Jagdalpur, Nasik, Pune and Hyderabad.**

(Left to Right) Mr. Praveen Jain, Chief Executive & Dr. Anil Jain, President, presenting welcome bouquet to Dr. D.K. Aswal, Director, NPL

During the last three years, Vaiseshika has installed their Calibration Standards in various ISO 17025 : 2005 compliant Laboratories in the US, Europe, South East Asian Countries and Middle East Countries.

The customer satisfaction is a priority at Vaiseshika. Therefore our team of engineers and experts undertake installation, commissioning, demonstration, training and maintainability of the Calibration Standards and Optical Instruments for many years after the date of first supply. At most of the places, the application engineering requirements of the customer are understood and custom-built design and aesthetics are provided. In certain critical requirements, we have repaired and recommissioned our instruments even upto a period of ten years .

It is relevant to mention here that the stability and drift record of our Reference Calibration Standards are maintained and we have been

Dr. D.K. Aswal, releasing the inaugural unit of precision Milli/Micro Ohm-Meter Calibrator

Dr. Anil Jain (Left) explaining the principle of Load Cell Force Calibration to Dr. Aswal on 15 Ton Morehouse Load Cell Calibration System.

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able to maintain a stability of the order of 0.00002 % over the last 20 years in our Metrology Laboratory. Further our engineers undergo regular training programmes at the National Physical Laboratory, New Delhi; the Quality Council of India and in the ISO17025 : 2005 A2LA Accredited Laboratory in York, Pennsylvania US to strengthen their metrology expertise .

Dr. Aswal told that Metrology is the Pillar of Quality Infrastructure in India. India can become a super-power provided precision measurements and protocols are adhered to by the industry, research and academia. He said that the quantum of exports from India can increase many times if precision metrology is employed in industrial production. The experience of interaction and listening to Dr. D.K. Aswal, the Director, National Physical Laboratory, New Delhi was a great learning and motivational experience for everyone at Vaiseshika.

- Anil Jain
Ph.D. (BITS, Pilani)
President

Dr. D.K. Aswal looking at the Load Cell Calibration procedure on Morehouse Universal Calibrating Machine

Dr. D.K. Aswal discussing the significance of Quality & Reliability in Calibration with Vaiseshika Metrology team.

Dr. D.K. Aswal and Mrs. Neelam Aswal with Vaiseshika Metrology team.

Dr. D.K. Aswal delivering the 28th Gian Chand Jain Memorial Lecture on 17th February 2018 on the topic Metrology: the Pillar of Quality Infrastructure at the auditorium of Sanatan Dharam College, Ambala Cantt.

He who can listen to the music in the midst of noise can achieve great things.

-Vikram Sarabhai

Morehouse : the World Class Leader in Force Calibration Standards

Established in 1925, Morehouse Instrument Company is a World Class Leader and Pioneer in the Design, Production and Standardization of Force Calibration Standards in accordance with ISO 376 Calibration Protocols for ISO 17025:2017 Standards for Testing and Calibration Laboratories. This reputation has been earned by years of uncompromising conformance to the principles originally established and maintained by the United States National Institute of Standards & Technology, Gaithersburg. Morehouse is dedicated to the design manufacture and application of Force Standards which can be used with confidence in standards laboratories and throughout industry.

Morehouse key to success is offering products with the lowest measurement uncertainties available. Ultimately, this helps our customer base make more accurate measurements, which save costs, reduce risk, and increase quality. Morehouse design the products which are in line with customer requirements, lean principles, and six sigma principles, and are within best measurement practices guidelines.

Morehouse Instrument Company can be of service to you whether you want to establish your complete in-house force standards laboratory or require periodic calibration of your load cells or other force measuring instruments from 0.1 lbf to 2,250,000 lbf. Offering dead weight calibration up to 120,000 lbf.

In 2004 Morehouse Instrument Company finished construction of its new Force Calibration Lab. This lab features a 120,000 lbf Morehouse Dead Weight Machine which allows us to give the best possible calibration to our customers.

In 2010 Morehouse Instrument Company finished construction of its Primary Torque Calibration Lab. The torque machine, built by National Physical Laboratory, gives Morehouse the privilege of being the Second Most Accurate Laboratory in the World for torque calibrations from 1 N-m through 2000 N-m (PTB has the lowest overall uncertainty).

Henry Zumbrun, President

Everything we do, we believe in changing how people think about force and torque calibration. Morehouse believes in thinking differently about force and torque calibration and equipment. We challenge the "just calibrate it" mentality by educating our customers on what matters, what causes significant errors, and focus on reducing them. Morehouse makes our products simple to use and user-friendly. And we happen to make great force equipment and provide unparalleled calibration services.

Wanna do business with a company who focuses on what matters most?

