



Plastic Welding Technology



Special Welding Machines for Plastics

# Extract from our production of special purpose machines

## WIDOS CNC 3.0 for serial production

The CNC control unit stores all data of the welding process in the RAM-memory or on a PCMCIA-card, adding a free selectable product number. This product number which can e.g. refer to the welding job, is entered over the keyboard or by means of ISO barcode. Due to this arrangement, all the relevant data of the welding process including your own product number can be entered, and the complete traceability of all parameters of production is thus guaranteed. The data are stored in ASCII-code thus enabling the further processing by means of standard software.

The standard control with illuminated two-lined display is designed very rugged and proofed in the hard conditions on-site. As option, additional keyboards are available for running all functions of the machine individually. This option is an optimal help especially for set-up and service works and can be operated intuitively due to the hereby used symbols. All functions are secured against each other so that critical movements, such as crashes, are not possible.



# Extract from our production of special purpose machines

## WIDOS 2500 pneumatic CNC

Welding machine for the welding of branch tees, with special clamping tools for thin-walled bows and forked pieces, automatic centering of the parts and alignment check in horizontal and vertical direction up to +/- 25 mm.



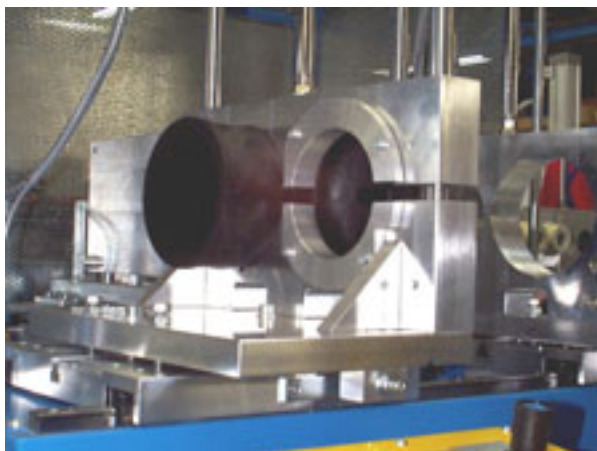
# Extract from our production of special purpose machines

## CNC-controlled welding of pieces made out of polyolefines, reinforced with GRP

Based on the WIDOS 2500 Pneumatic CNC, a welding machine for pieces made out of polyolefines reinforced with GRP was realized.

### Highlights of the equipment:

- pneumatically driven machine for a weld without internal bead
- tools with the possibility for alignment check in vertical and horizontal direction
- higher work safety through a transparent protective hood on shock absorbers
- different antistick-coated cover plates for the heating element
- serial interface for transfer of data onto pc or printer



# Extract from our production of special purpose machines

CNC-controlled welding of thin-walled exhaust pipes for heating and hot water boilers

Based on the WIDOS 2500 Pneumatic CNC, a socket-welding machine for thin-walled exhaust pipes for heating and hot water boilers was realized.

## Highlights of the equipment:

- designed for the multiple welding of as much as 4 pipes in one step
- controlled moving and clamping inside-plugs on basis of resistant silicone
- variable pipe supports for different lengths of the parts
- maximum length of pipes: 2 m



# Extract from our production of special purpose machines

## WIDOS 2500 P CNC

Pneumatic welding machine for the workshop with CNC controlled welding process for welding and riveting heat exchangers.

The machine in its modular construction is equipped with a special heating element comprising three different methods: heating element butt, high temperature and infrared welding. Input of the necessary welding parameters is very easy due to a comfortable user guidance on the display of the control. The work pieces are clamped by means of pneumatic devices which can be tooled with inserts according to the different piece dimensions. The form of the pieces to be welded does not play a role here since the clamping inserts are totally free in design.

