METALLIDEEN
GLASER

IDEAS
FOR YOUR
SUCCESS

MACHINERY CATALOG

Wrought-Iron/Tube-Processing Machines

1965 Foundation of the company as an one-man-business, trading of gates, metal doors and door frames, window bars and grills. Glaser headquarter is still at Kleestadt, near Groß-Umstadt. First exhibitions in Erbach, Groß-Umstadt and Frankfurt.

1971 Company moves to Groß-Umstadt; building of the first storage- and production hall "Am Brüchelsteg" Extension of the production line: windows, doors, benches and fences made out of plastic, wrought iron works and wrought-iron machines.

1976 Achieving of the Master Craftsman's Diploma of the Handwerkskammer Darmstadt.

1977 Opening up the second production hall. Extension of teh production line for wrought-iron articles

1982 For the first time GLASER is represented at the International Handwerkermesse München and the Hannover Fair. First pioneering success, mostly in the construction of machinery

1986 Buildingof the fourth factory hall for the production of machines and tools. Achieving the license to train in wrought-iron crafts and constructing of tools and machines. Export business is extended.

1990 Demolition of the first factory hall and putting up the new exhibition and administration building. GLASER's 25th anniversary on 8th December 1990

1992 Opening up a new establishment at Bamberg (Bavaria) of 2.000 square meters for the production of wrought-iron articles.

1995 Erection of the fifth hall of 3.000 m² with the most modern bending centre and facilities for stainless steel- and CAD trainings as well as production of machinery and tools.

1997 Wining award **»Staatspreis der Bayerischen Staatsregierung«** and the **»Bundespreis für hervorragende innovative Leistungen für das Handwerk« .**

1999 Foundation of a department in USA. Starting the INOX Production in Groß-Umstadt and the exclusiv design of door handles made from stainless steel.

2002 **Design-Award** for the stainless steel door handles

2004 Showing illuminated handrail, posts and door handle on the International Fair München. »Bundespreis« for the shown posts with Emergency lighting, awarded by the Fedarl Minister for economy and work, Wolfgang Clement.

2005 Company anniversary 40 years GLASER, celebrated at the location Groß-Umstadt together with friends and customers

2007 The store for art wrought iron parts is misplaced completely to the location Bamberg. A direct connection to the production of the METALLFORM GLASER therefore arises

2008 The company founder and owner Gerhard Glaser died at the age of 67 years. The enterprise is structured newly and subdivided into the Glaser group.

2010 The parent company Groß-Umstadt closed and moved the departments stainless steel and bending centre to Bamberg.

2011 today Lets talk metal - new booth at the fair BAU 2011 in Munich. New Internet homepage and much more information in our Blog

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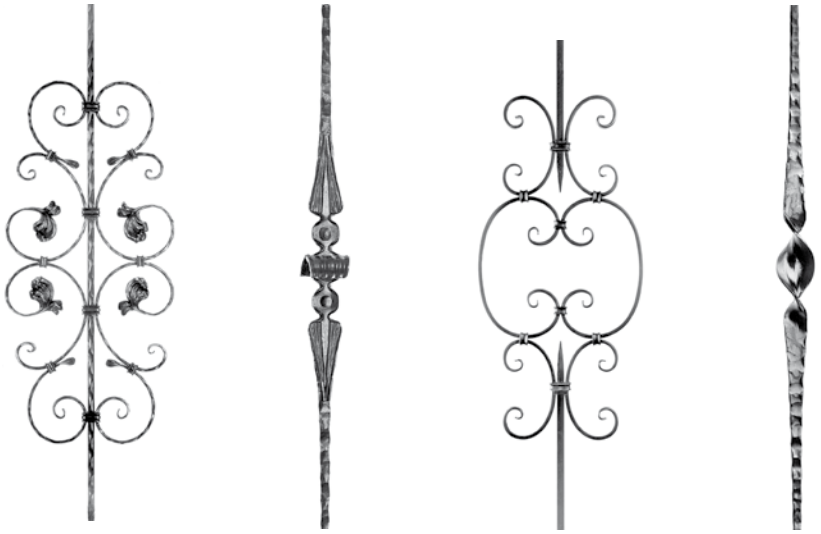
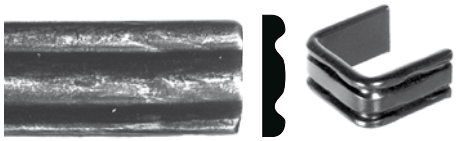
Wrought-Iron Products - Manufactured by Mechanical Support

Traditionally, wrought-iron articles have been forged manually from heated solid pieces. This process took a lot of time and required great craftsmanship.
Modern wrought-iron articles, manufactured by means of GLASER wrought-iron machines and modern welding technology, save a lot of effort and time.The components such as bars, twirls, scrolls and leaves are manufactured by machines. Subsequently they are hand-welded to form complete main bars and ornamental bars. Modern wrought-iron articles, manufactured by means of GLASER wrought-iron machines and modern welding technology, save a lot of effort and time.



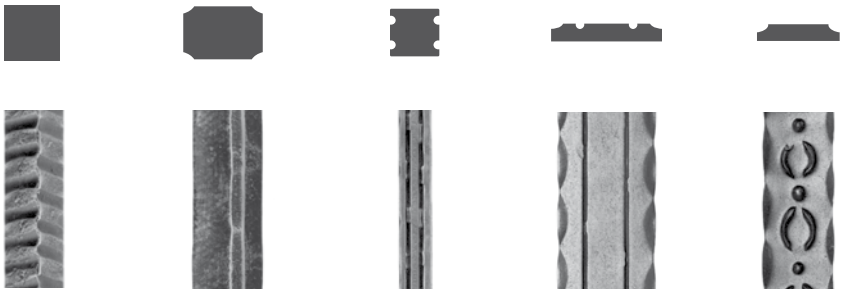
Collars Decorate Wrought-Iron Articles

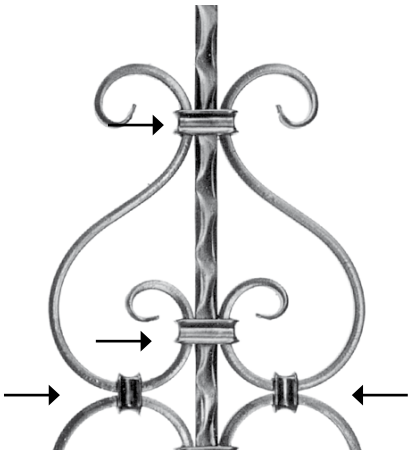
The transitions of a bar (i. e. from bar to twirl) and the connections between bar and scroll are welded together. The welded joints are then polished with a hand-grinder and covered by an ornamental collar. This collar only serves for decoration, not for mechanical support.



Stamping

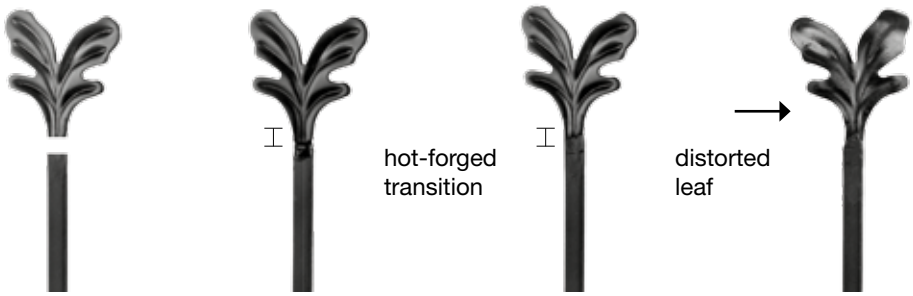
Different profile-rolling devices are available for stamping handrails, profiles, frame parts, bars and scrolls.
It is advisable to produce and store these articles in larger quantities. Upon demand, they are later welded together to form railings, window protections, doors etc.





Welding-Up the Leaves and Forging the Transition

The next step is welding the leaves to the scroll blanks and bars.
The welding joint must be forged to a transition. The welding joint can be forged in two ways: Direct after welding by using the welding heat or later after a re-warm up.

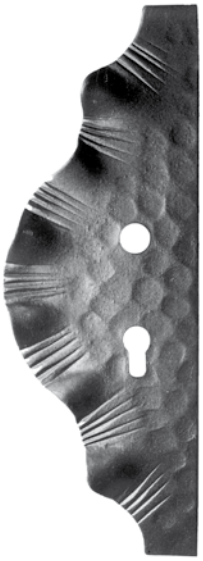


Producing three different Types of Wrought-Iron Articles with the same Pressing Tools and Bending Tools

Forged Wrought-Iron Articles

Wrought-iron articles of various shapes can be produced manually by means of an air hammer. A great variety of forging dies and delicate-forging dies are available for this purpose.

Whereas forging of individual parts normally requires a skilled blacksmith, mass production of certain parts can be done by employing special trainees.



lock coverings

forged part

baroque-style ornamental leave

rosettes

Distorting the Leaves

After forging the transitions, the leaves are shaped either manually by means of pliers or machined by a leaf distorting tool.

Bending the Scrolls

Bending scrolls with welded-up ornamental leaf is performed with special bending tools.

Straight Bars and Scrolls

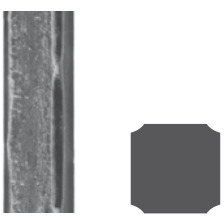
The standard ornamental bars are produced from even square bars with a cross-section of 12 x 12 mm and rectangular bars with a cross-section of 12 x 6 mm.

Fluted Bars and Scrolls

For the production of ornamental bars and scrolls with fluted sides, the square and rectangular bars can be stamped (fluted) on two sides in cold condition by a profile-rolling device before treatment.

Hammered Bars and Scrolls

It is also possible to hammer the edges of square bars and rectangular bars before producing ornamental bars and scrolls.
Hammering the edges can be performed by the profile-rolling device as well as by the air hammer. The differences are: The stamped bars are absolutely alike, while the forged bars differ from each other and show more manual skill.



Surface Shaping

The surface treatment of complete wrought-iron articles, such as partitions, railings, balustrades, lattices, doors, gates and fences serves two purposes: protection against corrosion and lacquering for embellishment.
(Usually there is no need for rust protection for indoor equipment.) Lacquering can be done either by brush or by spray gun.

Preparation
Before treating the surface, all welded joints have to be smoothed with a portable grinder or a file. Then remove rust mechanically from the entire surface of the wrought-iron article. Finally clean the surface chemically from any remaining oil or grease.

Priming
For outdoor equipment, galvanizing or a common primer is recommended.
The advantage of hot galvanizing is that even difficult points (such as the junction of a scroll to a bar) will be safely protected against rust.

Lacquering
Lacquering is done either by brush or by spray gun.
You may use any standard paint, if the equipment has been coated with a primer before.
This is not possible, however, if the article has been galvanized. In this case, apply special paints – such as our special forging varnish which adheres immediately and safely on a galvanized zinc surface.

Patinating
Patina paints improve the appearance of wrought-iron articles.
For instance, the initial lacquering is our antrazit miaceous No. 29501, our blade No. 29511 or our antique white No. 29521.

Basically, patinating is performed by two different methods:

- Patinating the embossed parts and edges with a soft brush, a cloth or a sponge. The results are patinated embossed parts.
- The second method results in patinated depressions. The according area is sprayed or painted almost entirely with patina paint.
  As soon as the patina is half-dry, the embossed parts are wiped with a soft cloth – they appear in their original colour.

Brass Brushing
Another traditional surface treatment is brushing it with a rotating brass brush. (The brass brush is clamped into a hand drill.)
Clean the surface of a lattice thoroughly with a wire brush before brushing it with a brass brush. This procedure spreads brass particles to the lattice surface.
You may achieve different colour effects by heating an area of the lattice.
Finally, protect the brushed surface against oxidation with a transparent varnish. For outdoor equipment use weatherproof varnish to finish off.

Antrazit miaceous together with Patina bronce

… with Patina copper and green

… with Patina green and Patina ducat gold

Requirements on the Steel

For manufacturing wrought-iron articles, hot-rolled bar steel with solid section is used – except for the frames. Partly because of their lower weight, frames are made from thick-walled rectangular tubes, of which, however, only the edges can be profiled by a profile-rolling device. Forged frames must be made from solid material.

Bars and Scrolls
Generally, structured steel St 37 is required for manufacturing bars and scrolls as well as handrails and profiles. St 37-2 is a standard steel for the machine- and steel-construction with a tensile strength of 340 – 370 N/mm^2 and is used for bars, scrolls and handrails etc.
The cross section of the material for bars is 12 x 12 mm and for scrolls 12 x 6 mm.

Twirls
The material for manufacturing twirls has to meet higher demands:

- The material has to be equally soft – without any hardenings.
- Always use the same material for the four parts of a twirl. (Don't combine bars of different charges for twirl blanks.)

Therefore, structural steel St 37-3 is recommended for manufacturing twirls. In principle, test a specimen before ordering a large quantity.

Leaves
Leaves are stamped out of stripes of steel or sheet metal. The width is 80 mm; the thickness should be 2 - 3 mm.
Use St 37-2 or softer material, e. g. Stw 22.

Collar Material
The cross section for the collar material is 12 x 3 mm or16 x 4 mm.
The material is St 37-3 or softer. First the collar material is stamped by a Profile-Rolling Device GPG. St 37-3 usually gets too hard after stamping and must therefore be heated red-hot for further treatment. Heating is not necessary with softer material.

Important Advice
Structural steel St 37-2 and St 37-3 can be bent or twisted in cold condition. During this process, however, the material hardens. Therefore the next step has to be in warm condition or the material must be heated red-hot before the next cold treatment.
Our manufacturing processes are designed in a way that either

- the first treatment is in cold condition (i. e. twisting bars, stamping handrails) or
- the first treatment is in warm condition and the second in cold condition (i. e. warm-forging and cold-rolling up of scrolls) or
- the first treatment is in cold condition and the second in warm condition (i.e. cold-stamping of handrails and warm-forging of the ends)

If harder material is used, additional annealing is recommended between two steps. E. g. the twirl blanks have to be annealed additionally after being welded together (before twisting and upsetting), or the collar material has to be annealed after being stamped with a ProfileRolling Device GPG 90.

Automatic Multiple-Purpose Iron Twisters

General

The Automatic Multiple-Purpose Iron Twisters GDM and the attach-ments have been specially developped for the production of components for wrought-iron articles. The standard models allow twisting and bending of ornamental bars in cold condition. For instance, orna-mental bars up to 40 x 40 mm can be cold-twisted with the Iron Twister GDM 50/0.
6 different types of iron twisters are available. They differ in twisting capacity and hydraulic equipment. Various attachments are available for all machines.

Hydraulic Equipment

The hydraulic equipment consists of a maintenance-free compactpump unit. A radial-piston pump and the motor are housed in a joint case. The valves are permanently screwed to the case to make them dust-resistant.

According to application, a 27-tons or a 10-ton hydraulic ram is employed. The hydraulic pump and the ram are connected by two high pressure hoses, permanently screwed to the valves. The cylinder is connected to the hoses by quick-couplers, enabling a fast mount-ing to the hydraulic rams. If the couplers are disengaged, the oil circulation is automatically closed, avoiding oil leak-age or air accessing the system. After converting the ram, ventilation is not necessary.

Mechanical Construction

The Multiple-Purpose Iron Twisters GDM are solid welded constructions. The cov-ered frame contains the electric control and the hydraulic equipment. The areas not in use contain tool cabinets.
The gearbox is the essential part of the machines, containing a dual-mounted driving shaft. The motor is flanged to the gearbox and drives the driving shaft in two speeds via a pinion.
A guideway is next to the gearbox - it can be optionally mounted

- a tailstock as counter-support for twisting bars and producing twirls
- a pressing bed for mounting the bending tools for bending the bars and scrolls
  and for
  mounting hydraulically driven attach-ments such as a Leaf Stamping Tool GBW or Handrail-Bender GKB
- attachments such as ProfileRoll-ing Device GPG, End Mill GAG 50, Round-Arch Rolling Device GRVV 60, Arch- and Ring-Bending Device GBR 66 or GBR 666 or Florentine-Rolling Device GFF 777.

Besides the guideway, the Automatic Multiple-Purpose Iron Twisters GDM 40 and 50 also hold a working table opposite the driving shaft. Attachments can be permanently mounted to this working table, such as a Profile-Rolling Device GPG or Arch- and Ringbending Device GBR. This facility saves the time for mounting the relatively heavy attach-ments.

Driving the Attachments

Mechanically driven attachments such as Profile-Rolling Device GPG or End Mill GAG are driven via an adapting shaft.