- Henry Zumbrun, President, Morehouse

www.mhforce.com

Vaiseshika is the Indian Engineering Partner of Morehouse

Vaiseshika Electron Devices, Ambala Cantt has been collaborating with Morehouse for the installation and commissioning of Morehouse Force Calibration Standards in India since 1996. We have the distinction of the installation and commissioning of Morehouse Force Calibration Standards, successfully installed and commissioned in the following prestigious organizations in India ;

Sr. No.	Institution	Calibration Standards
1.	National Physical Laboratory, New Delhi	Morehouse 50 kN Dead Weight Calibrator
2.	Vikram Sarabhai Space Centre, Rocket System Testing Division and Calibration Division, Trivandrum	Morehouse 60000 lbf Universal Calibrating Machine and Digital Proving Rings
3.	Satish Dhawan Space Centre, Sriharikota	450 Ton Morehouse Universal Calibrating Machine and set of Proving Rings
4.	Honeywell Technology Solutions Lab Pvt. Ltd., Bangalore	150 kN Morehouse Universal Calibrating Machine with 150 kN& 10 kN Load Cell
5.	GE India Technology Centre Pvt. Ltd., Bangalore	10 kN and 53 kN Morehouse Proving Ring
6.	Essar Ltd., Hazira	Morehouse Proving Ring
7.	Fluid Control Research Institute, Palghat	Morehouse Load Cell Calibrating Machine
8.	5 Base Repair Depot, Air Force Station, Coimbatore	Morehouse Dead Weight Calibrator
9.	Ahmedabad Textile Industries Research Association	Morehouse Universal Calibrating Machine and Proving Ring
10.	Ordnance Factory, Itarsi	Morehouse Proving Ring
11.	Defence Research and Development Laboratory, Hyderabad	Morehouse Proving Ring
12.	High Energy Materials Research Laboratory, Pune & Nashik.	100 Ton Morehouse Universal Calibrating Machine and 10 Ton & 50 Ton Proving Ring
13.	Electronics Regional Test Laboratory, Calcutta	5 kN Morehouse Proving Ring
14.	Hindustan Aeronautics Ltd., Bangalore	Morehouse Load Cell Calibrating Machine

Spectrum of Prestigious Projects, Organizations and Institutions using Vaiseshika 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 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 (Himachal Pradesh); Super Thermal Power Project, Kahalgaon; Thermal Power Project, Dhenkanal (Orissa); Vindhyachal Super Thermal Power Project, Sindhi and Karnataka Power Corporation Limited.

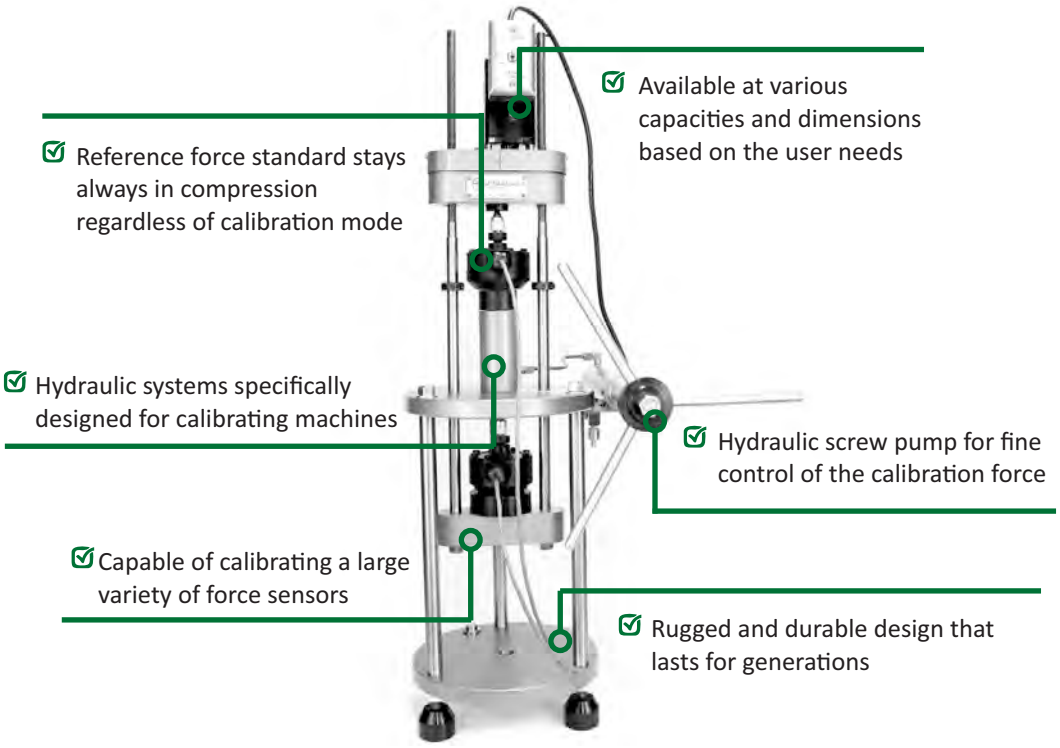
Prestigious Industrial Organizations in India

National Metrology Institutions

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

- 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.

