

TESA MICRO-HITE

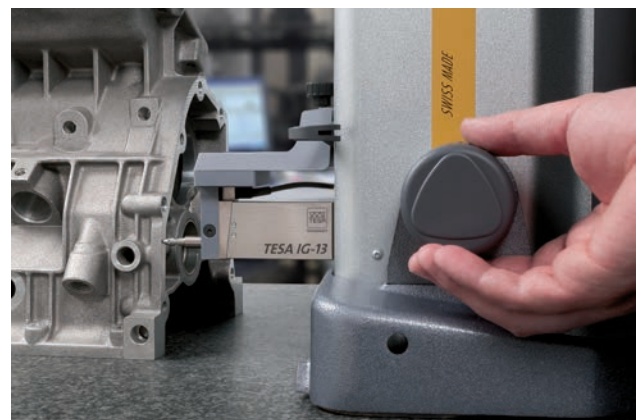
AN ALL-PURPOSE METROLOGY HEIGHT GAUGE



TESA's MICRO-HITE electronic vertical height gauge is widely used for measuring precision parts in workshops or gauge rooms. This battery-powered instrument eliminates the need for cables and glides on its own air cushion on a surface plate. It can measure internal, external, height, depth and step dimensions of geometric part features having either a flat, parallel or cylindrical surface.

With the Power Panel plus M, the MICRO-HITE can measure in single or two coordinate measurements as well as determine bore positions, both in polar and rectangular coordinates.

The MICRO-HITE comes with many accessories, including a TESA IG13 probe for measuring perpendicularity and straightness errors.



The latest generation MicroHite plus M versions, equipped with a rotary power control, combine the speed of a manual height gauge with the precision of a motorised one.

The MICRO-HITE is, thus, the most versatile and accurate height gauge in its class.

TURBO ENERGY LIMITED – PRECISION INSPECTION ON THE SHOPFLOOR



Established in 1982, Turbo Energy Limited (TEL) manufactures around a million turbo chargers for diesel engines in two plants, located in rural areas outside of Chennai. TEL's component manufacturing plant in Pulivalam consists of several workshops for manufacturing housings, compressor heads and other parts.

In a typical TEL workshop, up to 500 operators, working in 3 shifts, inspect their components on MICRO-HITEs. "The TEL corporate culture is oriented towards empowering machine operators to be responsible for the quality of their jobs", said Mr R. Bakthavatchalam, General Manager.

It all started when Mr N. Sridhar, Executive Director, Tespa Tools Private Limited, TESA's partner in India, took a MICRO-HITE 350 by train and on a bus in 1996 to the newly built TEL plant. This was the beginning of a partnership that has now resulted in over 70 TESA height gauges in operation in TEL and other units in the complex.

"Our operators learned on a step by step basis to use features such as the automatic capture of culmination points to measure bores and the IG13 probe for angular measurements," remarked Mr R. Balaji, Manager – SD, who selected the first MICRO-HITE.

Eighteen years have passed since the company purchased its first MICRO-HITE and now the company has standardised on the MICRO-HITE for its production units. "Our normal manufacturing cell has a turning centre, a machining centre and a MICRO-HITE for the inspection centre," says Mr Balaji.

Over the years TEL has developed fixtures that enable complex turbo charger parts such as housing or compressor head to be easily inspected on a MICRO-HITE.

"Most of our operators have learned to measure their components in two-coordinate mode, which is adequate for our purposes," said Mr Balaji. "We have done away with customised gauges since the MICRO-HITE's inspection capabilities can adapt to component design changes."

Mr Balaji cited the example of a turbo charger component where it took 25 minutes to measure 32 dimensions. The same job now takes only 10 minutes, using the MICRO-HITE Power Panel's programmable inspection feature.

If TEL have found the MICRO-HITE to be a cost-effective inspection solution then it is to their credit that they learned to use the height gauge to its fullest potential.

In short, TEL is an organisation where everybody from the top management down to the machine operator is aware of the MICRO-HITE's role in contributing to the quality of its products.



TURBO CHARGER HOUSING PLANT – INSPECTION ROUND THE CLOCK

“The turbo housing plant consists of ten manufacturing cells, each cell for one particular type of housing”, explained Mr. C. P. Nithyanandam, Deputy Manager – Quality Assurance, during our plant tour.



Depth measuring in machined housing mounted on a V-block

The MICRO-HITE has the same coefficient of expansion as steel and this allows TEL to use it in a rugged shop floor environment where temperatures can exceed 40°C in summer.