Function

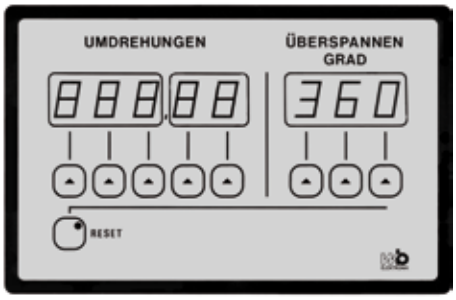
The Iron Twisters GDM contain a strong two-speed pole-reversible gear-motor. An electric brake is integrated in the motor (brake-motor). The motor drives the driving shaft in two speeds via a pinion.
Twisting bars with high speed requires the following technical specifications:

- application of a brake-motor
- digital default of the setpoint
- digital pick-up of the actual value at the main shaft
- overstraining the bar by a given angle
- considering a remaining time in over-strain

These requirements are met by means of a micro-processor control.
The actual value is picked up with a rotary encoder.
The number of rotations, overstrain and remaining time are entered via a mylar keyboard and displayed digitally.
The mylar keyboard is insensitive to dirt and grease and suitable for heavy-duty operation in the workshop.
For twisting bars, all rotation values from 1/4 to 999 mag be entered digitally. The resolution of the entry is 0.05 rotations.
When twisting bars in mass-production, the end position of the last bar has to equal the start position of the next one. Out of this reason the minimum resolu-tion is 0.25 rotations with square bars, and 0.50 rotations with rectangular bars.

General Information

The overstrain is represented in degrees. The required value is subject to the Cross-section and the temper of the material. The remaining time ranges between 0.3 and 2 sec.

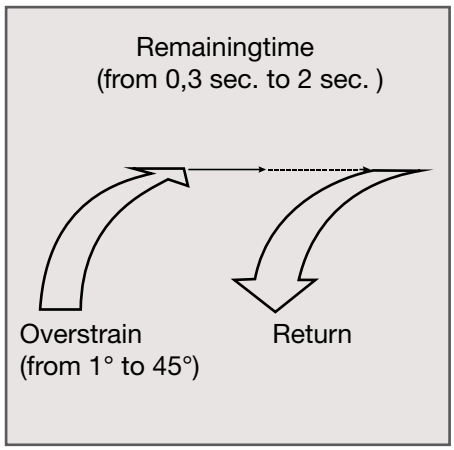


Operation Modes

The electric control comprises three operation modes: MANUAL, AUTOMATIC and PERMANENT.
With operation mode MANUAL, the driving shaft turns left or right as long as key LEFT RUN or RIGHT RUN is pressed. Operation mode MANUAL is used when adjusting the machines.
With operation mode AUTOMATIC, a process is started by the Operator and is automatically finished by the electronic control. Details are subject to the according operation.
Operation mode PERMANENT continuously operates attachments such as a Profile-Rolling Device or an End Mill..

Operating the Hydraulic Equipment

The hydraulic equipment can be operated manually as well as automatically. With automatic Operation, a process is started with key START or with the pedal switch.



With shape-bending or with hydraulically operated attachments such as Ornamental Collar Press GZP 9 or Leaf-Stamping Tools GBW 55, a process is started with the pedal switch. The amounting pressure at the tool's end position results in a reverted operating direction of the cylinder from forward to reverse movement. The reverse movement is stopped either by a mechanical limit value encoder (end switch) or by the amounting pressure at the end position of the hydraulic ram. The process is finished. The automatic procedure can always be interrupted by releasing the pedal switch.
A repeating hydraulic operation mode is available for straightening bars.
With twirl production, twisting of the driving shaft and operation of the hydraulic equipment is controlled automatically.

Automatic Multiple-Purpose Iron Twister GDM 30 — No. 3030

General

As the Automatic Multiple-Purpose Iron Twister GDM 3/0 (on page 20), the Automatic Multiple-Purpose Iron Twister GDM 30 twists flat and square irons up to 30 mm in cold condition. Twisting can be performed in two speeds either automatically or manually with right or left direction.

As with the new Multiple-Purpose Iron Twisters GDM 40 and GDM 50, the Iron Twister GDM 30 is equipped with a strong pole-reversive gear-brake-motor for two rotary speeds and a modern microprocessor-control. The rotary speed is 10 or 20 rotations per minute (rpm).

Electric Control

The electric control is geared to manual and automatic twisting of bars and for operating all attachments. VWith automatic Operation, the number of rotations and the overstrain are adjusted via an electronic control.

Tailstock

The standard version contains an adjustable tailstock for mounting the clamping jaws.

Applications

With the GDM 30 a variety of ornamental bars for wrought-iron articles such as ornamental lattices, railings, doors, gates and fences can be produced individually or in mass production.

Technical Data

- twisting length max. 1200 mm,
- extension by optional extension of guide-way on request
- minimum twisting length ca. 10 x crosssection of material (long side)
- length stoppet 80 to 1800 mm, variably adjustable
- turning speed I: 10 revolutions per minute (rpm) twists cross-sections up to 30 mm
- turning speed II: 20 revolutions per minute (rpm) twists cross-sections up to 20 mm
- voltage supply: 380 V three-phase current with loadable central conductor (220 V), 50 Hz
- different voltage or frequency on request
- power consumption: ca. 3.3 KW
- paintwork: two-component varnish, blue
- weight: 240 kg

Standard Accessories

- Twisting and clamping jaws for mounting square irons 12 and 20 mm and flat irons 20 x 5-6 mm
- length stopper up to 1800 mm
- double-ended spanner 17/19 mm
- screw hexagon wrench SW 5

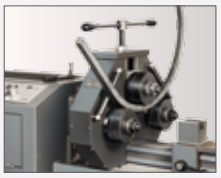
Accessories for GDM 30


Profile-Rolling Device GPG 90


Profile-Rolling Device GPG 99


End Mill GAG 50


Florentine-Rolling Device GFF 777


Arch- and Ring-Bending Device GBR 66


Arch- and Ring-Bending Device GBR 666

Automatic Multiple-Purpose Iron Twister GDM 30-3 — No. 3033

GDM 30/0 as GDM 30-3 without hydraulic equipment — No. 3031

General

The Automatic Multiple-Purpose Iron Twister GDM 30-3 twists flat and square iron up to 30 mm in cold condition. The Iron Twister GDM 30-3 is equipped with a strong pole-reversible gear motor with electric brake. The gearing has polished cog-wheels, moving maintenance-free in an oil-bath. The rotating speeds of the driving shaft are 9 and 18 revolutions per minute (rpm).
The Iron Twister GDM 30-3 contains a hydraulic equipment suitable for all pressing works, for twirl upsetting from pre-bent twirl blanks as well as for driving the hydraulically driven attachments.

Besides the machine drive with guideway the Iron Twister GDM 30-3 comprises a second drive side with a working table of 660 x 420 mm. Here can optionally be mounted a Profile-Rolling Device GPG 90 or GPG 99 or an Arch- and Ring-Bending Device GBR 66 or GBR 666 or a Florentine-Rolling Device GFF 777.
The guideway side is used for the twisting of bars and twirl upsetting or for the Installation of an attachment, such as End Mill GAG 50 or RoundArch Rolling Device GRW 60. For each of these purposes the Tailstock, the pressing bed or an attachment have to be mounted accordingly.

Speciality (only GDM 30-3)

The Iron Twister and the hydraulic equipment operate individually, which means that one operating person can twist iron with the Iron Twister respectively work with a mechanical attachment and a second person can press with the hydraulic equipment respectively work with a hydraulically driven attachment.
In case of twirl upsetting the Iron Twister and the hydraulic equipment operate together. In this mode only one operating person can work with the Automatic Multiple-Purpose Iron Twister GDM 30-3.

Production of Twirls

With the Iron Twister GDM 30-3 twirls of 12 up to 30 mm edge length can be produced from pre-bent twirl blanks.

Tailstock

The standard version contains an adjustable tailstock for mounting of the different clamping jaws and twirl upsetting jaws.

Tool Boxes

The standard equipment of the machine comprises two tool boxes.

Hydraulic Equipment (only GDM 30-3)

On the whole the hydraulic equipment consists of a 600-bar high-pressure pump, a 27-t hydraulic cylinder with 200 mm length of stroke and a pressing bed.
By means of the hydraulic equipment all pressing works can be executed. Furthermore it drives the attachments Ornamental Collar Press GZP 9, Leaf-Stamping Tools GBW 55 and Handrail Bender GKB 44 or GKB 45.

Electric Control

The electric control comprises the operation modes HAND-CONTROL, CONTINUOUS RUNNING and AUTOMATIC. When pressing the pedal switch the operation mode AUTOMATIC starts the working cycle for the pressing process. After the material is pressed, the hydraulic pressure intensifies and a manometric switch changes the oil flow into the opposite direction, the tool is released. In the end position a further switch disconnects the working cycle. The pressed bar can be taken out and new material put in.

Technical Data

- Twisting length max. 1000 mm
- extension by lengthening of guideway on request
- Minimum twisting length ca. 10 x cross-section of the material (long side)
- Length stopper 100 to 1000 mm, variably adjustable
- Rotating speed I: 9 revolutions per minute (rpm), twists cross-sections up to 30 mm
- Rotating speed 11: 18 revolutions per minute (rpm), twists cross-sections up to 20 mm
- Voltage supply: 380-400 V three-phase current with loadable central conductor (220-230 V), 16 A, 50 Hz
- Different voltage or frequency on request
- Power consumption:
  ca. 5,5 kW (GDM 30-3)
  ca. 3,1 kW (GDM 30/0)
- Paintwork: two-component varnish, blue
- Weight: ca. 710 kg (GDM 30-3)
  Weight: ca. 490 kg (GDM 30/0)

Standard Accessories

- Twisting- and clamping jaws for square iron 12 and 20 mm and flat iron 20 x 5-6 mm
- Length stopper up to 1000 mm
- Double-ended spanner 17/19 mm
- Socket screw hexagon wrench SW 5
- Socket screw hexagon wrench SW 14

[1]

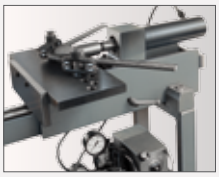
Accessories for GDM 30/0 and GDM 30-3

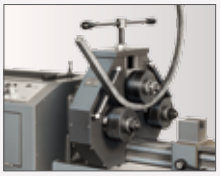

Profile-Rolling Device GPG 90


Profile-Rolling Device GPG 99

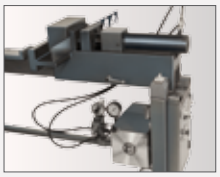

End Mill GAG 50

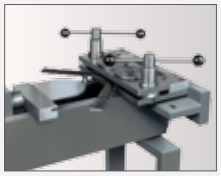

Florentine-Rolling Device GFF 777


Handrail Bender GKB 44 [1]


Arch- and Ring Bending Device GBR 66


Arch- and Ring Bending Device GBR 666


Leaf-Stamping Tool GBW 55 [1]


Handrail Bender GKB 45 [1]


Ornamental Collar Press GZP 9 [1]


Pressing Carriage GPW 5 (for GZP 9) [1]

[1] **only suitable for GDM 30-3**

Automatic Multiple-Purpose Iron Twister GDM 40-3 No. 3043

General

The Automatic Multiple-Purpose Iron Twister GDM 40-3 is the most-favoured Multiple-Purpose Iron Twister with hydraulic equipment. VWith the GDM 40-3 all hydraulic and mechanic attachments, except the Profile-Rolling Device GPG 999, can be applied. The Iron Twister GDM 40-3 is equipped with a strong pole-reversible gear-motor with an electric brake. The gear has polished cog-wheels moving maintenance-free in an oil-bath. The rotary speeds of the driving shaft are 10 and 20 revolutions/min. The Iron Twister GDM 40-3 twists flat and square iron up to 30 mm in cold condition.
The Iron Twister GDM 40-3 contains a hydraulic equipment suitable for all pressing works, for twirl upsetting according to methods 1 and 2 as well as for driving the hydraulically operated attachments.
Besides the machine drive with guideway the Iron Twister GDM 40-3 comprises a second drive with a working table of 630 x 540 mm. Here can optionally be mounted a Profile-Rolling Device GPG 90 or GPG 99 or an Arch- and Ring-Bending Device GBR 66, GBR 666.
The guideway side is used for the twisting of bars, twirl upsetting, pressing or for the Installation of an attachment. For each of these purposes the tailstock, the pressing bed or an attachment raust be mounted accordingly.

Speciality

The Iron Twister and the hydraulic equipment operate individually, which means that one operating person can twist bars with the Iron Twister respectively work with a mechanical attachment and a second person can press with the hydraulic equipment respectively work with a hydraulically driven attachment.
In case of twirl upsetting the Iron Twister and the hydraulic equipment operate together. In this mode only one operating person can work with the Automatic Multiple-Purpose Iron Twister GDM 40-3.

Twirl Production

The Iron Twister GDM 40/3 enables to produce twirls of 12 to 40 mm cross-section by two different methods. You will find the details for twirl production an page 13.

Tailstock

The standard version contains an adjustable tailstock for mounting the clamping jaws.

Tool Boxes

The standard equipment of the machine comprises two tool-boxes.

Hydraulic Equipment

On the whole the hydraulic equipment consists of a 600-bar high-pressure pump, a 27-t hydraulic cylinder with 200 mm length of stroke and a pressing bed.

Electric Control

The electric control comprises the operation modes MANUAL, AUTOMATIC and PERMANENT. With shape-bending, operation mode AUTOMATIC starts an operation process by pressing the pedal switch. After bending, the hydraulic pressure increases to switch a pressure switch to revert the oil flow into the opposite direction. The tool is retreated.
A second pressure switch stops the operation process at the final position.
The shaped bar can be removed and new material is inserted.
With other operation modes such as employing the Ornamental Collar Press GZP 9 or when upsetting twirls by method 2, the lifting length of the hydraulic ram is limited by mechanical stop switches.

Technical Data

- twisting length max. 1000 mm, extension by optional extension of guideway on request
- minimum twisting length ca. 10 x crosssection of material (long side)
- length stopper 100 to 1000 mm, variably adjustable
- turning speed I: 10 revolutions per minute (rpm) twists cross-sections up to 30 mm
- turning speed II: 20 revolutions per minute (rpm) twists cross-sections up to 20 mm
- voltage supply: 380 V three-phase current with load-able central conductor (220 V), 50 Hz
- different voltage or frequency on request
- power consumption: ca. 5.7 KW
- paintwork: two-component varnish, blue
- weight: 710 Kg

Standard Accessories

- Twisting and clamping jaws for mounting square irons 12 and 20 mm and flat irons 20 x 5-6 mm
- length stopper up to 1000 mm
- double-ended spanner 17/19 mm
- socket screw hexagon wrench SW 5
- socket screw hexagon wrench SW 14

No. 3144
Reinforced tailstock
for GDM 40-3

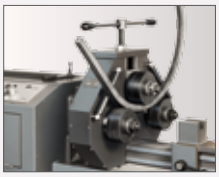
Accessories for GDM 40-3

Profile-Rolling Device GPG 90

Profile-Rolling Device GPG 99

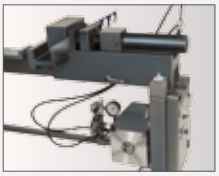
End Mill GAG 50

Florentine-Rolling Device GFF 777

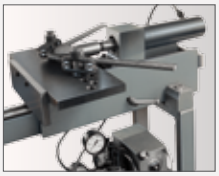


Arch- and Ring Bending Device GBR 66

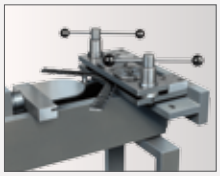
Arch- and Ring Bending Device GBR 666



Leaf-Stamping Tool GBW 55



Handrail Bender GKB 44



Handrail Bender GKB 45

Ornamental Collar Press GZP 9

Pressing Carriage GPW 5 (for GZP 9)

Automatic Multiple-Purpose Iron Twister GDM 50-3 — No. 3053

GDM 50-0 as GDM 50-3 without hydraulic equipment — No. 3050

Automatic Multiple-Purpose Iron Twister GDM 50-V — No. 3051

General

The Automatic Multiple-Purpose Iron Twister GDM 50-3 has been designed for mass-production and successfully approved since years in this kind of production. The Automatic Multiple-Purpose Iron Twister GDM 50-3 twists flat and square iron up to 40 mm in cold condition. It is equipped with a strong pole-reversible gear motor with an electric brake. The gear has polished cog-wheels moving maintenance-free in an oil-bath. The rotary speeds of the driving shaft are 10 and 20 revolutions/min. The Iron Twister GDM 50-3 contains a hydraulic equipment suitable for all pressing works, for twirl upsetting according to methods 1 and 2 as well as for driving the hydraulically driven attachments. Included in the extent of delivery is the Pressing Carriage GPW 5 for the optional application of the pressing bed or the Ornamental Collar Press GZP 9.

Besides the machine drive with guideway the Iron Twister GDM 50-3 comprises a second drive side with a working table of 870 x 790 mm. Here are normally mounted a Profile-Rolling Device GPG 999 and an Arch- and Ring-Bending Device GBR 66 or GBR 666. Optionally you can also attach an End Mill GAG 50 or a Florentine-Rolling Device GFF 777.
The guideway side is used for the twisting of bars and twirl upsetting according to methods 1 and 2.

Speciality (only GDM 50-3)

The Iron Twister and the hydraulic equipment operate individually, which means that one operating person can twist bars with the Iron Twister respectively work with a mechanical attachment and a second person can press with the hydraulic equipment respectively work with a hydraulically driven attachment.
In case of twirl upsetting the Iron Twister and the hydraulic equipment operate together. In this mode only one operating person can work with the Automatic Multiple-Purpose Iron Twister GDM 50-3.

Tailstock

The standard version contains an adjustable tailstock for mounting the clamping jaws.

Tool Boxes

The standard equipment of the machine comprises two tool-boxes.