Universal Calibrating Machines (UCM)



Standard Features

An accurate machine that enables calibrating most types of force sensors including: load cells, proving rings, force gauges, crane scales, dynamometers, load links, etc.
Rugged design and quality manufacturing ensures high durability
Available in various capacities from 5,000 to 1,000,000 kgf
Fully customizable features and dimensions based on users required specifications and needs
Can be powered by the convenient Morehouse Hydraulic Power Control (HPC), or Hydraulic Hand Pump
Available with a large variety of adapters such as: clevises, Quick-Change Tension Members, load pads, and ball adapters

Technical Specifications

Specifications	Universal Calibrating Machines
	Model: UCM
Mechanical	
Capacities	5,000 to 1,000,000 kgf
Calibration Mode	Both compression and tension
Maximum Misalignment	1/16th in. over max yoke length
Unit Under Test Area	Adjustable (see dimensions)
Maximum Jack Stroke	1.0 in.
Maximum Hydraulic Pressure	345 bar
Yoke Adjustment Speed	Approx. 2 in/min.
Standard Power Requirements*	
5K and 15K kgf Capacities	115 VAC, 60 Hz, single phase
30K, 50K, 75K kgf Capacities	115 VAC, 60 Hz, single phase
100K, 150K, 200K, 250K kgf Capacities	115 or 230 VAC, 60 Hz, single phase
500K kgf Capacity	230 or 460 VAC, 60 Hz, three phase

***All models available for operation on 220 VAC, 50 Hz.**

Morehouse A2LA Scope of Accreditation

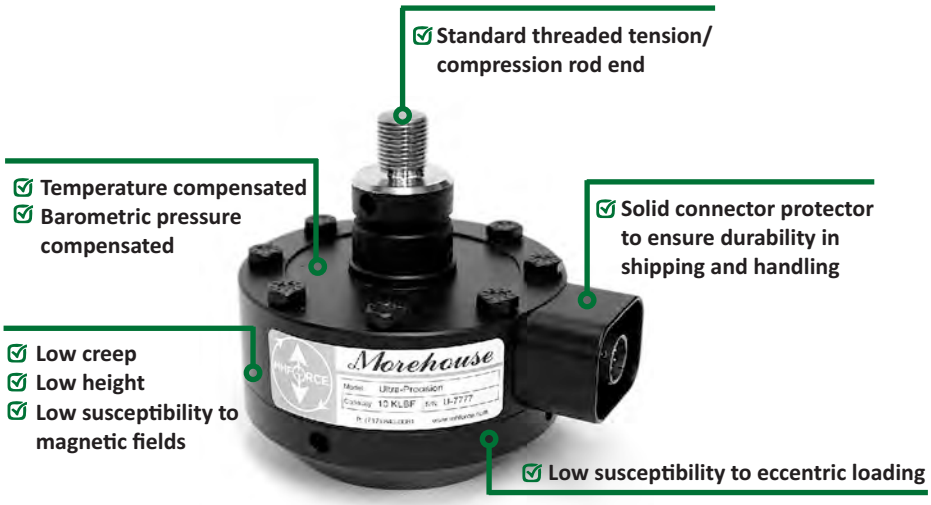
(Refer www.mhforce.com for details)

ilac-MRA A2LA ACCREDITED
Certificate No. : 1398.01 Dt. 08/03/2018

I. Electrical – DC/Low Frequency			
Parameter/Equipment	**Range**	**CMC²**	**Comments**
DC Voltage – Electrical Calibration of Load Indicators	(0 to 4.4) mV/V	0.00005 mV/V	Load cell simulator
II. Mechanical			
Force – Dead Weight Primary Standards: Tension and Compression	(5 to 105) gf (0.1 to 10) lbf [(0.44 to 44) N] (10 to 100) lbf [(44 to 444) N] (100 to 12 000) lbf [(444 to 53 378) N] (12 000 to 120 000) lbf [(53 378 to 533 786) N]	0.003 % 0.0025 % 0.0016 % 0.0016 % 0.0016 %	Force Calibration including ASTM E74 Class A and AA, ISO 376 Class 00, 0.5, 1 and 2 Forces can be applied incrementally and decrementally through 120 000 lbf thus permitting the determination of hysteresis errors
Force (cont) – N.I.S.T Calibrated Transfer/Secondary Standards: Tension and Compression	(120 000 to 1 000 000) lbf [(533 to 4448) kN]	1.5E-05 x F + 11 [(11.5 through 26.17) lbf] [(51.2 through 116.4) N]	Force Calibration including ASTM E74 Class A, ISO 376 Class 0, 0.5, 1 and 2 Forces can be applied incrementally and decrementally through 1 000 000 lbf thus permitting the determination of hysteresis errors
N.I.S.T Calibrated Transfer/Secondary Standards: Compression Tension	(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]	4.22E-05 x F + 52. [(94.7 through 147.6) lbf] [(421.2 through 655.9) N] 4.22E-05 x F + 52.5 [(94.7 through 145.3) l [(421.2 through 441.71) N]	Forces can be applied incrementally only from 1 000 000 through 2 250 000 lbf
Aircraft Scales/Truck Scales (Portable)[5]	(0 to 60 000) lbf	0.0016 %	Force
Torque – Dead Weight Primary Standards Clockwise & Counter-clockwise	(0.37 to 73.75) lbf·ft; (0.5 to 100) N·m (14.75 to 1475) lbf·ft; (20 to 2000) N·m	0.005 % 0.003 %	Primary torque standard, ASTM E2428 and other methods

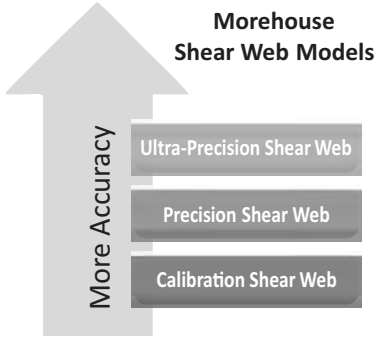
Morehouse Instrument Co. & Vaiseshika Electron Devices are Engineering Partners for Morehouse Calibration Standards in India