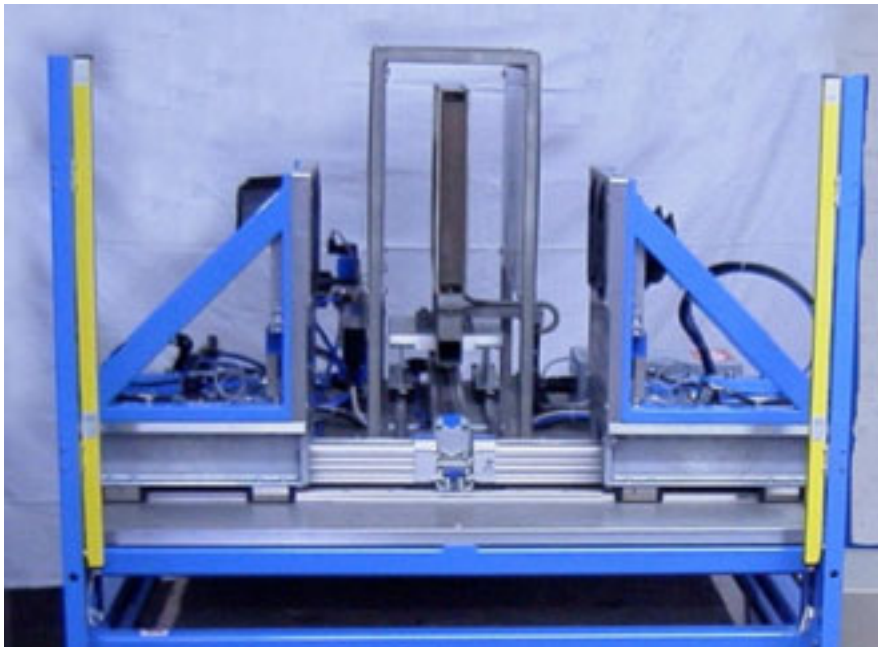
Due to an additional arrangement, a large number of riveting dies can be mounted in an extremely close scheme on the heating element, e.g. for a tight and loadable sealing of more than 1500 tubes of a heat exchanger with a carrier plate in one step.



# Extract from our production of special purpose machines

## WIDOS 2500 P CNC

Pneumatic welding machine for processing automatically pieces for the automobile industry made out of PP. Bench-type design for the simple integration in an automatic production line with universal interfaces for pieces insertion by robots. The maximum working welding surface is limited to 200 x 200 mm. The here presented configuration is equipped with double tools for the simultaneous welding of two pairs of work pieces. When the machine is operated by persons, the insertion area can be secured against unauthorized access by means of a light barrier.



# Extract from our production of special purpose machines

## WIDOS 2500 P CNC

Pneumatically controlled welding machine for the simultaneous production of several filters for pharmaceutical purposes in one cycle. The machine has completely been designed to fulfil clean room requirements and can weld simultaneously in one cycle both the connecting caps and the connecting pieces onto both sides of two pharmaceutical filters. The workpieces are fixed pneumatically in the basic clamping devices with reductions specific to the pieces. For a contactless heating of the pieces to be welded, both heating elements are designed as infrared radiators. Optional nonstick-coated top plates for a normal heating element butt welding process can be mounted on these heating elements. In addition, one heating element is split to protect the cores in the inside from being damaged during heating and displacing. In the automatic cycle, a straightening plate is swivelled in before starting the welding process so that the manually inserted workpieces can be aligned.

The clamping devices are adjusted to the different dimensions of the components by means of manual stops and reductions specific to the filter diameters. The machine inclusive integrated connections for the suction device has a complete housing made from special steel. This enables an extremely clean production in accordance with the requirements of the pharmaceutical industry. The laser labelling of the pieces could be integrated in the welding cycle over an additional interface. Expanding the machine with a full automatic unit for insertion and removal of the workpieces is also possible over standardized interfaces.