Electric Control

The electric control comprises the operation modes MANUAL, AUTOMATIC and PERMANENT.
With shape-pressing, operation mode AUTOMATIC starts an operation process by pressing the pedal switch. After bending, the hydraulic pressure increases to switch a pressure switch to revert the oil flow into the opposite direction. The tool is retreated.
A second pressure switch stops the operation process at the final position.
The shaped bar can be removed and new material is inserted.
With other operation modes such as employing the Ornamental Collar Press GZP 9 or when upsetting twirls by method 2, the lifting length of the hydraulic ram is limited by mechanical stop switches.

Hydraulic Equipment

On the whole the hydraulic equipment consists of a 600-bar high-pressure pump, a 27-t hydraulic cylinder with 200 mm length of stroke and a pressing bed.

The GDM 50-0 is identical to the Iron Twister GDM 50-3 but it will be deliverd without the hydraulic equipment.

Technical Data

- twisting length max. 1000 mm, extension by optional extension of guideway on request
- minimum twisting length ca. 10 x cross-section of material (long side)
- length stopper 100 to 590 mm, variably adjustable
- turning speed I: 10 revolutions per minute (rpm) twists cross-sections up to 40 mm
- turning speed II: 20 revolutions per minute (rpm) twists cross-sections up to 25 mm
- voltage supply: 380 V three-phase current with load-able central conductor (220 V), 50 Hz
  different voltage or frequency on request
- power consumption: ca. 7.8 KW
- paintwork: two-component varnish, blue
- weight: 1210 Kg

Technical Data (GDM 50-V)

- Twisting length max. 1000 mm, extension by lengthening of the guideway on request
- Minimum twisting length ca. 10 x crosssection of the material (long side)
- Length stopper 100 to 1000 mm, infinitely variable
- Rotating speeds infinitely variable between 8 and 50 revolutions per minute (rpm)
- In case of 10 rotations per minute (rpm) cross-sections up to 30 mm can be twisted
- In case of 25 rotations per minute (rpm) cross-sections up to 20 mm can be twisted

Standard Accessories

- Twisting and clamping jaws for mounting square irons 12 and 20 mm and flat irons 20 x 5-6 mm
- length stopper up to 590 mm
- double-ended spanner 17/19 mm
- socket screw hexagon wrench SW 6 /10 /14
- pressing carriage GPW 5

Accessories for GDM 50-0 and GDM 50-3

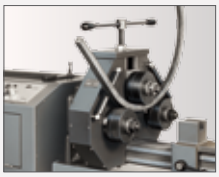

Profile-Rolling Device GPG 90


Profile-Rolling Device GPG 99

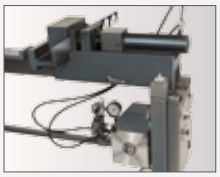

End Mill GAG 50

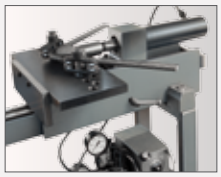

Florentine-Rolling Device GFF 777

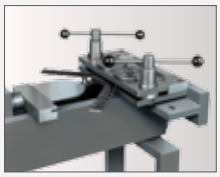

Profile-Rolling GPG 999


Arch- and Ring Bending Device GBR 66


Arch- and Ring Bending Device GBR 666

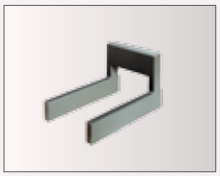

Leaf-Stamping Tool GBW 55


Handrail Bender GKB 44 [1]


Handrail Bender GKB 45 [1]


Ornamental Collar Press GZP 9 [1]


No. 4005 Pressing Carriage GPW 5 (for GZP 9)


Reistockarretierung **No. 3145**

[1] **suitable for** GDM 50-3

Driving Machine GDM 30-A — No. 3032

Fig. Driving Machine GDM 30-A with attachments Profile-Rolling Device GPG 99 and End Mill GAG 50

The mechanical construction of the Driving Machine GDM 30-A is similar to that one of the Automatic Multipie Purpose Iron Twister GDM 30-0, except the beam side of the machine is missing. With the Driving Machine GDM 30-A most of the mechanical attachments of the proven Automatic Iron Twisters GDM can be driven.
The GDM 30-A is equipped with a pole-reversible gear motor for two turning speeds. The gearing has got polished cog-wheels, moving maintenance-free in an oil-bath. The turning speeds of the driving shaft are 9 and 18 revolutions per minute (rpm).
The Output of the gear is left- and right-sided. On the left side there is a]arge working table enabling the Installation of a Profile-Rolling Device GPG 90 or GPG 99 or an Arch- and Ring-Bending Device GBR 66 or GBR 666. On the right side there is a second working table so that an additional attachment can be mounted, e.g. an End Mill GAG 50.

Technical Data

- Measurements of the left working table: 660 x 420 mm
- Measurements of the right working table: 420 x 300 mm
- Rotation speed I: 9 revolutions per minute (rpm)
- Rotation speed II: 18 revolutions per minute (rpm)
- Voltage supply: 380-400 V threephase current with loadable central conductor (220-230 V), 16 A, 50 Hz
- Different voltage or frequency an request
- Power consumption: ca. 2.8 WV
- Paintwork: two-component varnish, blue
- Weight: ca. 280 kg

Electric Control

The electric control offers the following operating modest SPEED 1/SPEED 2, CLOCKWISE-/COUNTER-CLOCKWISE RUNNING, HAND-CONTROL (by push-buttons) and CONTINUOUS RUNNING.

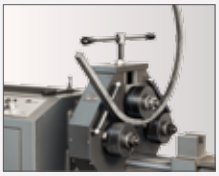
Accessories for GDM 30-A


Profile-Rolling Device GPG 90


Profile-Rolling Device GPG 99


End Mill GAG 50


Florentine-Rolling Device GFF 777


Arch- and Ring-Bending Device GBR 66


Arch- and Ring-Bending Device GBR 666

Driving Machine GDM 50-A No. 3052

Fig. Driving Machine GDM 50-A with attachments Profile-Rolling Device GPG 999 and Arch- and Ring-Bending Device GBR 66

The mechanical construction of the Driving Machine GDM 50-A is similar to that one of the Automatic Multiple-Purpose Iron Twister GDM 50-3, except the beam side of the machine and the hydraulic equipment are missing. With the Driving Machine GDM 50-A most of the mechanical attachments of the proven Automatic Iron Twisters GDM can be driven.
The GDM 50-A is equipped, like the Iron Twister GDM 50-3, with a polereversible gear motor for two turning speeds. The gearing has got polished cog-wheels, moving maintenance-free in an oil-bath.
The turning speeds of the driving shaft are 10 and 20 revolutions per minute (rpm).
The Output of the gear is left- and right-sided. On the left side there is a large working table, whereon a Profile-Rolling Device GPG 999 is firmly attached.
On the right side there is a second working table enabling the Installation of additional attachments, such as a Profile-Rolling Device GPG 99, an End Mill GAG 50 or an Arch- and Ring-Bending Device GBR 666. (However, it is not possible to run two Profile-Rolling Devices simultaneously.)

Technical Data

- Measurements of the left working table: 870 x 790 mm
- Measurements of the right working table: 660 x 420 mm
- Rotation speed I: 10 revolutions per minute (rpm)
- Rotation speed II: 20 revolutions per minute (rpm)
- Voltage supply: 380-400 V three-phase current with loadable central conductor (220-230 V), 25 A, 50 Hz
- Different voltage or frequency an request
- Power consumption: ca. 5.2 kW
- Paintwork: two-component varnish, blue
- Weight: ca. 720 kg

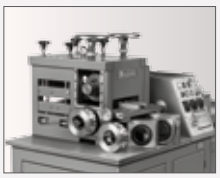
Electric Control

The electric control offers the following operating modest SPEED 1/SPEED 2, CLOCKWISE-/COUNTER-CLOCKWISE RUNNING, HAND-CONTROL (by push-buttons) and CONTINUOUS RUNNING.

Accessories for GDM 50-A

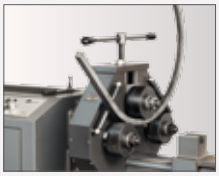

Profile-Rolling Device GPG 90


Profile-Rolling Device GPG 99


Profile-Rolling Device GPG 999


End Mill GAG 50


Florentine Rolling Device GFF 777


Arch- and Ring-Bending Device GBR 66


Arch- and Ring-Bending Device GBR 666

Extra Accessories for the Automatic Multiple-Purpose Iron Twisters GDM

he adaption of the various crosssections of material to the driving shaft resp. to the tailstock of the Automatic Multiple-Purpose Iron Twisters GDM is done by twisting and clamping jaws. The twisting jaw is fixed to the driving shaft, the clamping jaw to the tailstock. Twisting and clamping jaws are always supplied in pairs.

A short clamping jaw may be imployed instead of the standard clamping jaw, if necessary. This enables counter twists with short transitions.

Twisting and clamping Jaws for Square Bars

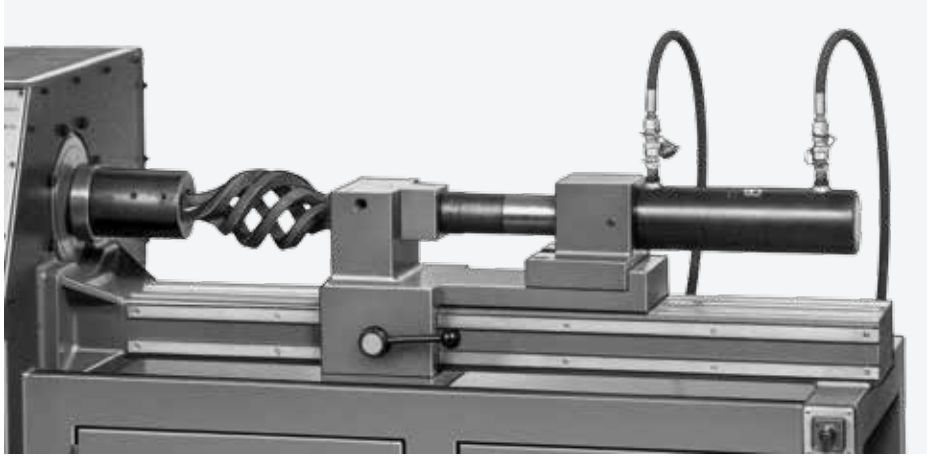
Twisting and Clamping Jaws	for Square Bars	GDM 30	GDM 40/0	GDM 40/3	GDM 50/0	GDM 50/3	GDM 3/0
3106	6 x 6 mm	•	•	•	•	•	•
3108	8 x 8 mm	•	•	•	•	•	•
3110	10 x 10 mm	•	•	•	•	•	•
3112	12 x 12 mm	•[1)]	•[1)]	•[1)]	•[1)]	•[1)]	•[1)]
3114	14 x 14 mm	•	•	•	•	•	•
3116	16 x 16 mm	•	•	•	•	•	•
3118	18 x 18 mm	•	•	•	•	•	•
3120	20 x 20 mm	•[1)]	•[1)]	•[1)]	•[1)]	•[1)]	•[1)]
3125	25 x 25 mm	•	•	•			•
3131	25 x 25 mm				•	•	
3130	30 x 30 mm	•	•	•			•
3132	30 x 30 mm				•	•	
3133	40 x 40 mm				•	•	

Twisting and Clamping Jaws for Flat Irons

Twisting and Clamping Jaws	for Flat Irons	GDM 30	GDM 40/0	GDM 40/3	GDM 50/0	GDM 50/3	GDM 3/0
3107	12 x 6 mm	•	•	•	•	•	•
3109	16 x 8 mm	•	•	•	•	•	•
3111	20 x 4-5 mm	•	•	•	•	•	•
3113	20 x 5-6 mm	•[1)]	•[1)]	•[1)]	•[1)]	•[1)]	•[1)]
3115	20 x 8 mm	•	•	•	•	•	•
3117	25 x 5-6 mm	•	•	•	•	•	•
3119	25 x 8 mm	•	•	•	•	•	•

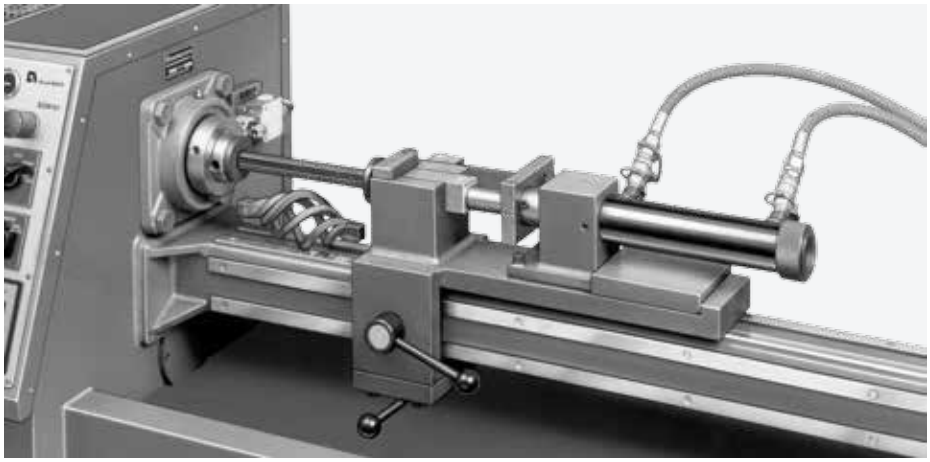
[1)] standard accessories

Production of Twirls



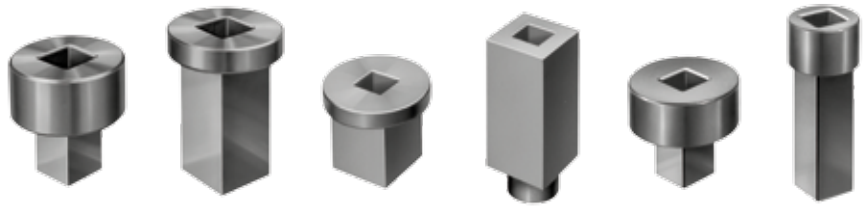
Method I

In method 1 the twirl blanks are prebent, welded together at their ends, twisted and upset simultaneously by means of an Iron Twister GDM with hydraulic equipment in one process.
For the pre-bending of the twirl blanks respective bending tools are available. The working height of the bending tools is 30 mm. Two twirl blanks of 6 x 6 mm, 8 x 8 mm, 10 x10 mm and 12 x 12 mm can so be bent at the same time.



Method II

Method 2 is applied for 4 straight square iron bars, the ends of which are also welded together. They are twisted by an Iron Twister GDM first by a 3/4 rotation in one direction, then re-twisted and optionally twisted again by a 3/4 or 1 rotation in the opposite direction. Simultaneously to the last twisting the twirl is additionally upset.
Method 2 can only be applied with the Automatic Multiple-Purpose Iron Twisters GDM 40-3 and GDM 50-3. The max. dimensions of the twirls are 24 x 24 mm (connecting dimensions).
In method 2 the material requisition is higher than in method 1!



3141 3142 3136 3139 3140

Twirl Upsetting Jaws

Twirl Upsetting Jaws	Twirls	(Twirl blanks)	GDM 40/3	GDM 50/3
3136	12 x 12 mm	6 x 6 mm	•	•
3137	16 x 16 mm	8 x 8 mm	•	•
3138	20 x 20 mm	10 x 10 mm	•	•
3139	24 x 24 mm	12 x 12 mm	•	•
3140	32 x 32 mm	16 x 16 mm	•[1)]	•[2)]
3141	40 x 40 mm	20 x 20 mm	•[1)]	•[2)]
3142	50 x 50 mm	25 x 25 mm		•[2)]

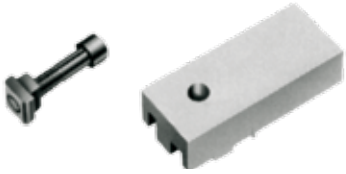
[1)] Reinforced tailstock required [2)] tailstock locking required

Profile-Rolling Device GPG 99 — No. 9099

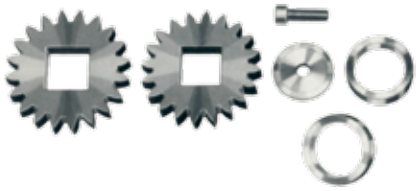
General

The Profil-Rolling Device GPG 99 is a further development of the well proved Device GPG9. The GPG 99 contains an elongated axial guide with 5 guiding rolls. The standard type of the profile-rolling device has a driven upper roll. Both lower and upper roll contains profiles.
When simultaneously stamping the bottom and the top of flat and square iron and the four edges the axial guide with its 5 guiding rolls makes sure that the material leaves the rolling device in absolutely straight condition. An additional straightening out of the stamped material is not necessary. (Especially suitable for square material.)
Like the pressure roll of the Profile-Rolling Device GPG 90 the upper roll is adaptable to different dimensions of material.
weight: 150 kg

Standard Accessories



Material guide for square iron 12 mm and flat iron 16x8 mm



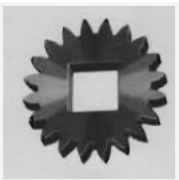
Driving cog-wheels for upper roll
1 pair with 19 teeth 1 pair with 21 teeth

No. 9091
Extra bearing block for the upper roll

No. 9092
Extra bearing block for the lower roll

Extra Accessories

9054	1 pair cog-wheels 111 mm Ø for 10 to 16 mm	19 teeth
9055	1 pair cog-wheels 123 mm Ø for 16 to 20 mm	21 teeth
9056	1 pair cog-wheels 132 mm Ø for 25 to 30 mm	24 teeth
9057	1 pair cog-wheels 135 mm Ø for 30 to 40 mm	25 teeth



Extra Guiding Pieces

9058	for 14 mm
9059	for 16 mm
9060	for 20 mm

On a special request we offer material guiding pieces for different diameters.