Shear Web Load Cells



Calibration Performance

Load Cell Model	ASTM E74 LLF	ASTM E74 Class A	ASTM E74 Class AA	ISO 376 Class
Ultra-Precision	0.005 % FS	2 % FS	10 % FS	00
Precision	0.01 % FS	4 % FS	20 % FS	0.5
Calibration	0.02 % FS	8 % FS	40 % FS	1



- Calibration using Primary Deadweight Standards is available for capacities up to 60,000 kgf.
- Available accessories such as: Quick-Change Tension Members, custom-cut protective cases, various indicators.
- Values presented in the table above can only be achieved when the load cell is used in conjunction with a high-quality indicator, such as Morehouse 4215, DSC, or HADI.

Technical Specifications

Specifications	Model - Capacity (kgf / kN)					
	Ultra- Precision		Precision		Calibration	
	150-1000 / 1-10	2.5K-100K / 20-900	150-1000 / 1-10	2.5K-100K / 20-900	150-1000 / 1-10	2.5K-50K / 20-500
Accuracy						
Recommended Excitation, VDC	10	10	10	10	10	10
Off-Center Load Sensitivity, %/in	±0.05	± 0.05	±0.10	± 0.10	± 0.25	± 0.25
Sensitivity Effect, % Rdg / 100°F	0.08	0.08	0.08	0.08	0.08	0.08
Creep, % Rdg / 20 Min.	± 0.015	± 0.015	± 0.03	± 0.03	± 0.03	± 0.03
Mechanical/Electrical						
Static Error Band, % R.O.	±0.02	± 0.03	± 0.02	± 0.03	± 0.04	± 0.05
Range, Compensated, °F	+15 to +115	+15 to +115	+15 to +115	+15 to +115	+15 to +115	+15 to +115
Zero Effect, % R.O. / 100°F	0.08	0.08	0.08	0.08	0.08	0.08
Safe Overload, % R.O.	150	150	150	150	150	150
Range, Operating, °F	-65 to +200	-65 to +200	-65 to +200	-65 to +200	-65 to +200	-65 to +200
Sensitivity (R.O.), mV/V, Nominal	2	4	2	4	2	4
Non-Linearity, % R.O.	±0.02	± 0.03	± 0.03	± 0.03	± 0.04	± 0.05
Zero Balance, % R.O.	± 1.0	± 1.0	± 1.0	± 1.0	± 1.0	± 1.0
Temperature						
Hysteresis, % R.O.	± 0.02	± 0.04	± 0.02	± 0.04	± 0.03	± 0.05
Input Resistance, Ω	350 +40/-3.5	350 +40/-3.5	350 +40/-3.5	350 +40/-3.5	350 +40/-3.5	350 +40/-3.5
Side Load Sensitivity, %	± 0.05	± 0.05	±0.10	±0.10	± 0.25	± 0.25
Non-Repeatability, % R.O.	± 0.005	± 0.005	± 0.01	± 0.01	± 0.01	± 0.01
Insulation Bridge/Case, MegΩ	5000 @50 VDC	5000 @50 VDC	5000 @50 VDC	5000 @50 VDC	5000 @50 VDC	5000 @50 VDC
Flexure Material	Aluminum	Steel	Aluminum	Steel	Aluminum	Steel
Output Resistance, Ω	350 ± 3.5	350 ± 3.5	350 ± 3.5	350 ± 3.5	350 ± 3.5	350 ± 3.5

SHAR Space Centre, Sriharikota

भारत सरकार
अन्तरिक्ष विभाग
सतीश धवन अन्तरिक्ष केन्द्र
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फेक्स : 91-8623-245160

Government of India
Department of Space
Satish Dhawan Space Centre
SHAR
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Fax : + 91-8623 – 245160.

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 Load Cell Calibration Facility at VAST, Satish Dhawan Space Center SHAR.

Ref: Your letter dated 3-11-2010 with Ref no. (F-07): SHAR:-AJ-26.

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, adopters etc and calibrated load cells ranging from 0.5t to 450t. At present both the machines have been commissioned and are working satisfactorily.

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.

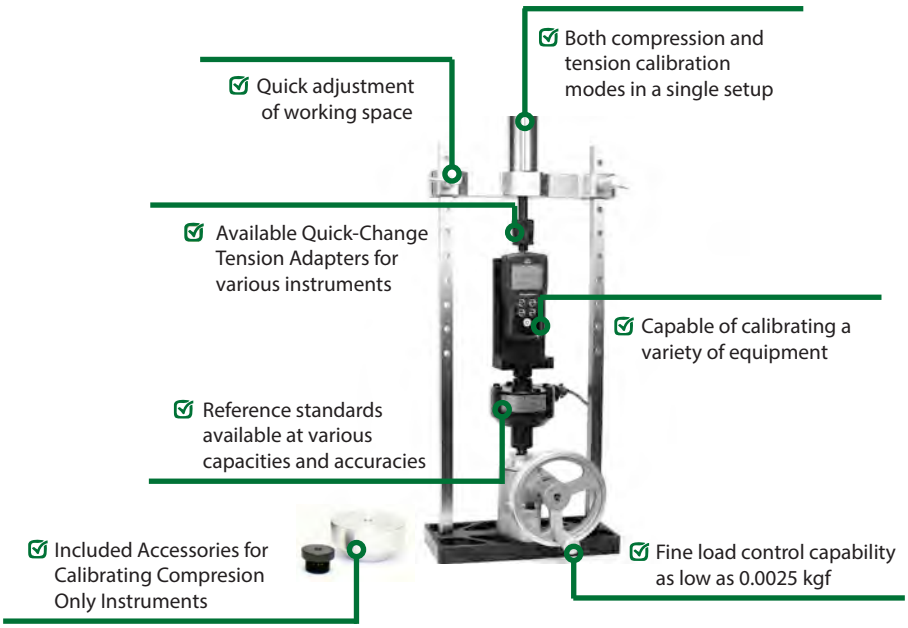
(K.SUBHAS)
K. Subhas
Deputy Director
VAST

