



Tool Carriers for PU Processing

Plastics
Technologies
in Motion.

FRIMO Tool Carriers – Strong characters – in every sense

FRIMO supplies customized tool carriers for PU processing, which can be integrated without any problems into all current plant concepts. FRIMO tool carriers are well-established on the market for years and stand for evidenced security and reliability. The product portfolio includes standard tool carriers for large and small components as well as special tool carrier concepts for the whole range of PU applications. Besides that all forms of kinematics and drive systems are available. FRIMO tool carriers are characterized by a compact and modular design, short closing times, flexible use, optimal pivoting movements and ergonomics as well as short set-up times and easy tool change. The modular design allows for customized adjustments.

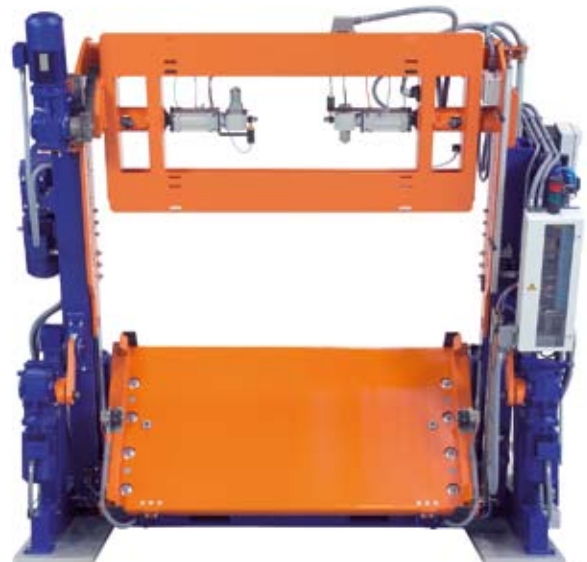
FRIMO tool carrier *Type 6* – The fastest type on the market

The tool carriers *Type 6* offer a technically perfected basic equipment, aligned to functionality and economic efficiency. With a closing time of less than 3 seconds, the electrically driven FRIMO *Type 6* is the fastest in its class. The concept offers versatile pivoting options that lead to good ergonomics and accessibility. Electrical drives and synchronizing coupling ensure smooth motion sequences and accurate parallel movements at any time. The foam pour direction is variably adjustable between 0° and +30° and can even be retrofitted to 0° up to -30° on demand. The tool carriers need extremely low maintenance and convince with low energy consumption, as the drives are engaged only for the respective movement. As an option customized devices for quick tool change, control modes and security equipment can be offered.



Technical Data *Type 6*

Dimensions and weights	
Width	3.300 mm
Depth	1.460 mm
Height (closed)	2.420 mm
Height (open)	3.280 mm
Weight	3.800 kg
Dimensions / weights for foam tool installation	
Width	2.000 mm
Depth	1.100 mm
Height	1.000 mm
Max. upper tool weight	1.000 kg
Max. lower tool weight	1.200 kg
Clamping pressure	400 kN (40t)
Tool carrier movements	
Parallel stroke upper carrier	0 - 1.100 mm
Pivoting angle upper carrier	0° - 90°
Pivoting angle lower carrier	0° - 35°
Foam injection adjustment	0° - 30°/-30°
Cycle times	
Close parallel stroke	< 3 sec.



For a maximum of flexibility and productivity

FRIMO tool carrier *Type 6 PLUS* – Top-class equipment on top conditions

The *Type 6 PLUS* offers further technical developments based on the *Type 6* standard, perfectly suited for the production of instrument panels, center consoles, door panels or even window frames. The concept offers an even extended range of pivoting movements, which are operated seamlessly via rack and pinion stern segments. The upper carrier can be pivoted 180° which enables the safe and parallel execution of individual operations at both sides of the tool carrier. Manual or robotic process steps at the upper tool, such as flame treatment or positioning of a retainer at the rear of the carrier can be carried out, while, simultaneously, a skin can be positioned safely in the lower tool from the front of the carrier. The foam pour position is infinitely variable up to 35° in both directions. All movements are precisely controlled by sensors and can be individually adjusted. All kinematic functions are designed for the perfect support of ergonomics and the foaming process. The *Type 6 PLUS* offers an optimum of technical equipment and functionality at an attractive price-performance ratio.



Technical Data *Type 6 PLUS*

Dimensions and weights	
Width	3.300 mm
Depth	1.490 mm
Height (closed)	2.420 mm
Height (open)	3.500 mm
Weight	4.200 kg
Dimensions / weights for foam tool installation	
Width	2.000 mm
Depth	1.100 mm
Height	1.000 mm
Max. upper tool weight	1.000 kg
Max. lower tool weight	1.500 kg
Clamping pressure	400 kN (40t)
Tool carrier movements	
Parallel stroke upper carrier	0 - 1.100 mm
Pivoting angle upper carrier	-90° - +90°
Pivoting angle lower carrier	0° - 45°
Foam injection adjustment	-35° - +35°
Cycle times	
Close parallel stroke	< 3 sec.