Extra stamping roll with a flat upper roll

GPG 99 standard stamping roll with its upper roll

No. 9095
Special set of extra upper stamping roll with cog-wheels etc. for stamping of 40 mm width thick-walled tubes and solid material.

Extra stamping roll with a flat pressure roll for one-side stamping

We produce handrail profile onto customer request.

Profile-Rolling GPG 999 — No. 9999

GPG 999-100 — No. 9998

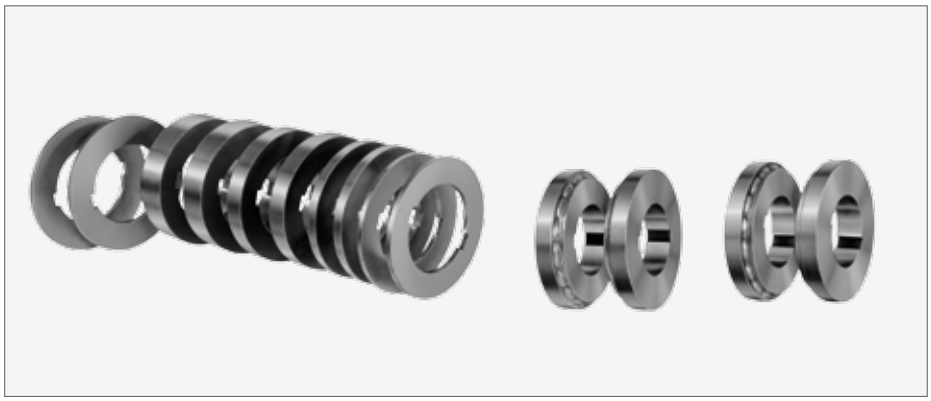
The difference compared with the device GPG 999 consists in the greater adjustability of the upper driven roller.
By additional gear wheels and rollers, pipes can be marked to 100 mm of height at all 4 edges in one operation.

General

The Profile-Rolling Device GPG 999 has been employed in mass-production since years and is a rolling device with two driven stamping rollers and a 5-rolls-axial-guide.
The Profile-Rolling Device GPG 999 is made of a solid welded steel-construction. It contains the same mechanical measurements for connection as the successful Profile-Rolling Devices GPG 90 and GPG 99.
For driving, the Profile-Rolling Device GPG 999 requires an Automatic Multiple-Purpose Iron Twister GDM 50/0 or GDM 50/3, With Profile-Rolling Devices GPG 90 and GPG 99, the stamping rolls contain fixed profiles. But the stamping rollers of the Profile-Rolling Device GPG 999 consist of an smooth shaft to carry various stamping rings. The stamping rings are easily exchangeable and can be supplied on demand. According to demand, the user can mount the stamping rings with different profiles.

If different profiles are to be stamped, it is no longer necessary to change the stamping roll - changing the profile rings on the shaft is all. This greatly facilitates the profile changing and increases the number of profiles to be supplied to the customer.
The profile-rings are 60 or 120 mm wide and can be equipped with one or two profiles, according to profile width.
The lower stamping roller is in a fixed position and driven by the iron twister. The upper stamping roller is driven by a mechanically added gearing, allowing a stamping on both sides of the material in one process. It is adjustable in height up to 50 mm, allowing the adaptation to different thickness of material.
Both stamping rollers are mounted in four heavy-duty bearings. Each bearing contains an additional thrust bearing for taking the lateral forces.

One end of the lower stamping roller the shaft holds a driving pivot, the other a second driving pivot. A second and frequently used attachment, such as End Mill GAG 50 or Ring-Bending Device GBR 66 or GBR 666 can be driven via the second pivot. This reduces the assembly time for mounting the devices.
The Profile-Rolling Device GPG 999 is equipped with a height-adjustable table for guiding the material. This table holds a two-piece material guide to be positioned via hand-wheels and threaded spindles.
The 5-rolls-axial-guide consists of two lower and three upper shafts. Lower and upper shafts can be adjusted separately.
The standard version of the ProfileRolling Device GPG 999 is supplied with four sets of stamping rings (60 mm wide).
The diameter of the stamping rings is 156 mm. This effects the following stamping capacities:
10 rpm = 4900 mm/min.
20 rpm = 9800 mm/min.
weight: 470 kg



No. 9096
Attachment for Profile-Rolling Device
GPG 999
for stamping square and rectangular tubes.

Square tubes:
20 x 20 mm - 60 x 60 mm
Rectangular tubes:
30 x 20 mm - 80 x 60 mm

Stamping rings, 60 and 120 mm wide

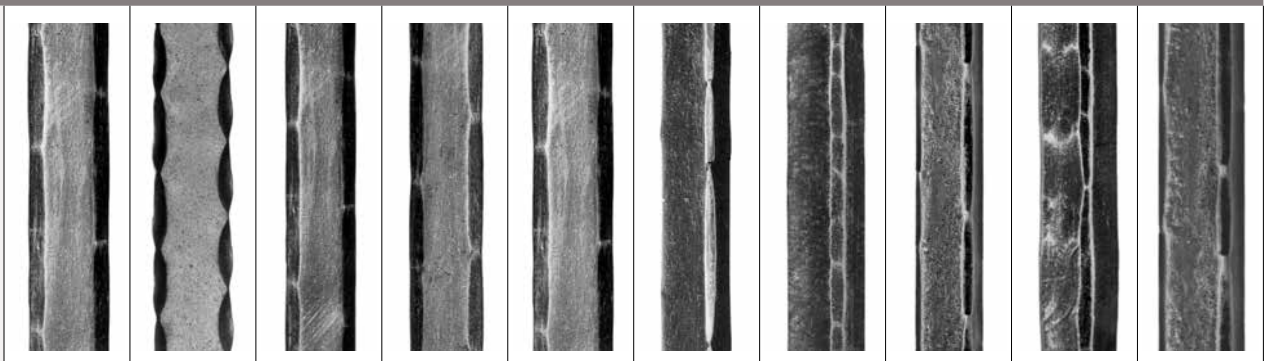
Profiles of the Standard Stamping Rings

Number	Profile	stampable material thickness		
31200	8 mm	8 - 25 mm		
34053	16 mm	8 - 16 mm		
34054	20 mm	8 - 20 mm		
35050	40 mm	6 - 20 mm		
35057	40 mm	6 - 20 mm		
36095	20 mm	6 - 20 mm		
12377	12 mm			
12417	14 mm			
12418	16 mm			
12419	20 mm			

Profies for Extra Stamping Rolls

Profile								
Width (mm)	50	30	40	50	40	40	50	60
Material (mm)	6-12	6-12	6-12	6-12	6-12	6-12	6-12	6-12
Number	**35164**	**35156**	**35157**	**35165**	**35144**	**35158**	**35166**	**35167**

Profies for Extra Stamping Rolls

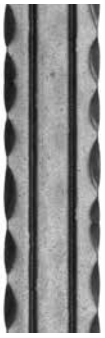


Profile										
Width (mm)	30	30	25	30	40	20	30	20	25	30
Material (mm)	6-16	6-16	6-12	6-12	6-12	6-16	6-20			
Number	**34114**	**34145**	**34112**	**34113**	**35116**	**34111**	**29203**	**34115**	**34116**	**29204**

Profies for Extra Stamping Rolls

Profile															
Width (mm)	12	15	12	16	10	12	14	16	20	25	30	10	12	14	16	20
Material (mm)	6-10	6-10	6-10	6-12												
Number	**34155**	**34152**	**35162**	**35161**	**35160**	**12377**	**12417**	**12418**	**12419**	**12420**	**35159**	**22495**	**22496**	**22498**	**22497**	**35163**

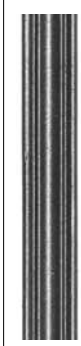
Profies for Extra Stamping Rolls

								
Profile								
Width (mm)	40	40	40	40	50	50	50	60
Material (mm)	6-12	6-12	6-12	6-12	6-10	6-10	6-10	6-10
Number	**35143**	**35088**	**35153**	**35122**	**35126**	**35151**	**35100**	**35112**

Profies for Extra Stamping Rolls

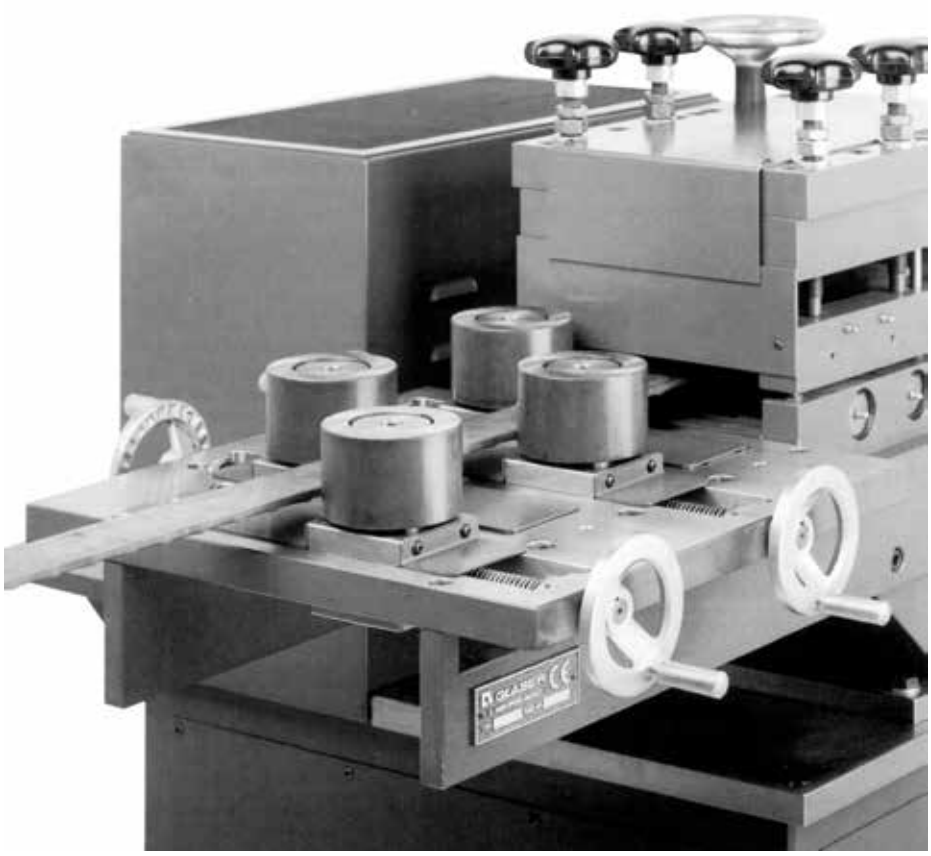
									
Profile									
Width (mm)	40	40	25	30	40	40	40	40	40
Material (mm)	6-10	6-12	6-20	6-15	6-12	6-12	6-12	6-12	6-12
Number	**35154**	**35152**	**36060**	**36120**	**35142**	**35145**	**35130**	**35146**	**35147**

Profies for Extra Stamping Rolls

														
Profile														
Width (mm)	6	8	12	16	12	12	16	12	16	20	25	30	30	30
Material (mm)	8-20 [1]	8-25 [1]	12-25 [1]	16	12 [2]	12 [1]	16 [1]	3-20	4-20	4-20	4-20	6-8	6-12	6-20
Number	**34145**	**31200**	**34147**	**34148**	**31149**	**34144**	**34143**	**21078**	**21076**	**21079**	**21070**	**35155**	**34051**	**34142**

[1] fluted on both sides [2] fluted on four sides

Vertical-Alignment Unit GVR for Profile-Rolling Devices GPG — No. 9098



General

The standard execution of the Profile-Rolling Devices GPG 90, GPG 99 and GPG 999 integrates an alignment unit.

The additional Vertical-Alignment Unit GVR has been developed for the rolling rectangular and square iron of inferior quality as well as for the rolling of square and rectangular tubes generally. The Vertical-Alignment Unit GVR is mounted an the material outlet of the Profile-Rolling Devices GPG 90, GPG 99 or GPG 999.

The Vertical-Alignment Unit contains 4 vertical straighteners, each of which being adjustable by means of a spindle with hand wheel.

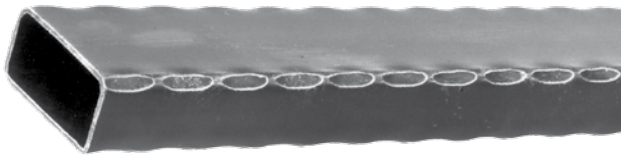
Weight: 55 kg

Profiles for square tubes and rectangular tubes

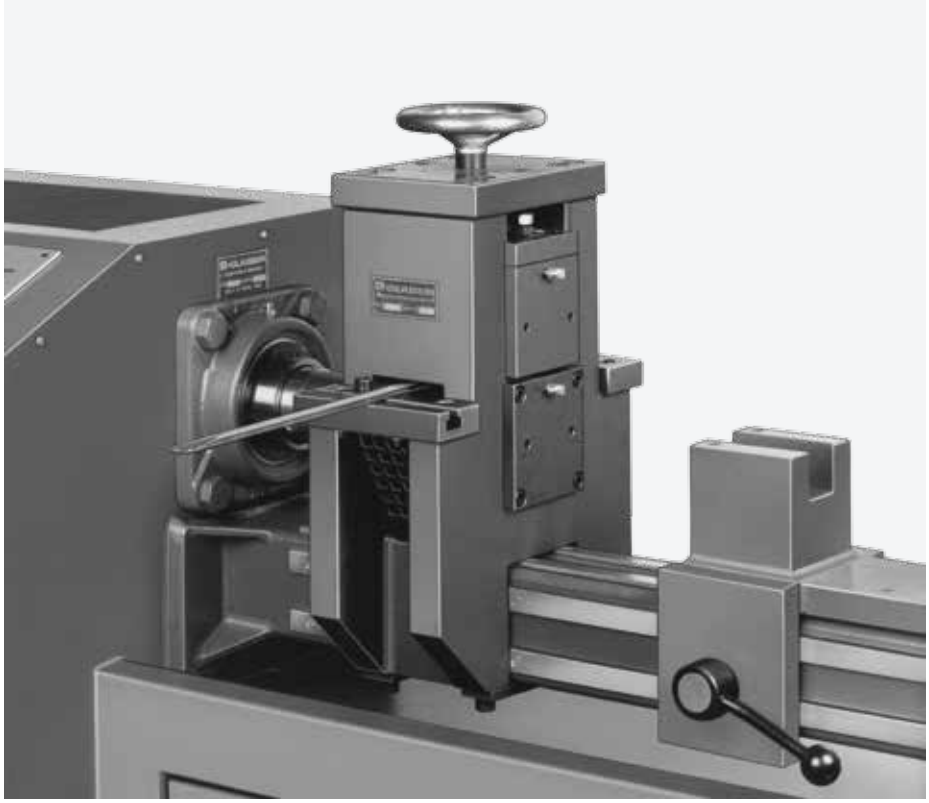
29220	20 x 20 x 3 mm	
29221	25 x 25 x 3 mm	
29222	30 x 30 x 3 mm	
29223	40 x 40 x 3 mm	
29224 [1]	50 x 50 x 3 mm	
[2]	60 x 60 x 3 mm	
[2]	80 x 80 x 3 mm	
[2]	100 x 100 x 3 mm	

[1] only for Profile-Rolling Device GPG 999 [2] only for Profile-Rolling Device GPG 999-100

29230	30 x 20 x 3 mm	
29231	40 x 20 x 3 mm	
29232	40 x 30 x 3 mm	
29233	50 x 30 x 3 mm	
29234	60 x 30 x 3 mm	
29235	60 x 40 x 3 mm	
29236	80 x 40 x 3 mm	



End Mill GAG 50 No. 9050



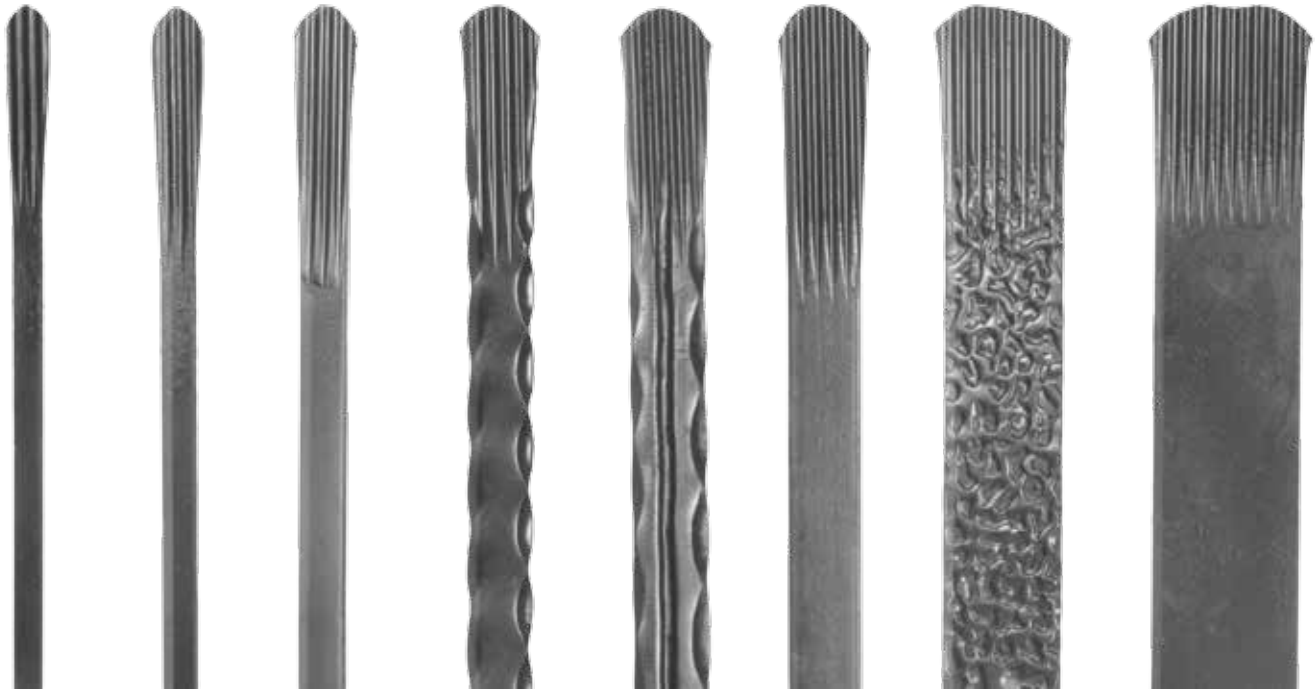
General

The End Mill GAG 50 hot-forges the ends of flat and square iron rayshaped on both sides. This brings about nearly the same result as forging by air hammers with ray-dies.