# Extract from our production of special purpose machines

## WIDOS 2500 S CNC

Servo controlled welding machine for the highly precise fabrication of series components. The machine is driven by means of servo and ball screws, beared on precise linear guidances. Due to this arrangement, the path tolerance of the tables is within 0.03 mm to the regulation of the joining path, and different speeds within the process can be selected. The tools, such as heating element and straightening plate, are positioned within a tolerance of +/- 0.1 mm. The workpieces are tightened pneumatically in the basic clamping tools by means of reduction inserts specific to the pieces.

Specialities: the heating element is designed as infrared – radiator, which enables a contactless heating up of the pieces. As option, nonstick coated tops can be mounted on this heating element for a standard heating element – butt welding operation. In addition, a divided heating element is available in order to not damage parts within the workpieces, such as boards or cables, during heating up or moving. In the automatic cycle, a straightening plate is driven in before welding for an exact alignment of the workpieces at manual feeding. With the WIDOS 2500 S CNC average series up to approx. 100.000 pcs. / year can thus be fabricated in a rational and highly precise way.



# Extract from our production of special purpose machines

## WIDOS 2600 S CNC

Servo-pneumatic workshop machine with CNC controlled welding process for welding manholes.

This very rugged machine with a servo-controlled welding process and pneumatically moved tools in modular construction is equipped with a special heating element comprising three different methods: heating element butt, high temperature and infrared welding.

The servo-pneumatic welding process allows highest dynamic and exact positions so that even short-cycle materials can be processed. In addition, either force-control or way-limitation can be selected as joining method.

The work pieces are clamped by means of pneumatic devices which can be tooled with inserts according to the different piece dimensions. The form of the pieces to be welded does not play a role here since the clamping inserts are totally free in design.

Input of the necessary welding parameters is very easy due to a comfortable user guidance on the display of the control.

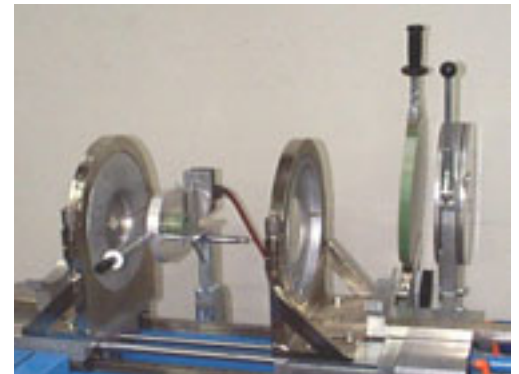


# Extract from our production of special purpose machines

## CNC-controlled butt- and socket-welding machine

Based on the WIDOS 4002, a welding machine for CNC-controlled butt- and socket-welding of polyolefine tubes and fittings was realized for the dimensions:

- OD 90 up to OD 400 mm - butt-welding
- OD 32 up to OD 160 mm - socket-welding



# Extract from our production of special purpose machines

## Pneumatic Welding Table 1000 x 500 mm

A pneumatic welding table with table dimension 1000 x 500 mm, separately movable for different heat-up and adjusting times, as well as vertically movable general-purpose angle brackets with threaded lattice for customer specific tooling. Heating element, 10 kW, with threaded lattice, moving in and out program-controlled, can be loaded by lateral forces in order to receive different adjusting forces and times, depending on the type. The joining force is indicated in newton, the range is going from 200 up to 3600 N. The control is based on relays, a cnc-control is available alternatively. The machine is equipped with a protective case in order to intensify the work safety.



# Extract from our production of special purpose machines

## Hydraulic Welding Table 1800 x 1500 mm

A hydraulic welding table with table dimension 1800 x 1500 mm, separately movable for different heat-up and adjusting times, as well as vertically movable general-purpose angle brackets with threaded lattice for customer specific tooling. Heating element, 50 kW, with threaded lattice, moving in and out program-controlled, can be loaded by lateral forces in order to receive different adjusting forces and times, depending on the type. The cylinders are height-adjustable for a central force application, the joining force is indicated in newton. The range of the joining force goes from 700 up to 18000 N. The control is based on relays, a cnc-control is available alternatively. The machine is equipped with a protective case in order to intensify the work safety.



