made in germany

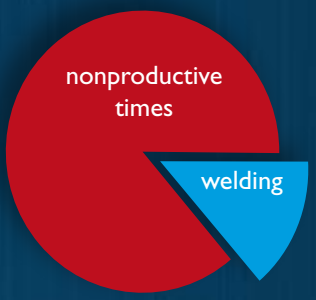
FÖRSTER
welding systems

3-D WELDING TABLE SYSTEMS
JIGS & FIXTURES
AUTOMATION

The Förster Slot-System

Saving of time

Welding time can nowadays hardly be reduced by modern manufacturing processes alone. The accurate arranging of components at precise angles as well as measuring, repositioning and adjusting take up the bulk of welding time.
The combination of an accurate preparation of components, a precise working basis for assembling components as well as universal clamping elements and stops results in significant time savings – even in single-piece production.



Precision

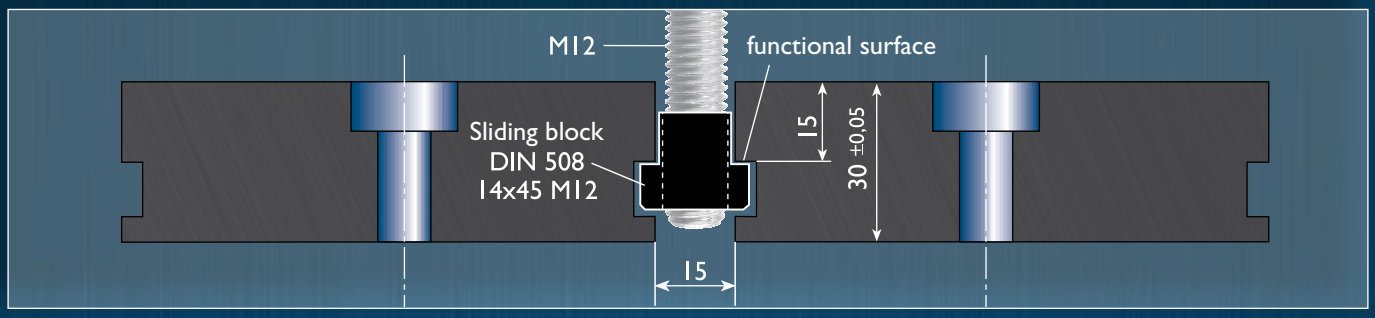
The table and the right angle brackets have been manufactured with very high precision, complying with ISO 2768 T2 requirements on flatness and angularity (tolerance classes "H" and "fine", respectively). The rails of the table top have a tolerance of ± 0.05 mm and thus are interchangeable.

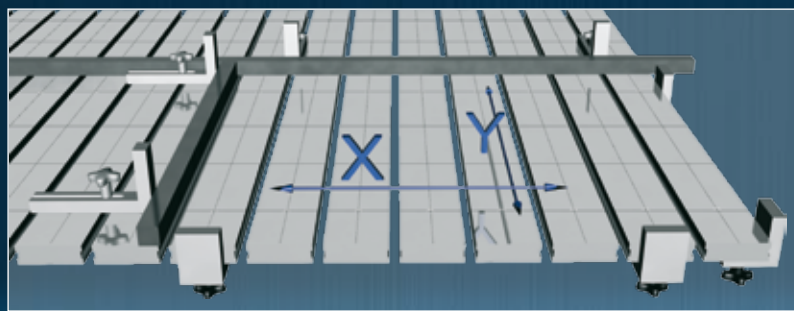
Measuring and positioning

The engraved grid pattern of 100 x 100 mm on the surface of the table top facilitates straight and angular alignment. The work on the component usually starts with positioning it at a right angle to the brackets on the side and front edge of the table. The length and width of the component, that usually do not fit into a fixed grid, can be easily defined by continuously adjusting the brackets.

What is the advantage of the slot system?

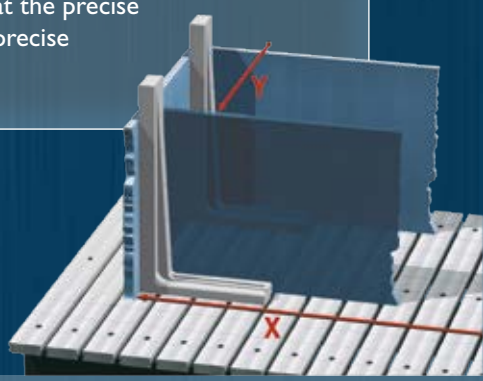
The T-slot is an ideal basis for flexibly solving a variety of clamping tasks with the simplest means (a T-nut) on one working place.
T-slots allow **continuous positioning** of all clamping elements and stops at any point of the table, which poses a great advantage and is especially useful for producing cases and frames since several right angle brackets can be placed exactly in the corners of components.





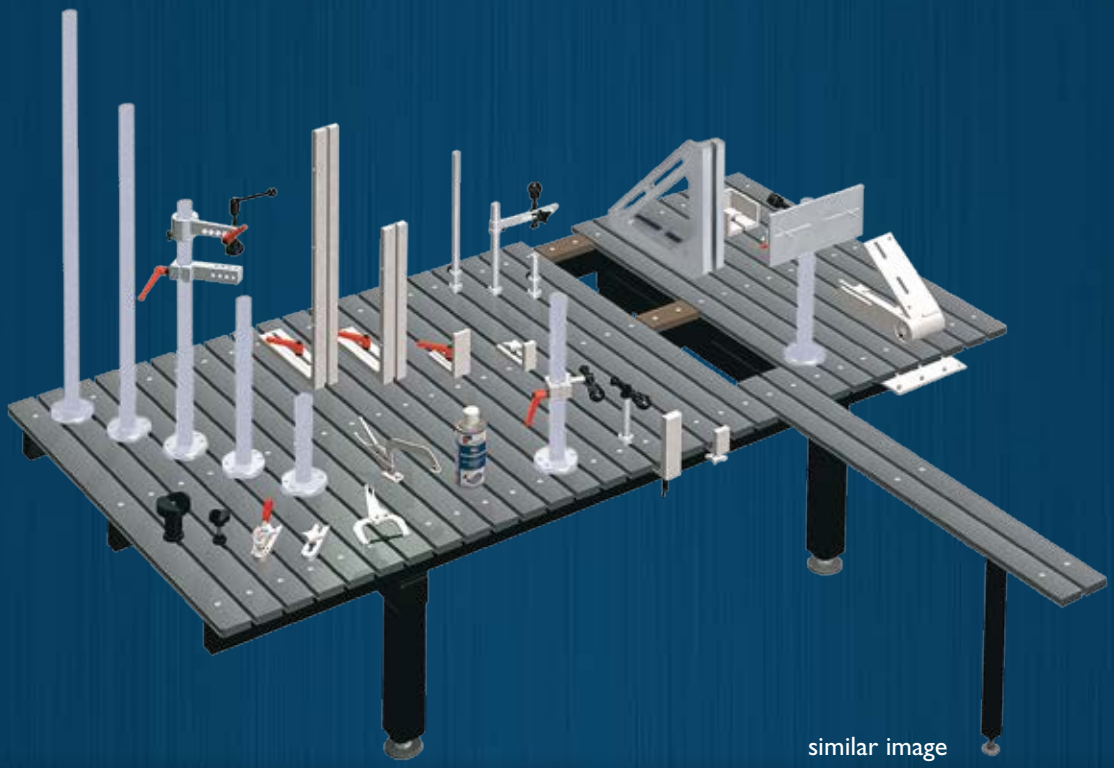
Only possible with the slot system!

The ability to make adjustments simultaneously in two axes makes it possible to precisely adjust the stops at the precise point and in the precise direction.



No H7 bores, which are sensitive to spatter, are required to mount special clamps, and our patented version of the slot between two rails prevents the inside of its track from becoming dirty.
Rhombic slot nuts can be added from above to slots that are already in use.

just great



similar image


2010 *


2020 2021 2022


2040 *


2041


2042 *


3029 *


2050 *


3010 * 3011 *


3012 *


3013 *


3015 * 3016 *


2051 *


2043 *


2052 2053 2054 2055


1601


3014 *


3030 *


2045 *


1602


1604


2096


3019 *


3020 * 3021 *


3022


2090


2092


2097


2094

* optional for stainless steel processing

FÖRSTER welding systems

Grey cast iron GG211

designed for a long durability

The safest protection from spatter!

Why does the special grey cast iron provide optimal protection against unwanted adhesion?

- The **high proportion of graphite** in our special grey cast iron keeps weld splatters from adhering to the table surface. Graphite protects your welding table in the same way against splatters as it keeps metal from adhering to foundry machines.
  Even bigger drops become that brittle in the transition area that they can be easily removed with a chisel and do not affect the flatness of the table surface.
- The graphite particles, which are deposited within the porous cast structure, immediately mix with the protective substance, which is applied to and then penetrates the open-pored surface.
  Thus, an oil-graphite mixture forms which provides an almost perfect protection against splatter adhesion.
- Further advantages of our grey cast iron rails are the lower thermal expansion coefficient compared to steel and that the rails can freely expand and shrink under the influence of heat (without plastic deformation).
- The sound-absorbing property of grey cast iron reduces workplace noise and ensures a pleasant working environment.

Grey cast iron –
the most reliable basis
for rough welding operations

Al/Cu-Alloy

the safe basis for the stainless steel processing

Why an Al-Cu alloy as a table top?

- The professional processing of stainless steels requires a strict separation of ferritic materials and thus an appropriate welding and working table since the smallest adhesions and scratches on the surface may cause further corrosion.
- Flaws on the table surface can usually only be removed by complete “immersion in a pickling bath”. Consequently, stainless steel processors are increasingly interested in designing the welding and working table, which is in constant contact with his component, appropriately in advance.
- Therefore, tables with a non-ferritic surface made of an Al-Cu alloy have proven themselves for years for the more susceptible stainless steel production.
- Polished stainless steel surfaces are barely damaged thanks to the relatively high tensile strength (= F 37, similar to structural steel) and the low surface hardness of stainless steel.
  The high thermal conductivity of Al-Cu alloys at normal temperature almost completely prevents the adhesion of potential weld spatter.
- It is still recommended to apply a release agent for continuous operations.

3D-Welding tables

The basis for quality

The table tops are completely covered with grey cast iron rails or non-ferritic rails with a spacing of 100 x 100 mm. The plates have a grid pattern of 100 x 100 mm.

The maximum permissible point load per rail is 1.5 t for grey cast iron and 1.0 t for Al-Cu alloy.
The maximum permissible total component load can be increased to more than 1.5 t if necessary.

