

A single partner to manage the implementation of control processes.



Win-win synergy between companies far apart in the world but with one mutual goal: the quality

A technical and commercial joint venture for Meisterbocks and checking fixtures in the field of the car manufacturers and automotive subcontracting.

who we are



who we are

ALUKEEP is a German company situated in Munich, with the Headquarter located in the north-east of Italy, in Verona, a territory in Veneto region with a high concentration of precision mechanics production.

For 15 years ALUKEEP has been producing a patented modular fixturing system for measurement equipments and regularly exported in 25 countries in the world through distributors operating in the metrology market.

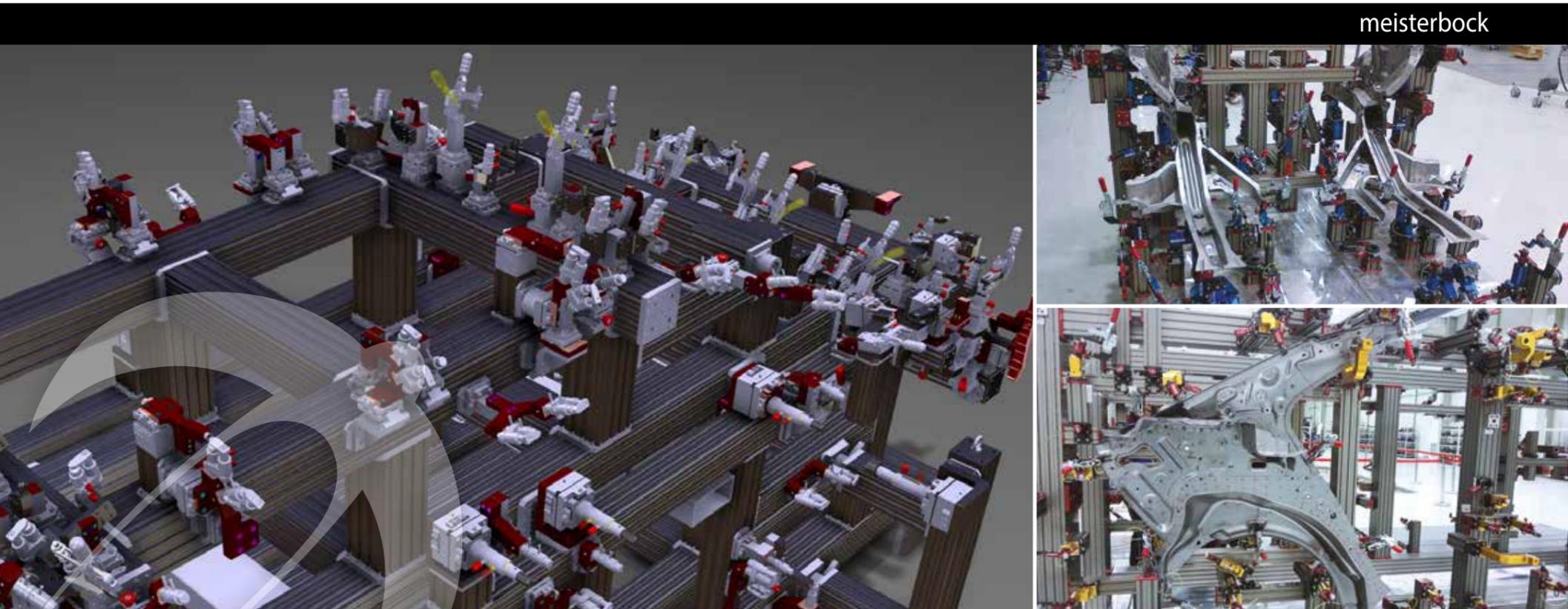
The automotive field, especially car manufacturers and their suppliers are the main users of our product.

ALUKEEP modular fixturing system has been appreciated for its quality, competitive price, easy use and flexibility.

Inspired by our worldwide agents, who operate close to the final customers in various fields, we tried to develop the field of utilization of our system adding components to our range, day after day.

We technically developed our product bringing the system to level requested by car manufacturers for its use in the high-tech checking systems such as Meisterbock Fixture and Checking Fixtures for sheet metal and/or plastic components.

All the patented components are subjected to strict quality and repeability checks to guarantee the highest level of reliability, stability and recyclability.



A Meisterbock is a theoretical and accurate reproduction of vehicle assembly process, free from welding breakings, deformations and other typical events that may occur in a real context. In the former phase, meisterbock was used by car manufacturers to analyze the equipment for production cycle calibration such as welding line.

Afterwards Meisterbock's goal became monitoring the geometry conditions of assembly processes during all its lifetime. Meisterbock is designed and built in order to assure the assembly of production components subjected to dimensional check, both as sheet metal and sub-groups.

Our constructive philosophy aims to use modular material from our own production, from our own design and manufacturing, with first level features.

Usually, Meisterbock is built from an assembled structure with modular bars in order to assure the maximum stiffness. In our case, we have a high stiffness modular bar, completely CNC machined for its 6 sides, with highlighted mechanical and geometrical features.

The structure can be used on sandwich plates or bars structure depending on the movement requirement. The production cycle is simulated through a fastening system, adjustable inserts, various elements and centering pins integrated to the base, which can repeat exactly equipment conditions, assuring the absence of torsion / deformation of the component to be measured.

For simplicity and clearness means, car manufacturers usually associate the following abbreviations to meisterbock project in order to identify the main supply components:

FMB - Fugemeisterbock: complete structure for parts and sub-groups of Chassis-Underbody.

AMB - AussenMeisterbock: complete structure for external parts of complete Body in white, Closures, Bumpers and Lights.

SMB - SideMeisterbock: complete structure for parts and sub-groups of the external Side Panel LH-RH, which can be integrated with an inner side panel.

FRMB - Front-rail Meisterbock: complete structure for parts and sub-groups of Front Rail LH-RH.

GMB - General Assembly Meisterbock: complete structure for vehicle roof parts and configuration for final assembly.