Optimized accessibility for closed mold pour



Features/equipment for quick tool change without hoisting devices



Foam position: pivot drive via rack and pinion stern segments, seamlessly adjustable from -35° to +35°



Pivoting of the upper carrier by 180° enables simultaneous handling on both sides

FRIMO tool carrier *Type 10* – Perfect for the open mold pour from the operator’s side or closed mold pour

The cam-driven FRIMO *Type 10* tool carrier represents the cost- and space-saving alternative for a reliable production. Due to the limited movements this concept is not as flexible as the FRIMO tool carrier *Type 6*, but for special applications the *Type 10* is particularly suitable and convinces with its minimized space requirement and lower weight. Cam-driven tool carriers are perfectly designed for open mold pour from the operator’s side on rotary table systems, but also represent an interesting option for processes, where the foam injection into the closed tool is required. The tool carriers can be integrated into various plant concepts without difficulty. All movements are executed by electrical drives. The tool carrier can be individually upgraded and supplied with additional technical features on demand.

Technical Data *Type 10*

Dimensions and weights	
Width	2.650 mm
Depth	2.100 mm
Height (closed)	1.900 mm
Height (open)	2.800 mm
Weight	3.500 kg
Dimensions / weights for foam tool installation	
Width	2.000 mm
Depth	1.100 mm
Height	1.000 mm
Max. upper tool weight	1.000 kg
Max. lower tool weight	1.200 kg
Clamping pressure	400 kN (40t)
Tool carrier movements	
Air cushion stroke lower carrier	0 – 5 mm
Pivoting angle upper carrier	0° – 90°
Parallel stroke upper carrier	0 – 350 mm
Foam injection adjustment	0° – 25°
Cycle times	
Close parallel stroke	3 sec.



Basic version with manual adjustment of foam pour direction

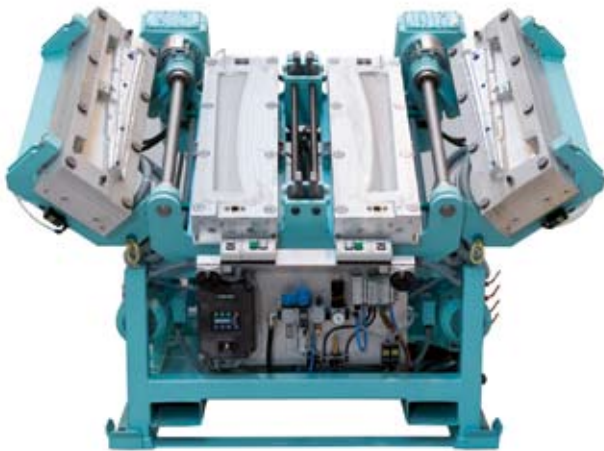
Cam-driven tool carriers for closed mold pour within a stationary plant



Clever types for small components

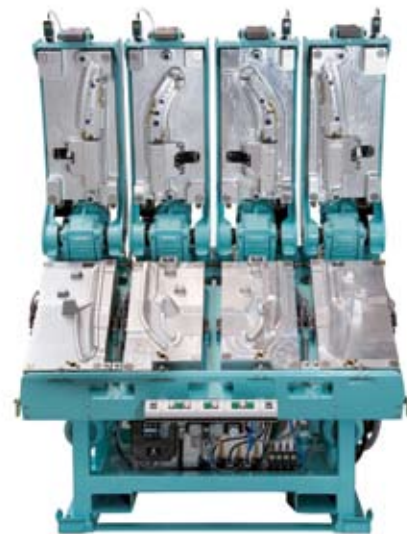
FRIMO tool carriers *Type 11 and Type 12* – Compact and highly productive

The *Type 11* and *Type 12* tool carriers – also called “Butterfly” and “Crocodile” due to their specific opening and closing motion – have especially been developed for the production of smaller parts. Typical applications are front or back foaming of door panel components, arm rests or various seats, such as for Jet Ski. The extremely compact design enables the production with up to four tool cavities with smallest space construction. Very short closing times and ideal ergonomics ensure a highly efficient production for a nearly unlimited range of PU applications. The carriers` dimensions are individually configurable and depend on part and tool size.