Special grey cast iron (GG 25) for steel processing

	standard table – **stationary** (height adjustable from 835 up to 945 mm)	standard table – **mobile** (fixed height of 855 mm)
3,000 x 1,500 mm	1108	1008
3,000 x 1,200 mm	1109	1009
2,400 x 1,200 mm	1110	1010
2,000 x 1,000 mm	1115	1015
1,800 x 1,200 mm	1120	1020
1,000 x 1,200 mm	1130	1030

Aluminium-copper alloy (Al-Cu) for stainless steel processing

	standard table – **stationary** (height adjustable from 835 up to 945 mm)	standard table – **mobile** (fixed height of 855 mm)
3,000 x 1,500 mm	1308	1208
3,000 x 1,200 mm	1309	1209
2,400 x 1,200 mm	1310	1210
2,000 x 1,000 mm	1315	1215
1,800 x 1,200 mm	1320	1220
1,000 x 1,200 mm	1330	1230

Other sizes and forms available on request.
Rails are also separately available in lengths of 800/1,000/1,200 and 1,500 mm on request.

Creativity without limits

The height of the table can be adjusted from 835 up to 945 mm thanks to four adjustable feet.

Mobile version with three wheels and two additional adjustable feet for a secure footing.

Table design

The most diverse tabletops fitting your individual needs can be created using only a few elements thanks to the modular system.

There are no restrictions to the modular configuration of the entire tabletop.
We provide various combinations as lift tables, or welding tables with a swivel and tilt function.

It has proven especially beneficial to open particular areas of the tabletop for long protruding parts to stick through.

FÖRSTER welding systems

Clamping elements

clamp arm Ø 30 mm 2010 *

material: steel, chromated, with sliding and pivoting clamping element, pad Ø 30 mm
with steel or bronze v-block

clamping tube Ø 30 x 150 mm 2020
clamping tube Ø 30 x 350 mm 2021
clamping tube Ø 30 x 550 mm 2022

precision steel pipe, chromate with slot nut and shaft collar

* optional for stainless steel processing

universal and effective

clamp arm Ø 50 mm 2050 *

material: steel, chromated, with sliding and pivoting clamping element, pad Ø 60 mm with steel or bronze block

supporting arm Ø 50 mm 2051 *

material: steel, for 3-D clamping, continuous, freely movable

clamping pole Ø 50 x 300 mm 2052
clamping pole Ø 50 x 600 mm 2053
clamping pole Ø 50 x 900 mm 2054
clamping pole Ø 50 x 1.200 mm 2055

clamping pole Ø 50 x 300 mm precision steel pipe, for 3-D clamping, continuous, freely movable

* optional for stainless steel processing

Stops and clamping elements

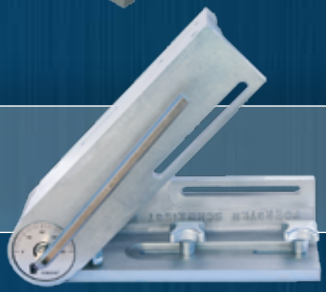
flat stop 170 x 40 x 20 mm chromated steel or aluminium, with locking screw	3012 *	
right-angle bracket (table top) 100 x 170 mm outer surface machined, chromated with locking screw	3013 *	
right-angle bracket (table top) 170 x 170 mm outer and side surfaces machined, chromated, incl. locking lever	3014 *	

* optional for stainless steel processing

Precise and handy

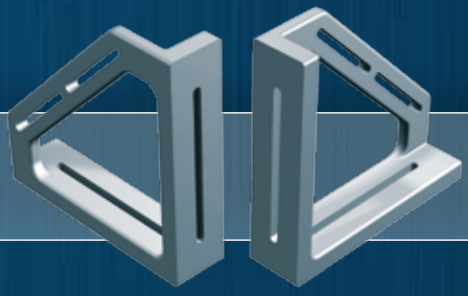
right-angle bracket (table top) 600 x 350 mm 3015 *
right-angle bracket (table top) 1.000 x 350 mm 3016 *

Precision profile with T-Slot for steppless positioning in combination with universal angle 3029 made of aluminium with 2 fixing elements



continuous adjustable angle 350 x 350 mm 3019 *

chromated steel or aluminium, with Allen key and locking screw



universal stop 350 x 350 mm 3029 *

aluminium, with two locking elements, can be used as left and right angle stop

* optional for stainless steel processing

FÖRSTER welding systems

Stops and clamping elements

right-angle bracket (table edge) 70 mm 3010 *
right-angle bracket (table edge) 200 mm 3011 *

for straight and right-angle positioning of components along the edge of the table, clamping side slightly chamfered for secure fitting, chromated, with screw stop

* optional for stainless steel processing

Simple and user-friendly

flat clamp 350 x 350 mm — 2040 *

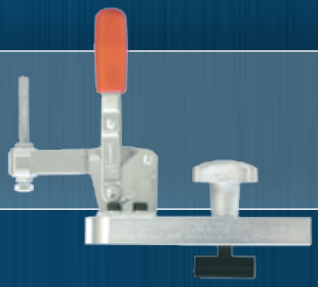
for holding flat components tightly in position, throat depth 200 mm, maximum clamping height 110 mm (adjustable)

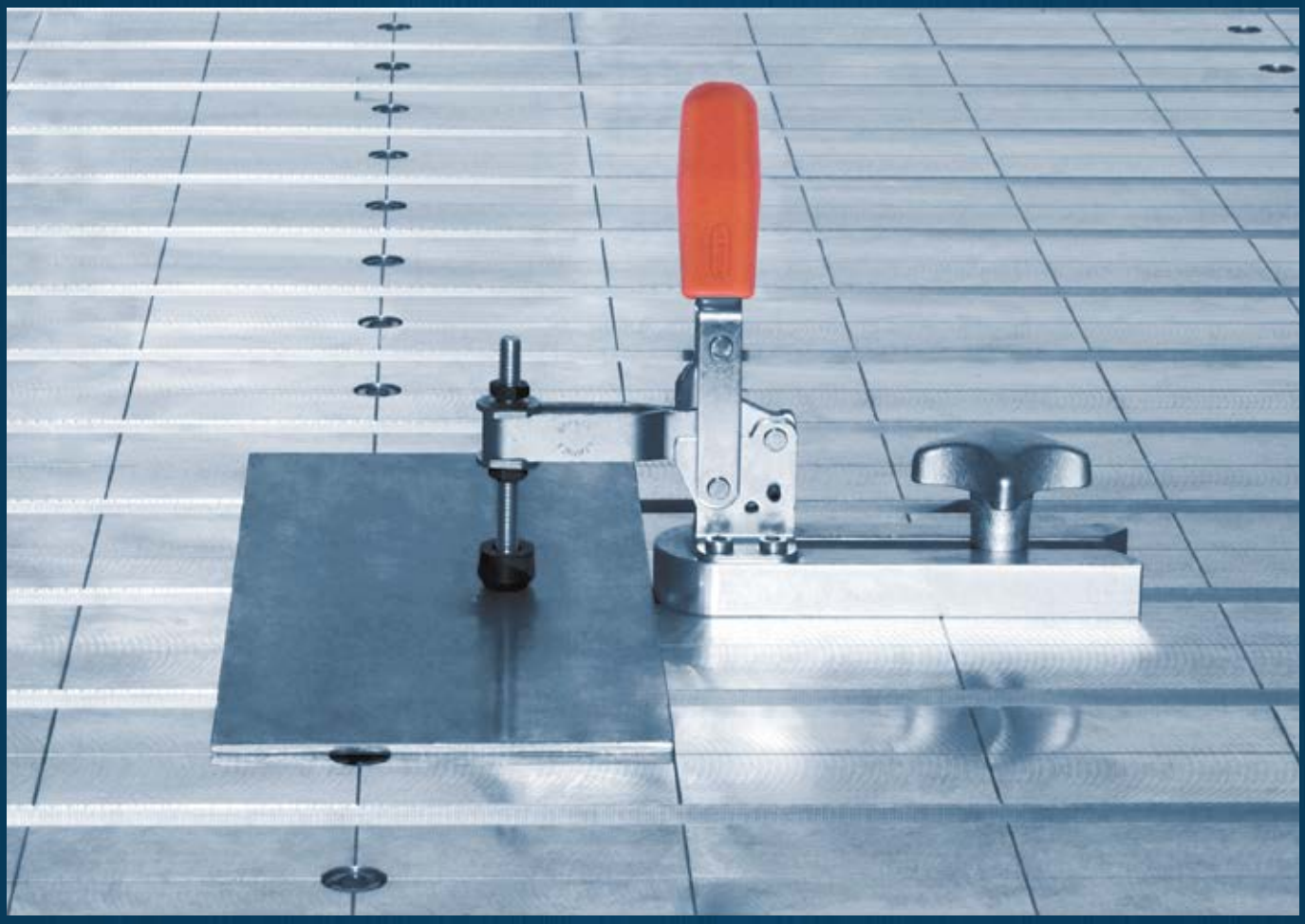
c-clamp — 2041

for clamping flat components to right-angle brackets, throat depth 70 mm, maximum clamping range 60 mm (adjustable)

quick-release clamp with flat stop — 2042 *

for clamping sheet metal and small components, quick-release clamp can be freely positioned along the x- and y-axis with the flat stop





* optional for stainless steel processing

FÖRSTER welding systems

Stops and clamping elements

v-block support Ø 60 mm 3020 *
v-block support Ø 100 mm 3021 *

v-block 120, steel or bronze with threaded piece, adjusting screw and slot nut

horizontal clamp without clamping pole Ø 50 mm 2045 *

for applying horizontal clamping forces at various heights, continuously adjustable on clamping pole, clamping pole not included in delivery

horizontal clamp without clamping tube Ø 30 mm 2043 *

for applying horizontal clamping forces, steel or bronze pad, clamping tube not included in delivery

flange clamp with clamping pole Ø 50 x 600 mm 3030 *

for free positioning of different flanges, with pitch circles from 97 to 355 mm and a bore diameter with a contact surface of at least 13 mm and a stainless steel clamp hook