# Extract from our production of special purpose machines

## Special machine for the welding of pump housings

Realization of a machine for the welding of pump housings. For side-mounted branches of the housings.



# Extract from our production of special purpose machines

## WIDOS Pneumatic Double Welding Machine

Full automatic welding machine, based on the infrared socket welding technology, with feeding from stacking magazines for minimum 50 sets of pieces.

The complete working process is CNC / SPS controlled with automatic removal from and refeed of the welding stations.

Welding is performed simultaneously on both sides of the basic pieces, the job is thus completed in one cycle.

The necessary cycle times are reduced to an absolute minimum by quick pneumatic components and very short process times due to the infrared technology.

Automatic supporting sockets and extremely short heat up times prevent the thin-walled pieces from sinking in. The output capacity is at about 120 pieces / h.



# Extract from our production of special purpose machines

## Fully automatic manhole welding machine

The installation is working on manholes with a diameter up to 1000 mm and a height of 500 – 800 mm. By means of the infrared-technology, a bottom is welded fully automatically and CNC controlled on the basic piece. The feeding also is performed automatically by transport on roller conveyors. The hydraulic welding motion of the machine is supported by pneumatic and electric drives respective conveyor means and a vacuum – clamping system for the bottoms.

The infrared welding technology enables a strong focussing of the heating energy which means that only the necessary surfaces are heated up but not adjoining parts. The heating elements are divided in separated control loops and sides ensuring a very exact constancy and distribution of temperature.

All operational steps are running CNC controlled, are traceable on a graphic display and can be performed separately in the manual mode. The repetitive accuracy of the machine is in a very close range of tolerance, is logged completely and is output for further treatment on pc through a serial interface. A SIEMENS SPS S7 300 with graphic operation panel OP 27 is used.

All wear parts are built on in special quick change attachments which means that after sales service or repair can be performed with a minimum of time.

The cycle times were rather reduced by overlapping operational steps. The output rate is at 15 parts per hour.





# Extract from our production of special purpose machines

## WIDOS Vertical Welding Machine

Vertical machine for the staggered production of manholes up to a dimension of OD 1000 x 1000mm height for the waste pipe technology. The machine has a vertical lift table for the reception of the respective manholes or auxiliary tools, a vacuum plate situated overhead and a vertically moved heating element. The pieces to be welded are inserted together manually, lifted hydraulically and separated automatically for the welding process by means of vacuum technology. The welding process is performed with infrared radiation or high temperature technology. Retractable stops and clamping devices allow an easy workpiece insertion. The welded pieces can be removed on the machine backside. Together with an optional automatic workpiece insertion, this ensures a continuous material flow. The heating element can be equipped with profiled top plates for special applications and is controllable in several zones. As safety devices, light barriers or protective doors are available.



# Extract from our production of special purpose machines

## WIDOS Welding Machine for Collectors

Manual machine for welding collector profiles onto the collecting pipes.

Including an integrate cutting device and a feed unit for an exact sizing of the pieces, controlled by servo.

The joining process is a combination of butt and socket welding, thus enabling the highest strength of the joint and accuracy to size.

During heating up and welding, the very thin-walled welding spigots of the collecting pipes are fixed by means of integrated rake-shaped supports. Thus the spigots are not deformed and keep completely open.

