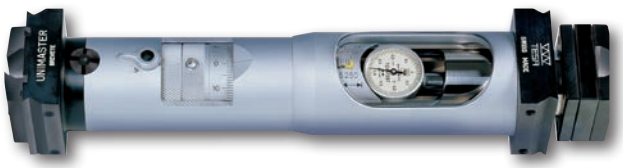
CASE STUDY

TESA UNIMASTER

SR Technics – Zurich – Switzerland

TESA UNIMASTER, the ideal instrument to measure large internal and external dimensions



Exclusive, portable and versatile: the TESA UNIMASTER universal measuring instrument enables large dimensions of heavy jet engine components to be measured in the maintenance environment.

Inaccurate dimensions can cause unforeseen problems and, as a result, quality assurance is a top priority, particularly in the aviation industry. The measurement methods used at SR Technics, which form an integral part of the repair process, have to meet high standards. The company relies on a wide range of testing tools and instruments. The TESA UNIMASTER plays a central role in measuring particularly large internal and external dimensions. SR Technics has eleven units of this universal measuring tool in long-term use.

SR Technics

HEXAGON METROLOGY

Highest precision for engine maintenance

SR Technics, headquartered in Zurich, is one of the largest independent providers of technical aircraft services in the world. It is a full-service provider of MRO for aircraft, component, and engine services. The company's Engine Services division specializes in maintaining and repairing CFM56 and PW4000 jet engines manufactured by CFM International and Pratt & Whitney. The demanding maintenance, repair and overhaul tasks must be carried out in accordance with the manufacturers' stringent specifications and require the highest levels of precision.

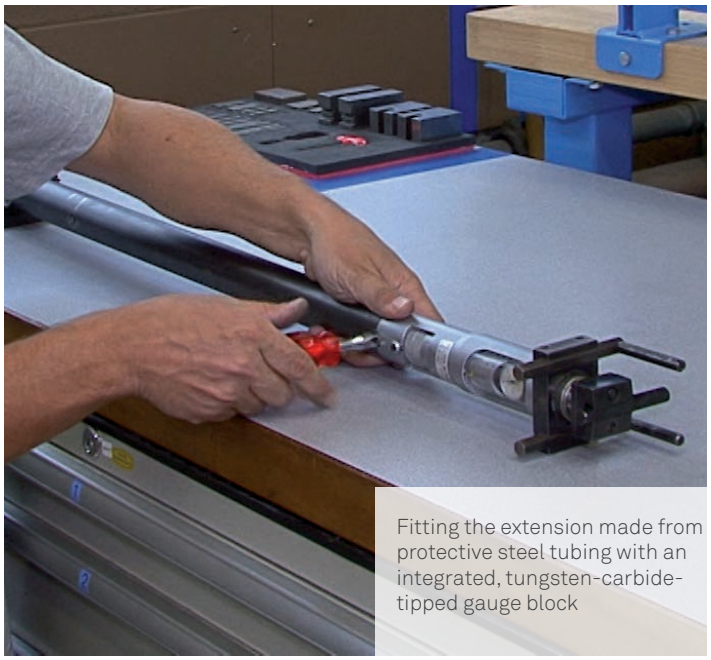
Absolute precision is equally important during the inspection of the components' dimensions after the work has been completed. "Our employees have a high level of responsibility particularly with regard to the extremely expensive engine components," says Daniel Povse, capability implementer in the CoE Cases & Frames department. "So it is vital that our maintenance specialists can rely totally on the measurement tools they are using. Every specialist is responsible for ensuring that the measurement devices are correctly calibrated."

The company, which is ISO 9110:2010 certified, has made use of the entire range of TESA handheld measuring instruments, both standard and customized models, in its repair departments for many years. A measuring tool for large dimensions, which is the only one of its kind for this type of application, has been particularly valuable to the aircraft maintenance company. The handheld TESA UNIMASTER, which has been commercialised for 55 years and carries the SWISS MADE label, combines high precision and mobility.

This combination is hugely valuable when it comes to measuring heavy engine components, such as combustion chambers, diffuser cases or low-pressure turbine cases. The TESA UNIMASTER comes into its own when calipers are not sufficiently accurate and the transport of the work piece towards a 3D-coordinate measuring machine is too complex for logistical reasons.

Internal measurement of a low-pressure turbine case,
SR Technics, Engine Services, CoE Cases & Frames department.

Before the measurement is made, the robust measuring device is adapted to the size of the component using a range of extensions. The extensions are made of steel, have quick connectors, are fitted using a special screwdriver and enable the device to measure dimensions ranging from 250 to 2500 mm. At SR Technics, the TESA UNIMASTER is zeroed and configured on a measuring bench in order to transfer the reference measurement to the instrument



Fitting the extension made from protective steel tubing with an integrated, tungsten-carbide-tipped gauge block

Transferring the reference measurement from the measuring bench to the UNIMASTER

After this the employee can take the calibrated measuring instrument directly to the component and make absolute measurements or faster comparative measurements in the chuck of the mill or lathe. As part of the maintenance process at SR Technics, the engine components are chrome- or nickel-plated or plasma-coated to repair any damage. In order to ensure that the diameter after the maintenance work remains the same as the original measurement, the component is inspected by means of the TESA UNIMASTER. Using the two-point measurement method, measurement errors can be effectively kept to a minimum.