* optional for stainless steel processing

Simple and user-friendly

FÖRSTER welding systems

Accessories

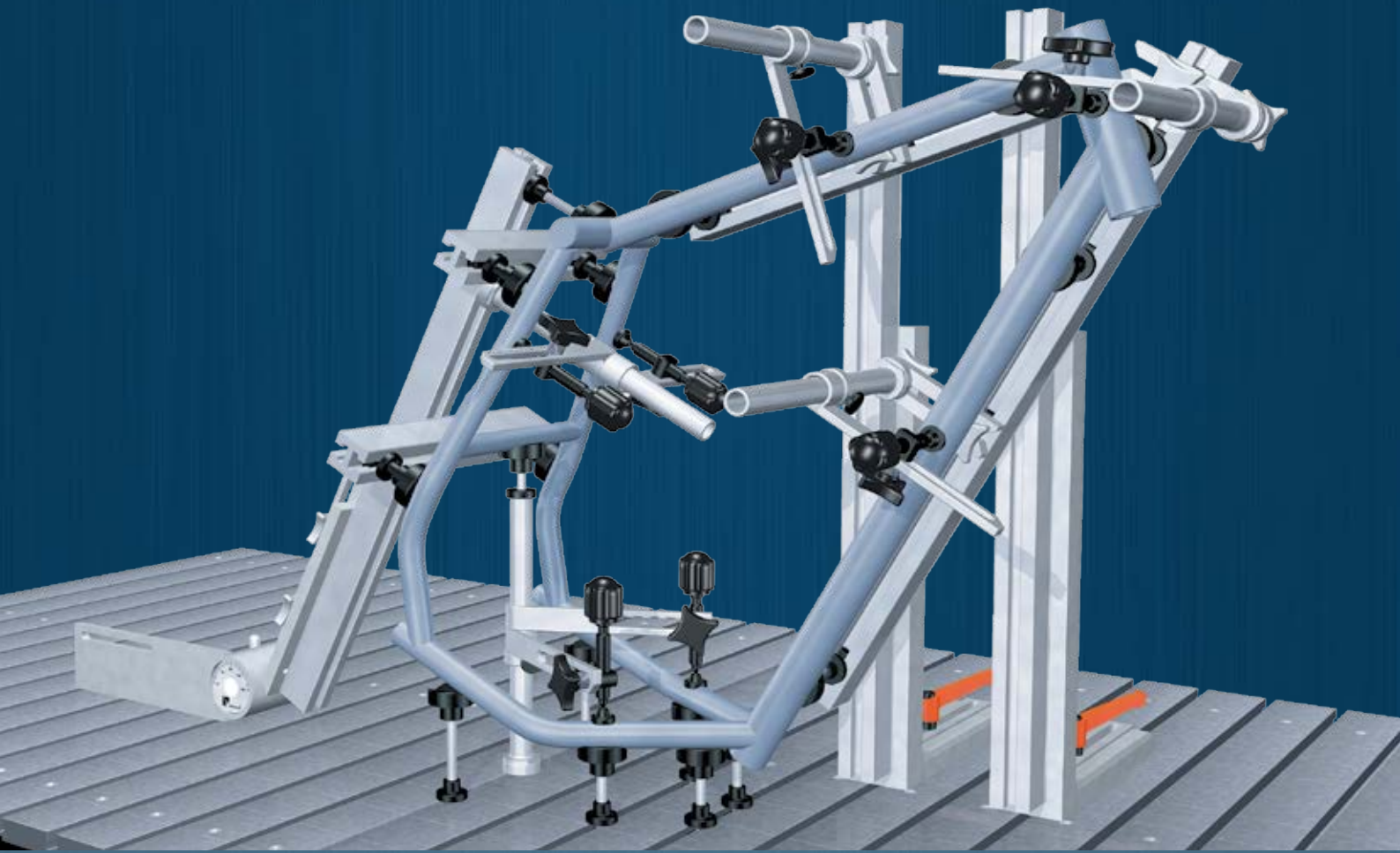
accessory cart 2090
1,000 x 800 x 1,650 mm, mobile, for storing a wide range of accessories

protection and maintenance agent
- plastic canister (10 litres) with spray bottle 2094
- spray bottle (1 litre) 2097
- 12 spray cans (400 ml) 2092

silicone-free, for deep ingress into the porous cast structure, which provides a safe protection against weld spatter adhesion

double T-slot profile 50 x 55 mm, sold by the metre on request

The profiles consist of a high-strength F 37 aluminium alloy. All Förster clamping elements and stops can be fastened in its standard 14-mm t-slot. The profiles can be used as an attachment for right-angle brackets as well as for building stop walls for 3-D sheet metal constructions. The profiles can be shifted and locked on two axes at the same time using the special connecting elements. Simple connectors and connectors for biaxial shifting are available as accessories.



Functional and practice-tested

cover plate 1601

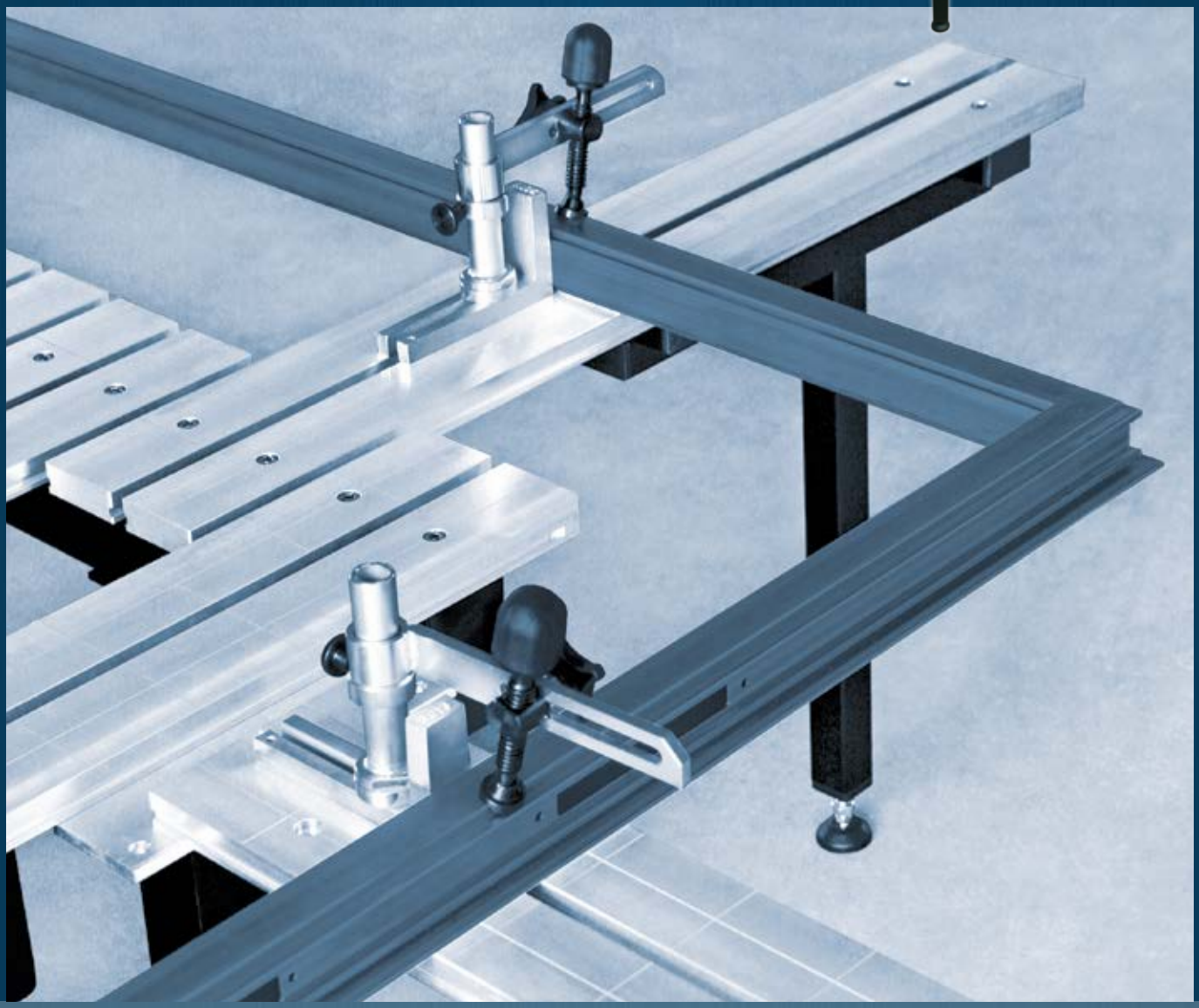
hardwood 200 x 100 x 30 mm, for protecting free areas of the frame when the tabletop is only partially covered by rails

table extension plate 1602

300 x 120 x 10 mm for connecting several tables (2 plates for each connection) or for extending the table with two cast rails and a support foot (can be attached to the long side and the front)

support foot 1604

for supporting two cast rails to extend the welding table



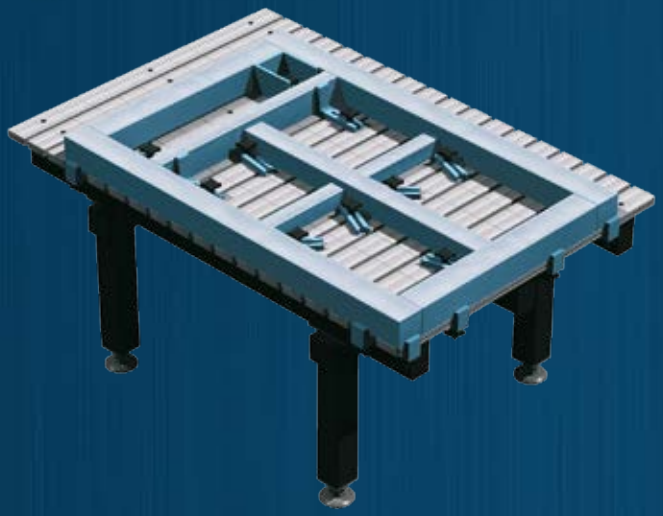
Frame construction

Combined with right-angle brackets, the edge of the table can be used as a straight or a right angle for frame constructions.

Flat stops or small right-angle brackets can be precisely positioned in the T-slot and then turned into the desired direction. They form a complex unit with the attached clamping element.

Equipment suggestion for frame construction

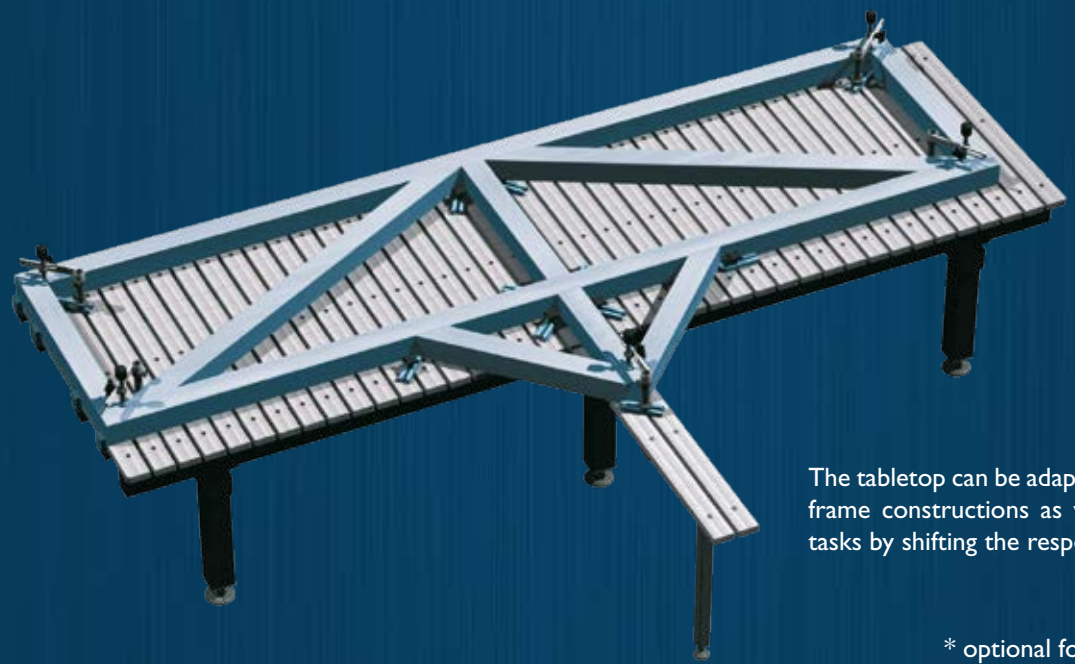
similar image



For smaller profile frames,
just insert – fasten – weld the components.

