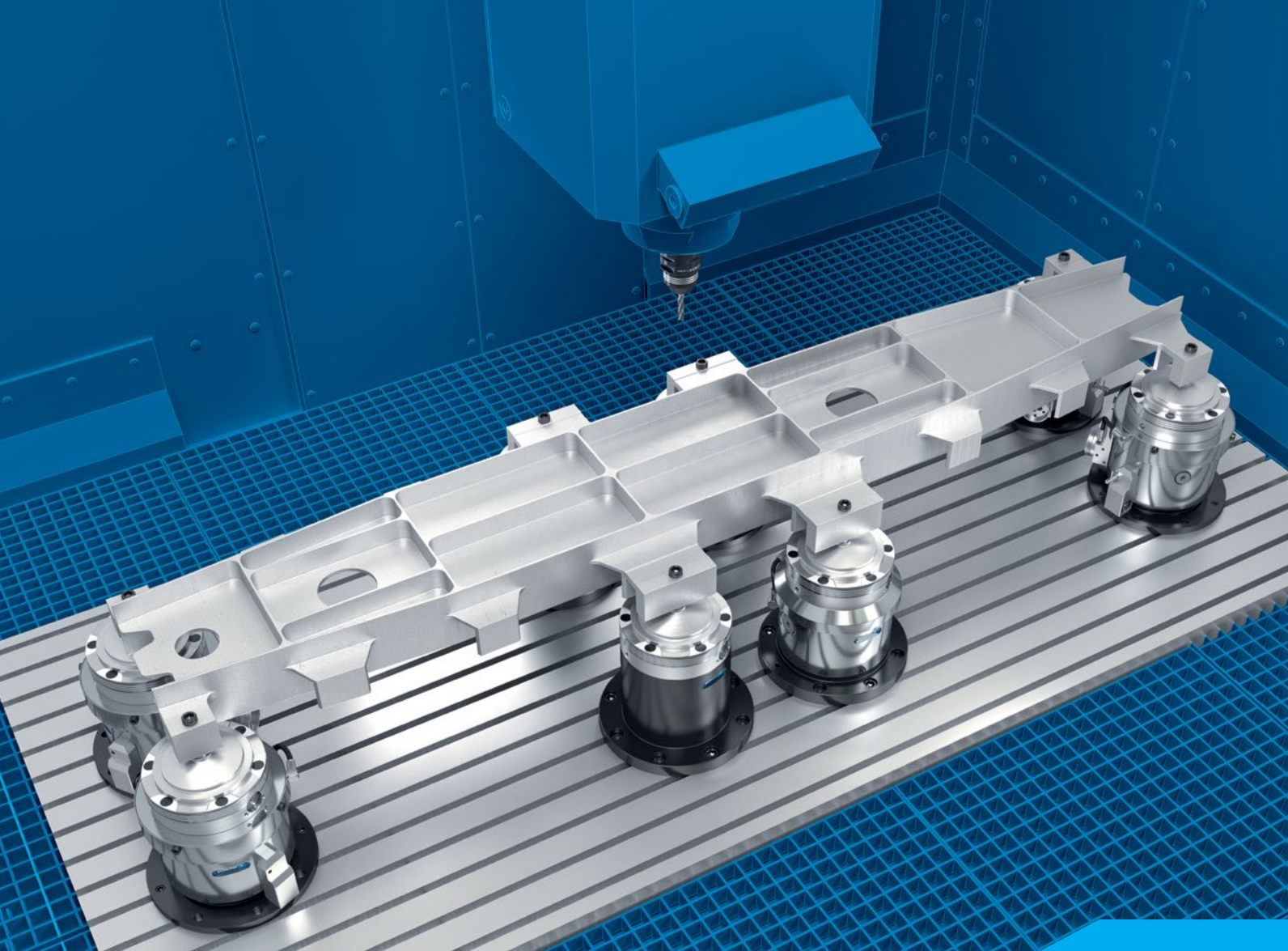




Superior Clamping and Gripping



VERO-S Aviation

Modular System for efficient
Workpiece Direct Clamping
of Structural Parts

Stress-free in the Growth Market

The aviation industry is a growth market and will remain as such – including for machining. Structural components in particular are very cost/set-up time intensive since they have very high set-up requirements. The reason for this is the resulting residual stress that is freed up during machining. For repeated unclamping of components, lots of adjustments, changes or new set-ups are required.

The SCHUNK quick-change pallet system VERO-S is the ultimate of efficient workpiece clamping. The revolutionary SCHUNK VERO-S Aviation clamping system has been developed to enable users to benefit from the efficiency in saving set-up costs with structural components too. It enables drastically reduced set-up due to controlled flexibility.