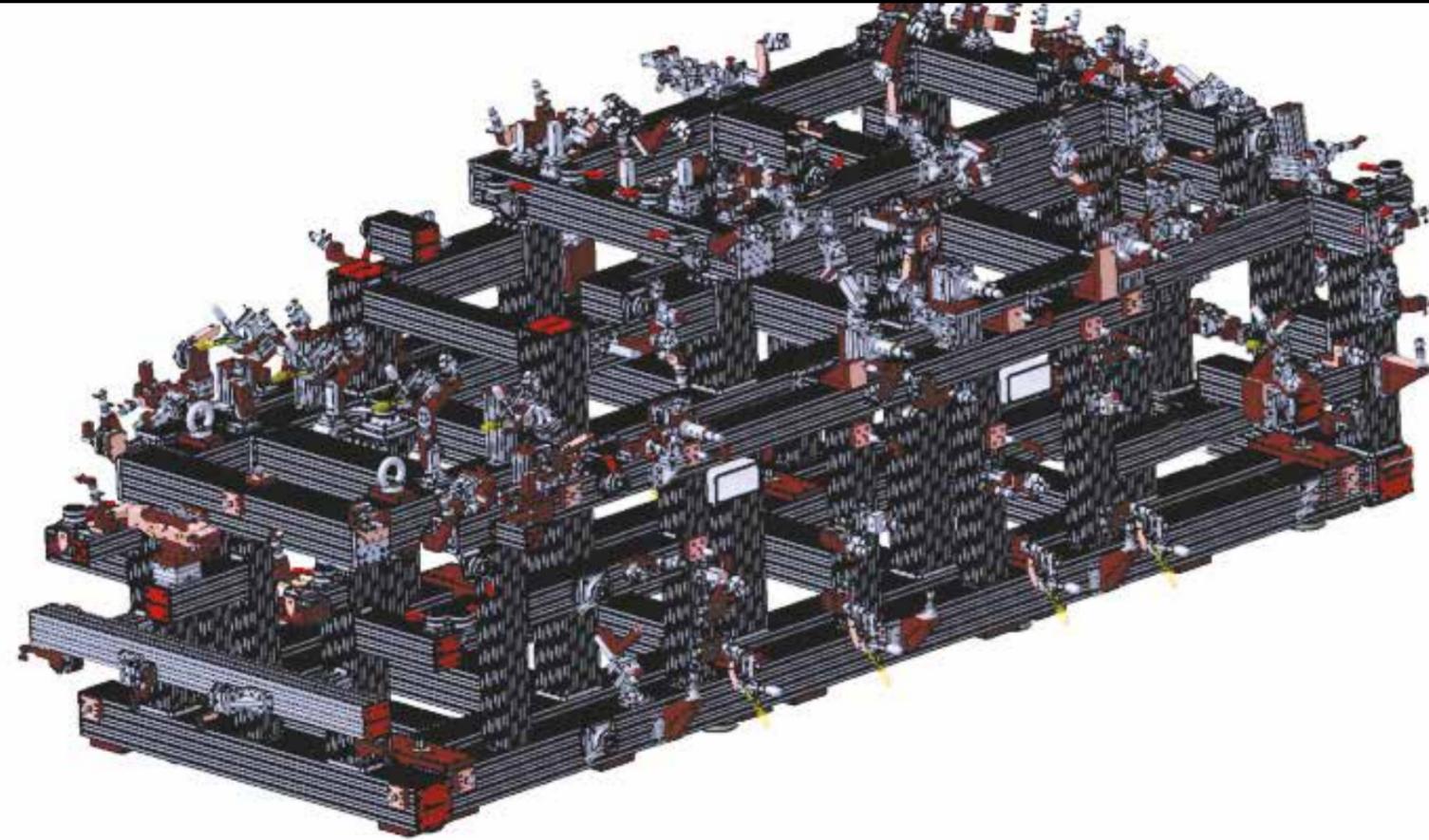
CLOSURES: complete structure for parts and sub-groups of the doors, hood, fender, liftgate.

For automotive subcontracting of sheet metal components, we can supply specific projects which can theoretically represent a "mini-meisterbock" for a reduced reference points RPS linked on single or assembled component.

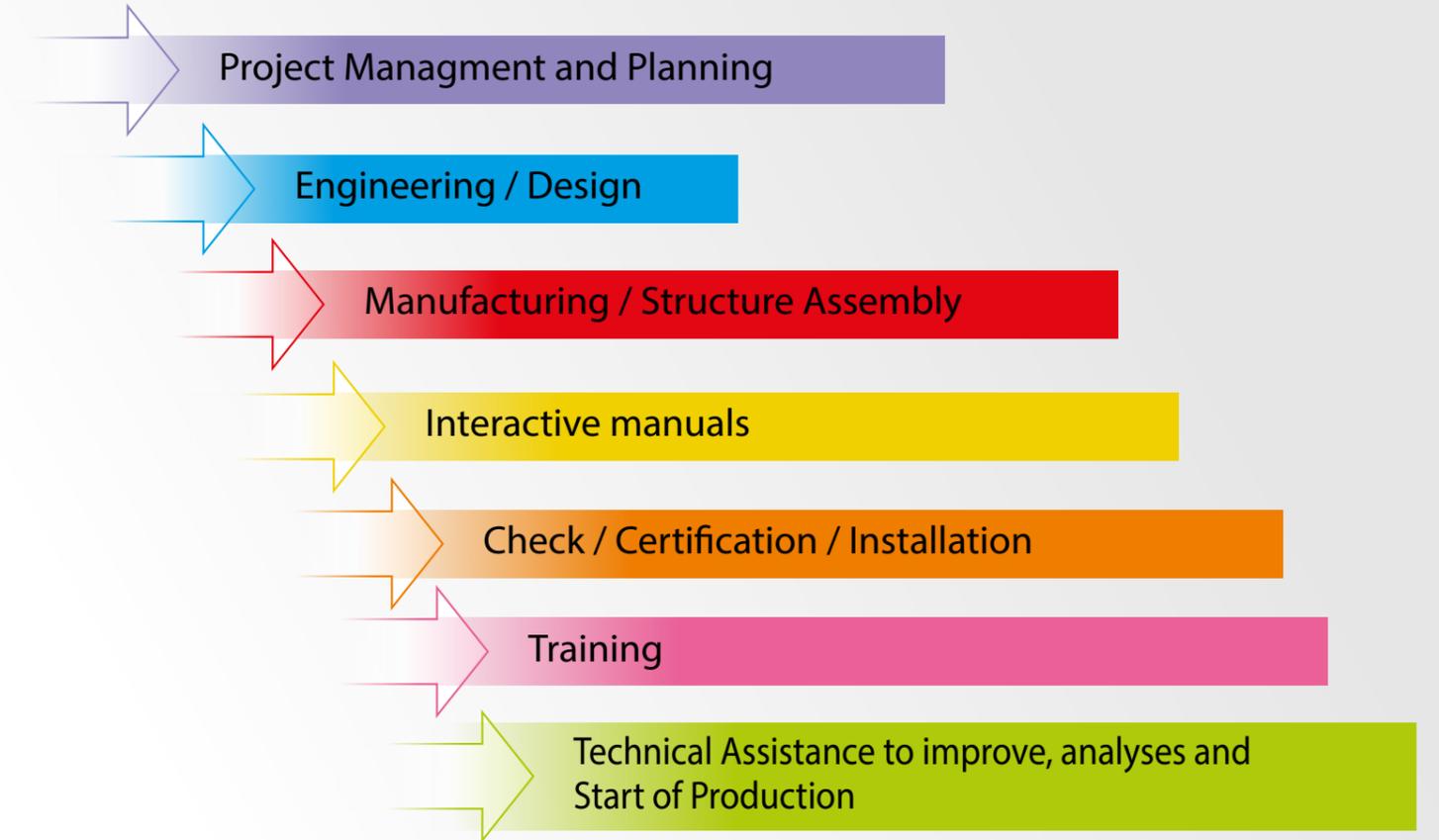
This type of "mini-meisterbock" projects are industrialized with the same components as entire meisterbock projects.