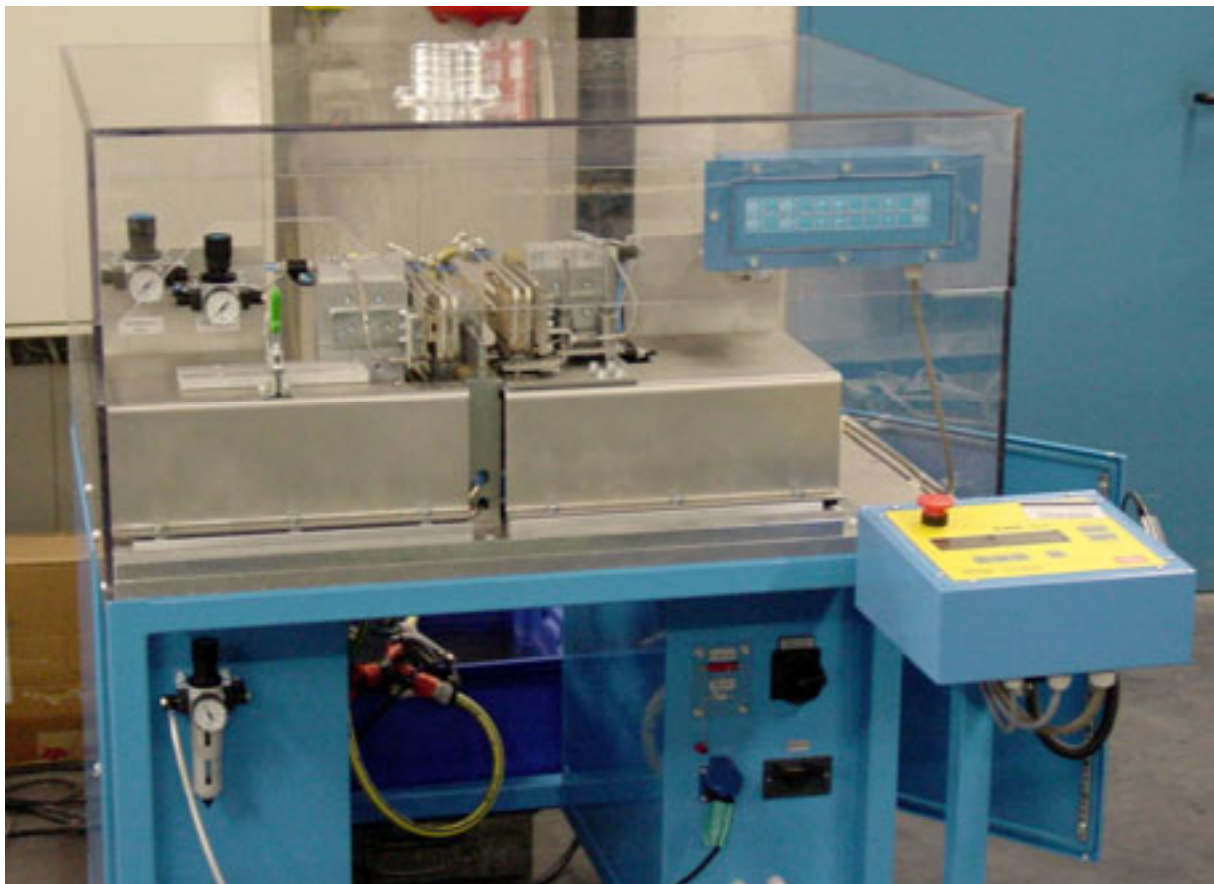
All machine motions are driven pneumatically by servo and can be started manually.



# Extract from our production of special purpose machines

## WIDOS Machine for welding stranded wires

Full automatic welding machine for manufacturing fluoro polymers in the aircraft industry. The machine with servo control joins protective covers and cables made out of PFA or FEP absolutely tightly and with high quality. The servo controlled movements realize high precise process courses, simultaneously from two sides. Due to a special mechanic, the machine parts move radially onto each other, the movements can be adjusted in all directions. The integrated water cooling allows extreme temperature differences and thus very short process times.



# Extract from our production of special purpose machines

## WIDOS "Grip-welding machine"

Special purpose machine for the automatic parallel welding of one grip each on both fronts of plates.