Accessories kit 1 for frame construction *

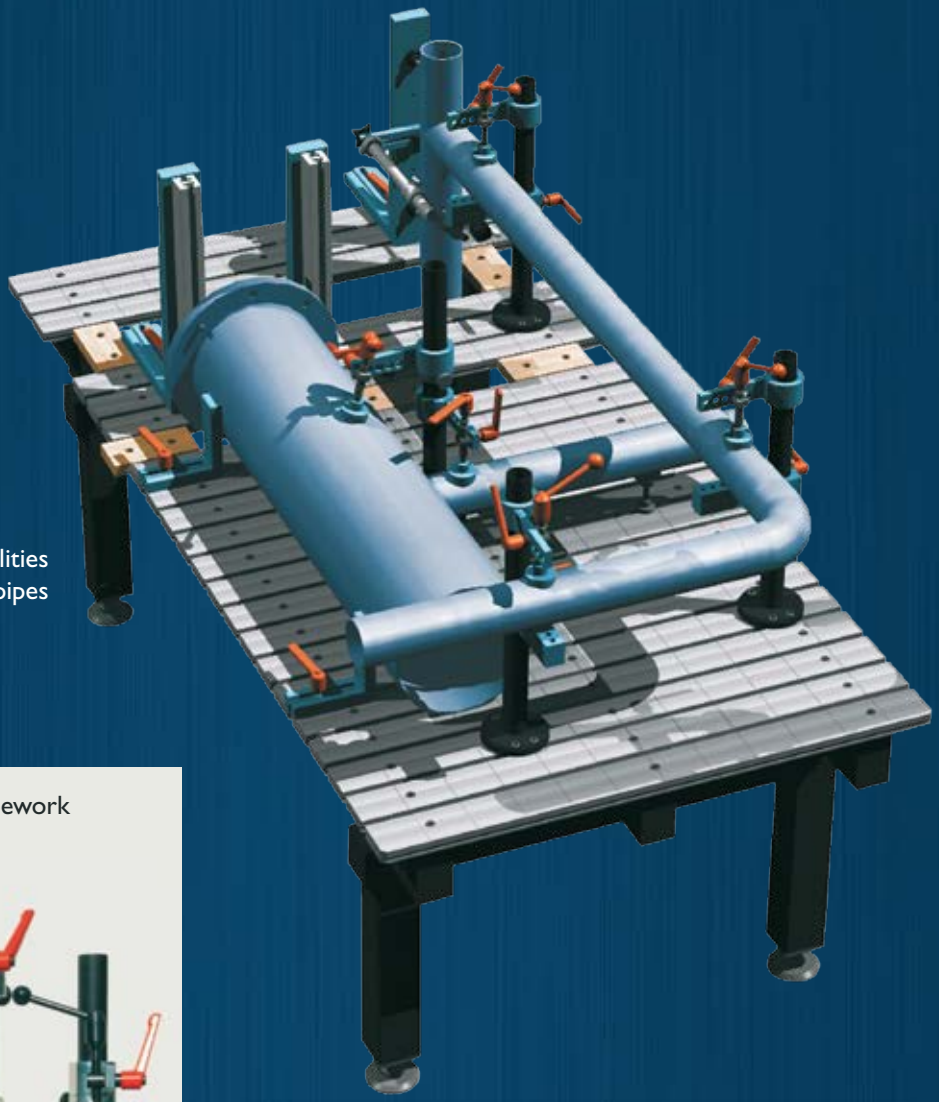
4 pcs	clamp arm (Ø 30 mm)	2010
4 pcs	clamping pole (Ø 30 x 350 mm)	2021
6 pcs	flat clamp	2040
5 pcs	right-angle bracket (table edge) (70 mm)	3010
12 pcs	flat stop (170 x 40 x 20 mm)	3012
6 pcs	quick-release clamp with flat stop	2042
4 pcs	right-angle bracket (tabletop) (100 x 170 mm)	3013
2 pcs	universal stop (350 x 350 mm)	3029



The tabletop can be adapted to large and protruding frame constructions as well as to individual work tasks by shifting the respective rails to the side.

* optional for stainless steel processing

Pipework



various possibilities
for clamping pipes

Equipment suggestion for pipework

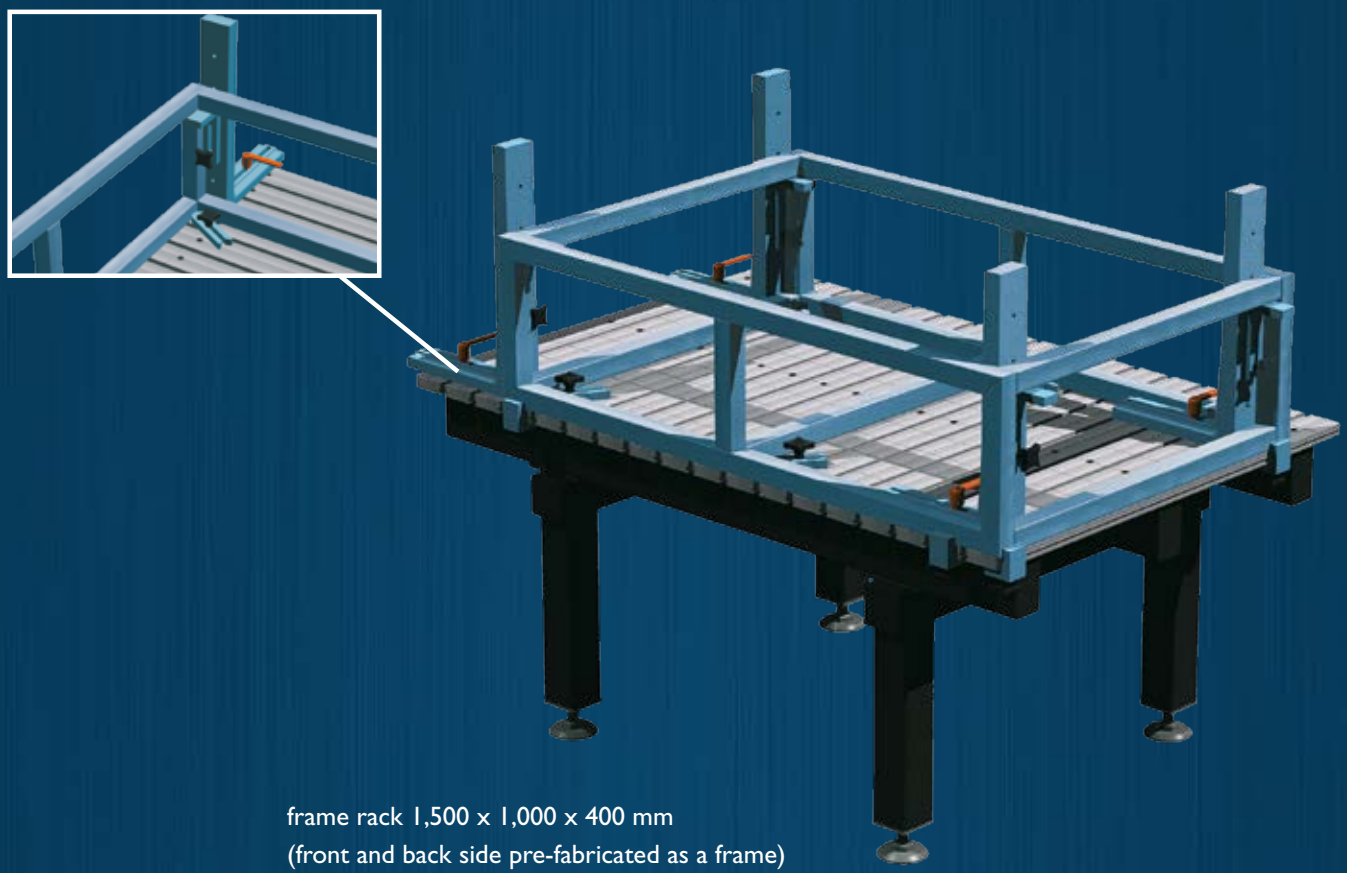
similar image

Accessories kit 2 for pipework *

6 pcs	clamp arm (Ø 30 mm)	2010
6 pcs	clamping tube (Ø 30 x 350 mm)	2021
4 pcs	clamping pole (Ø 50 x 350 mm)	2054
4 pcs	clamp arm (Ø 50 mm)	2050
4 pcs	right-angle bracket (table edge) (200 mm)	3011
4 pcs	supporting arm (Ø 50 mm)	2051
2 pcs	flange clamp with clamping pole (Ø 50 x 600 mm)	3030
6 pcs	v-block support (Ø 60 mm)	3020
4 pcs	v-block support (Ø 100 mm)	3021
4 pcs	right-angle bracket (tabletop) (100 x 170 mm)	3013
2 pcs	right-angle bracket (tabletop) (170 x 170 mm)	3014
2 pcs	right-angle bracket (tabletop) (600 x 350 mm)	3015

* optional for stainless steel processing

Rack and case construction



frame rack 1,500 x 1,000 x 400 mm
(front and back side pre-fabricated as a frame)