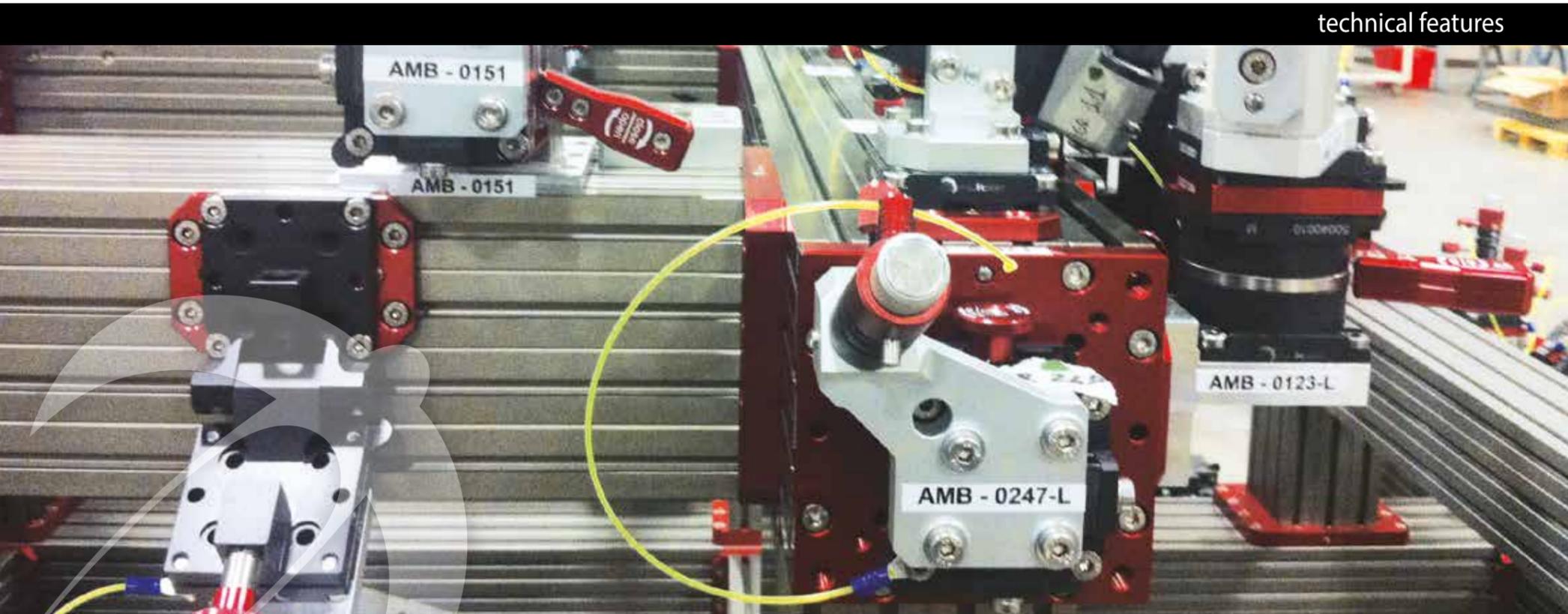
meisterbock

meisterbock projects



milestone chain





technical features

When to use it:

our target is to realise a light structure from simplified engineering in order to guarantee simple management of the Meisterbock in the development and improvement process of a production line, using first level hardware-materials to assure the complete technical features requested by the customer.

Meisterbock concerns the following activities:

- Product technical development
- Sample quality control and reference to requested tolerances
- Standard quality warranty (problem analysis)
- Check of the standard production parts (internal and external of the vehicle)
- Surfaces check
- Tolerances analysis (Gap and Flush Analysis)
- Management checks
- Check reports and activities analysis
- Check the best fit from all the closures

Difference between Cubing (Master) and Meisterbock:

Meisterbock doesn't foresee surfaces or reference components but reference points, defined as RPS.

The structure-gauge of Meisterbock is designed and built with the scope to simulate production assembly process.

Meisterbock is positioned on the pilot-system in the first phase, at the moment of the approval for pre-series production.