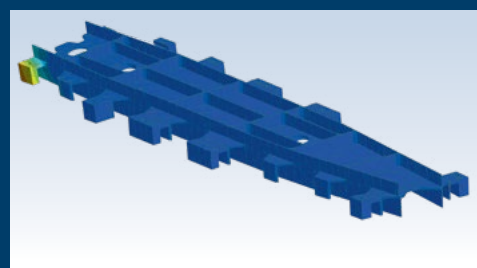
Requirements when clamping structural components

- Optimization of workpiece accessibility with significantly less set ups at the same time
- Compensating deformation due to resulting residual stress during metal cutting
- Workpiece-independent clamping solution
- Compensation of length changes by temperature fluctuations of parts
- Low set-up effort
- Repeatable clamping for roughing and finishing until measuring
- Reduction of vibrations within the workpiece
- High holding forces
- Can be used for machining and assembly applications

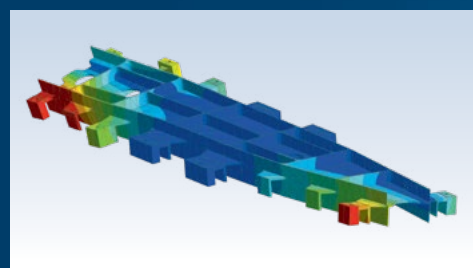
Advantages of SCHUNK VERO-S Aviation

- The optimum workpiece accessibility allows a high metal removal rates of up to 98% with significantly less set-up
- Repeatable set-up, from machining and deburring to measuring and assembly
- Saving on process time and costs due to fewer operation sequences and lower set-up effort
- Parts faithful to geometry direct from the machine table. Cost reduction for final straightening
- Flexible clamping system for set-up of different parts on different machines

Comparison: Resulting residual stress in the component with and without VERO-S Aviation



Tension in the component is reduced with VERO-S Aviation without any further set-up effort or loss of the workpiece's zero point.



Without VERO-S Aviation, the part is deformed during unclamping, which usually leads to cost-intensive rework.

SCHUNK VERO-S Aviation Clamping System

Systematic Strain Relief of the Component

The SCHUNK VERO-S Aviation clamping units enable the rapid and uniquely efficient adjustment of the entire clamping set-up by means of a special bearing of the SCHUNK quick-change pallet system VERO-S.

The clamping unit bearing is unclamped by spring force. To relieve the component, it is pneumatically released and the mounted quick-change pallet system can compensate in various degrees of freedom.

2D Clamping Unit CU-0: A-Version

Rigid clamping unit. For definition of workpiece zero point.

- Pneumatic system
- Actuation pressure: 5 bar
- Spring-tensioned, pneumatically released
- Pull-down force: 8 kN
- Repeat accuracy: < 0.005 mm
- Monitoring for Clamping module open

ID: 1333365

2D Clamping Unit CU-X: B-Version

Compensating clamping unit. For definition of the workpiece position. Depth gauge errors with the rigid clamping unit are compensated for.

- Pneumatic system
- Actuation pressure: 5 bar
- Spring-tensioned, pneumatically released
- Pull-down force: 8 kN
- Gauge balance: ± 6 mm
- Repeat accuracy: < 0.035 mm
- Air – buffer support for heavy work pieces
- Monitoring for Clamping unit clamped
- Monitoring for Clamping module open
- Center notch for center position

ID: 1333367

The Clamping Principle

A rigid 2D clamping unit CU-0 defines the **workpiece zero point in X-, Y-, and Z-direction**. A compensating 2D clamping unit CU-X defines the **workpiece position in X and Y** and balances out any depth gauge errors with the rigid clamping unit CU-0. A floating 2D clamping unit CU-XY defines the **workpiece position in Z** and balances out any depth gauge faults with the other 2D clamping units. The remaining clamping points are clamped with 3D clamping units CU-XYZ. They enable the release of all degrees of freedom in order to enable deformation of the work-piece and hence the reduction of stress without any loss of the workpiece position or the workpiece's zero point.

2D Clamping Unit CU-XY: C-Version

Floating clamping unit. Without force in position. Release of degrees of freedom in X/Y. Generation of 3-point bearing in Z together with the rigid and compensating clamping unit.

- Pneumatic system
- Actuation pressure: 5 bar
- Spring-tensioned, pneumatically released
- Pull-down force: 8 kN
- Gauge balance: ± 6 mm
- Air-cushion support for heavy parts
- Monitoring for Clamping unit clamped
- Monitoring for Clamping module open
- Center notch for center position

ID: 1334312

3D Clamping Unit CU-XYZ-F: D-Version

Without force in position or location for release of all degrees of freedom. Depth gauge and positional deviations to all other clamping units are compensated.