To

Dr. ANIL JAIN
PRESIDENT.
M/s VAISESHIKA ELECTONIC DEVICES
AMBALA.

भारतीय अन्तरिक्ष अनुसंधान संगठन **Indian Space Research Organisation**

Portable Calibrator



- Portable and bench-top calibrating machine weighs less than 17 kgf (w/o reference standard)
- Capable of calibrating a variety of equipment such as: load cells, ring force gauges, hand-held digital force gauges, etc.
- Included bearing block and ball seat for calibrating compression only load cells
- Capable of controlling force at very fine level depending on the reference standard (control load to as low as ±0.0025 kgf with a 250 kgf reference standard) Calibration to Primary deadweight standards available
- Compatible with Morehouse Quick-Change Tension adapters at different sizes for calibrating various instruments
- Morehouse Shear Web Load Cells available as reference standard from 50 kgf to 1000 kgf
- Available protective case which contains the Portable Calibrator as well as all the instruments and accessories

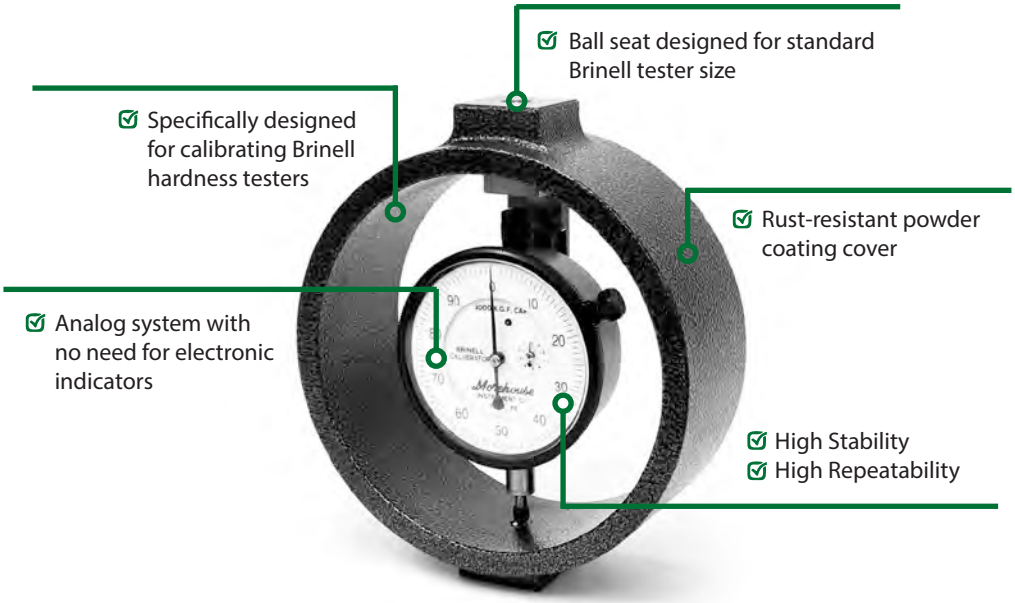
* Special adapters might be required to calibrated certain instruments in the Morehouse Portable Calibrator. The setup pictured above includes a Morehouse L-Bracket designed to calibrate hand-held digital force gauges. This adapter is not included with Morehouse Portable Calibrator. However, a value kit consisting of various L-Brackets for multiple hand-held force gauges is available for purchase.

Technical Specifications

Specifications	Portable Calibrator Model: PCM2K
Calibration Capabilities	
Reference Standards Available	50 to 1000 kgf
Control Resolution*	±0.001 % of Ref Standard Capacity
Loading Mode	Compression and Tension
Loading Direction	Ascending and Descending
Mechanical	
Loading Capacity	1000 kgf
Coarse Adjustment Increments	1.5 in.
Maximum Stroke	3.5 in.
Jack Turns to Raise 1 inch	100
Weight (w/o Standard)	17 kgf
Standard Mounting Thread	0.625”-18, UNF-3B
Dimensions	
Overall Dimensions (WxDxL)	12 x 5 x 26 in.
UUT Working Area (WxL)	9.25 x 10.5 in.

* Example: If the calibrating machine is equipped with a 500 kgf standard reference load cell with 2.0 mV/V rated output, the control capability of the machine would be ± 0.00002 mV/V.

