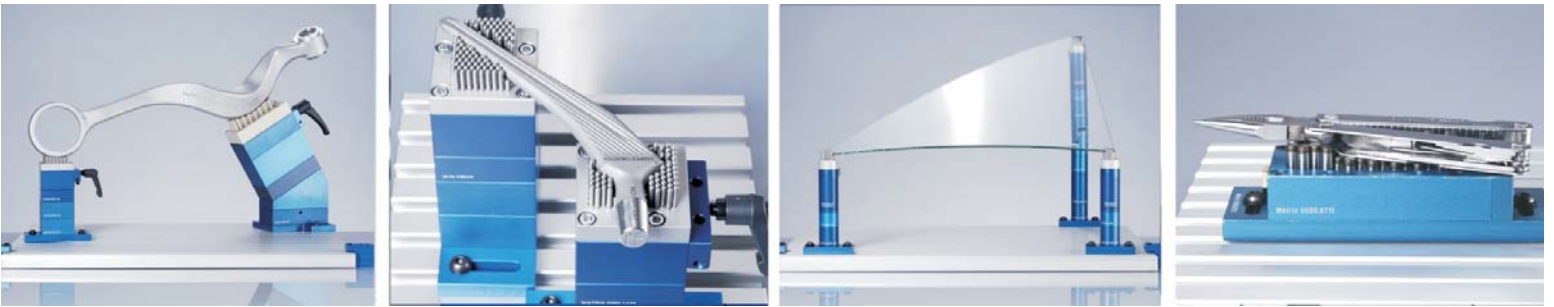


## Gently Embedded Form Adaptive Support Technique

The geometric dimensions of a work piece often need to be examined as quickly as possible. In order to achieve quick, accurate results, the work piece must be held in a very specific manner. This is often the case when measuring, prototyping, or initially designing parts. There is no one device that can accommodate all of these applications, due to every part's unique shape. However, when the device is able to form to the work piece itself, the frequent changing of work pieces or applications is realized in a shorter amount of time.

Work piece fixtures are often conceptualized and then custom made to fit individual part requirements. The expenditure for these fixtures increases as the size and measurement complexity of the work piece itself does. The quicker the work piece is measured, the quicker the measurement results are produced, and the quicker the work piece can be production efficiency.



## MATRIX Systems:

Until now, many custom devices were manufactured to hold specific parts during the measurement and design process. A new support system has just been put into place at DaimlerChrysler AG in Sindelfingen. This new system, X-Support from MATRIX GmbH, Esslingen, contains a flexible form-fitting element. Each module is made out of an array of spring-loaded pins that can be locked into place once the form of the object has been imprinted upon them. The holding force is so light that delicate work pieces, for example thin sheet metal, will not be deformed. By locking the pins into place, the imprinted contour of the work piece remains on the fixture, and the work piece can be repeatedly placed back upon its original impression on the pins. Often times when constructing a custom holding device, it is necessary that the holding device repeatedly contact specific points on each work piece. This is easily made possible with the pin matrix solution. After the fixture is no longer needed, the pins can be released, and they matrices to be built up in order to accommodate any part. The accessibility of this system to measurement devices allows for quick, problem-specific measurements. It is useful for unplanned measurements during production, or spot-checking.

## Applications:

In the automobile industry, MATRIX systems are used for the measurement of many free-form work pieces. Applications can range all the way from working on raw parts to the completion of body work. A few specific applications in the measurement, initial design, and prototyping of car doors, demonstrate the many advantages that MATRIX systems offer. Until now, each door (left, right, front and rear) required a different support fixture in order to be optimally held. However, with the MATRIX system flexible pin design, all of these different form variations can be optimally held using only one support system.

The foundation shown to the right consists of aluminum profile frames, which any MATRIX system can be mounted to. The MATRIX pin modules can be easily moved along the aluminium profiles and reset in order to best fit any part. Within minutes the system is ready to support a different door type. This makes it unnecessary to purchase dedicated fixtures for each door.

Often times, it is very expensive to support a complex work piece in order to retrieve accurate measurement results. MATRIX systems offer an economical solution to the traditional problems of support technique.