- Pneumatic system
- Actuation pressure: 5 bar
- Spring-tensioned, pneumatically released
- Pull-down force: 8 kN
- Gauge balance: ± 6 mm
- Angular compensation: $\pm 2^\circ$
- Air-cushion support for heavy parts
- Monitoring for Clamping unit clamped
- Monitoring for Clamping module open
- Center notch for center position
- Flexible and adjustable Z-force

ID: 1390861

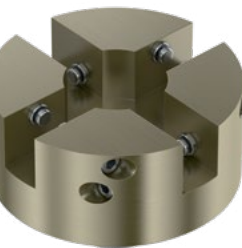
Accessories

Control unit / Vacuumpad

For pneumatic release and clamping.
ID: 1419435

Distributor

For control unit and clamping unit.
ID: 1419441 / 1419443



Rib-clamping adapter

For vibration damping by targeted stabilization of component. Versatile positioning on roughened or machined bars on workpiece.

ID: 1553138 / 1366731



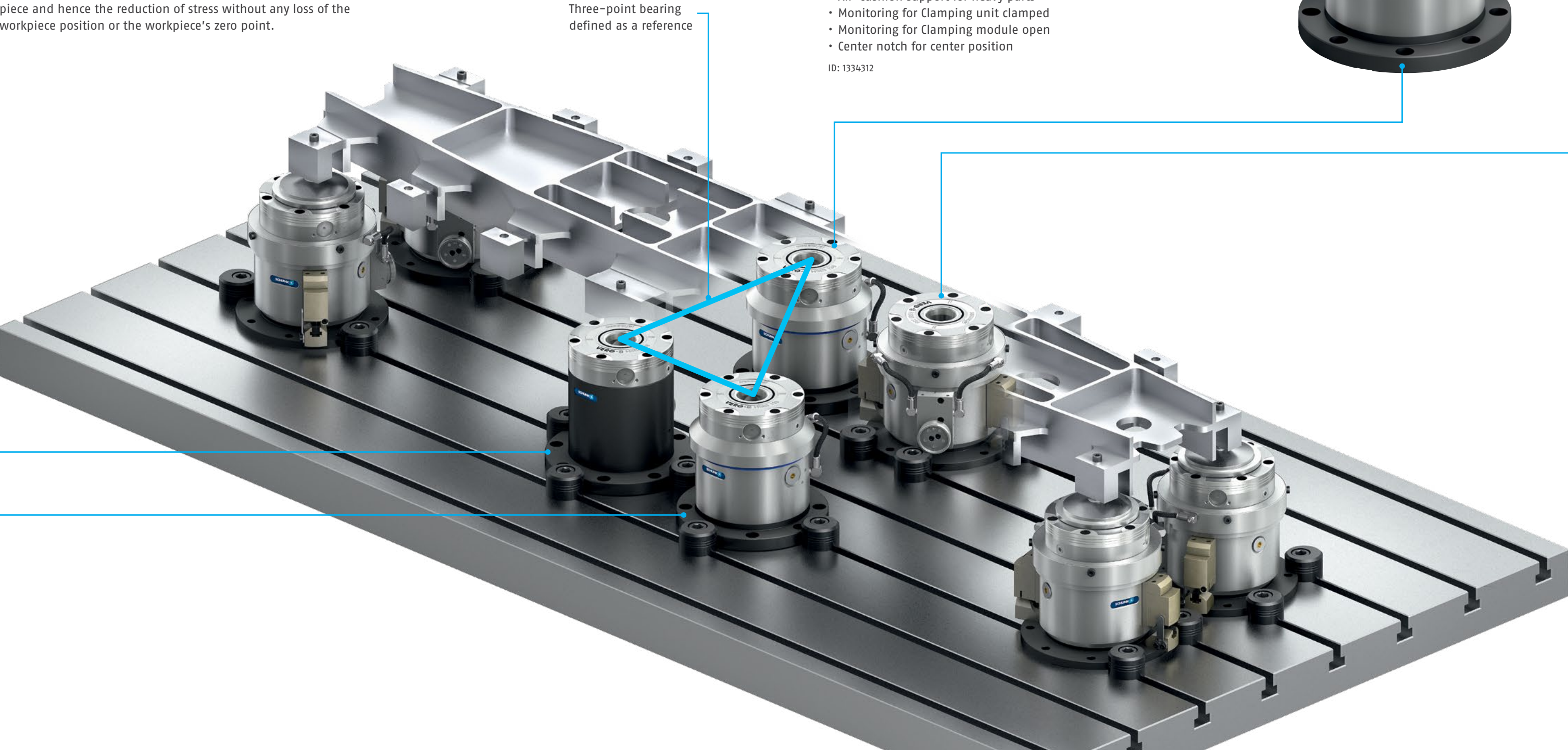
Compensation pins

Possible in B and C-version.
ID: 0471155 / 0471156



Positioning arbor

For precise alignment of clamping units.
ID: 0471155 / 0471156



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