Brinell Calibrator



General Features

- Instrument specifically designed for calibrating Brinell hardness testing machines
- Accurate design and quality manufacturing ensure high repeatability and stability over time
- Comes with a certificate of calibration to deadweight Primary Standards
- Supplied with an instrument case
- Low-profile version (4 in. high) available when an opening less than 6 inches is required

Technical Specifications

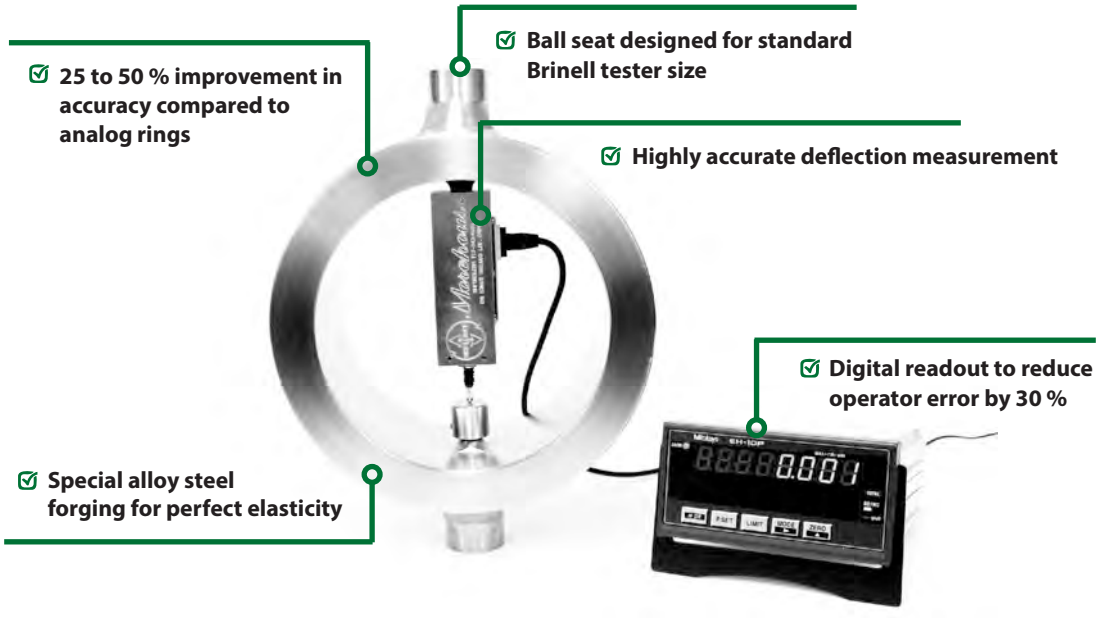
Specifications	Brinell Calibrator	
	Standard	Low Profile Version
Accuracy		
Accuracy	0.1 % of reading	0.1 % of reading
Deflection at Capacity	Approx. 0.06 in.	Approx. 0.06 in.
Divisions at Capacity	Approx. 600 division	Approx. 600 division
Sensitivity	1/10th division	1/10th division
Readability	1/10th division	1/10th division
Calibration Forces	500, 1000, 1500, 2000, 2500, and 3000 kgf	500, 1000, 1500, 2000, 2500, and 3000 kgf
Dimensions		
Diameter (Maximum Width)	5.25 in.	4 in.
Thickness	2 in.	2 in.
Total Height	5.785 in.	5.785 in.
Instrument Weight	2 kgf	2 kgf
Shipping Weight (Including case)	5 kgf	5 kgf

To calibrate a hardness tester, the Morehouse Brinell Calibrator is simply inserted into the tester in place of the usual metal specimen. The load is applied to the Brinell Calibrator and the resulting deflection is read on the indicator. The error of the hardness tester load is determined by dividing the deflection of the Brinell Calibrator under load into the difference between the actual deflection and what the deflection should be for the load being calibrated.

Example:

A. Load applied according to hardness tester reading.....3,000 kgf.
B. Deflection of the Brinell Calibrator under load.....575.8 div.
C. Deflection of Brinell Calibrator at 3,000 kgf should be (according to average on certificate).....610.5 div.
D. Difference between B and C.....34.7 div.
E. Error of Brinell Hardness Tester in applying load.....5.8 %.

Digital Proving Rings



General Features

- Conversion of Morehouse analog proving rings (Series 100, 200, and 1000) to digital system available
- Remarkable reliability, repeatability, and accuracy
- Digital counter display reduces operator error
- Highly accurate 0.1-micron resolution sensor for measuring ring deflection
- Ring manufactured from Special alloy steel forging for perfect elasticity
- Calibration conforming to ASTM E74, ISO 376, ISO/IEC 17025 and ISO 7500 protocol for universal testing machines and load cells