Equipment suggestion for
rack and case construction

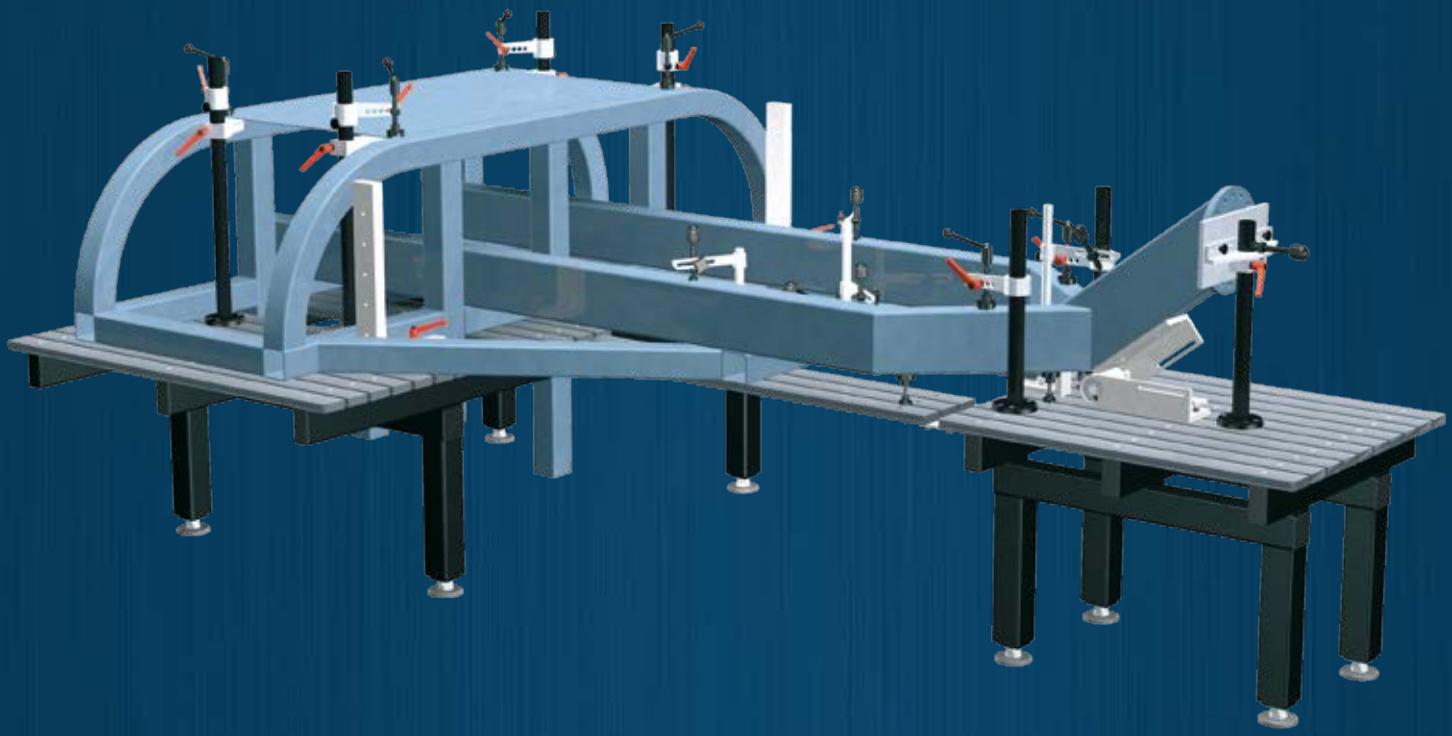
similar image

Accessories kit 3 for case construction *

6 pcs	clamp arm (Ø 30 mm)	2010
6 pcs	clamping pole (Ø 30 x 350 mm)	2021
4 pcs	flat clamp	2040
4 pcs	clamp arm (Ø 50 mm)	2050
4 pcs	supporting arm (Ø 50 mm)	2051
4 pcs	clamping pole (Ø 50 x 900 mm)	2054
5 pcs	right-angle bracket (table edge) (70 mm)	3010
6 pcs	flat stop (170 x 40 x 20 mm)	3012
4 pcs	right-angle bracket (tabletop) (100 x 170 mm)	3013
2 pcs	right-angle bracket (tabletop) (170 x 170 mm)	3014
2 pcs	right-angle bracket (tabletop) (600 x 350 mm)	3015
1 pc	continuously adjustable angle (350 x 350 mm)	3019
2 pcs	universal stop (350 x 350 mm)	3029

* optional for stainless steel processing

Universal construction



Equipment suggestion for universal construction

similar image

Accessories kit 4 for universal construction *

6 pcs	clamp arm (Ø 30 mm)	2010
6 pcs	clamping pole (Ø 30 x 350 mm)	2021
4 pcs	flat clamp	2040
2 pcs	clamp arm (Ø 50 mm)	2050
2 pcs	supporting arm (Ø 50 mm)	2051
2 pcs	clamping pole (Ø 50 x 900 mm)	2054
3 pcs	right-angle bracket (table edge) (70 mm)	3010
2 pcs	right-angle bracket (table edge) (200 mm)	3011
6 pcs	flat stop (170 x 40 x 20 mm)	3012
4 pcs	right-angle bracket (tabletop) (100 x 170 mm)	3013
2 pcs	right-angle bracket (tabletop) (170 x 170 mm)	3014
2 pcs	right-angle bracket (tabletop) (600 x 350 mm)	3015
1 pc	continuously adjustable angle (350 x 350 mm)	3019
4 pcs	v-block support (Ø 60 mm)	3020

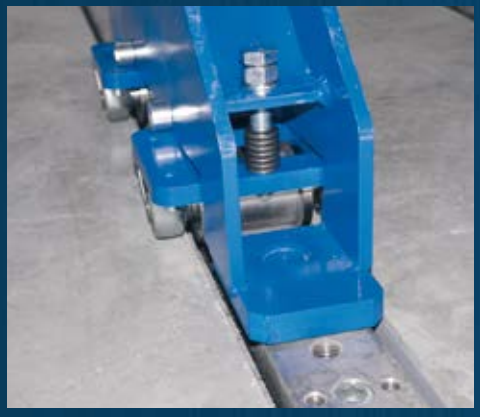
* optional for stainless steel processing

Floor rail system

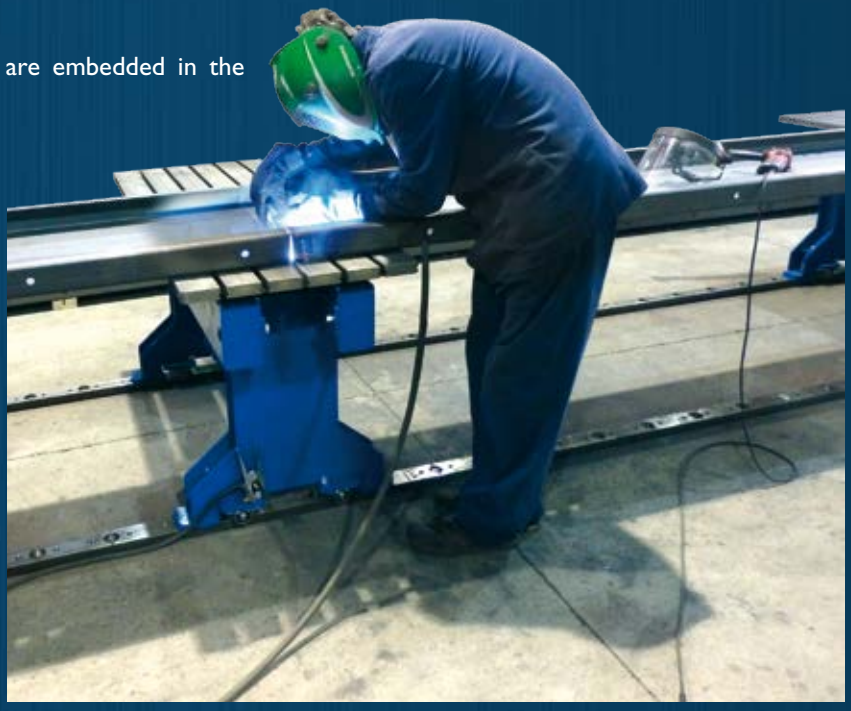
Table bridges
width: 800, 1,000, 1,500, 2,050, 2,450, und 3,050 mm
Standard heights: 470 and 870, plus rail
Standard length: 500 mm

Individual tables or table bridges can be moved parallel and in series as well as fixed on levelled rails in the entire hall.

The rails and the respective adjusting screws are embedded in the floor.



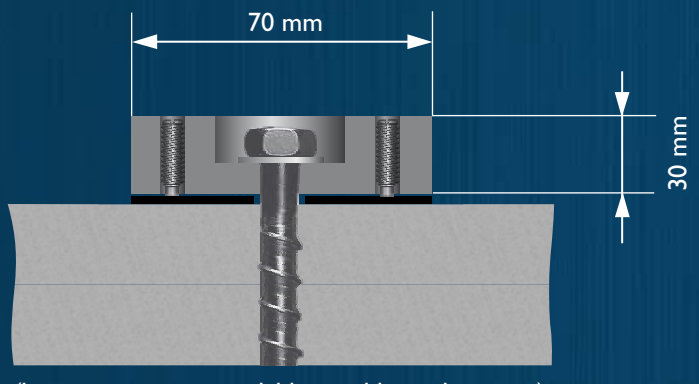
Those rails are also used for fastening in plant and mechanical engineering.

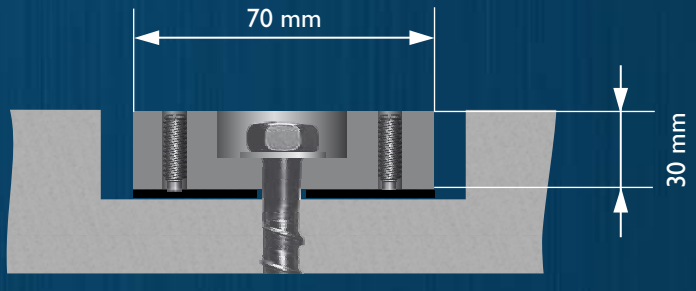


For mobile table bridges and plant assembly

Rail system for table bridges

can be installed into or embedded in the concrete foundation





(bumpers or ramp available as additional options)

FÖRSTER welding systems

Ergonomic welding tables

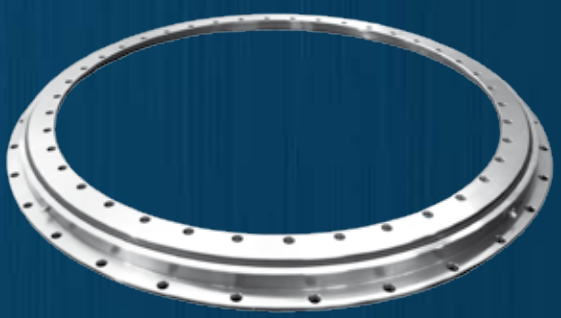
lifting and rotating

adjustable in height

stable telescopic legs, manually adjustable

Welding table with swivel function

By integrating a slewing ring, the tabletop can be swivelled by 360° and fixed in any position.