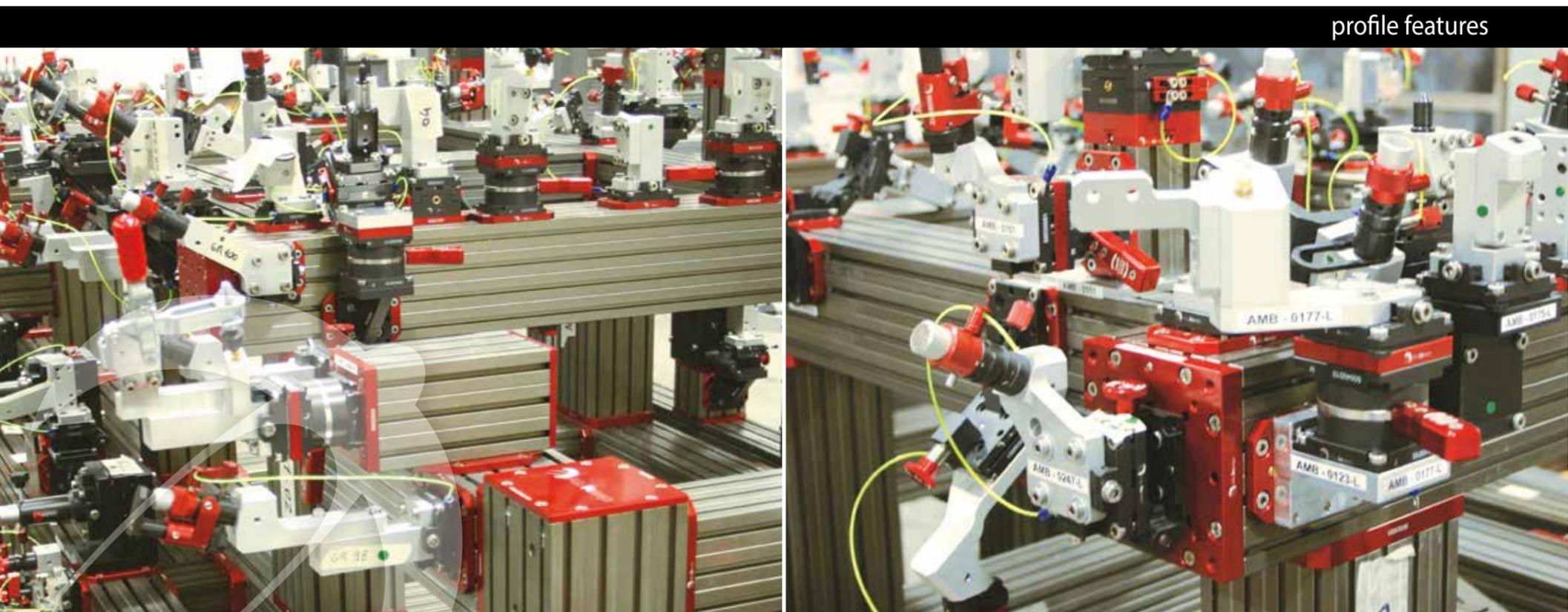
For the customer, Meisterbock is used to solve design, process and quality critical situations referred to metal sheet part or sub-groups and chassis of a new vehicle.

Meisterbock is usually delivered 8-10 months before the SOP in order to check the mounting of pre-series metal sheet components (P-0 phase).

Cubing is installed at the customer's plant 6-8 months before the SOP for process check (phase P-1). Reference points are defined in the project and don't change for the whole life of the vehicle.

All assembly process of the metal sheets are driven by the above-mentioned reference points.

technical features



profile features

**Composition:**

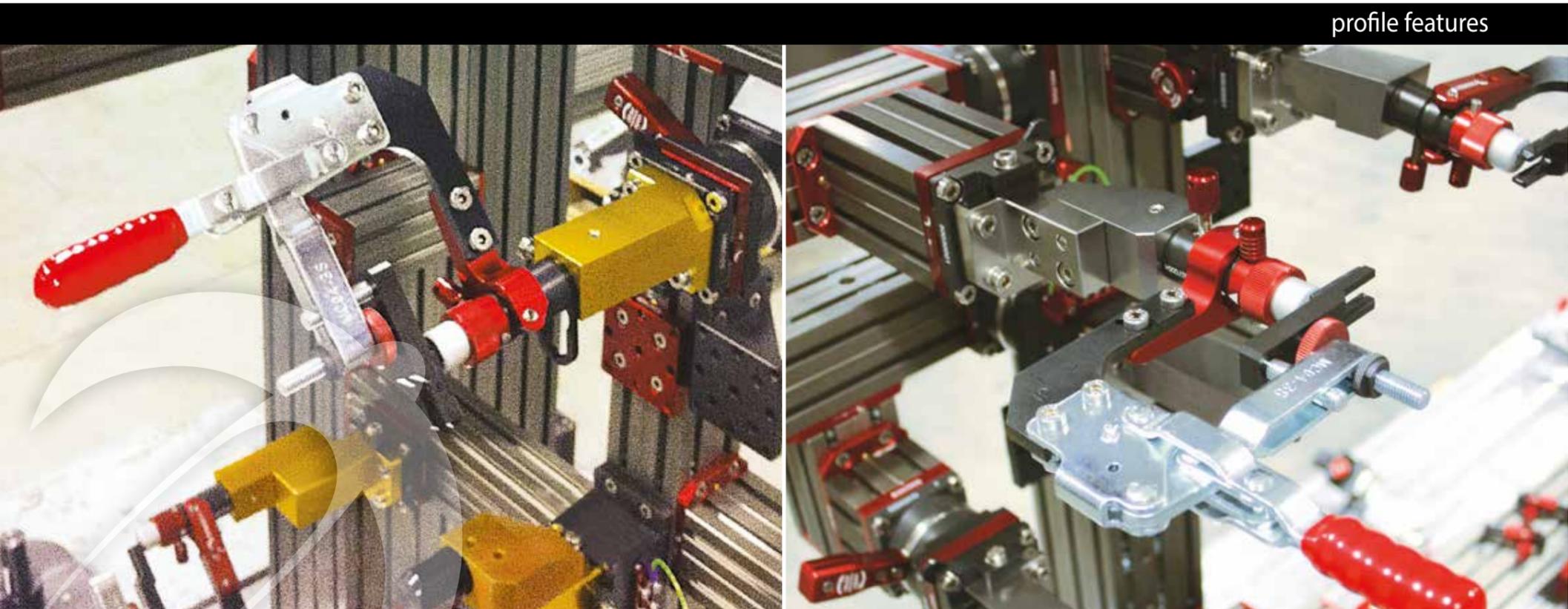
As mentioned in the introduction, Meisterbock frame is composed by a tubular structure of aluminium profiles. The extruded profile section is of our engineering and production with the above average strength and stability results. Engineering reference points (centering or clamping) are made of our production and standard components. The entire structure is composed by aluminium profiles with technical features listed here below, but we can anticipate how during advances research phases a technological development step carbon fibre for some components / structures can further improve its already excellent technical features.