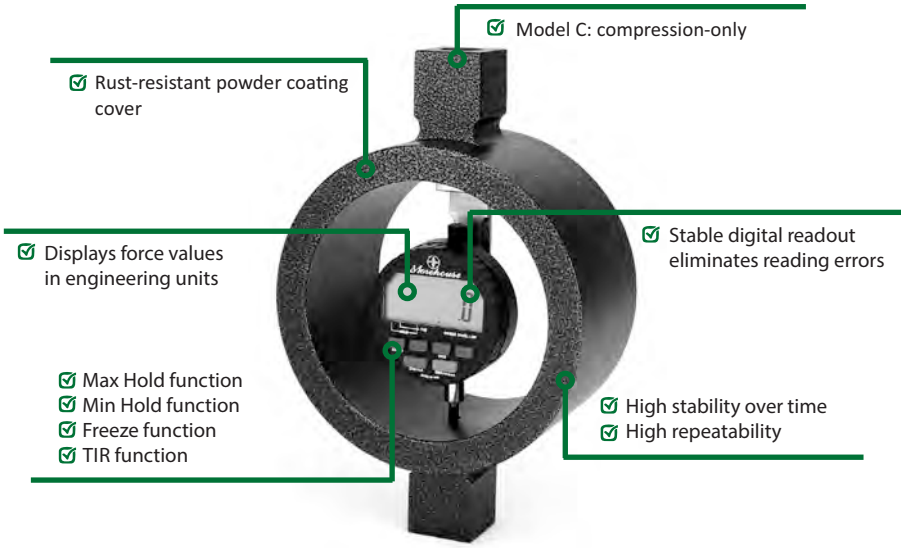
Technical Specifications

Specifications	Digital Deflection Transducer
	Model: 542-181
Accuracy	
Accuracy at 20°C	(0.8+L/50) µm (L=mm)
Resolution, mm	0.0001 mm
Measuring Range	10 mm
Measuring Force (Spindle Down)	< 1.2 N
Electrical	
Max Response Speed	400 mm/sec.
Output Signal	90° phase diff., differential square wave
Signal Pitch	0.5 µm
Connecting Cable Length	2 m (6 ft)
Connector	RM12BPE-6PH (Hirose)
Environmental	
Operating Temperature Range	0 to 40 °C (32 to 104 °F)
Operating Humidity	20 % to 80 % RH (no condensation)
Mechanical	
Contact Point	Φ 3 mm carbide
Stem Size	Φ 8 mm
Bearing Type	Linear ball bearing
Weight	310 g (11 oz)

Specifications	Digital Conversion of Proving Rings		
	Model: Series 100	Model: Series 200	Model: Series 1000
Accuracy			
Uncertainty, % Rdg.	±0.05	±0.025	±0.0125
Divisions at Capacity	10,000	20,000	40,000
Readability, Div.	1	1	1
Sensitivity, Div. (% F.S.)	1 (0.008)	1 (0.005)	1 (0.0025)
Capacities*, kgf	12,500 to 5,00,000	5,000 to 5,00,000	2500 to 2,50,000
Temperature Effect, % Rdg /°C	0.027	0.027	0.027

∗**Note:** Digital Proving rings could be made at lower capacities per customer's request.

Digital Force Gauge, Model C



Digital Upgrade Available for Morehouse Analog Ring Force Gauges

General Features

- Accuracy: 0.25 percent of capacity
- Displays force values directly in kgf unit with no need for an interpretation table
- Built-in functions such as: Max Hold, Min Hold, Freeze Hold, Auto-off, and TIR mode
- Rotational indicator bezel for easy reading in different orientations
- Capacity load deflection: approximately 0.03 in.
- Load button and base supplied with Model C, capacities 1250 kgf and under
- Sensitivity in linear inches: 0.00004
- 10-point calibration and adjustment to Primary deadweight standards available
- Supplied in a protective case
- Available accessories such as: Quick-Change Tension Members

Model C

Morehouse Digital Force Gauges are highly versatile force measuring instruments which can be utilized in a large variety of measurement applications. Unlike other load rings on the market, Morehouse Digital Force Gauges display the applied force on a digital screen directly in engineering units. They do not need to be accompanied by an interpretation table to make any conversions. By default, gauges are adjusted to display force in LBF unit; however, adjustment to other force units is also available per user's request.

Indicator Functions

Morehouse Digital Force Gauges are equipped with a high precision digital indicator to measure the deflection and convert readings to calibrated force values. The indicator features very useful functions which can help with some force measurement applications. These functions in Model C include:

- Max-Hold: holds and displays the highest force applied.
- Min-Hold: holds and displays the lowest force applied.
- Freeze-Hold: holds and displays the force displayed when HOLD button is pushed manually.
- Total Indicator Runout (TIR): ignores travel direction, instead measuring the difference between peak and valley (Max and Min) forces. In TIR mode, Max and Min force values are also recorded in memory and can be retrieved.
  Auto-off: turns off the indicator after 10 minutes of "no activity" (no key presses or spindle movement). This feature may be disabled if continuous operation is desired.

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 कैलिब्रेटर, करंट कैलिब्रेटर, वोल्टेज कैलिब्रेटर, प्रेशर कैलिब्रेटर, 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 बाद ही यान का प्रक्षेपण संभव हो पाता है।

वह 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 जाता है।
- चंडीगढ़ के रामगढ़ में टर्मिनल बैलेस्टिक रिसर्च लेबोरेट्री है। इसमें मिसाइल पर रिसर्च का काम किया जाता 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 भंडारा में डायरेक्टर जनरल ऑफ क्वालिटी एश्योरेंस लेबोरेट्री है। इसमें मिसाइल में लगने वाले कलपुर्जों के गुणवत्ता 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 प्रावधान है। स्वास्थ्य मंत्री अनिल विज ने पिछले दिनों कोलकाता के दौरे के बाद इस बात की पुष्टि भी की। साइंस म्यूजियम बनने के बाद अम्बाला के अलावा प्रदेश के लोगों के लिए भी साइंस से जुड़ी जानकारी ले सकेंगे।

Ambala firm gives technical support to Agni-V project

The Tribune

28 December 2016

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.