The end mill contains a driven stamping roll and a free- wheeling pressure roll. The constantly rotating stamping roll holds the shaped profile. The profile is eccentrically worked into the stamping roll in a way that enables the blank to be inserted while the stamping roll is rotating. With the profile getting close to the pressure roll, the blank is automatically gripped and rolled. At the same time the bar end already shaped is pressed out. The position of the pressure roll can be widely adjusted and thus be adapted to different dimensions of mate-rial.

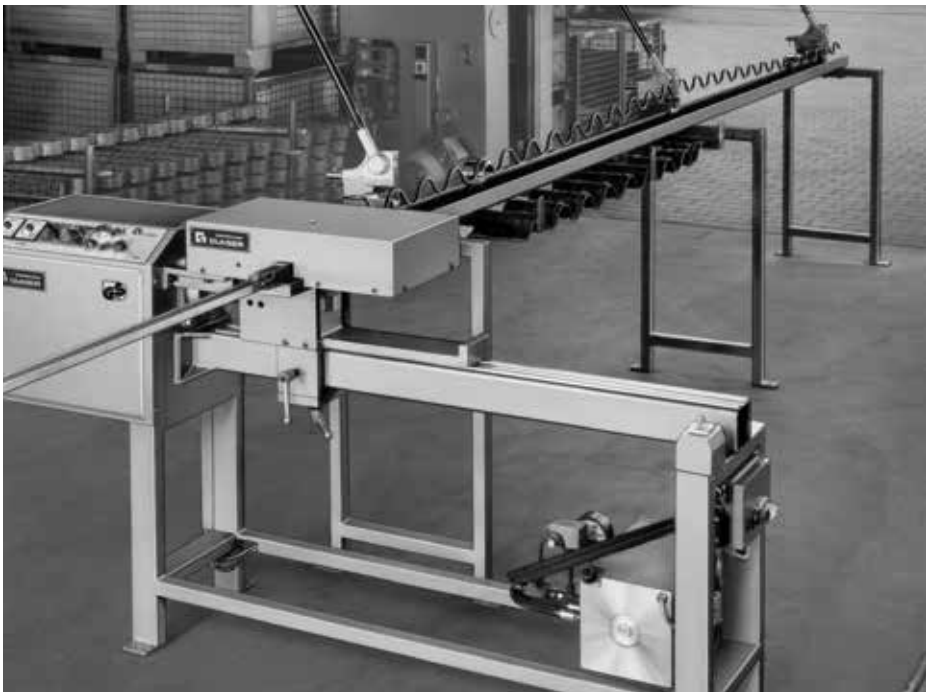
Technical Data

- Cross-sections of material to be pro-cessed: width up to 60 mm thickness up to 10 mm
- Weight: 90 kg



Florentine-Rolling Device GFF 777 — No. 9077

Florentine-Rolling Device GFF 777



Florentine-Rolling Device GFF 777 with material guideway (option)

General

The Florentine-Rolling Device GFF 777 is an attachment to the Automatic Multiple-Purpose Iron Twister GDM. This device rolls Florentines and undulatory bars continuously from straight material. The rolling is done by two pressing discs.

The rolling device is mounted an the guideway and driven by the main shaft like the other GDM attachments. The two pressing discs are driven by conical gears placed in the housing. The synchronism of the two pressing discs is achieved by a pair of gear wheels.

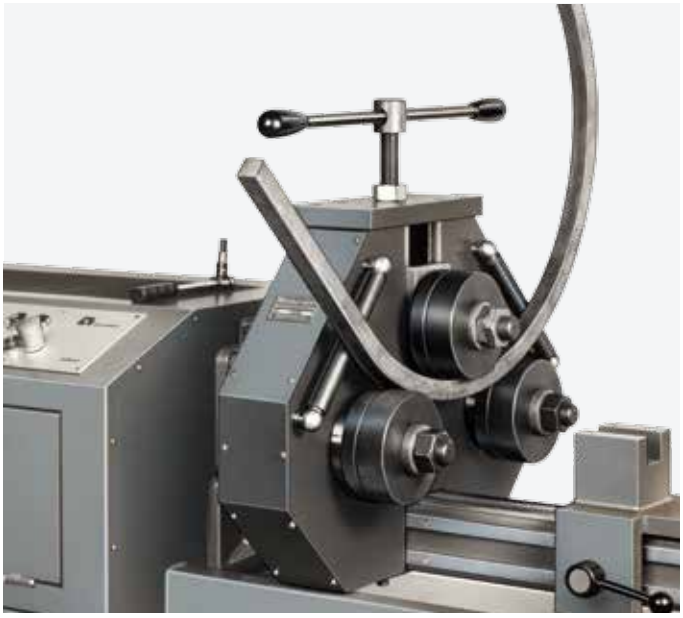
The standard type of the rolling device is equipped with pressing discs for rolling of Florentines. Additionally pressing discs for rolling of undulatory bars are disposable.

The rolling device rolls long flat iron bars continuously in one piece. At the end of the rolling device the rolled material is led to a guideway. This guideway is also an axial guide for the rolled material. The guideway is supplied as an option.

Technical Data

- Both pressing discs are constructed for material thickness of 6 mm.
- width of the Florentines: max. 12 mm (max. 12 x 6 mm)
- width of the undulatory bars: max. 20 mm (max. 20 x 6 mm)
- weight: 135 kg

Arch- and Ring-Bending Devices



Productinformations

Devices for bending arches and rings from flat, square and round iron, T-shaped and angular iron, square and round tubes.

The Arch- and Ring-Bending Devices GBR are constructed in accordance with the latent state of engineering: The gear box is of welded steel construction. The driving shafts are dually mounted in roller bearings. Owing to this both-sided mounting in bearings a high loading capacity of the shaft ends and consequently an enormous bending capacity is achieved.

The bending devices dispose of three bending shafts mounted in triangular position. At the bottom there are two driving shafts driven via cog-wheels. On top there is a bearing support, adjustable in height, carrying the pressure shaft, by which the bending radius is adjustable. Bending rolls are mounted an all three shafts. The pressure roll free-wheels in a maintenance-free DU-bush.

For bending the various profiles several bending rolls are disposable. Together with the Bending Device GBR a set of split bending rolls with distance rings (8 mm) are supplied. Therewith bending is possible for: Flat iron edgewise and flat, angular and T-shaped iron, square iron and thick-walled square and rectangular tubes.

For bending thin-walled tubes to arches and rings with small diameters it is indispensable to have exactly suiting bending rolls, in Order to avoid a lateral bulging. We produce such bending rolls according to your requirements within short time.

GBR 666 / 66 No. 6660 / 6066

The Arch- and Ring-Bending Device GBR 66 can be supplied either as attachment to the Automatic Multiple-Purpose Iron Twister GDM or as manual bending device.

For the manual Operation the bending device is equipped with a Speed re-duction gear carrying a second driving pivot. The crank is optionally fixed on one of the two pivots. This enables a higher reduction with thick profiles and thus an easier handling.

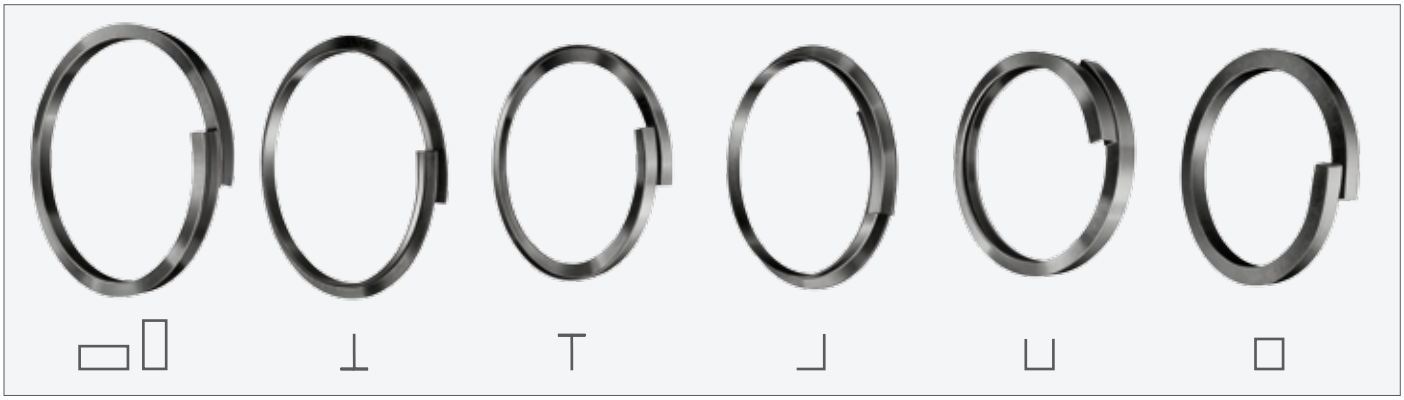
The schedule Shows the bending capacity.

weight: 190 kg / 90 kg

Max. Bending Performance

GBR 666				GBR 66			
Profiles	mm	min. Radius		Profiles	mm	min. Radius	
	60 x 10	700	•		80 x 10	600	•
	70 x 12	500			80 x 16	250	
	30 x 30	300			35 x 35	200	
	35 x 30	400			40 x 30	210	
	30	300			40	210	
	50 x 50 x 4	2000	•		60 x 60 x 4	2000	•
	40 x 40 x 3	1500	•		60 x 40 x 4	1500	•
	1 ½" x 2	800	•		50 x 4	600	•
	1 ¼" x 2	300	•		40 x 3	450	•
	45 x 6	500			2" x 2	500	•
	45 x 6	600	•		1 ¼" x 2	200	•
	40 x 6	350	•		45 x 6	250	
	45 x 6	300			45 x 6	400	•
	60 x 40	400			45 x 6	300	•
	60 x 40	600			45 x 6	250	
					60 x 50	400	
					60 x 50	600	

• Extra rolls



Extra rolls for round tubes

Extra double rolls for round tubes

Extra rolls for thin-walled square and rectangular tubes

Handrail Benders GKB

General

The Handrail Benders GKB hydraulically bend elbows and arched tubes. For that works we supply the Handrail Bender GKB 44 and Handrail Bender GKB 45. Both Handrail Benders are employed with the 27-t-pressing bed of the Automatic Multiple-Purpose Iron Twister GDM 40/3 or GDM 50/3 or the Hydraulic Press GHP 27. The 27-t-cylinder of the basic machine version is used as hydraulic ram.

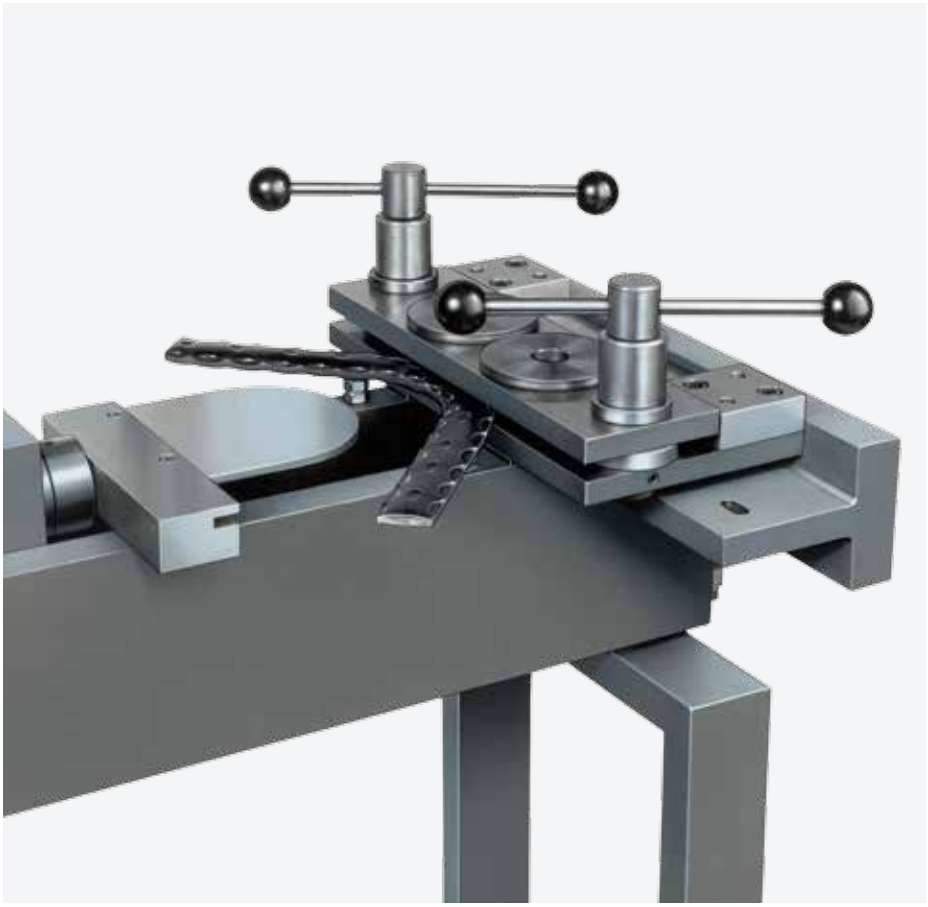
GKB 44 No. 9044

The Handrail Bender GKB 44 is designed for bending of elbows and arched tubes.

Three sets of bending patterns for 8 mm flat iron are supplied with the Handrail Bender GKB 44. The bending radii are 100 mm, 120 mm and 150 mm.

Bending patterns for arched tubes an request.

weight: 63 kg



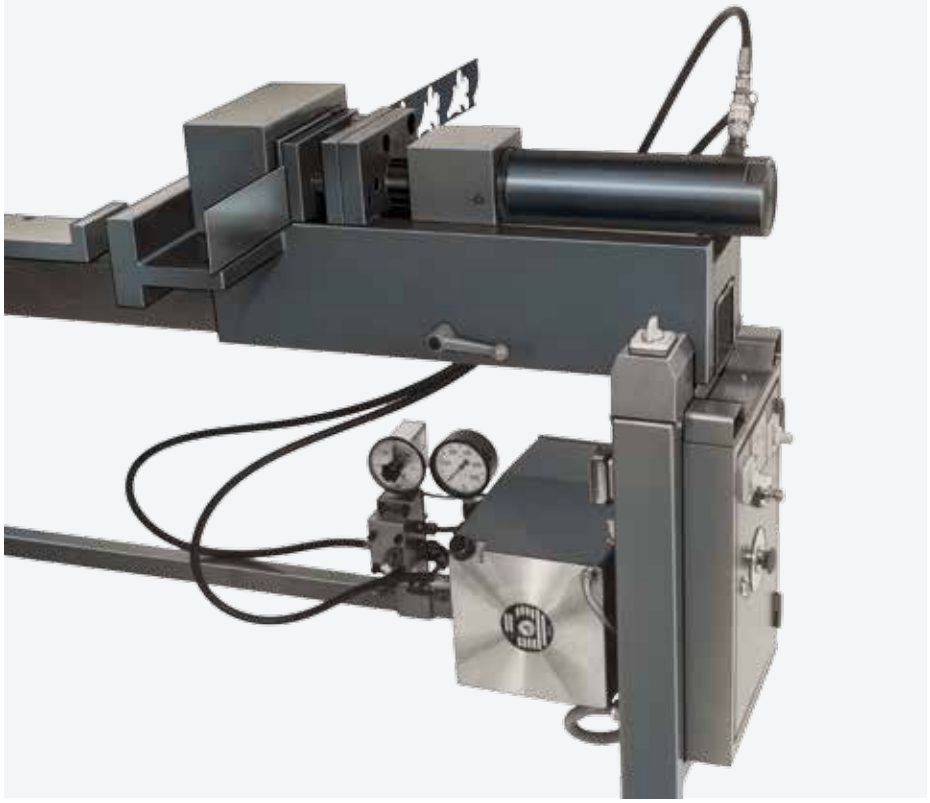
GKB 45 No. 9045

The Handrail Bender GKB 45 is a special construction for bending of elbows for banisters.The feature of the GKB 45 is the exact horizontal guidance of the material.