Thanks to Anhui Shangzhan Mold Industrial experience of Cubing activity, all the fastening parts which are not manufactured in aluminium as for example screws and bushes, are supplied with long duration anticorrosion material (Aisi 304).

**Technical features:**

- Tolerance position of reference ball:  $\pm 0.05$  mm
- Tolerance Centering Pin Reference Points RPS:  $\pm 0.05$  mm
- Tolerance contact Surfaces Meisterbock Screws Reference Points PRS:  $\pm 0.05$  mm
- Profile Structure Parallelism & Perpendicularity / Length :  $\pm 0.05$  mm / 500 mm
- Overall Structure Tolerance:  $\pm 0.15$  mm
- Assembly Repeatability:  $\pm 0.1$  mm
- Dimensions and Tolerances of Centering Pin Reference Points RPS:  
Diameter:  $\varnothing -0.05$  mm /  $-0.014$  mm, concentricity:  $\pm 0.1$  mm
- Dimensions and Tolerances of Centering Holes Reference Points RPS:  
Diameter:  $\varnothing 0/+0.015$ mm, concentricity:  $\pm 0.1$  mm;
- Centering dowels and hole tolerances: H7/g6.
- Used Material: Aluminium alloy EN AW 7075, EN AW 6082, EN AW 6026
- Certified material, extruded in Italy by a primary company following to our drawing.
- Technical features and property are available for customer consultancy.





profile features

#### 6000-CNC Series Profile features

Used Typology and available in list (maximum length 4500 mm):

- Code 6000100C dimension 48x48 mm
- Code 6000200C dimension 48x98 mm
- Code 6000300C dimension 48x148 mm
- Code 6000400C dimension 98x98 mm
- Code 6000500C dimension 98x148 mm
- Code 6000600C dimension 98x198 mm

#### 6000-CNC Series Profile Length

From 10 to 4500mm depending on the project

#### 6000-CNC Series Profile Drilling Map

Depending on the offer specification of the customer, we can offer different types of drilling 5001-CNC Series profile:

- A. Drilling as per drawing of the four sections and standard drilling of the heads.
- B. Pitch every, 100 mm distance of the four sections and standard drilling of the heads.
- C. Standard drilling of the heads only

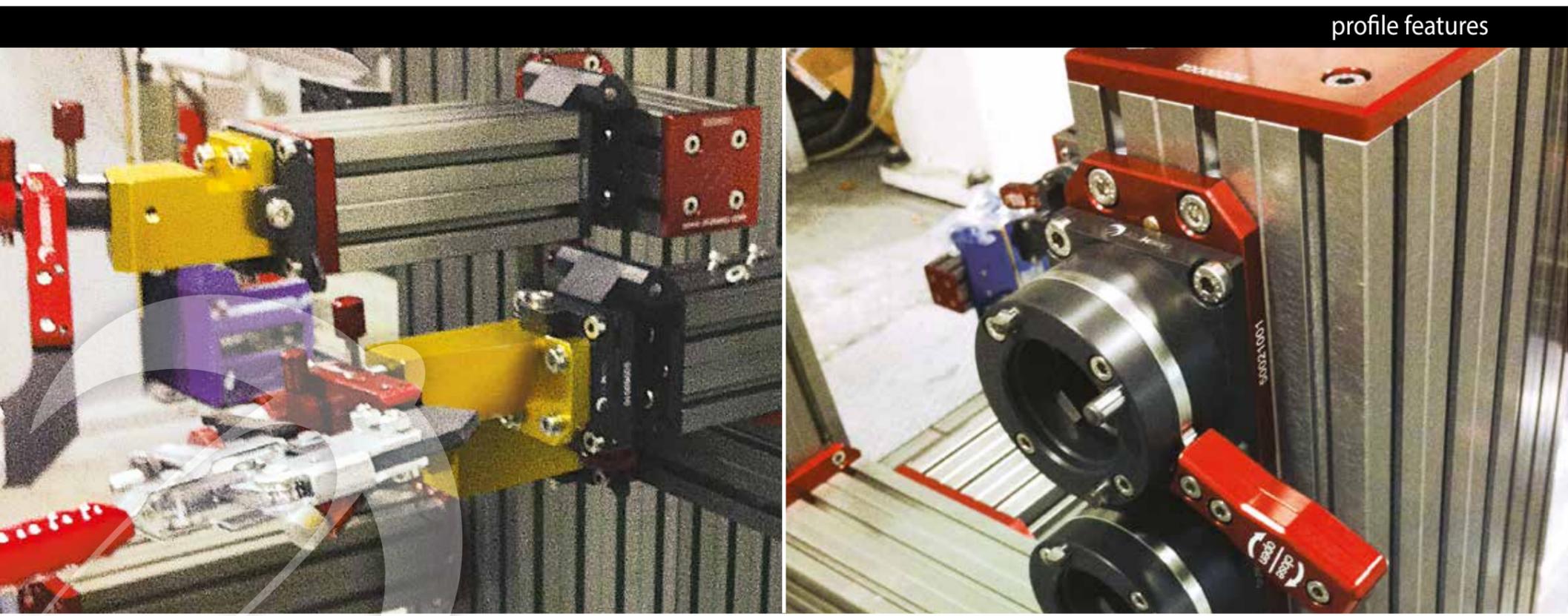
#### Used Material for 6000-CNC Series Profile

AL Mg 0,7Si HOT HARDENED, high mechanical strength  
Certified material, extruded in Italy by a primary company following to our drawing.  
Technical features and property available for customer consultancy.