Technical Data *Type 11 „Butterfly“*

Dimensions and weights (depending on part/tool size)	
Width	2.200 mm
Depth	1.700 mm
Height (closed)	2.800 mm
Weight	1.300 kg
Dimensions / weights for foam tool installation	
Width	300 mm
Depth	1.000 mm
Height	300 mm
Max. upper tool weight	150 kg
Max. lower tool weight	200 kg
Clamping pressure	20 kN (2t)
Tool carrier movements	
Pivoting angle upper carrier	0° – 135°
Foam injection adjustment	-10° – +30°
Parallel stroke lower foam tool	0 – 5 mm



Technical Data *Type 12 „Crocodile“*

Dimensions and weights (depending on part/tool size)	
Width	1.800 mm
Depth	1.700 mm
Height (closed)	2.200 mm
Weight	1.900 kg
Dimensions / weights for foam tool installation	
Width	350 mm
Depth	750 mm
Height	300 mm
Max. upper tool weight	120 kg
Max. lower tool weight	150 kg
Clamping pressure	20 kN (2t)
Tool carrier movements	
Pivoting angle upper carrier	0° – 110°
Foam injection adjustment	-10° – +30°
Parallel stroke lower foam tool	0 – 5 mm



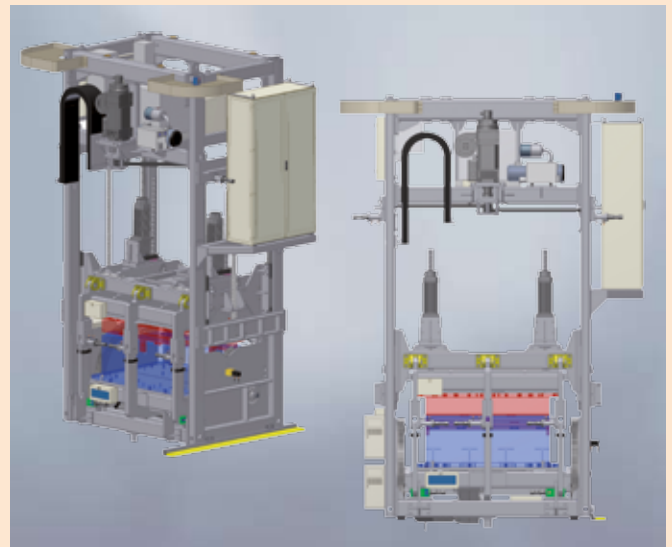
FRIMO Special-purpose tool carriers – The individual types for special cases

FRIMO is the specialist for the development of optimally customized tool carrier concepts. The product portfolio includes a wide range of special designs. Tool carriers suited for high tool weights and with clamping forces up to 400t can be realized. FRIMO has already built a large range of customer-specific carriers for laboratory use or the application in try-out-centers. Tool carriers which are installed in so-called overhead conveyor systems (*PURe Track*) are also offered. FRIMO has supplied special solutions for the following applications: damping elements, leather processing, RIM Skin, ski manufacture, acoustic components, foam-insulation around hot-water tanks, glass-roof foaming, steering wheels, seat cushions, head rests and many more.



PURe Track tool carriers

- Operating in overhead conveyor systems.
- All kinds of drives and kinematics

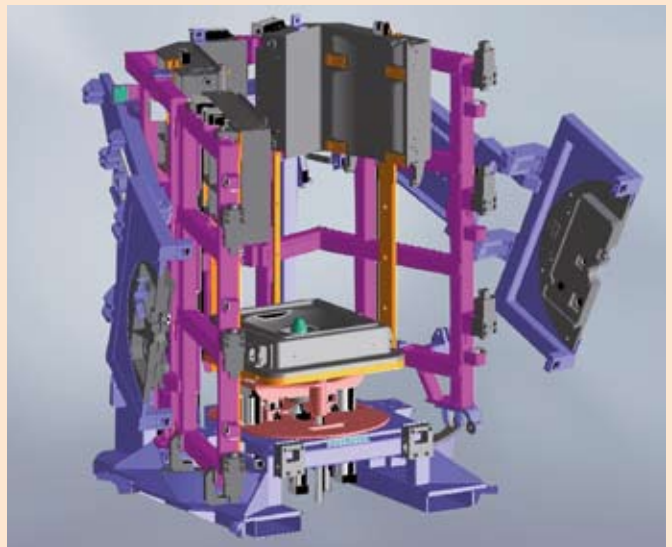


- High tool weights up to 10t possible
- Clamping forces up to 1.800 kN have been realized