For plate dimensions of 250 x 250 mm up to 1500 x 2000 mm, up to a thickness of 100 mm, grip dimensions maximum 400 x 400 mm, up to a thickness of max. 100 mm.

The position of the grips can be freely chosen in all three dimensions. The welding process is running automatically after input of the parameters, all movements of the machine run pneumatically. All settings such as plate dimension, welding position and welding parameters can be adjusted continuously.

Fields of application:

- welding of lateral add-on pieces on plates or fittings
- transport grips or handles as insert devices into registers
- partial enlargement of areas



# Extract from our production of special purpose machines

## Diaphragm welding machine

A fully automatic CNC-controlled machine was realized with a combined hydraulic and pneumatic control for the simultaneous bonding of 3 plastic sheets to one diaphragm. The machine was specially designed for PP sheets of dimensions between 470 x 470 mm up to 2,000 x 1,500 mm. The change-over time is at 4 sec only.



# Extract from our production of special purpose machines

## WIDOS Tool Tilting Welding Machine

Servo pneumatic controlled machine for the automatic welding of complete housings for cleaners. The pieces are welded with infrared radiation with servo-controlled welding stroke and servo-controlled tilting tables. For a simple workpiece insertion, the tilting tables are positioned horizontally with a lifting device, for the welding process, the tables are then tilted vertically and locked.

Customer specific workpiece holding devices can be mounted on the basic plates. The machine has been designed for pieces of a dimension up to 1000x500x500 mm. An optional light barrier in the area of intervention or a total case with protective door are available.



# Extract from our production of special purpose machines

## WIDOS Multiple Tool Welding Machine

Servo-pneumatic machine for the automatic welding of four different complete housings in flexible small series where a retooling is not necessary. The machine has two heating elements which are selected by the computer of the machine. The pieces are clamped on rotary towers; on each of the four sides of the tower, different pieces can be clamped. The heating elements and the tools are set-up program-controlled fully automatically. For a simple workpiece insertion, the rotary towers are positioned forward. For the welding process, the towers are then centered and locked. Most different workpiece holding devices up to a dimension of 1000 x 500 x 500 mm can be mounted on the universal plates. An optional light barrier in the area of intervention or a total case with protective door are available.



# Extract from our production of special purpose machines

## Spiral welding on of welding rods

With the construction of a completely new type of welding machine we have realized the spiral welding of usual in trade as well as of special welding rods onto the outside of pipes of the dimensions from OD 160 mm up to OD 315 mm, of any length.

To be pointed out are the automatic feed and the turning process with pneumatic clamping and control of pressing for the tolerance compensation of an out-of-round.





# Extract from our production of special purpose machines

## WIDOS Branch Welding Machine

Manual machine for welding reduced branches up to OD 315 in standard manholes up to OD 1000 for the waste pipe technology, particularly for welding corrugated or roller laminated pipes with profiled surface. The machine is mounted on a base frame for the reception of the pipes / manholes and has one tool carriage each for boring and for welding the branches. The heating elements and the boring tools are set-up manually. Due to the turntable and the linear bearing of the tools, every height and angle position can be easily reached without having to move the pipe / the manhole for that purpose. The integrated boring head produces exact round holes and is designed for highest cutting performance and a long working life. Due to the integration of the different work steps, a time-consuming handling of the pieces between boring and welding is not necessary.



# Extract from our production of special purpose machines

## Special welding machine for saddle welding

A pneumatic CNC-controlled machine in vertical design was realized with automatically in- and outjumping heating element in half-round form for saddle welding. The machine was specially designed for short change-over times for PVC and a simple handling of the set-up. The total welding process is running fully automatically after input of the parts.



# Extract from our production of special purpose machines

## WIDOS Friction-welding machine RSM 110

Rotation-friction-welding for the repetitive work

Automatic rotation-friction-welding machine for the simple and quick production of rotational symmetric weldings in repetitive work, up to OD 110 mm. With pneumatic chuck, pneumatic clamping tool and a free adjustable sequencing. Besides various safety guards, such as protective door and safety query, the machine offers the opportunity of manual operation. Automatic welding process after input of parameter.