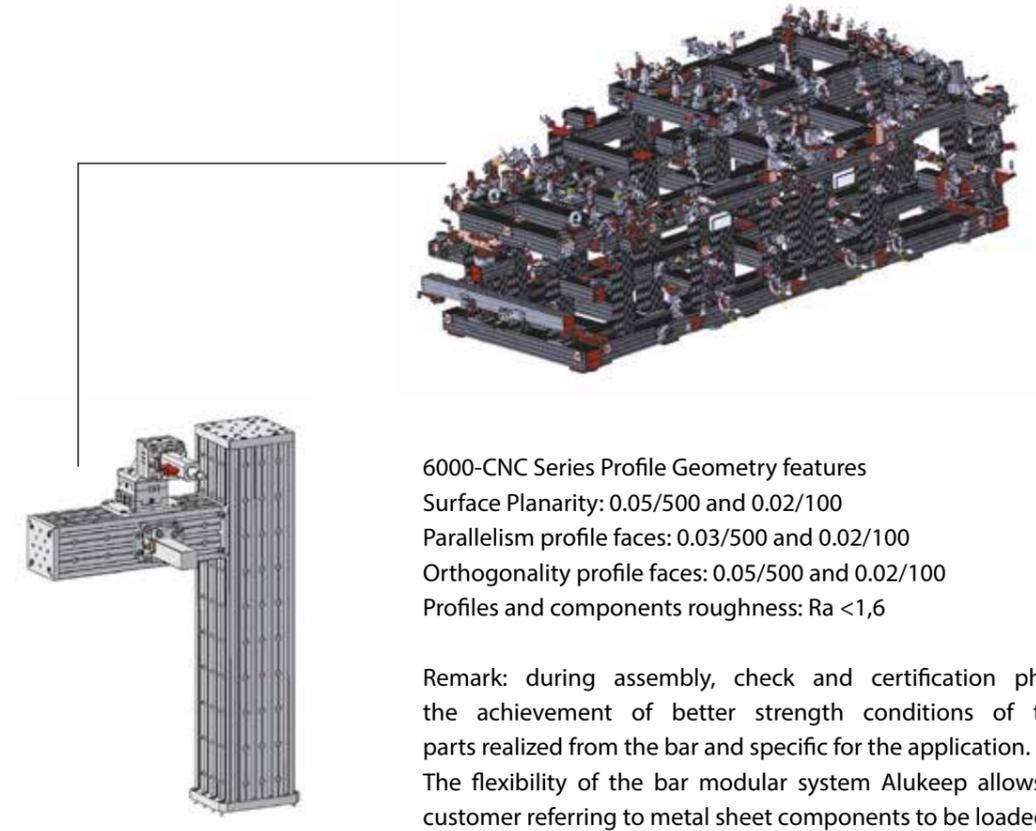
#### 6000-CNC Series Profiles Machining Process

All base surfaces are machined with CNC technology with the achievement of parallelism, perpendicularity and flatness in relief in order to obtain excellent assembly positions with the minimum deviations to engineering.  
Quality reports with certification of geometry features of some sample profiles are usually delivered within the project technical documentation.





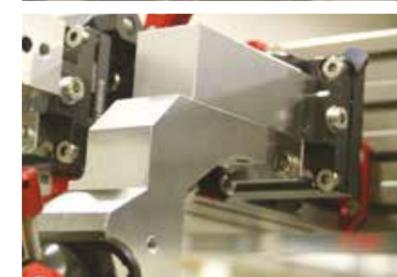
profile features



6000-CNC Series Profile Geometry features  
 Surface Planarity: 0.05/500 and 0.02/100  
 Parallelism profile faces: 0.03/500 and 0.02/100  
 Orthogonality profile faces: 0.05/500 and 0.02/100  
 Profiles and components roughness: Ra <1,6

Remark: during assembly, check and certification phase it is possible to make stiffening intervention focused on the achievement of better strength conditions of the structure using standard modular elements or customized parts realized from the bar and specific for the application.  
 The flexibility of the bar modular system Alukeep allows to make various adjustments and possible modifications from the customer referring to metal sheet components to be loaded on the Meisterbock.

general features



general features

Surfaces Treatment:

Profiles and components in general: hard anode oxidation, thickness 40/50 micron.

Under request:

black anode oxidation

Interfaces plates – profile and points link:

Standard surface anodizing with red colour (under request: black color).

Customising parts on the Point:

Standard surface anodizing with colour selection for the visual identification of the unit.

Typology of Misterbock to be defined with the customer during engineering phase.

Profiles and components roughness: Ra <1,6

Micro-adjustment parts:

All reference pins are equipped with a micro-metric adjustment unit in order to assure the adjustment in the range of  $\pm 5$  mm.

Adjustment devises in the X-Y axes have a graduated scale to analyse with precision and directly eventual gaps.

The adjustment is equipped with a fastening dowel with the possibility to fix the position once it is adjusted so that it can shift from its nominal position.

This adjustment doesn't compromise in anyway the stability of the referring unit.