Special-purpose tool carriers

- Designs for insulation and acoustic parts, e.g. carpet backfoaming

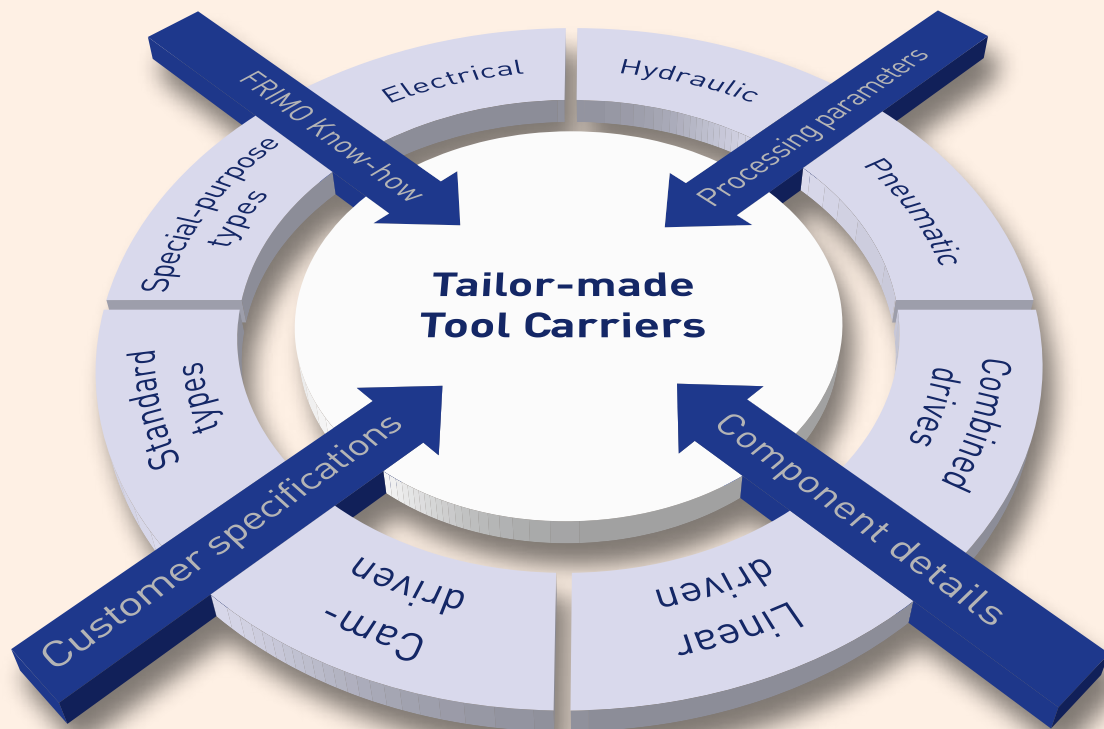


- For insulation foaming, for example boiler

One Stop. All Services.

FRIMO P_{UR}e Technology offers

- Extensive global component competency and many years of experience in the polyurethane processing industry
- Support with component design for optimization of producibility and for reduction of material consumption
- Process neutral consultation for optimum technical and economic solutions
- Application specific consultation for an optimally designed manufacturing concept
- Delivery of tools, machines, and plants for the processing of polyurethanes and other reactive materials from one source. Bundled competency for fewer interfaces and shorter ways
- "In-house" sample, prototype and spare part production with modern equipment and all relevant processes
- Modification, relocation, upgrading and service of existing tools, machines, and plants



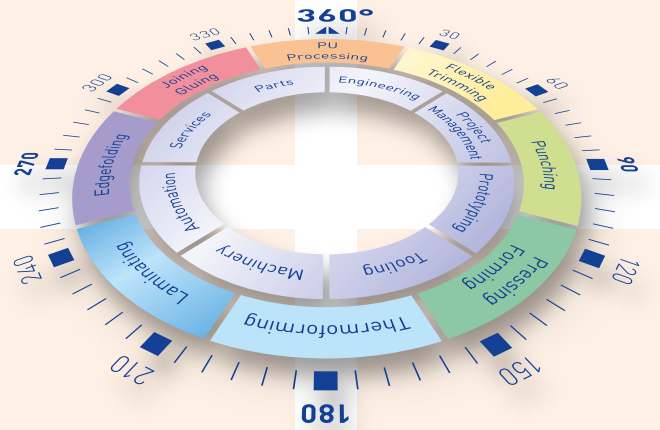
Benefits FRIMO tool carriers

- Concepts for maximized economic efficiency
- Compact and modular design
- Shortest closing times
- Exactly reproducible closing movements
- Short set-up times / easy tool change
- "Plug & Produce" philosophy
- Optimal serviceability and ergonomics
- High quality, technical reliability and safety
- Energy efficiency
- Operation with multiple tools (e.g. *Type 11 / Type 12*)
- Compatibility of different tool carriers





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