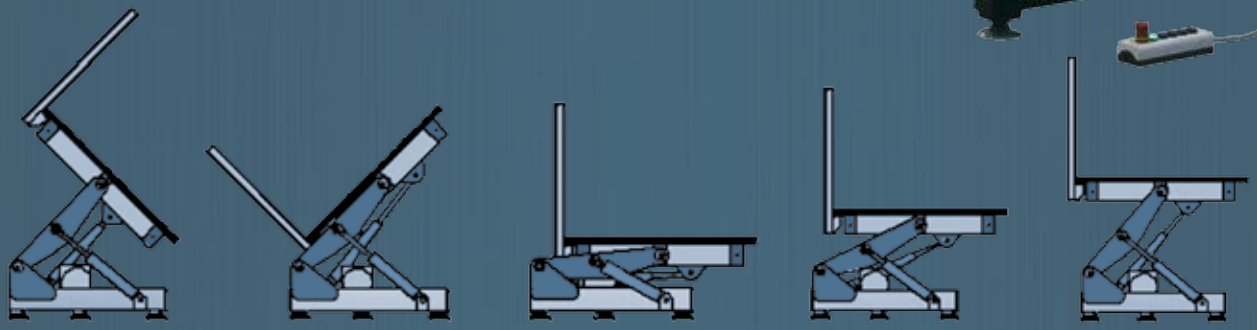
for rotating, tilting and pivoting

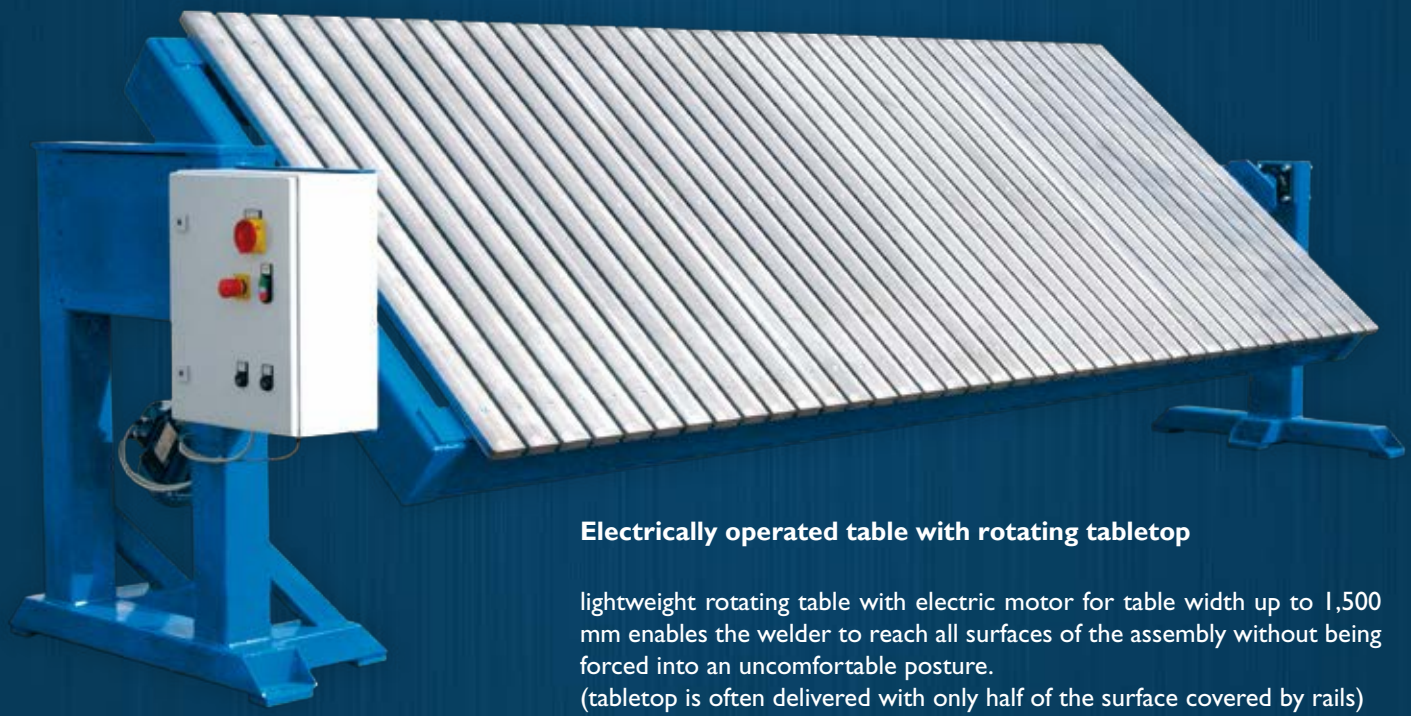
lifting and tilting

Welding table with lift and tilt function

Working surface 3,000 x 1,500 mm
(other sizes available)

independent electrohydraulic lifting and tilting operation lifts from 590 - 1,050 mm and tilts 2 x 45° for loads up to 2,000 kg





Electrically operated table with rotating tabletop

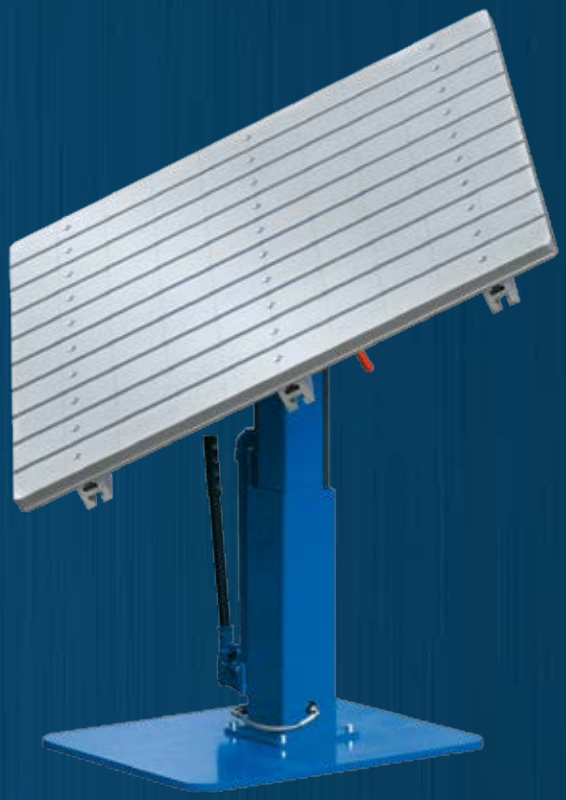
lightweight rotating table with electric motor for table width up to 1,500 mm enables the welder to reach all surfaces of the assembly without being forced into an uncomfortable posture.
(tabletop is often delivered with only half of the surface covered by rails)

FÖRSTER welding systems

Ergonomic welding tables

Manipulator Ergofix

- tabletop 800 x 800 or 1,000 x 1,000 as Al-Cu alloy
- continuous hydropneumatic adjustment of the tabletop height from 690 to 990 mm
- rotatable by 360° with continuous locking
- up to 45° manually tiltable



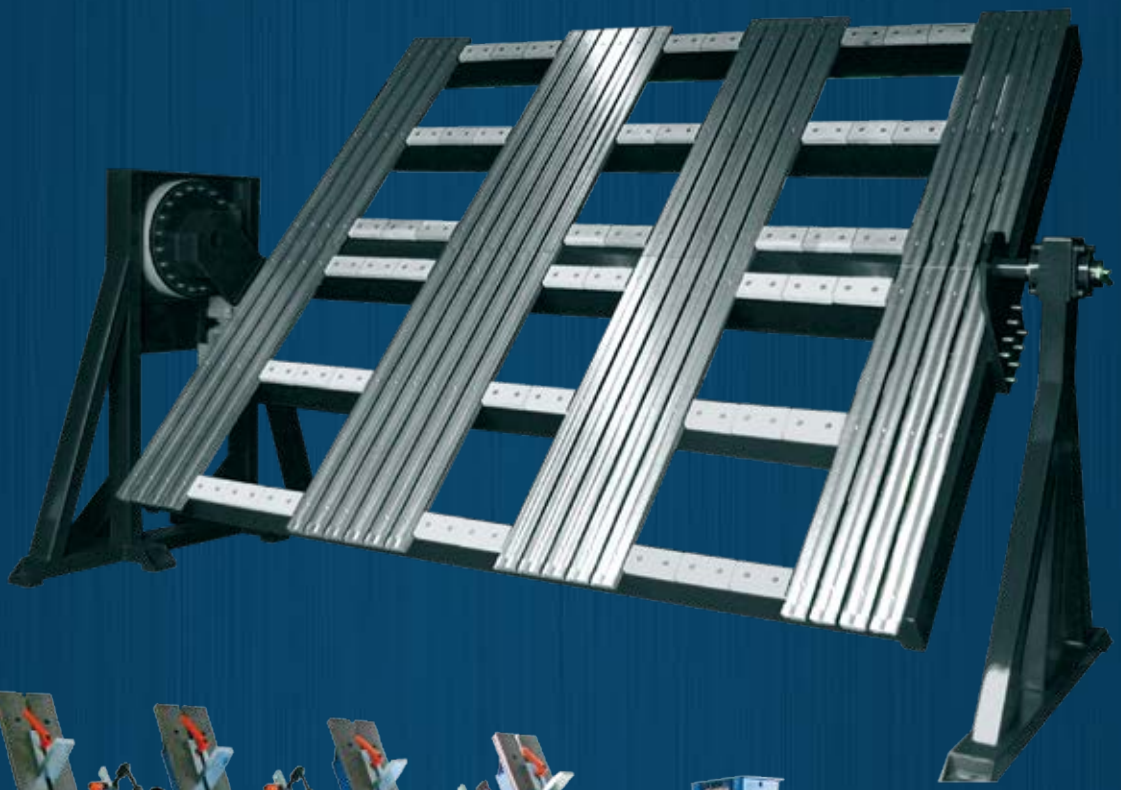
Vacuum clamping system - Vacufix®

- for robotic welding and manual welding of sheet metal constructions
- maximum accessibility to welding seams
- for secure 3-D fixing of plates and profiles
- vacuum clamping plates for high temperatures

for rotating, tilting and turning

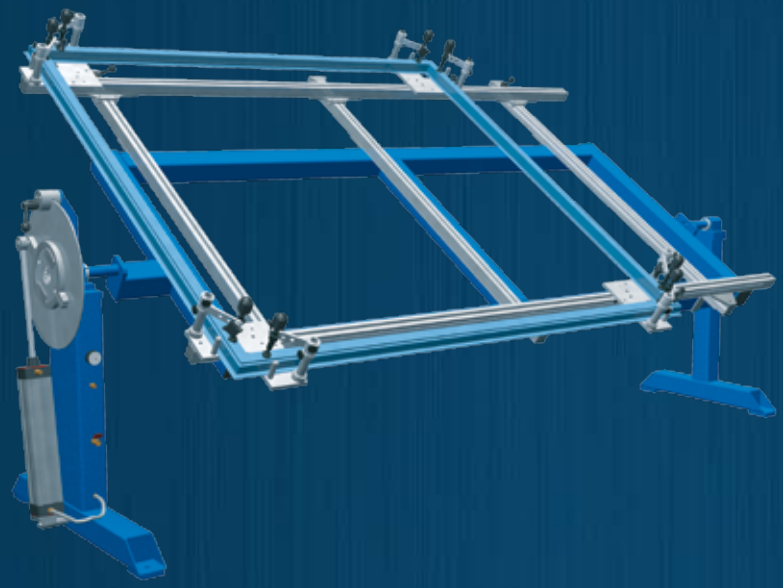
Welding positioner – lift table with rotating tabletop, operated by an electric motor

tabletop can be rotated by 360°
enables the welder to reach all surfaces of the assembly without being forced into an uncomfortable posture (tabletop is often delivered with only half of the surface covered by rails)
The component can be turned into the flat position.