reference points

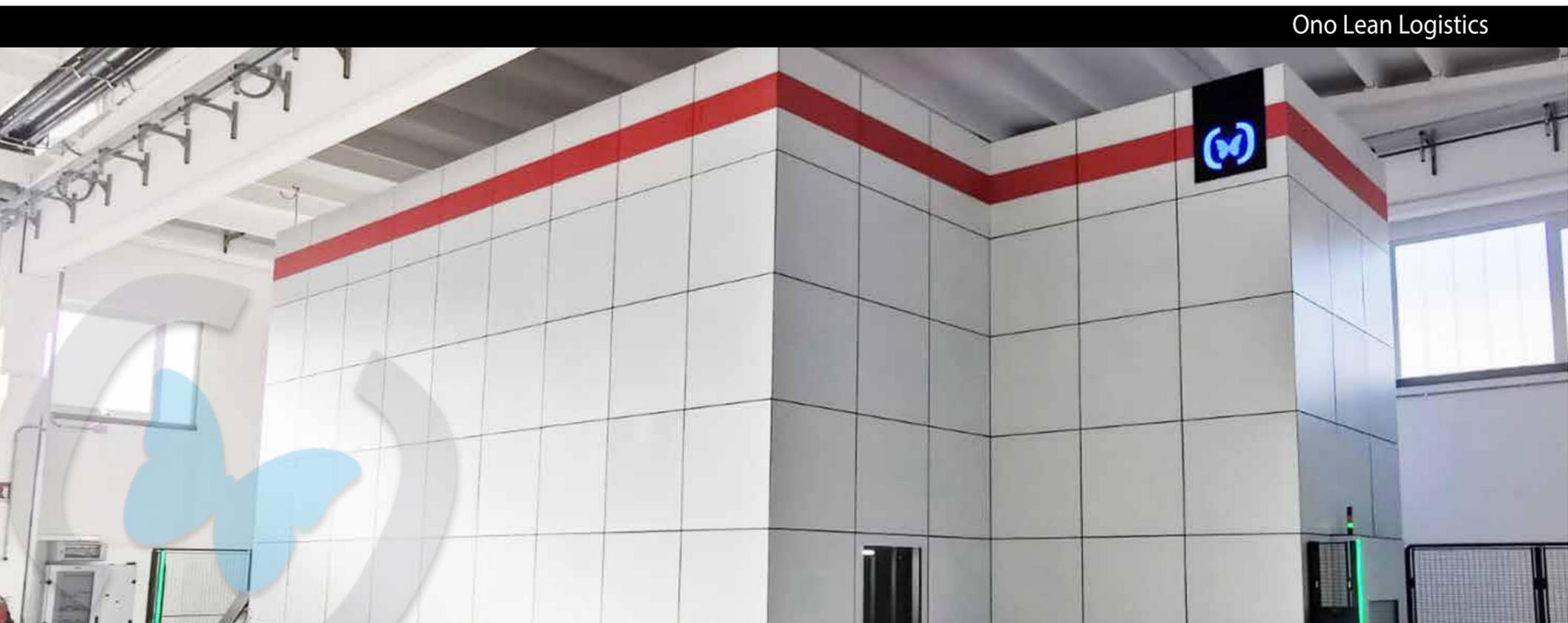


The parts to be analysed are incorporated on reference points/holes (main reference inserts) coherently with the assemble plan.

- Tolerances for reference points are:
- Adjustment direction  $\pm 0,1$  mm
  - Remaining coordinates  $\pm 0,2$  mm
  - Pin coordinates on 3 axes  $\pm 0,2$  mm

Adjustment slides used in the reference pin units (two or singular direction) assure a strength which can guarantee the repeatability of measurement and the tolerances of the point described here above.

During check phase with measurement machine, it is possible to verify and eventually to install support parts to limit torsions within parameters requested by specification – flexions of various bumping fastening points.



Ono Lean Logistics



Ono Lean Logistics

You can integrate the Meisterbock experience using our automated warehouse that solves the storage problem of the unused sub-groups.

ONO Lean Logistics offers the first scalable automatic and omnidirectional warehouses, natives 4.0, designed for the company of the future.

Our ONO Racks represent a truly revolutionary solution in the field of warehouse logistics: their capacity, shape and structure can be expanded over time with minimal and low-cost interventions, thus allowing to schedule and recover the initial investment already made and adapting the warehouse to the current needs of the company.

They are the perfect solution for companies that need to store and move goods and production materials frequently, with the desire to eliminate waste of time and resources, as well as automate the movement of materials.

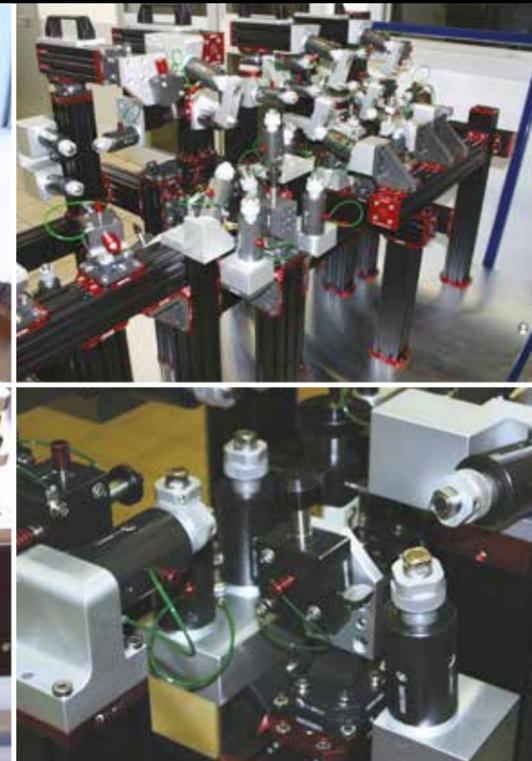
Moreover, thanks to our international patent, you can connect every warehouse of the system and more operators can access and handle different materials simultaneously by using different bays. This also allows you to have real-time inventory control of the entire system, at any time.

Dimension 2mt x 3mt height 4mt (max 300kg), the best solution to save space.

mac structures



checking structure



checking structure

Holding Fixtures LASER SCAN FIXTURES / CHECKING STRUCTURES are generally used for dimensional check of metal sheet and plastic elements. These types of structure are used by car manufacturers / suppliers as analysing tools in the production cycle calibration and later as checking tools during the whole production life of the model.

Our constructive philosophy has the purpose of the use of modular material of our drawing and production, with first-level technical features as geometries, tolerances and finishing.

Usually Laser scan fixtures are made up by an assembled structure with modular section bars in order to assure maximum rigidity.

Components to be measured are blocked with clamping systems and inserts following to RPS points underlined by specification, assuring the repeatability of the position and at the same time avoiding the deformation of the material.