Two sets of bending patterns for 8 mm and 10 mm flat iron are supplied with the Handrail Bender GKB 45.

weight: 32 kg

Leaf-Stamping Tools GBW 55



General

The Leaf-Stamping Tools GBW 55 are designed for the manufacturing of ornamental leaves for wrought-iron articles. The ornamental leaves are punched and stamped from sheet metal stripes in one passage. For each type of leaf is an own Leaf-Stamping Tool GBW 55 required.

The Leaf-Stamping Tools are attachments of the Automatic Multiple-Purpose Iron Twister GDM 40/3 and GDM 50/3 as well as the Hydraulk Press GHP 27. These tools are inserted into the pressing bed and driven by the hydraulic equipment of the basic machine.

The Operation of the leaf-stamping tool is controlled by the foot pedal of the basic machine.

If possible, soft material ought to be used (e. g. Stw 22), which influences the intensity of the profile.

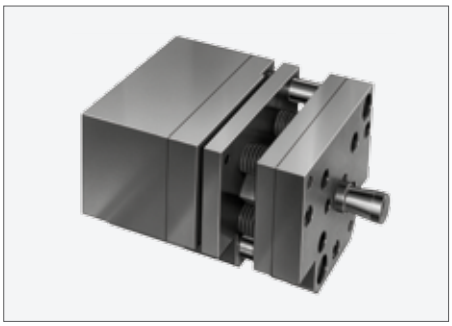
After stamping the leaves they are to be welded at a bar or scroll. The transition must be forged in warm condition. The transition can be forged alter welding by hand directly. In this case re-warm up isn't required. The welding heat can be used. In the other case the transition must be re-warmed up later.

For mass-production Leaf-Distorting Tools GVW 55 can be supplied.
The Leaf-Distorting Tools GVW 55 are extra tools of the automatic Collar Press GZP 9.

Technical Data of the Basic Material

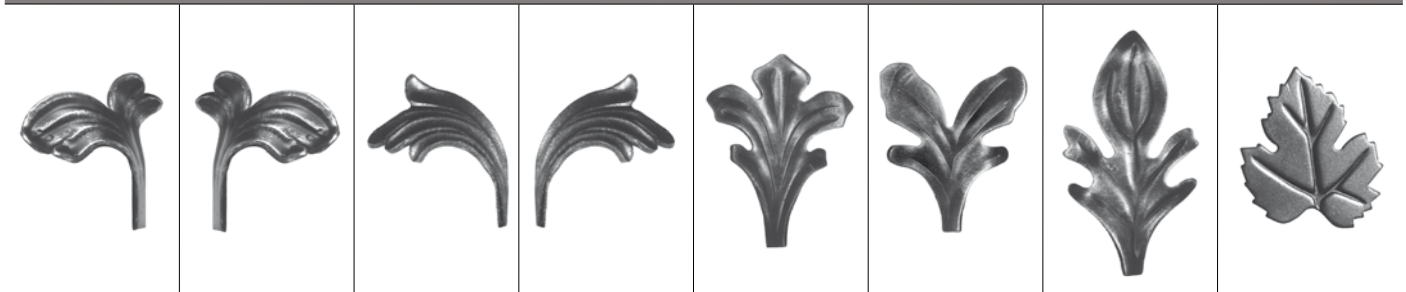
sheet metal stripes 80 mm wide material: St 37-2 or softer material, e. g. Stw 22

The admissible material thickness depends an the strength of the basic material and the shape of the leaf, max. 3 mm.



Leaf-Stamping Tool GBW 55

Leaf-Stamping Tools for GBW 55



22103	22104	22105	22106	22112	22119	22102	22109
punched	punched	punched	punched	punched	punched	punched	punched
9684	9685	9686	9687	9682	9683	9680	9681

Ornamental Collar Press GZP 9 — No. 9000

General

Ornamental collar press for cutting and bending of collars, binding of collars around the bars, distorting of welded on leaves and cutting out of ornamental pointed pieces.

The Ornamental Collar Press GZP 9 is attached to the Automatic Multiple-Purpose Iron Twister GDM 40/3 and GDM 50/3 as well as the Hydraulic Press GHP 27.

The Ornamental Collar Press GZP 9 contains a proper 10-t-hydraulic ram to which the high-pressure hoses of the hydraulic equipment of the basic machine are connected by quick-couplings.

The Ornamental Collar Press GZP 9 is set up on the guideway of the basic machine or the extra Pressing Carriage GPVV 5.

The control is geared in a way that the foot pedal must be pressed down once for each pressing process (for example closing of a collar).

For the manufacturing of collars flat iron 12 x 3 mm or 16 x 4 mm (stripes of St 37 or softer material) is required. If the material is rolled by the Profile-Rolling Devise GPG before, the material will be harder. Offen the collar material must be annealed before cutting and bending.

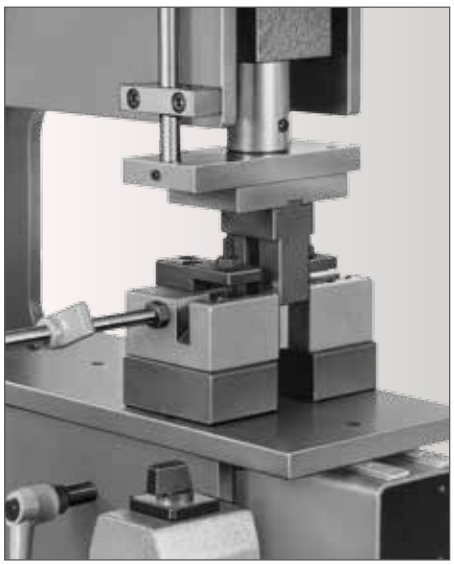
weight: 136 kg

The Ornamental Collar Press GZP 9 can be equipped with the following tools:

Cutting Tool for Pointed Double Ends — No. 9679

Cutting tool for pointed double ends
No. 22101 as showed at our catalogue "Wroughtiron catalogue".

The forging of the pointed ends is done with an Air Hammer GSH.



Closing Tools

Closing tools for collars,
e. g. 24 x 12 mm for Closing around one bar 12 x 12 mm and two scrolls 12 x 6 mm.
The following schedule shows the standard Closing Tools:

Number	Tool	Bars to be collared WxH	Collar Material
9790	for collars	12 x 12 mm	12 x 3 mm
9791	for collars	24 x 12 mm	12 x 3 mm
9792	for collars	18 x 12 mm	12 x 3 mm
9793	for collars	16 x 16 mm	16 x 4 mm
9794	for collars	24 x 16 mm	16 x 4 mm

Leaf-Distorting Tools GVW 55

Ornamental leaves punched and stamped by the Leaf-Stamping Tools GBVV 55 raust be welded to the bars and scrolls.

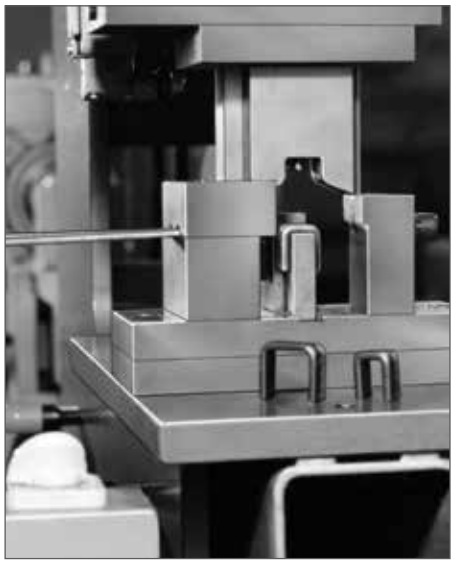
For distorting of the leaves the following Leaf-Distorting Tools are available:

Nummer	Tool	Ornamental Leaves
9780	for ornamental leaves	22102 left and right
9781	for ornamental leaves	22112 left and right
9782	for ornamental leaves	22119 left and right
9783	for ornamental leaves	22103 and 22104
9784	for ornamental leaves	22105 and 22106

Cutting/Bending Tools

Cutting/bending tools for simultaneous cutting and bending of two collars:
e. g. one collar 24 x 12 mm and one collar 12 x 12 mm.

The following schedule shows the standard Cutting/BendingTools:



Number	Tool	Bars to be collared WxH	Collar Material
9691	for collars	12 x 12 mm and 24 x 12 mm	12 x 3 mm
9692	for collars	12 x 12 mm and 18 x 12 mm	12 x 3 mm
9693	for collars	16 x 16 mm and 24 x 16 mm	16 x 4 mm
9694	for collars	24 x 12 mm and 32 x 16 mm	16 x 4 mm

Hydraulic Press GHP 27 No. 4027

General

The Hydraulic Press GHP 27 is designed for all shape-pressing and bending works. Also, it can drive all hydraulically operated attachments such as Leaf-Stamping Tools GBW 55, Ornamental Collar Press GZP 9 or Handrail Benders GKB 44 and GKB 45.

Hydraulic Equipment

The hydraulic equipment consists of a maintenance-free Compact pump and a 27-tons hydraulic ram with 200 mm lifting length.
The Hydraulic Press GHP 27 comprises a 27-tons pressing bed for holding the hydraulic ram and the pressing tools resp. attachments.

Technical Data

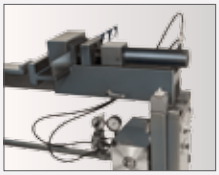
- voltage supply:
  380 V three-phase current with loadable central conductor (220 V), 50 Hz different voltage or frequency on request
- power consumption: ca. 3.7 KW
- paintwork: two-component varnish, blue
- weight: 380 Kg

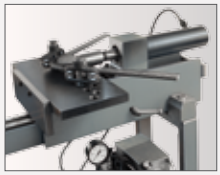
Electric Control

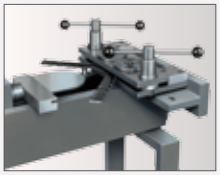
The electric control contains the operation modes MANUAL and AUTOMATIC. For operating the press from a remote place, as is advisable for working with long bars, an additional operating panel is available for pedaland two-handed operation.
In operation mode MANUAL, the machine assembles tools and bends individual parts.
In operation mode AUTOMATIC, shape-pressing is started with a pedal switch.

The hydraulic oil-flow is stopped by a pressure switch at the end position and reverted into the other direction - the hydraulic ram reverts as well. At the start position, another pressure switch halts the pump.
Two mechanic stop switches enable a repeating operation, e.g. straightening bent bars.

Accessories for GHP 27


Leaf-Stamping Tool
GBW 55


Handrail Bender
GKB 44


Handrail Bender
GKB 45


Ornamental Collar
Press GZP 9


Pressing Carriage
GPW 5

No. 4028

Operating Panel for pedal- and two-handed operation

The Hydraulic Press GHP 27 can be equipped with an additional operating panel for pedal- and two-handed ope-ration. A Gable connects the operating panel with the control. This enables to operate the hydraulic press from a remote place when working with long bars.

Bending Tools

For the Automatic Multiple-Purpose Iron Twisters GDM 40/3 and GDM 50/3 and for the Hydraulic Press GHP 27, a wide range of bending tools is available. These tools can also be inserted in all previously supplied machines, if they comprise of the necessary hydraulic equipment.

The bending tools are made of polished and tempered machine-steel, and are designed for high strain in individual and mass-production.

The tool numbers correspond to the parts-numbers of our " Wrought-Iron catalogue".

The bending tools all have a working height of 30 mm. They are designed for different mate-rial sizes. The bending tools are divided in four categories:

Bending Tools for Twirl Blanks
The material size depends an the size of the twirls and ranges from 6 mm, 8 mm, 10 mm, 12 mm, 16 mm, 20 mm to 25 mm.

Bending Tools for Scrolls
These bending tools are designed for a material thickness of 6 mm. This enables to bend the illustrated scrolls and bars with a cross-section of 12 x 6 mm.

The following cross-sections of material can be bent
The material thickness (standard 6 mm) can range from 4 to 8 mm (6 ± 2 mm). Different cross-sections may cause minor changes in scroll-shape due to technical reasons.

Bending Tools for Bars
These bending tools are designed for a mate-rial thickness of 12 mm. This enables to bend the illustrated bars with a cross-section of 12 x 12 mm.

The following cross-sections of mate-rial can also be bent:

The material height may vary from ca. 4 mm up to 20 mm (the working height of the bend-ing tools is 30 mm).
The material thickness (standard 12 mm) can range from 10 to 14 mm (12 ± 2 mm). Different cross-sections may cause minor changes in bar-shape due to technical reasons.