# Extract from our production of special purpose machines

## WIDOS Friction Welding Machine RSM 160 S CNC

Fully servo controlled rotational friction welding machine for the precise serial production

CNC controlled rotational friction welding machine for the exact and quick serial production of dynamically balanced welding joints up to OD 160 mm. The drive of the rotational motion is based on a servo drive with high torque performance with exactly adjustable circumferential speed. Also the welding feed is performed by servos with precise ballscrews so that an exact welding process can be set and reproduced. The machine is equipped with pneumatic clamping devices for the rotating workpiece and for the fixed workpiece including quick change equipment for the different dimensions, with complete protective devices with safety inquiries as well as with a peeling device for the automatic removal of the external weld bead at the end of the cooling time. The welding process is controlled with the WIDOS CNC 3.0. The parameter sets are entered directly at the display of the control. Several sets can be stored in an internal data base and called again over a barcode system. All relevant desired and actual parameters are logged in the RAM and on PCMCIA in ASCII formate so that they can be stored and evaluated with a standard software.



# Extract from our production of special purpose machines

## WIDOS Friction Welding Machine RSM Vertical S CNC

Fully servo controlled rotational friction welding machine in vertical design for the precise serial production

CNC controlled rotational friction welding machine for the exact and quick serial production of dynamically balanced welding joints up to OD 400 mm. The drive of the rotational motion is based on a servo drive with high torque performance with exactly adjustable circumferential speed. Also the welding feed is performed by servos with precise ballscrews so that an exact welding process can be set and reproduced. The machine is equipped with pneumatic chuck for the rotating workpiece and with a manual clamping device for the fixed workpiece including complete protective devices with safety inquiries. The welding process is controlled with the WIDOS CNC 3.0. The parameter sets are entered directly at the display of the control. Several sets can be stored in an internal data base and called again over a barcode system. All relevant desired and actual parameters are logged in the RAM and on PCMCIA in ASCII format so that they can be stored and evaluated with a standard software.



# Extract from our production of special purpose machines

## Induction welding machine

A pneumatic CNC-controlled machine was realized with Siemens control type S 7 for the simultaneous bonding of two fittings each by means of induction heat. The machine was specially designed for short change-over times and a simple handling of the set-up. The total welding process is running fully automatically after input of the parts. The lot size is at about maximum 500,000 parts per year.



# Extract from our production of special purpose machines

## WIDOS IR-welding machine for mats

Automatic machine with pneumatical drive for the welding of mats with maximum 1 m at the end, up to a thickness of 1 - 10 mm, by means of IR-radiator. The welding process is running automatically after input of data, recording or CNC-control is available on request. The machine has extra large support tables and a gib for a simplified insert of the parts.

Versions up to dimensions maximum 3 m at the end and a thickness up to 30 mm are available on request.



# Extract from our production of special purpose machines

## Riveting machine

A pneumatic CNC-controlled machine was realized in vertical design with 12 automatically in- and outjumping specially coated heating elements for riveting up two plastic frames and an inserted leather bellow. The machine was specially designed for short change-over times and a simple handling of the set-up. The total welding process is running fully automatically after input of the parts.





# Extract from our production of special purpose machines

## WIDOS Riveting machine

Full automatic riveting machine for the sealing of injection holes made out of fluoro polymers. After feeding the parts, a protective cover is closed and the pieces are clamped automatically. Pressing the button "start" performs the automatic riveting cycle. The injection hole is preheated during an adjustable period and then sealed by means of a cold tool. This arrangement allows very short cycle times with high quality.