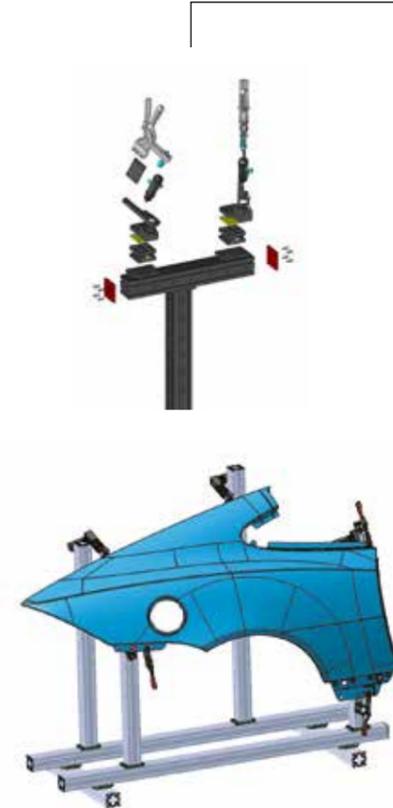
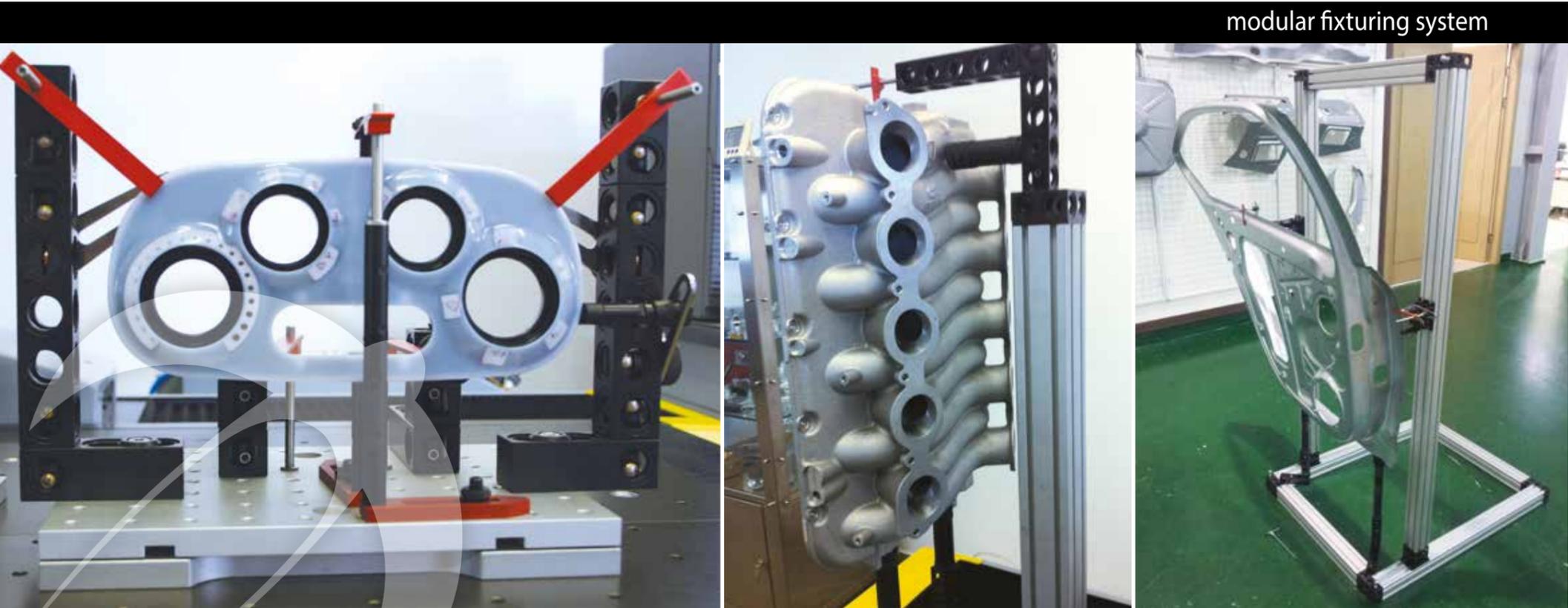
The structures are designed and assembled using a range of listed parts.

Color: all black to avoid the scanlaser refraction problems.

In these years, we achieved to combine modularity and flexibility:

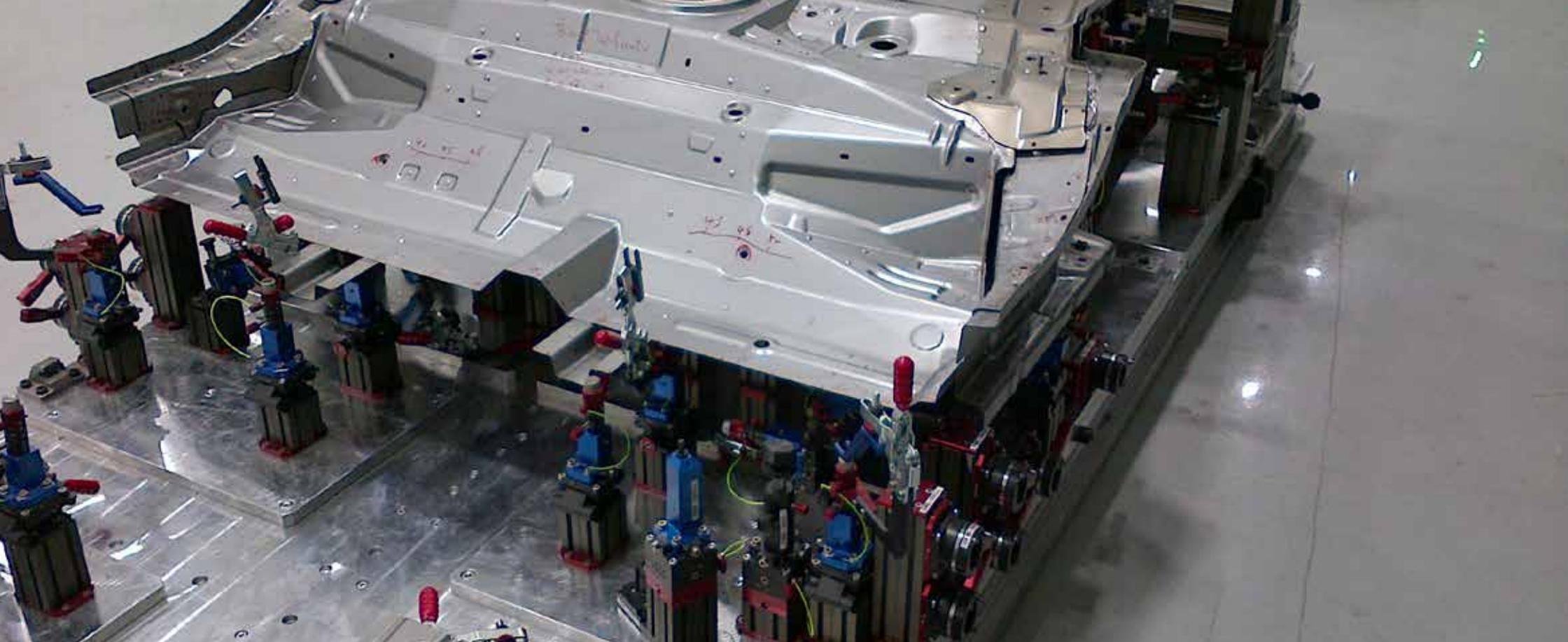
- Modular for possible reuse by the customer, easy to be improved for other applications.
- Flexible and recycable

Engineering and production of checking fixtures are know-how of our own property. Thanks to the collaboration with our dealers / distributors located in 25 countries, we can assure an assistance that goes from the evaluation and engineering phase to installation phase, calibration activity and post-sales in worldwide main markets.



modular fixturing system





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