Bending Tools for Twirl Blanks

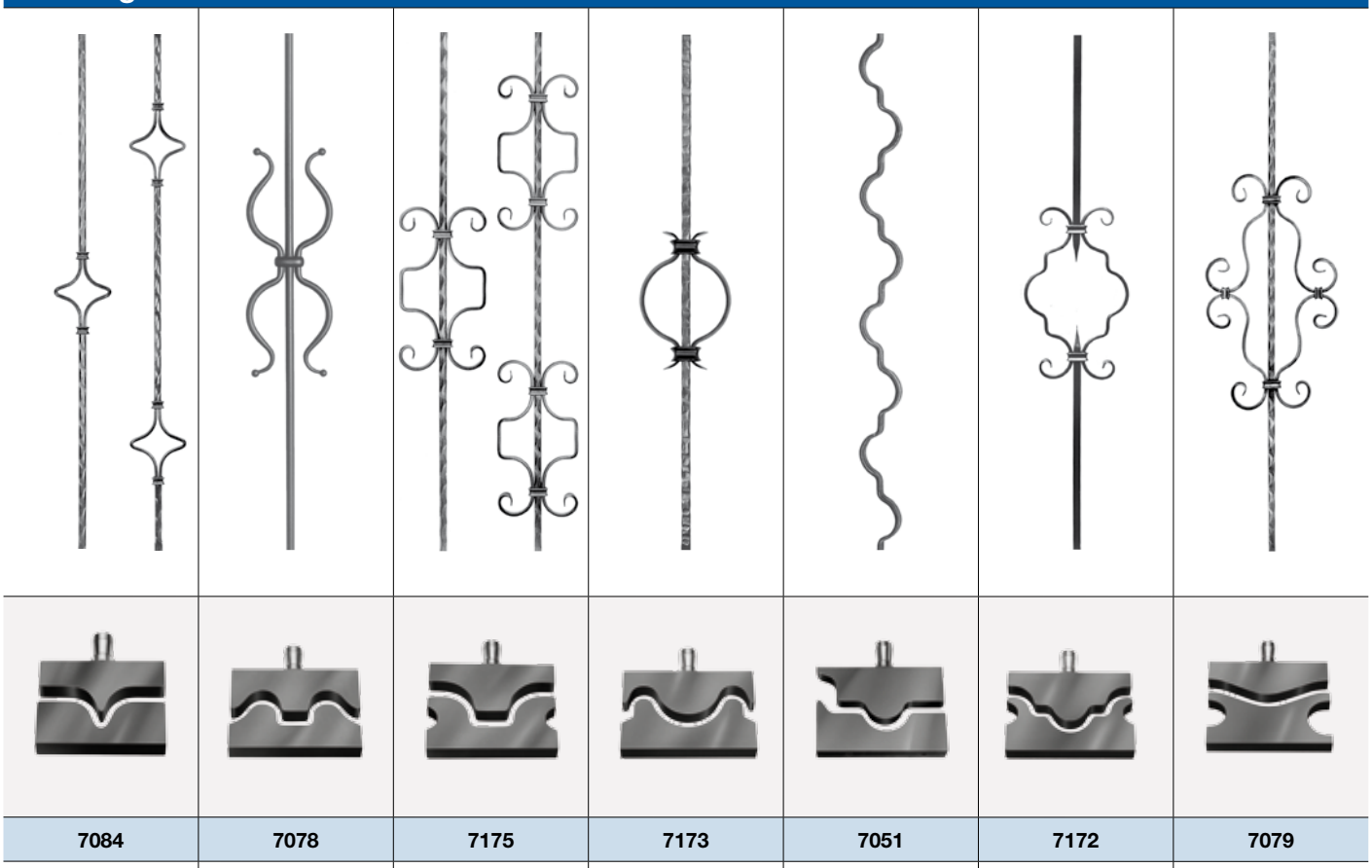
Tool

Machining

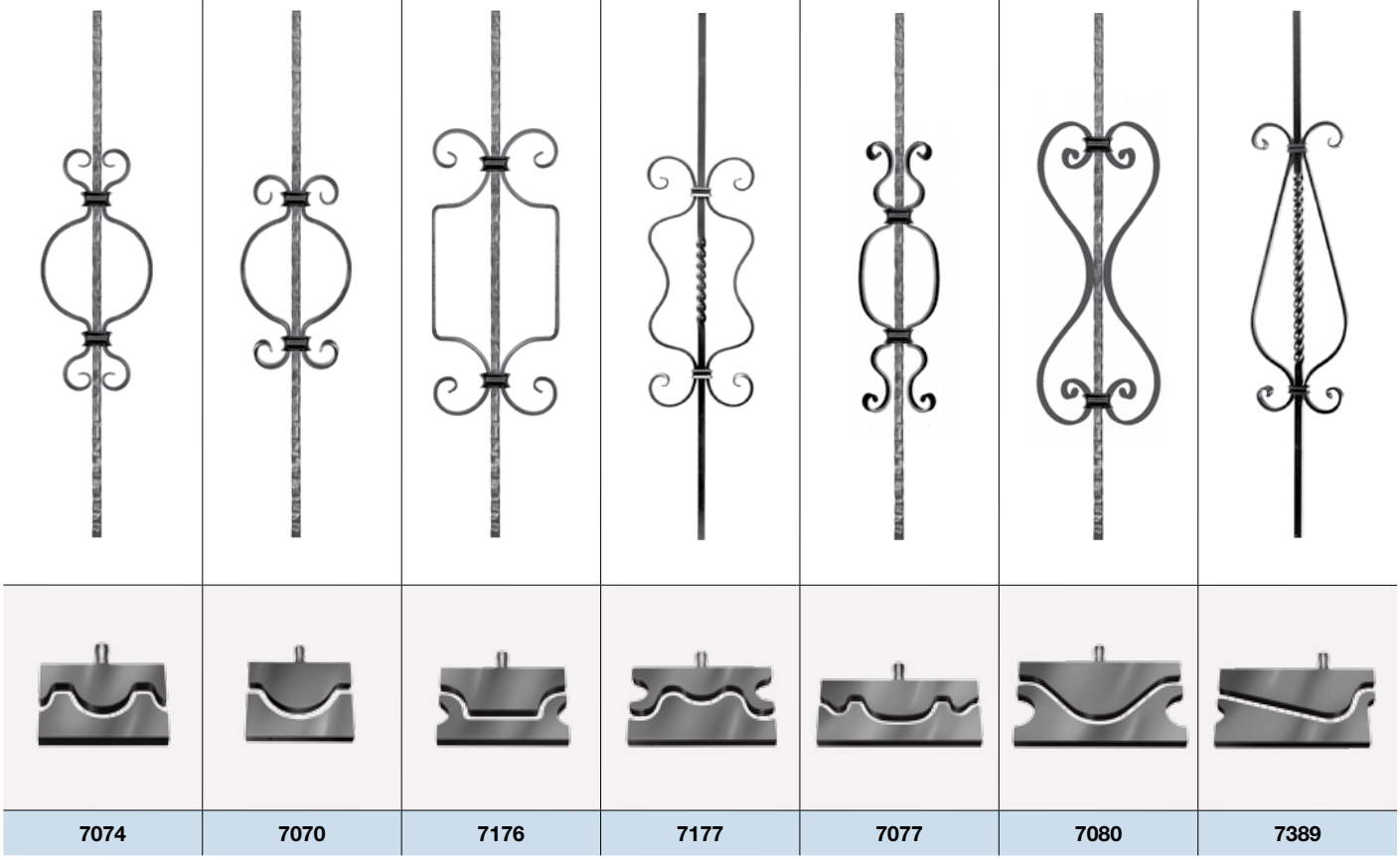
End product

☐ 6 mm	☐ 8 mm	☐ 10 mm	☐ 12 mm	☐ 16 mm	☐ 20 mm	☐ 25 mm
7067	7089	7068	7069	7071	7072	7073

Bending Tools for Scrolls

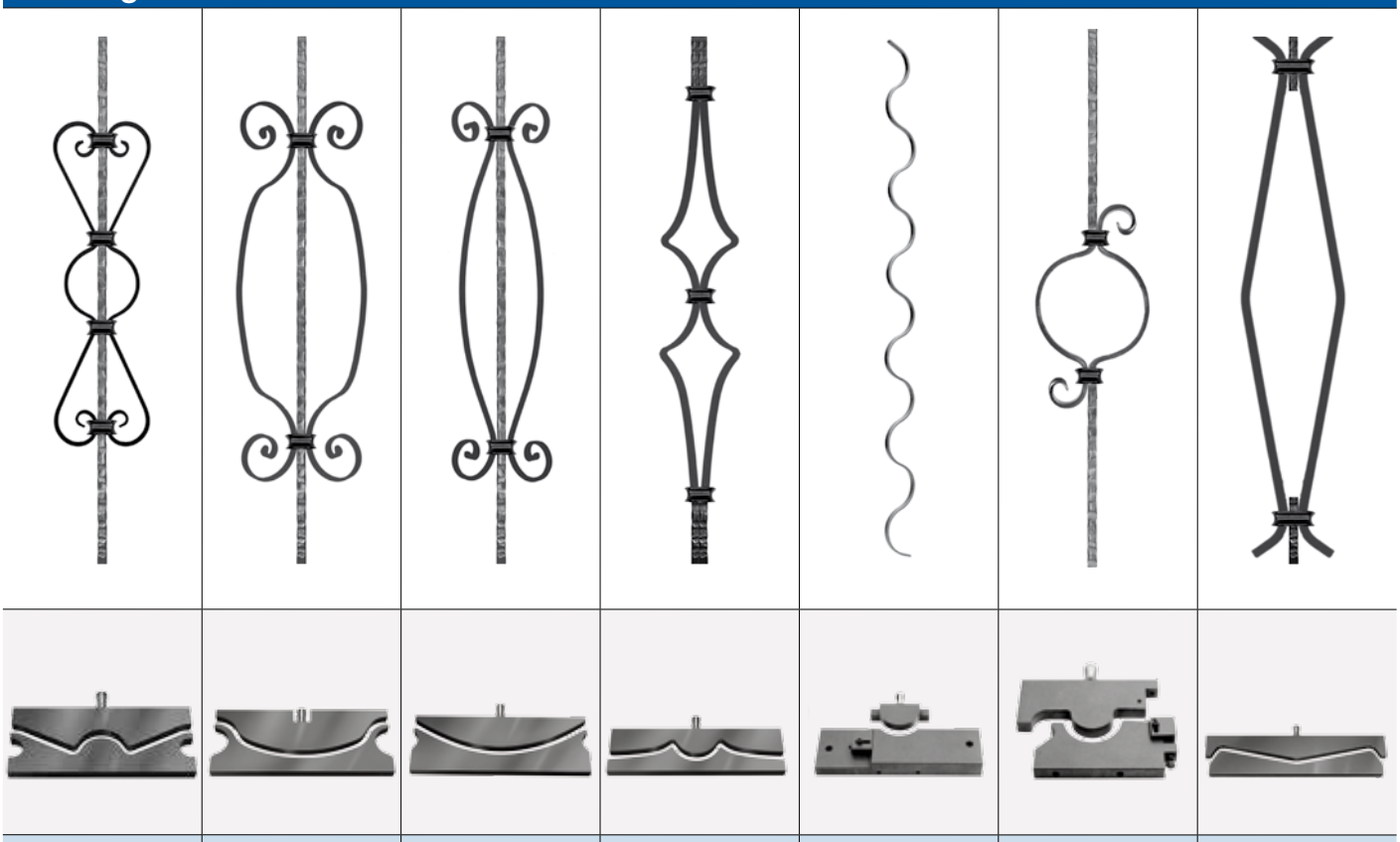


7084	7078	7175	7173	7051	7172	7079

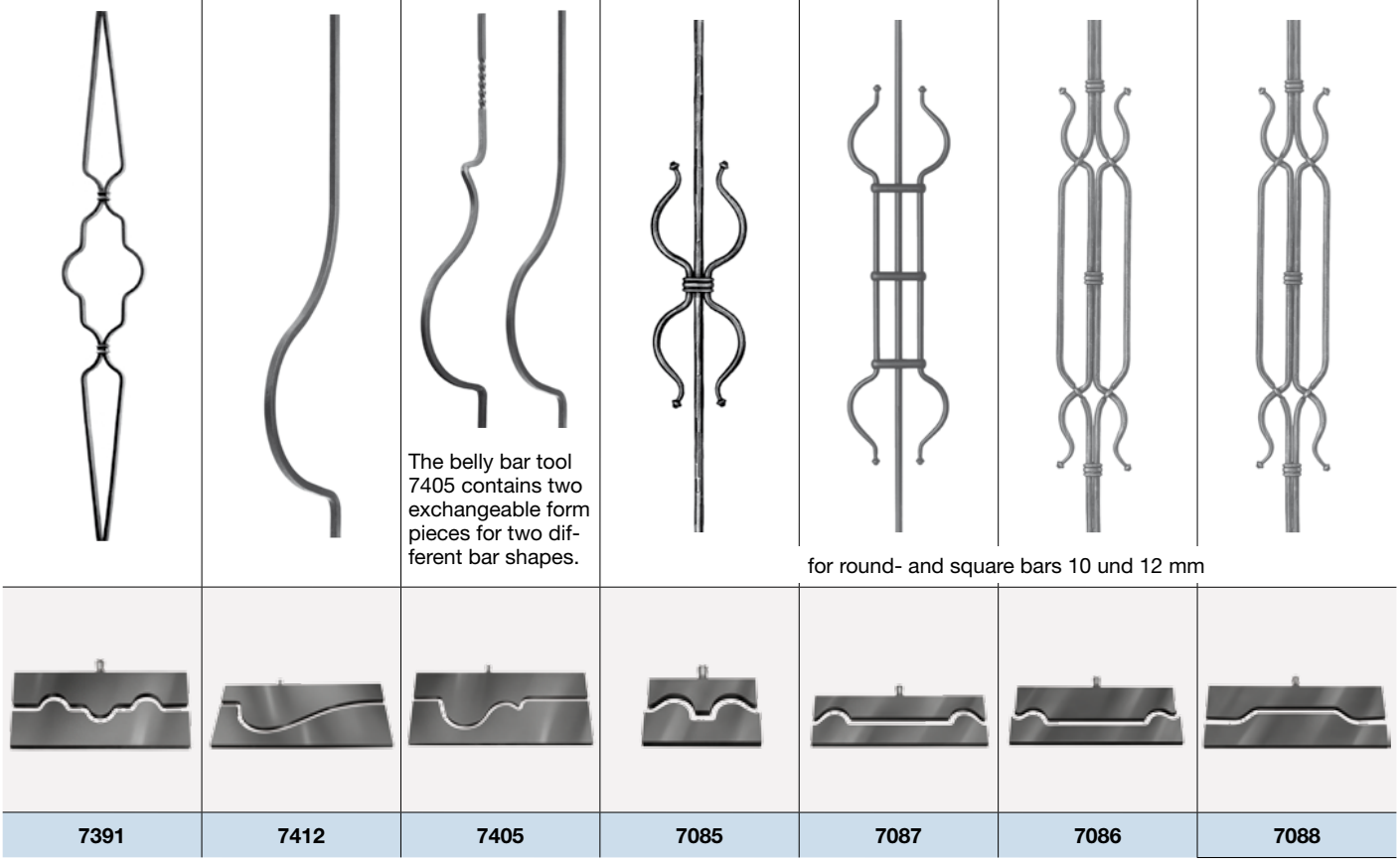


7074	7070	7176	7177	7077	7080	7389

Bending Tools for Scrolls



7308	7344	7081	7076	7083	7082	7392



The belly bar tool 7405 contains two exchangeable form pieces for two different bar shapes.

for round- and square bars 10 und 12 mm

7391	7412	7405	7085	7087	7086	7088

Automatic Scroll Bender GSB 8 E — No. 8088

8002

8011

8013

General

The Automatic Scroll Bender GSB 8 E cold-bends forged scrolls. Pre-cut flat or square iron is the raw material of which the ends are hot-forged first.
The scroll bender consists of two assembly groups:

- of the well-approved Scroll Bender GSB 8 with an extensive variety of bending tools and special attach-ments and
- of a new-developed support with electrical drive and control.

The Scroll Bender GSB 8 E has been developed for single and mass- production in small and medium-size enterprises. It is superior especially by its extensive program of bending tools and attachments.

The scroll bender is driven by a strong geared brake-motor enabling a stop independent of the material.

The starting and stopping positions depend on the particular bending tool. The positions are adjusted on a limb disc by two variable cams ranging from 0 to 360 degrees. Additionally by means of a switch 1, 1.5 or 2 rotations can be Chosen. By this combination of adjustment for instance unsymmetrical S-scrolls can be bent by one tool in two steps. Only the rotations have to be changed from 2 to 1.5.

Bending Tools

For the Scroll Bender GSB 8 E the same bending tools can be used as for the GSB 8 being approved in a thousand times.

Standard Accessories

- 3 bending tools: 8002, 8011 and 8013
- 2 socket screw hexagon wrenches

Technical Data

- Bending capacity: Depending on the applied bending tool, warm-forged flat iron up to 60 x12 mm and round- and square iron up to 20 mm
- Bending speed: 15 rotations/min
- Power consumption: 1.25 kW
- Weight: 310 kg
- Voltage supply:
  380-400 V three-phase current with loadable central conductor (220-230 V), 16 A, 50 Hz or 220-230 V three-phase current, 16 A, 50 Hz
  With a power supply in a frequency of 60 Hz the scroll bender runs faster by 20 %.

Automatic Scroll Bender GSB 80-P — No. 8130

Bending speed
12 and 24 rotations/min

Weight: ca. 370 kg

The Automatic Scroll Bender GSB 80-P bends forged scrolls in cold condition. Raw material is pre-cut flat, square or round iron, the ends of which have been hot-forged before.
The Scroll Bender GSB 80-P contains a pole-reversible gear motor with brake for two different rotating speeds (12 and 24 rotations/min.).
The Scroll Bender GSB 80-P is equipped with the GLASER-Position Control GPS-2 including a memory for max. 200 locations. Each location memorises, besides the starting position of the used bending tool, all angles for a special scroll. First Information is the first bending angle of the tool and the corresponding release angle for taking out the scroll. Subsequently it memorises the data for bending- and release angle of the second bending.
The scroll bending process goes as follows: First the bending tool is turned into its starting position. Then the scroll blank is pushed into the bending tool, and the bending process is started, the tool is turned to the programmed end point.
So the first bending of the scroll is finished. After a short dwell time the tool is released and the bent scroll can be taken out. After that the tool is returned into the starting position. Now, if required, a second bending may follow. In case of a symmetric C-scroll the same procedure is repeated. For an unsymmetrical S-scroll the bending tool is turned to another end point and released. A simple scroll does not necessitate a second bending.
The control of the Scroll Bender GSB 80-P operates in the modes Adjusting, Hand-Control and Foot-Control. In the operating mode Adjusting the basic position of a new bending tool is taken over into the Position Control. The automatic scroll bending proceeds in the operating modes Hand-Control and Foot-Control.

The different memorised locations are successively re-used by pressing a push button or the pedal. Thereafter the bending tool is turned into the basic position, and the Next scroll may be bent. The operation with mode Foot-Control is recommendable for the mass-production, thus achieving the utmost Output.
The Scroll Bender GSB 80-P is mobile.

Technical Data

- Bending capacity: depending on the applied bending tool, warm-forged flat iron up to 60 x 12 mm and round- and square iron up to 20 mm
- Bending speed I: 12 rotations/min.
  Bending speed II: 24 rotations/min.
- Voltage supply:
  380-400 V three-phase current with loadable central conductor
  (220-230 V), 16 A, 50 Hz.
- Other voltage and frequency on demand.
- Power consumption: 1.9 kW
- Paintwork: two-component varnish, blue
- Weight: ca. 370 kg

Bending Tools

All bending tools indicated in the catalogue (No. 8000 to 8015, 8150 and 8151) can be applied. The back pressing roll of the spindle sleeve is blocked for small bending tools, whereas for large tools it is mobile so that it can be adapted to the tool by means of a spring. It is also possible for unusually large bending tools (special developments) to mount the spindle sleeve up to 100 mm aside. The scroll blank to be bent is guided on the base plate.

Standard Accessories

- 3 bending tools: No. 8002, 8011 and 8013
- 2 socket screw hexagon wrenches

Extra Accessories

- Bending tools No. 8000 to 8015, 8150 and 8151

Automatic Scroll Bender GSB 80-V — No. 8110

Bending speed
5 - 45 rotations/min

Weight: ca. 350 kg

The Automatic Scroll Bender GSB 80-V bends forged scrolls in cold condition. Raw material is pre-cut flat, square or round iron, the ends of which haue been hot-forged before.

The Scroll Bender GSB 80-V is equipped with a modern electronic drive with variable rotating speed, which can be selected between 5 and 45 rotations/min. The bringing-up acceleration and deceleration of the bending tool is perfectly adjusted in our works.

The Scroll Bender GSB 80-V is equipped with the GLASER-Position Control GPS-2 including a memory for max. 200 locations. Each location memorises, besides the starting position of the used bending tool, all angles for a special scroll. First Information is the first bending angle of the tool and the corresponding release angle for taking out the scroll. Subsequently it memorises the data for bending- and release angle of the second bending.

The scroll bending process goes as follows: First the bending tool is turned into its starting position. Then the scroll blank is pushed into the bending tool, and the bending process is started, the tool is turned to the programmed end point.

