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How to build an accurate measuring fixture in the minimum of time

Industrial requirements have changed. Nowadays measuring fixtures are needed faster and faster. At the same time quality and precision requirements are growing, the budgets in many companies have been cut.

The solution to this situation is a reusable, modular workholding system made of highly accurate components.

The advantages of modular measuring fixtures are

- Possibility to build a fixture on the spot saves a lot of time. Small fixtures are ready within an hour.
- Fixtures are modified with simple changes. There is no loss of time in case of design-modifications of the workpiece. Fixtures are adapted to new requirements immediately.
- While traditional, dedicated fixtures can only be used for corresponding workpieces are sometimes initially low-cost, in comparison with modular-based fixtures they are more expensive in the long run. A modular system pays for itself from the second application onwards.
- A high quality modular system guarantees very accurate measuring fixtures
- One set of modular components can be used for many different workpieces. It provides numerous fixturing possibilities.
- Modular systems need less storage space. While no fixture is in use, all dismantled components can be stored with minor space requirements.

Modular fixturing is not a new concept. It's been on the market for more than 20 years but due to the changing needs in metrology it's more important than ever right now.

The Alufix fixturing system from Witte consists of numerous highly accurate components, which can all be assembled together. Apart from the high accuracy of the parts, milled out of solid material, the long life of the individual components is a further advantage. The Alufix components are very hard-wearing. Some users have been working for many years with the same components. They are absolutely wear resistant. Nevertheless, in order to adapt to changing requirements, new elements are constantly being developed. The basic principle remains consistent, so that new elements are compatible to all existing ones. Once an investment in basic equipment has taken place, a customer never needs to worry about future fixture costs. Because on the one hand the flexibility of Alufix allows us to build all kinds of fixtures very quickly, and on the other hand Alufix parts are so strong and hardwearing that costs for replacements can be excluded from the beginning.

Modular fixturing systems are available as a complete fixture, basic set or as individual components.

Witte America, 120 E. Market Street, Suite 455, Indianapolis, IN 46024;
Email: info@witteamerica.com; www.witteamerica.com,
Tel.: 317.822.7003, Fax: 317.822.7009

Press: Maren Roeding, Email: mroeding@witteamerica.com

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This system is not only used for sheet metal parts but also for very fragile products like plastic components, which need special handling. The material is soft and fragile; the parts are often unstable and this leads to the main problem of distortion. That means in order to get correct part data the workpieces cannot be clamped but only supported. No pressure may be exerted on the workpiece, otherwise it will temporarily deform and lead to false measuring results.

Basics Modular Fixturing

Modular fixturing systems consists of characteristically basic items:

This may be a base plate, grid base plate or frame made of bars. Additional vertical or horizontal bars are mounted as supports for workpiece contact points.

Positioning on base columns/supports is limited to grid position. To move off grid some kind of adjustment element is required. Modular systems are offering a large range of elements, which allow movement off-grid, from simple components like 1D bar to sophisticated cross slides or 3D adjustment blocks.

These elements represent the interface between part and fixture and range from standard items such as ball points to contour blocks which are designed and manufactured acc. to customer data.

In order to stop a part moving out of position, i.e. if fixture is moved or knocked, some form of clamp is necessary. Hold-down springs used together with column and holder has proven unbeatable for this job. For heavier, larger parts toggle clamps may be used.

To connect the basic elements there are different kinds of connection items available.

Photos:

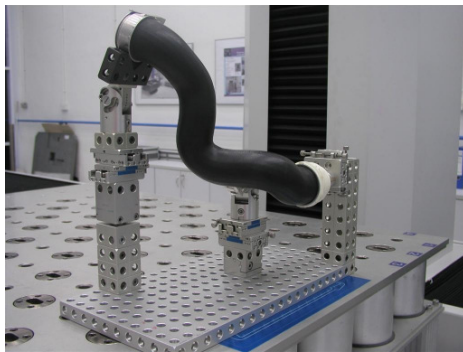


Photo 1: Pipe fixture

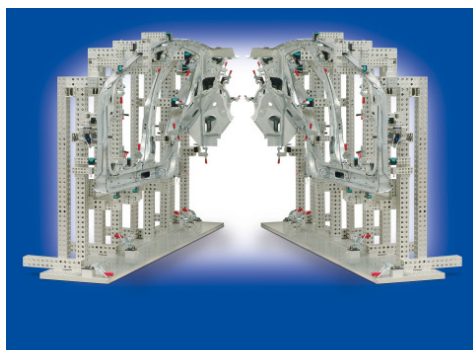


Photo 2: Sidepanel