

### Quality control in aircraft building/ MRO

#### Checking repair- and overhaul-parts

Exhaustive control checks and maintenance of sensitive aircraft parts must be carried out regularly. Certain parts on which strong demands are made, such as for instance landing gear, are given to special repair companies. As those companies often do not have the original drawings of the components available dimensional checking in the range of quality control is often very extensive. They have to work acc. to basic data supplied by the manufacturers. Especially position and diameter of bushes fall into that category. Often it is not known in which alignment the part was measured. However when it is a matter of highest accuracy, the alignment of a part and the support points must be taken into account for dimensional measurement. As these details are often not available, checking of complex parts proves to be problematical. Especially with heavy parts, which are often the case in the aircraft industry, part fixturing has considerable influence on the measuring results. In order to achieve comparability of results, measuring must always take place with the part in the same situation e.g. in installation position, horizontally or vertically.

After successful measuring the data results are sent to the part manufacturer for comparison purposes. If deviations are established, measuring with different alignment must be done again. Problems then ensue when dedicated measuring fixtures cannot be adapted and therefore are no longer of any use for changed support situations.

Additionally it is mostly small quantities which have to be checked, whereby the manufacture of a new dedicated fixture is often not cost-effective, especially if they have to be made two or three times. In such cases the use of modular fixturing systems is called for, whereby individual and highly accurate measuring fixtures are built on the spot.

The user remains independent of fixture builders, which can lead to considerable savings.

Modular systems such as Alufix stand out through the high precision and reusability of almost all components. It allows adaptation of finished fixtures catering for changed measuring requirements at the customer's plant. When the fixture is no longer required it is completely disassembled and all components are free to build a new fixture. Investment in a modular fixturing system pays for itself after only a few applications.

As parts in the aircraft industry to be checked are often large and require corresponding coordinate measuring machines, many repair companies in Singapore work together with measuring laboratories. In order to achieve a comparison of results appropriate measuring fixtures have to be supplied with the part or put at the lab's disposal.

Witte Far East, one of the companies with aerospace certification based in Singapore, provides individual measuring fixtures for each part to be measured. "That is the only way we can guarantee reliable results with high repeatable accuracy," Stefan Roeding explained, Managing Director of Witte Far East. Even for large parts up to 6m modular fixtures are built at short notice, whereby all special support requirements are taken into account.

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## About Alufix

### Repeatable workpiece supports for measuring and manufacturing technology

Alufix is a modular fixturing system made out of high-tensile aluminium for measuring fixtures, checking gauges, assembly or welding fixtures, cubing, gauges, meisterbocks, blue bucks, data control models. It is indispensable in design, R+D and prototyping areas where a lot of changes during development of a product take place. This modular system for holding workpieces is available in six sizes. The different system sizes can be combined with each other.

After their useful life fixtures can be disassembled and the single components can be used for new fixtures.

### Advantages of Alufix

- high accuracy of all components
- very lightweight but very stable
- system sizes can be combined
- no weight or size limits on workpieces
- all fixtures are repeatable
- components are reuseable
- low storage space required when not in use
- parts library in CAD
- design software
- corrosion free
- longlasting and maintenance free

### About Witte Far East

Witte Far East Pte Ltd, a multi-national company founded in April 2001, has established its presence in Asia Pacific as well as Middle East countries. Well known for fixturing in aluminium and vacuum clamping technology, its extensive capabilities also includes Metrology services for parts up to 7000mm as well as subcontracting services.

With efficient operation that render projects from concept to completion, consistent and stringent framework with a high emphasis on quality standards also awards us with the **ISO/IEC 17025:2005 Singlas Certification** from Spring Singapore, **ISO 9001:2000** and **ISO 9100:2003 Aerospace certifications** from TÜV Rheinland, Germany.

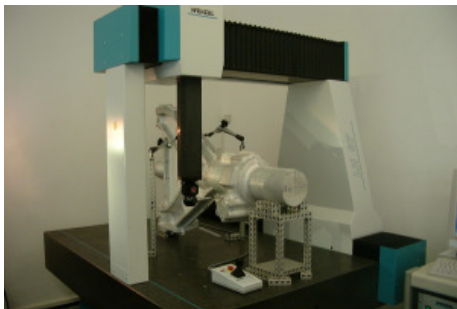
Witte Far East offers its products and solutions mainly in China, Japan, Australia, India, Malaysia, Taiwan, Korea, Pakistan, Thailand, New Zealand, Philippines, Iran and Dubai. Witte Far East has grown to become one of the top international suppliers of workholding products and services primarily to Automotive, Heavy Equipment and Aerospace industries.

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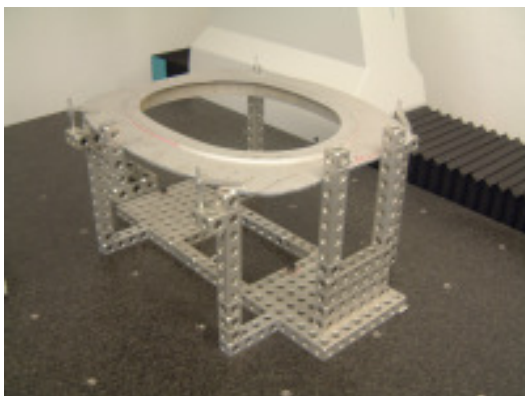
### Photos:



**Photo 1:** Turboshaft mounted on standard Alufix 25 components for CMM measuring

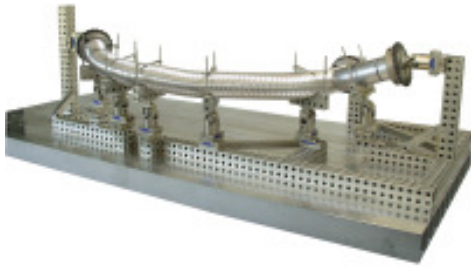


**Photo 2:** Main fitting. Aircraft landing gear fixed on Alufix Classic components

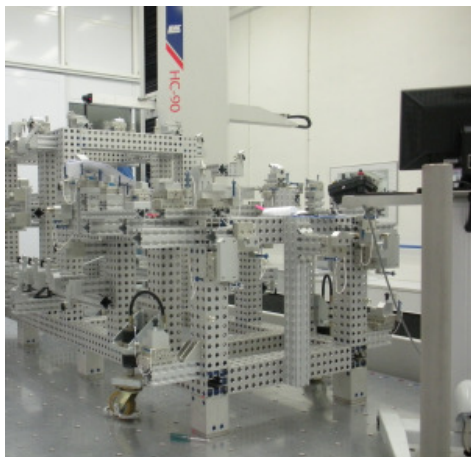


**Photo 3:** Window of Airbus A-380 according to predefined CAD data. Mounted on Alufix 25 standard components, no special machining required

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**Photo 4:** Assembly checking fixture for Aircraft parts made modulare, reusable Alufix components.. The tube ends are fixed by 3-jaw-chucks.



**Photo 5:** Measuring room at Witte Far East, Singapore with Alufix fixture. Parts up to 6 meter length can be measured.