There are five MICRO-HITE inspection stations in this workshop. All are in constant use and sometimes there is a queue of operators waiting to inspect their parts.

Watching an operator inspect a machined housing with a practised movement, we asked him what he liked about the MICRO-HITE. “It is easy to measure bore positions in two coordinates,* he explained.



Bore measuring in machined housing mounted on a V-block

By using MICRO-HITEs in place of a three-coordinate measuring machines, TEL has been able to achieve substantial cost savings.

Moving to another MICRO-HITE, we saw an operator place his part on a V-block device before measuring a number of dimensions. “This instrument repeats very well,” he said.



Two-dimensional inspection of bore positions in machined housing



Bore measuring of machined housing

To ensure service, Tespa Tools Private Limited, TESA’s partner in India, have posted a resident service engineer at TEL with a commitment to provide service on a 24/7 basis and maintains an inventory of MICRO-HITE spares as well. “Our top priority is service since we must live up to the trust bestowed on us by Turbo Energy,” says Mr K. S. Shetty, managing director, Tespa Tools Pvt. Ltd.

CALIBRATION ROOM – ECONOMIC INSPECTION OF GAUGES

TEL mainly uses MICRO-HITE height gauges in its production shops but also has a unit in each of its Calibration Rooms for calibrating ring and plug gauges.

With a digital display selection (0.0005, 0.001, 0.01 and 0.1 mm) and a minimal length-based deviation error, the MICRO-HITE is accurate enough to calibrate a large number of special gauges used for manufacturing processes as well as ring and plug gauges.

Ms Jamuna, Supervisor, Calibration Room, demonstrated the measurement of a ring gauge mounted on a V-block. With a practised hand, she captured the culmination points of the bore to measure the diameter to a resolution of a micron.

TEL exports 35 million turbo charger components per year and the MICRO-HITE in the Calibration Room is also used to validate precision production components at 20°C for a second check. The MICRO-HITE has a built-in printer in its power panel to enable such measurements to be recorded. The instrument also has a RS232 data output in case measured values have to be transferred to a data base for batch traceability.

TESA is proud to be associated with TEL as its top supplier for electronic height gauges. It is a partnership that has been a win-win situation for all parties concerned.



Ring gauge measurement

We thank Turbo Charger Limited for their friendly support and for the authorization to publish this case study



Hexagon Manufacturing Intelligence helps industrial manufacturers develop the disruptive technologies of today and the life-changing products of tomorrow. As a leading metrology and manufacturing solution specialist, our expertise in sensing, thinking and acting – the collection, analysis and active use of measurement data – gives our customers the confidence to increase production speed and accelerate productivity while enhancing product quality.

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Established in 1941 and headquartered in Renens, Switzerland, TESA SA manufactures and markets precision measuring instruments that stand for quality, reliability and longevity.

For more than 75 years, TESA has distinguished itself in the market through its excellent products, its unique expertise in micromechanics and precision machining as well as its proven experience in dimensional metrology.

The TESA brand is the global market leader in the field of height gauges and a pioneer thanks to its wide range of instruments, including callipers, micrometers, dial gauges, lever-type dial test indicators and inductive probes.

TESA is a true benchmark for the inspection of incoming goods, as well as for production workshops and quality assurance laboratories.

Through its worldwide distribution network the company focuses on the mechanical engineering, micromechanical, automotive, aerospace, watchmaking and medical industries.

In 2001, TESA became part of Hexagon, a leading global provider of information technologies.

www.tesatechnology.com

About Turbo Energy Limited

Turbo Energy Limited (TEL) is part of the TVS Group of companies. Established in 1982, TEL is a joint venture between Brakes India Limited, Sundaram Finance Ltd and BorgWarner Turbo Systems Worldwide Headquarters GmbH.

TEL is India's leading manufacturer of turbo chargers, producing over a million turbo chargers every year as well as turbo charger components for export. Its plants are equipped with state of the art technology and skilled manpower to consistently deliver quality products. Emphasizing team work, trust and care among the employees, TEL always strives for higher standards of performance.

TEL has been able to achieve customer satisfaction by being able to provide products and services of high quality at globally competitive prices. It had a R&D centre for new product development.

In line with the corporate commitments of the TVS Group, TEL has a firm commitment towards its stakeholders, thereby ensuring sustained growth of the organisation. TEL also recognises that its vendors are partners in progress.

About Tespa Tools India Private Limited

Tespa Tools India Private Limited, a TESA partner, markets and services TESA Group products. Tespa also operates calibration laboratories located in key Indian cities.