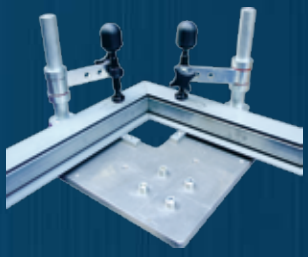
Lift table with rotating tabletop and movable traverses

Frame welding fixtures



Frame welding fixture
4100, 4200, 4300, 4400

- parallel movable, exactly according to the scale
- Roundly welding with clamping corner braces that have been specifically designed for this purpose
- with pneumatic load balancing system for wider, non-centrally positioned frames



For welding on additional bars, we offer optional cross beams with stops or clamping corners.

Frame welding fixture 4500, with electric motor
(heavy versions)

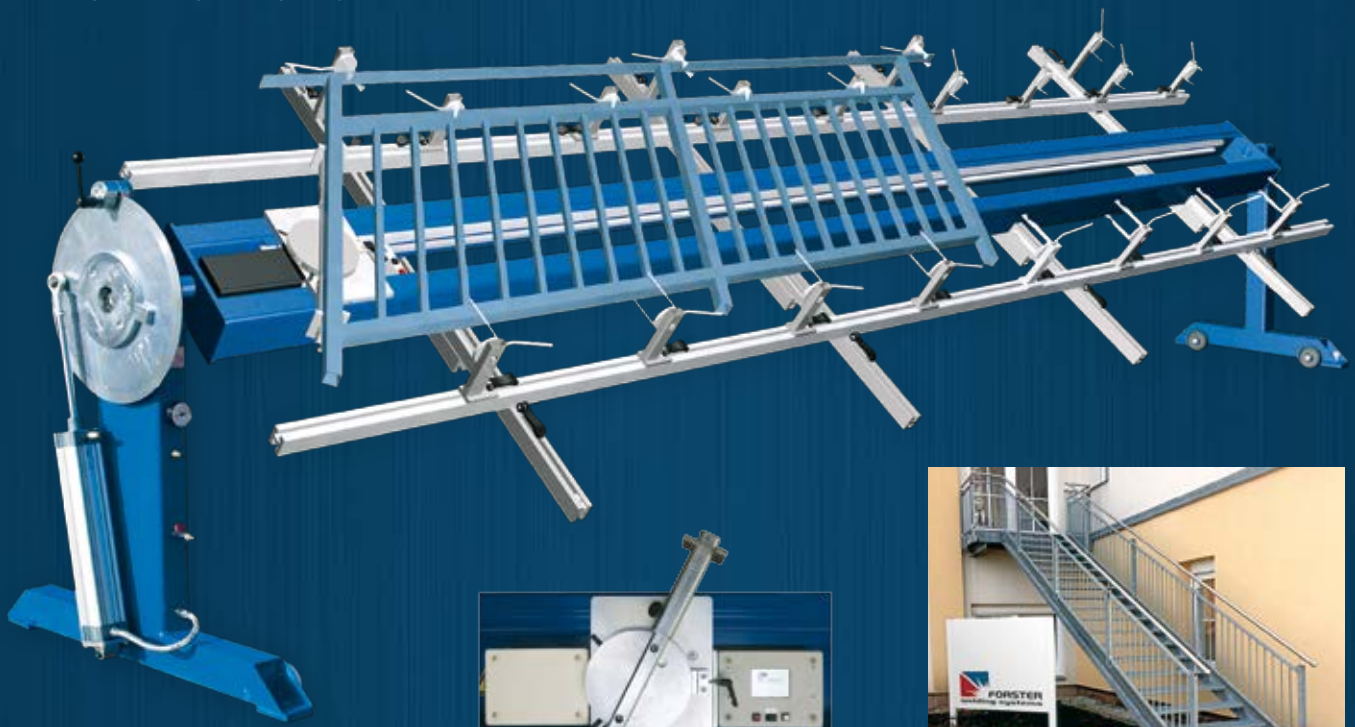
- parallel movable along the x-axis and exactly according to the scale
- movable along the y-axis using a digital display
- standard delivery with one fixed cross beam and a moveable cross beam
- alternative solution with additional cross beams
- alternative solution with programme-controlled moving
- alternative solution with pneumatic centering and clamping
- alternative solution for robotic welding

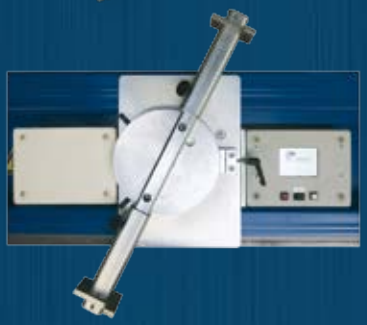
	4100	4200	4300	4400	4500
frame size (in mm)	1,500 x 3,000	1,500 x 3,000	2,000 x 3,000	2,500 x 3,000	3,000 x 4,000
max. working load (in kg)	50	100	100	100	200
swivel range	360°	360°	225°	225°	225°
load balancing system	-	pneumatic	pneumatic	pneumatic	with electric motor
locking brake	manual	manual	manual	manual	with electric motor

Railing welding fixtures for railings and fences

Railing welding fixture with simple programming

- with front, middle and end post
- with handrail, top and bottom chord
- with all possible spindle spacings



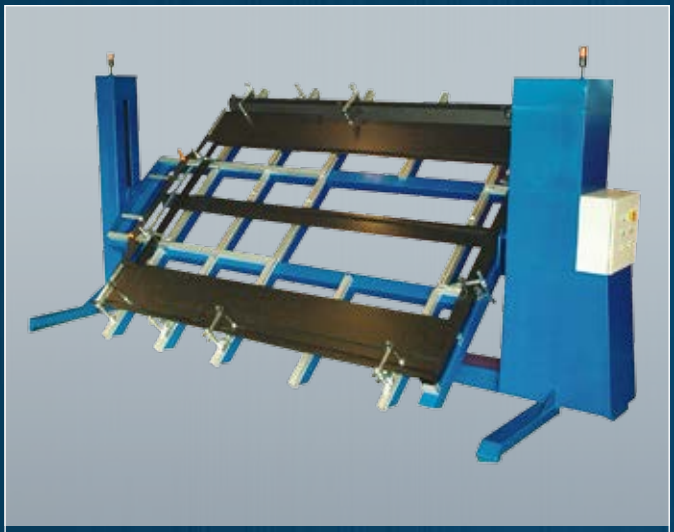


Technical features:
- very stable construction
- inserting, tacking and welding always in the optimum position
- holders for handrail, top and bottom chord are available as "centric clamping units"
- the slope angle for banisters can be directly selected at the driving carriage
- the spindle spacing and the number of equal spindles are entered into the touch display
- driving carriage with the holding device for the spindles moves to the next position at the touch of a button
- positioning of the spindles is freely programmable
- the control is equipped with a touch display and an absolute encoder, which prevents checksum errors

	4225	4226	4227
railings length (in mm)	5,000	6,500	7,000
railings height (in mm)	600 - 1,200 (450 - 1,200 optional with special accessories)		
railings angle (in mm)	0 - 60		
spindle spacing	from 0 to unlimited		
max. working load (in kg)	150		
swivel range	360°		
load balancing system	-	pneumatic	pneumatic
battery capacity of the driving carriage	> 8 h		
locking brake	manual		

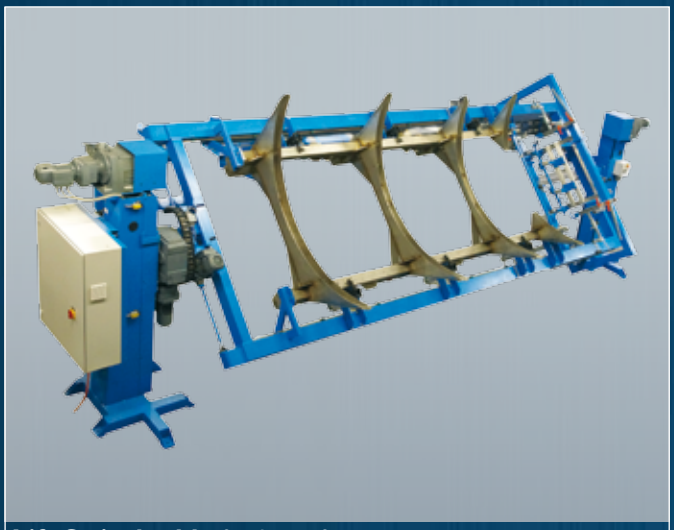
FÖRSTER welding systems

Special fixtures and jigs

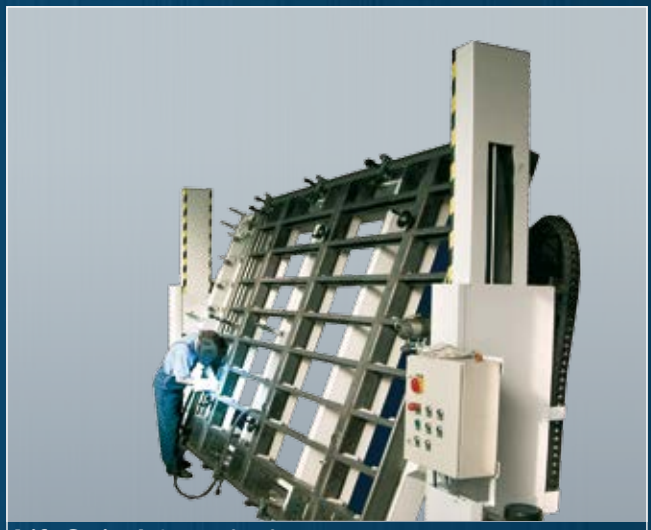


Lift-Swivel table for large frame constructions

Swivel device for welding of components



Lift-Swivel table for large frame constructions



Lift-Swivel device for frame constructions

Grinding-Station with platform

Roller bed

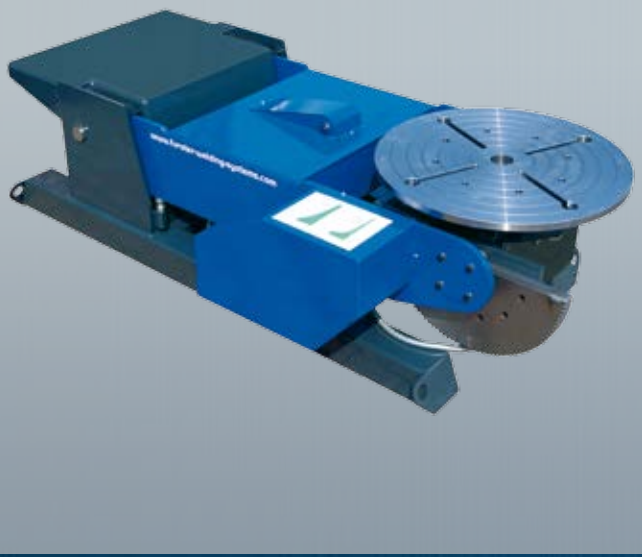
Manipulators & positioners

rotate – axis 1

rotate – axis 2

lift – axis 3

Welding manipulator



Rotating tilting positioner
with lifting, turn and tilt function
with face plate or slotted tabletop