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

MARS ORBITER MISSION

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.

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

Ambala firm provides technical support for ISRO satellite launch

TRIBUNE NEWS SERVICE

AMBALA, JANUARY 12

Ambala firm Vaiseshika Electron Devices gave technical and engineering expertise in the successful launch of ISRO's 100th satellite PSLVC40, which was launched today.

The firm had installed and commissioned a 5 tonne capacity Digital Proving Ring with technical certification of American Accreditation Board for Testing and Calibration Laboratories at the Static Test Bed Facility at the Satish Dhawan Space Centre, Sriharikota.

The Digital Proving Ring tests and checks the accuracy of load cells used in testing thrust capacity of rocket motor of a PSLV rocket before its launch. Another Digital Proving Ring of 100 tonne capacity will be installed within this year.

Such testing ensures that the motor of the rocket has been correctly designed for a successful launch. Any error or inadequacy in the thrust capacity can lead to a crash.

Dr Anil Jain, President, Vaiseshika Electron Devices, told The Tribune, "The Digital Proving Ring was commissioned nearly three months ago. The firm has been designing, manufacturing, producing, installing and commissioning various temperature sensors, thermocouples, microstructure examination system and measurement software, sensor calibration standards and load cell calibration standards to the Satish Dhawan Space Centre, Sriharikota and Vikram Sarabhai Space Centre, Thiruvananthapuram, since 2010 in various satellite projects. Vaiseshika has earlier installed calibration standards for MARS Orbiter Mission also." "It was a proud moment for us as we have contributed in such a prestigious project. It is always a great feeling to do something for the country", he said.

The Tribune, 12 January 2018

Dead Weight Calibrator

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

General Features

Deadweight systems provide the most accurate force calibration standards available on the market. A Morehouse Deadweight Calibrating Machine includes a set of calibrated weights at different sizes. The user can choose any combination of desired weights through the control system, and apply the determined force to the instrument under test. Some models are capable of performing the calibration automatically by applying the listed test points, and recording the instrument output for several commonly used indicators on the market.

All Morehouse Deadweight Calibrating Machines make full use of the accuracy of deadweights, and are built using true primary standards. This means there are no multipliers (hydraulic or otherwise), levers, or flexures between the weights of the calibrator and the instrument to be calibrated. Weights are individually calibrated to primary force standards requirements, and calibration are directly traceable to NIST. Due to the high accuracy and importance of all the details in these systems, each Morehouse Deadweight Calibrating Machine is custom designed and manufactured for the specific needs and requirements of its user. Morehouse has manufactured numerous Deadweight Calibrating Machines at various capacities ranging from 125 kgf to 60,000 kgf, which are being used by the most reputable laboratories throughout the world. These machines have a proven record of high reliability and stability, and are designed and manufactured to last for decades.

Calibration Capability

These machines are capable of calibrating ISO 376 Class 00, ASTM E74 Class AA, AS 2193 Class AA, and other force measuring devices requiring the utmost accuracy. These include: load cells, proving rings, crane scales, force gauges, dynamometers, and several other force measuring devices. The weight of the yoke (the mechanism that transfers the force from deadweights to the instrument) is minimum amount of force that a Morehouse Deadweight Calibrating Machine can apply. The available force points between the minimum force and machine capacity depends on the number and size of the weights ordered by the user. Generally, higher number of weights provides user with more flexibility in terms of generating test points. For instance, a Deadweight Calibrating Machine with 5,000 kgf capacity can generate more weight combinations when built with 500 kgf weights than a machine with the same capacity and built with 1000 kgf weights.

APPROXIMATE DIMENSIONS FOR STANDARD CAPACITIES (kgf)					
	50	**500**	**1,000**	**2500**	**5,000**
HEIGHT (Inch)	70	82	92	150	150
BASE	18″x18″	22″x18″	24″ SQ	32″ SQ	37″ SQ
WEIGHT (kg)	350	1,050	1,700	3,850	7,000
	10,000	**15,000**	**25,000**	**50,000**	**60,000**
HEIGHT (Inch)	180	204	210	280	280
BASE	43″ SQ	57″ SQ	60″ SQ	110″ SQ	110″ SQ
WEIGHT (kg)	16,500	20,750	32,000	62,500	72,500

Vaiśeshika®

Spectrum of Vaiseshika Resistance Calibration Standards

Fixed Value Insulation Tester Calibration System

Micro-Milli Ohm Meter Calibrator

Portable Wheatstone Bridge

High Stability Decade Megohm Box-5kV/10kV

Standard Resistor

Decade Resistor Box

DC Shunt

High Voltage Probe

High Precision Decade Resistance Box

Spectrum of Vaiseshika Material Inspection & Testing Instruments

Inverted Metallurgical Microscope

Upright Metallurgical Microscope

Stereo Zoom Microscope

PCB Inspection Microscope

Leeb Hardness Tester

Universal Hardness Tester

Micro Vickers Hardness Tester

Sample Mounting Press

Fibre Optics Cold Light Illumination System

Magnascope

Quartz/LED Machine Lighting System

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

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