A two-point measurement method

The instrument has one fixed anvil and one which can be moved lengthways. The measuring movements of the ball-bearing-mounted anvil are transmitted to an integral dial indicator which allows the measurements to be taken with a nearly constant force. The advantage of the device is that it is largely independent of the feel of the person carrying out the inspection, which increases the reliability of the results. In addition, the direction of the measuring force applied by the mobile anvil can be reversed, which allows the TESA UNIMASTER to be used for measuring both internal and external dimensions. This is another feature which makes the instrument particularly useful for SR Technics.

Internal measurement of a diffuser case in a lathe chuck

The UNIMASTER principle

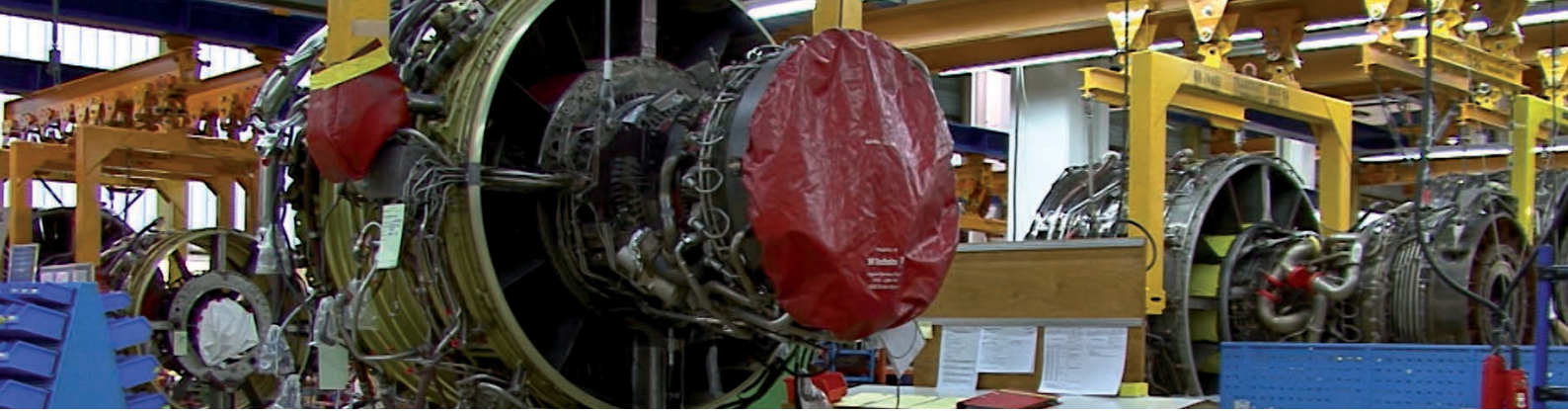
The TESA UNIMASTER is designed on the principle of an internal micrometer with two-point contact. The display setting of the instrument can be made via the setting gauge that is part of the delivery content. The tool is ideal for a wide variety of measurements, including diameters, bore sizes etc. The instrument can be converted from internal to external measurements using the adjuster screw on the mobile anvil. The reversal point is displayed on the integral shockproof lever-type indicator. The user-friendly device meets the high standards of SR Technics as a result of its consistent measurements, stiffness, heat-resistance and reliable display

A universal measuring instrument which is also suitable for smaller dimensions. External measurement of a compressor rotor spool.

SR Technics is impressed by the versatility, flexibility, stability and low maintenance requirements of the TESA UNIMASTER. The specialists agree that the portable measuring tool always allows them to meet the necessary tolerances quickly and precisely. It is easy to use and, therefore, produces reliable results in the case of measurements taken both horizontally and vertically.

The long service life of the instrument indicates how robust it is. “We have been using one of our eleven UNIMASTER devices for more than 40 years,” explains Andreas Schlagenhauf, the calibration specialist for dimensional measurements who is also responsible for purchasing measuring equipment. “This confirms our view that TESA handheld measuring devices offer high levels of quality, excellent results and reliability.”

We would like to thank SR Technics for their friendly support and for the authorization to publish this case study.



About the Mubadala Aerospace MRO network

A solid MRO network is one of the main facets of the aerospace industry that Mubadala Aerospace aims to build. In line with its greater vision to contribute to the aerospace sector for Abu Dhabi, Mubadala Aerospace is creating a network of companies which include a full spectrum of aerospace products and services.
Abu Dhabi Aircraft Technologies (ADAT) is the Middle East's leading independent aviation technical solutions provider, and offers a comprehensive set of airframe, engine and component maintenance, repair and overhaul (MRO) capabilities.
Zurich-based SR Technics is one of the largest independent providers of technical aircraft services in the world. It is a full-service provider of MRO for aircraft, component, and engine services. This is coupled with extensive engineering know-how, broad technical training offerings, and VIP completion services.
www.srtechnics.com

About TESA

Established in 1941, TESA SA manufactures and markets today more than 5,000 dimensional metrology products, ranging from high-precision hand-held tools to sophisticated measuring systems. CMM products and vision systems for non-contact measurement are now also included. Most of them are produced under the SWISS MADE Label.

A worldwide direct sales and distribution network is one of the major assets of the Swiss company whose primary markets are the automotive, aerospace, watch-making, medical and metal processing.
www.tesabs.ch

About Hexagon

Hexagon Metrology offers a comprehensive range of products and services for all industrial metrology applications in sectors such as automotive, aerospace, energy and medical. By empowering our customers to fully control their manufacturing processes, we enhance the quality of products and increase efficiency in manufacturing plants around the world. For more information, visit www.hexagonmetrology.com.

Hexagon Metrology is part of Hexagon (Nordic exchange: HEXA B; www.hexagon.com). Hexagon is a leading global provider of design, measurement and visualisation technologies that enable customers to design, measure and position objects, and process and present data.

All modification rights reserved – 1112.015.1303