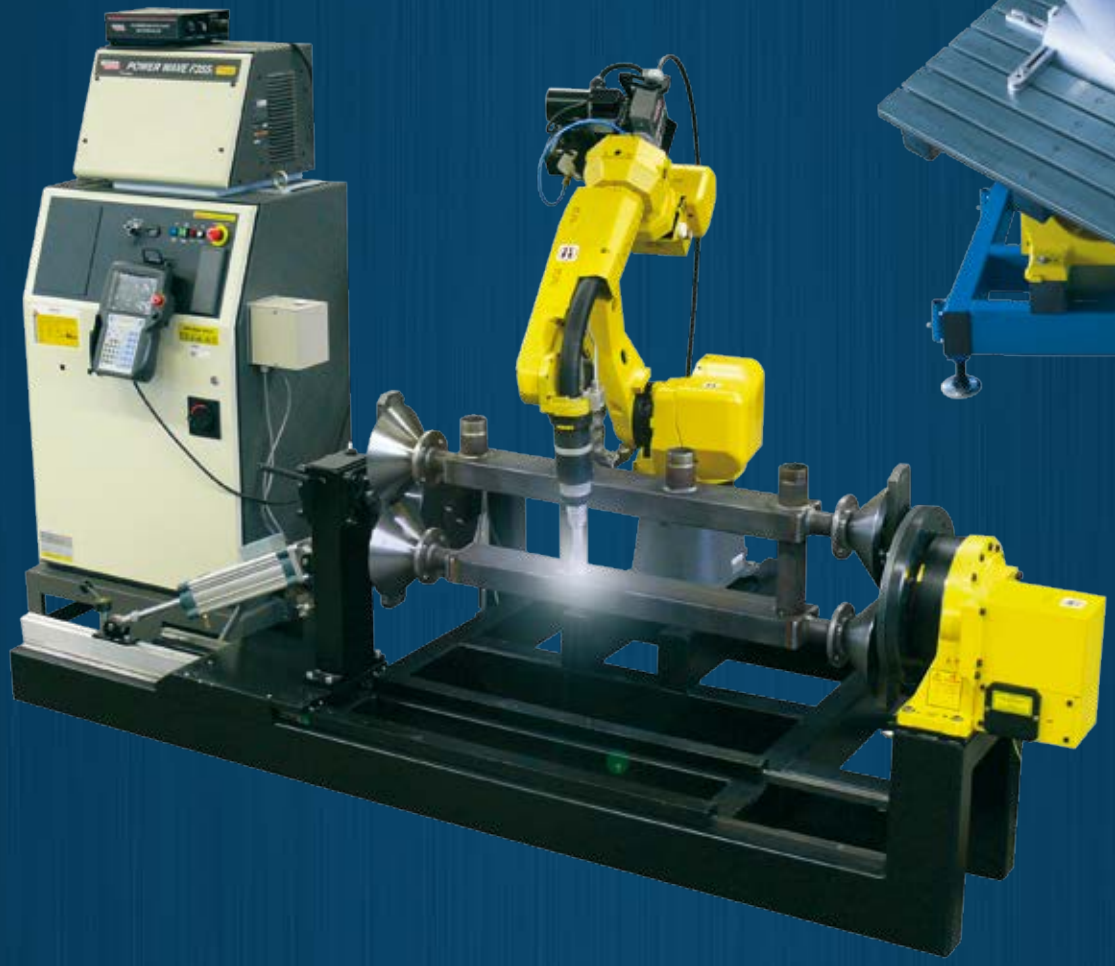
Turntable positioner
with parallel lifting, turn and tilt function
with face plate or slotted tabletop

FÖRSTER
welding systems

System house

As a system house for complete welding solutions, we build your individual robotic welding system combining:

- our many years of experience in all areas of welding technology
- our extensive capabilities in plant and facility engineering
- the in-house component programming with comprehensive support and training of your staff as well as sample welding and welding optimisation
- The integration of safety equipment such as safety enclosures, fume extraction and other components



for FANUC-Robotics

Standard welding tables for robotic welding are appropriate for small and medium quantities, in which case the application of fixed devices would serve no purpose. Using our slot system, it is possible to quickly build simple devices yourself and to bolt them for repeatability.

FÖRSTER welding systems

Welding automation

Automated frame manufacturing with welding robot

Submerged arc and MIG/MAG welding systems
with mast and portal

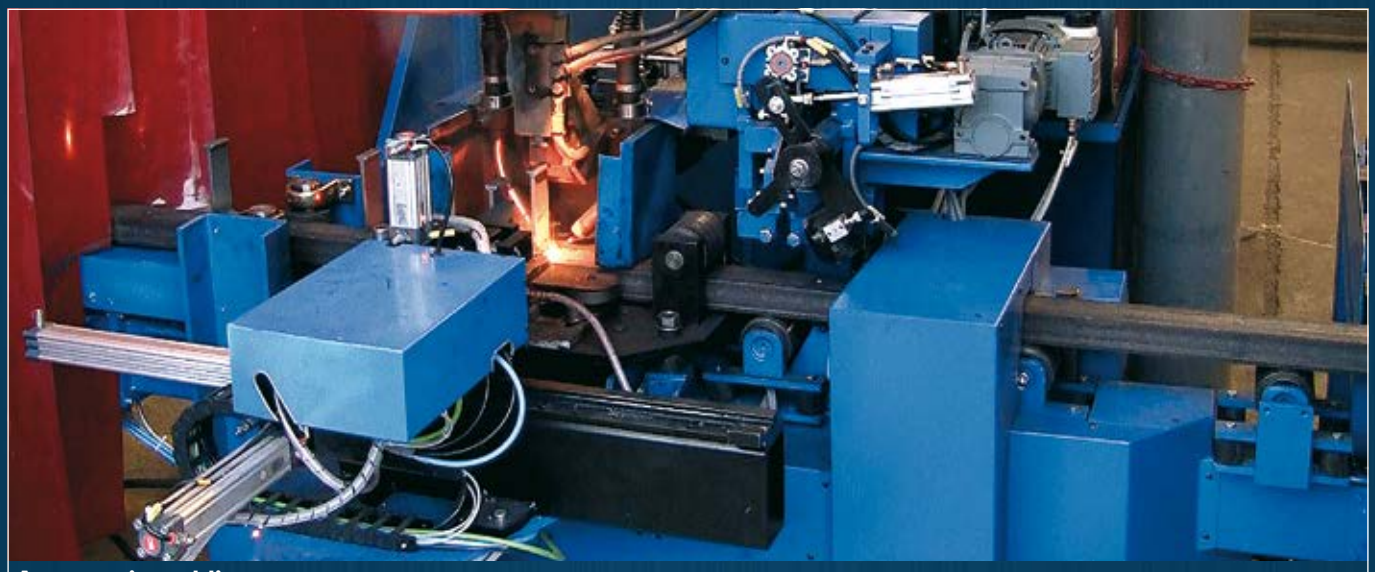
UP-welding with robot
with positioner with parallel lifting, turn and tilt function

Welding automation

Mechanised welding of longitudinal seams

Automated welding with welding robot

Mechanised welding of circumferential welds



Automatic welding system

FÖRSTER
welding systems

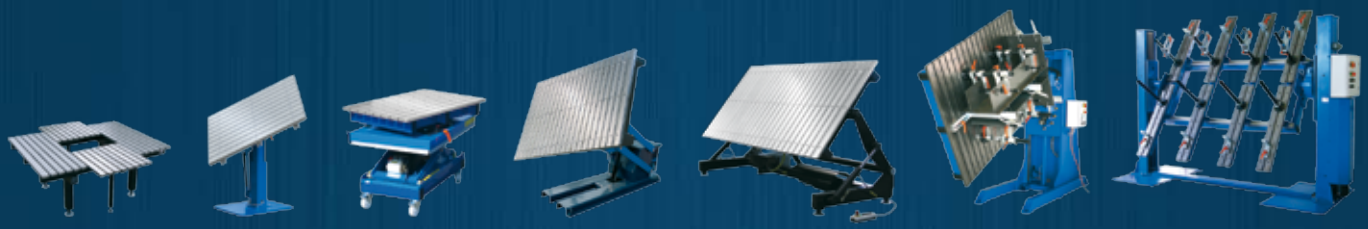
FEDERAL PRIZE 2011
FOR OUTSTANDING INNOVATIVE ACHIEVEMENTS IN THE TRADE SECTOR

BAVARIAN STATE PRIZE 2002

BAVARIAN STATE PRIZE 1997

HANDCRAFT AWARD 1997

30 years of experience in the rationalisation of welding production processes enable us to find a solution for almost each request of our clients. Thus, a vast number of innovative, patented solutions have been developed since the Förster family business has been founded.
Most of our production is completed in-house, which allows us to provide fast and high-quality solutions for specific requests of our clients.



Our fields of work:

- own construction and development department
- own CNC production
- 3-D welding table installation
- production of special fixtures and jigs
- manufacture of welding machines and robotic systems
- welding plant service and sales
- welding accessories, additional materials and gases
- training and customer support
- welding technological consulting

Dipl.- Ing. (EWE) Rainer Förster

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Gefördert aus Mitteln der Europäischen Union