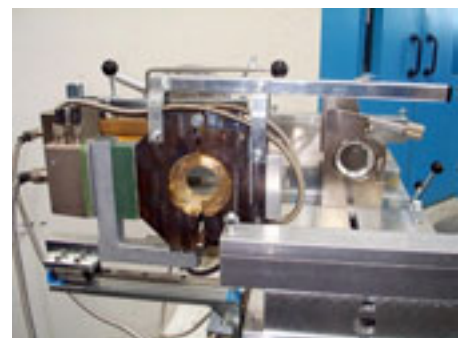
# Extract from our production of special purpose machines

## WIDOS PTFE - PFA Welding Installation

Welding installation in version for laboratory tests for working on PTFE and PFA pipes and foils. The installation is equipped with 3 different heating elements, is operated manually and has a CNC control unit for an exact regulation of the temperature with the capability of ramp functions. The sintering heating elements are realized in a flexible version in order to compensate the high thermal expansions of PTFE without leaving contractions in the welding area.

The different applications :

- Welding of PFA - pipes and fittings up to a diameter of 63 mm by means of IR - technology.
- Welding of PTFE - pipes up to a diameter of 60 mm by means of sintering technology.
- Welding of PTFE - foils up to a dimension of 300x10 mm by means of sintering technology.
- Heating element butt welding of thermoplasts up to a diameter of 63 mm.



# Extract from our production of special purpose machines

## WIDOS Automatic Planing Machine

Servo-pneumatic machine for the automatic and burr-free planing of pipes onto exactly adjustable lengths with a length tolerance of  $\pm 0,2$  mm. The machine can store at least 10 work pieces of the dimensions OD 70 up to 110 mm, has an automatic feeding and planing process of these pieces, quality control with measuring of the length followed by a sorting device for rejected pieces. With counter for the pieces of each fabricated dimension (adjustable), printing of the protocols on stickers and automatic type identification by means of a barcode system.



# Inquiry for special solutions

**Fax-No.: 07152 / 99 39 - 40**

## Do you have special purposes ?

For the solution of your special purposes which can not be covered by a standard product range, we dispose of a large know how in almost all technologies of joining and disjoining. To reduce time-consuming checkbacks, please describe your purposes as completely as possible by means of this preselection and profit on this way of our know how.

Company:	Person in charge:
Project:	Address / Tel.no. / Fax:

Material: <input type="checkbox"/> PE <input type="checkbox"/> PP <input type="checkbox"/> PVFD <input type="checkbox"/> PVC <input type="checkbox"/> ABS <input type="checkbox"/> PA <input type="checkbox"/> PC <input type="checkbox"/> others _____ <input type="checkbox"/> filled <input type="checkbox"/> not filled (Type / %) _____ <input type="checkbox"/> others _____
Dimension of parts: (H / W / D) _____      Pieces / time unit: _____
Order of automation (feed / discharge / input of parameter / diagnosis / etc.) <input type="checkbox"/> manual <input type="checkbox"/> semiautomatic <input type="checkbox"/> fully automatic <input type="checkbox"/> not yet decided
Preselection procedure: <input type="checkbox"/> HE – buttweld. <input type="checkbox"/> HE – socketw. <input type="checkbox"/> Hot air <input type="checkbox"/> Infrared <input type="checkbox"/> Ultrasonic <input type="checkbox"/> Vibration <input type="checkbox"/> Rotation <input type="checkbox"/> Induction <input type="checkbox"/> Bonding <input type="checkbox"/> Riveting <input type="checkbox"/> Disjoining <input type="checkbox"/> not yet decided
Special remarks (degrees of purity / work safety / running time, shifts / manufacturer's regulations / etc.)

Note:

The more you detail your specifications the faster we are in the position to give a statement on solutions of your problems and a possible realization. For further questions we ask you to note your telephone and faxnumber.

Definite offers and technical details can not be given until the definition of the parts' geometry and the receipt of regular drawings / sketches.

**Of course, we will handle all mentioned dates and documents confidentially and send them back to you on request.**