So the first bending of the scroll is finished. After a short dwell time the tool is released and the bent scroll can be taken out. After that the tool is returned into the starting position. Now, if required, a second bending may follow. In case of a symmetric C-scroll the same procedure is repeated. For an unsymmetrical S-scroll the bending tool is turned to another end point and released. A simple scroll does not necessitate a second bending.

The control of the Scroll Bender GSB 80-V operates in the modes Adjusting, Hand-Control and Foot-Control. In the operating mode Adjusting the basic position of a new bending tool is taken over into the Position Control. The automatic scroll bending proceeds in the operating modes Hand-Control and Foot-Control.

The different memorised locations are successively reused by pressing a push button or the pedal. Thereafter the bending tool is turned into the basic position, and the next scroll may be bent. The operation with mode Foot-Control is recommendable for the mass-production, thus achieving the utmost Output.

The Scroll Bender GSB 80-V is mobile.

Technical Data

- Bending capacity: depending on the applied bending tool, warm-forged flat iron up to 60 x12 mit and round- and square iron up to 20 mm
- Bending speed: 5 to 45 rotations/min.
- Voltage supply:
  380-400 V three-phase current with loadable central conductor
  (220-230 V), 16 A, 50 Hz.
  Other voltage and frequency on demand.
- Power consumption: 1.9 kW
- Paintwork: two-component varnish, blue
- Weight: ca. 350 kg

Bending Tools

All bending tools indicated in the catalogue (No. 8000 to 8015, 8150 and 8151) can be applied. The back pressing roll of the spindle sleeve is blocked for small bending tools, whereas for large tools it is mobile so that it can be adapted to the tool by means of a spring.

It is also possible for unusually large bending tools (special developments) to mount the spindle sleeve up to 100 mm aside. The scroll blank to be bent is guided on the base plate.

Standard Accessories

- 3 bending tools: No. 8002, 8011 and 8013
- 2 socket screw hexagon wrenches

Extra Accessories

- Bending tools No. 8000 to 8015, 8150 and 8151

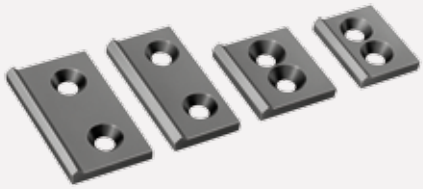
Bending Tools for Scroll Benders — GSB No. 8081

For the Automatic Scroll Benders GSB 8 E, GSB 80-P and GSB 80-V as well as for the Manual Scroll Benders GSB 7 and GSB 8 the same bending tools are applied. They distinguish between simple and hinged bending tools. The simple bending tools are used for bends up to approx. 360°, the hinged bending tools are applied for bends up to approx. 720°.

The bending tools are made of tool steel, polished and tempered. They are destined for the application in the mass-production. Our extensive program of bending tools is described an pages 83 to 86. With these tools C-scrolls of 60 mm up to 420 mm and S-scrolls up to 520 mm can be produced. On demand further bending tools can be developed.

There are, however, some restrictions with the Manual Scroll Bender GSB 7. Owing to its smaller mechanical dimensions only bending tools no. 8000 to 8012, 8150 and 8151 can be applied.

Automatic Blade Clamping
First the ends of forged scrolls are forged in warm condition or hot-rolled with an End Mill GAG 50.
For the automatic clamping of the forged scroll end a blade is inserted in the bending tools. The forged end of the scroll blank is simply pushed into the tool and automatically clamped. This kind of fixing is absolutely the simplest and quickest way.



Spare blades for bending tools No. 8081

Scroll-Ends Rolling-up Device GSE 805 — No. 8135

The Scroll-Ends Rolling-up Device GSE 805 is an attachment to the approved Automatic Scroll Benders GSB 80-P and GSB 80-V. With this attachment warm-forged scroll ends can be tightly rolled-up in cold or warm condition.

The rugged construction does not contain any sensitive parts being not wear-resistant. The conversion requires only a short time. The control of the Operation sequence is proceeded by the GLASER-Position Control GSP-2 of the Scroll Bender GSB 80. The new developed rolling-up process does not damage the surface of the rolled scroll ends, but gives them a smooth finish. The thickness of the rolls can be selected by easily exchangeable rolling-up inserts. Standard rolled-up scroll-ends can be produced in one working process. Tightly rolled-up ends have to be produced with different rolling-up inserts in two steps. Flat iron of 12 x 6 mm can be rolled in cold condition without any problems. Flat iron up to 20 x 8 mm and round iron up to 12 mm diameter will be rolled in warm condition.

Bending Tools	Extra Accessories
There are additional new-developed bending tools available for the production of scrolls with tightly rolled-up ends.	Rolling-up jaws for round material of different diameters. Radial dies for the optimised forging of scroll ends with an Air Hammer GSH.
Standard Accessories	Weight: 31 kg
Rolling-up inserts for flat material of 12x 6mm and 16 x 8 mm.	

Scroll Bender GSB 8 No. 8080

Technical Data

The Scroll Bender GSB 8 contains a bending disc 420 mm in diameter. The GSB 8 processes Cross-sections of material up to 30 x 15 mm or 50 x 10 mm. Also, 180 mm bulge belly bars can be cold- bent out of 12 mm square iron or out of 30 x 10 mm flat iron.

weight: 50 kg

Standard Accessories

The GSB is supplied as standard with 3 bending tools, allen wrench and a bending stopper

- bending tool No. 8002
- bending tool No. 8011
- bending tool No. 8013

Extra Accessories

For the Scroll Bender GSB 8 the following special bending tools can be supplied-.

- Roundbending Conversion-Set No. 8208
- Belly Bar Conversion-Set No. 8400
- Basket Bar Conversion-Set No. 8411
- Roundbending Conversion-Set No. 8394

The Scroll Benders GSB 8 cold-bend flat and square iron by exchangeable bending tools into forged scrolls, belly bars or rings. With forged scrolls, the ends must be hotforged first. Special tools are available for bending round iron and tubes into rings.

The scroll bender consist of a basic body on which a stationary bending disc is mounted. The bending disc contains the mounting for the exchangeable bending tools.

Between body and bending disc, the bending arm is mounted maintenance-free in a bush. The bending arm holds an adjustable bending mandrel with a pressing roll at its end. The pressing roll presses the material around the stationary bending tool.

The Scroll Benders GSB 8 differ in the size of bending disc and bending arm and in the applicable bending tools.

The bending tools are constructed for automatic clamping of the material for bending (automatic blade clamping).

The bending tools for forged scrolls differ in being simple bending tools and hinged bending tools. The standard bending tools enable bendings up to max. 360 degrees (one rotation). The hinged bending tools enable bendings up to max. 720 degrees (two rotations).

Both scroll benders contain an adjust-able angle buffer. This enables a con-stant bending angle with mass-production. When using hinged tools, a special mechanism permits an angle buffer ranging from 360 to 720 degrees and more.

Roundbending Conversion-Set — No. 8208

The optional Roundbending Conversion-Set 8207 bends rings around exchangeable bending rolls. The Conversion-Set consists of a bending mandrel without compression spring, a bending axle with precision thread, a distance washer, a 60 mm exchangeable bending roll and a vice for mounting to the bending disc. The working height of the Roundbending Conversion-Set is 50 mm. The max. diameter of material to be processed is 20 mm.

Rings of round iron or tubes up to 250 mm in diameter can also be manufactured by means of different bending rolls.

example of use

Forged Basket Bar Conversion-Set — No. 8411

By the attachment Forged Basket Bar Conversion-Set 8411 basket bars with a bulge of approx. 210 mm are bent out of 30 x 10 mm flat iron.

The conversion-set consists of a bending tool and a support.

example of use

Belly Bar Conversion-Set No. 8400

Belly Bar Conversion-Set No. 8400
By the attachment Belly Bar Conversion-Set 8400 belly bars with a bulge of 180 mm are cold-bent out of 12 mm square bars or 30 x 10 mm flat iron.

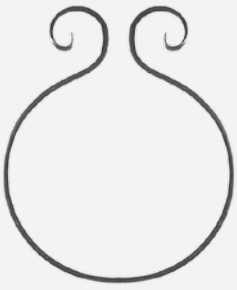
The conversion-set consists of a bending tool, a bending stopper, a distance piece and several accessories.

The conversionset consists of a bending tool, a bending stopper and a support.

example of use

Roundbending Conversion-Set No. 8394

The Roundbending Conversion-Set 8394 is an attachment of the Scroll Bender GSB 8 for bending ornamental rings, such as used e.g. for our ornamental bars.
First the ends have to be rolled in by a scroll bender (bending tool 8006).



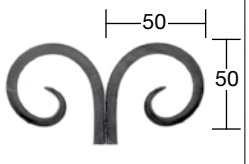
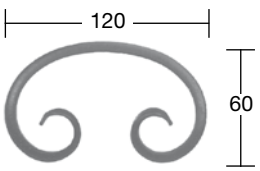
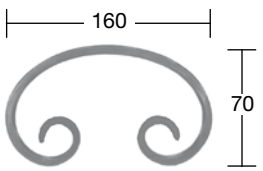
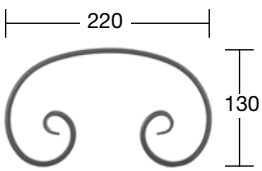
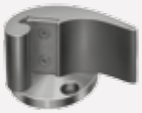
example of use

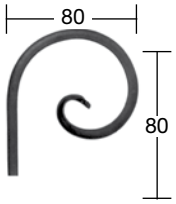
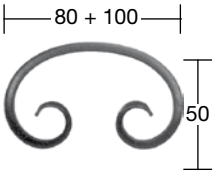
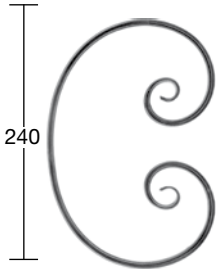
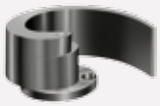
Automatic Stop No. 8170

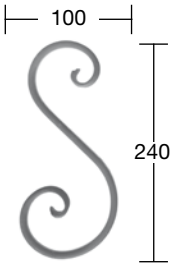
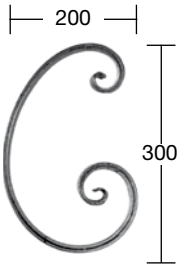
The scrolls are bent depending an their size or shape either with one or two revolutions. The end position is then fixed by a mechanical stop.

The attachment Automatic Stop activates after the first revolution so that the stop is effective only with the second revolution.

Bending Tools

				
				
8000	**8001**	**8002**	**8003**	**8004**

					
					
8005	**8006**	**8007**	**8008**	**8010**	**8011**

					
					
8012	**8013**[1]	**8014**[1]	**8015**[1]	**8150**	**8151**

[1] not usable with GSB7

Metal Hand-Shears — GSH 410 (No. 2410) und GSH 420 (No. 2420)

GSH 410	Technical Data
The Shears GHS 410 are hand-lever shears for a thickness of sheets up to 5 mm and round iron up to 11 mm diameter. The shears are equipped with an adjustable press pad.	■ length of shear blade: 195 mm ■ cutting capacity max.: sheet iron: 5 mm flat iron: 70 x 6 mm round iron: 11 mm ■ weight: 20 kg

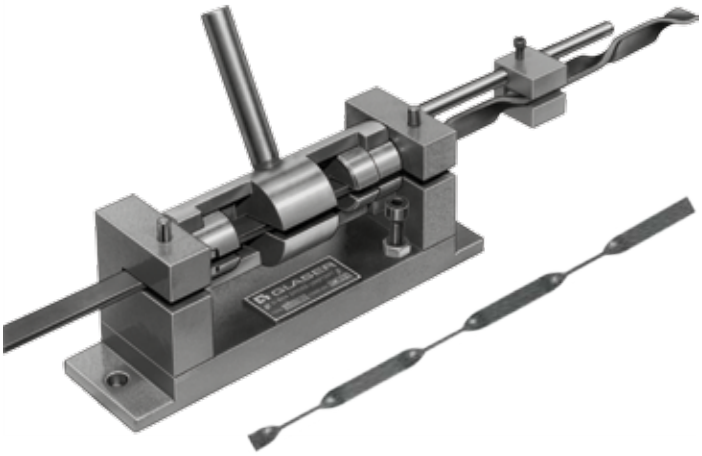
No. 2411
Spare Blade Complete
weight: 2.3 kg

GSH 420	Technical Data
The Shears GHS 420 are destinated for combined application for sheet and section iron. Besides sheets they cut flat-, square-, round-, L-shaped and T-shaped iron. Furthermore miter cuts and block-outs on L- and T-iron are possible. The Shears GHS 420 is equipped with a solid press pad being adjustable in height.	■ length of shear blade: 170 mm ■ cutting capacity max.: sheet iron: 10 mm flat iron: 90 x 14 mm square iron: 20 mm round iron: 22 mm L-iron: 60 x 7 mm T-iron: 60x7 mm ■ weight: 108 kg

No. 2421
Spare Blade Complete
weight: 3,3 kg

The Metal Hand-Shears GHS 410 and GHS 420 are applicable for locksmiths and wrought-iron works in the workshop and on the building site.

Iron Twister GDW 11 — No. 2011



Manual iron twister for twisting of flat iron of 20 x 6 mm in the opposite direction for the production of ornamental gates and doors.

The flat iron is twisted by the Iron Twister GDW 11 each time by 90°. There is a fixed and a variable section. The fixed section to be twisted is 100 mm. The following section is variable and can be adjusted at a stopper.

weight: 11 kg

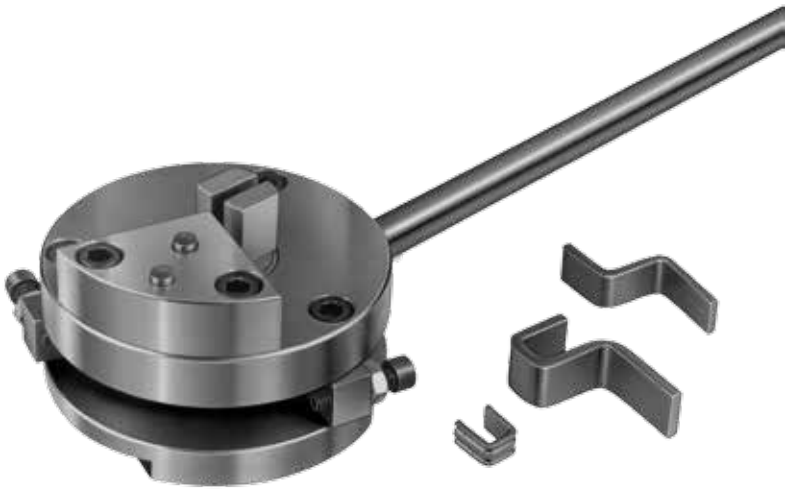
Collar Bender GBB 41 — No. 2041

Capacity

- Flat material of 10 x 3 to 25 x 3 mm or 10 x 4 to 16 x 4 mm.
- Interior dimension of collars steplessly adjustable from 10 to 40 mm.
- Bending capacity up to 400 pcs./h. Time for one bending process approx. 3 secs.
- weight: 14 kg

Manual device for the simple and economical manufacture of ornamental collars on one Operation.
The device consists of a bottom plate with the adequate boreholes and guides for pressing and bending elements. Power is transmitted from the lever over a tooth segment to the longitudinal rack. Bending jaws and pressing piece are of tempered material. A Counter support running in ball bearings enables a perfect angular bevelling of the collars.
The device can be clamped into a vice or screwed on a work table.

Collar- and Angle-Bender GBW 42 — No. 2042



The standard type of the Collar and Angle Bender contains a bending shaft for collar material of 10 x 3 mm up to 25 x 4 mm. An additional second bending shaft is provided for collar material of 10 x 5 mm up to 30 x 5 mm (in this case the minimum inside measurement of the collar is 16 mm). The bending shaft can easily be changed alter unscrewing the hand lever.
It is in the same way that single 90-degrees angles and opposing 90-degrees angles can be bent. For long pieces the exterior length stopper can be replaced by a special length stopper made by the customer. (A female thread M 12 enables the connexion.)
The device can be clamped into the vise or screwed on a work bench.

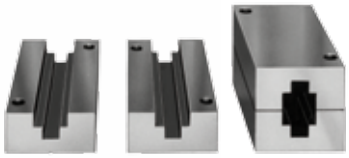
This manual device serves for the simple and economical manufacture of different collars from 12 mm of inside measurement and for bending of angles. The device is distinguished by a particularly easy Operation. It is only with a minimum requirement of energy that big collars can be bent in single piece or series production.
The device consists of a fixed base plate and an upper part turning through 90 degrees. Into the upper part a bending shaft as material guide is inserted. Furthermore a hand lever is screwed in at the side of the upper part which is also equipped with two adjustable length stoppers.

The collar bending proceeds as follows: Presupposing that the collar material to be bent is precut and the length stoppers have been correctly adjusted. The device is in starting position. The material is put into the bending shaft and the hand lever is turned through 90 degrees. Thus the first bending process is executed. Then the collar material is turned through 180 degrees. Finally the hand lever is turned back through 90 degrees, the collar bending is concluded. Both stoppers can be adjusted finely. The maximum bending range is some-what larger than 90 degrees, which enables an adjustment of an overtension depending on the material.

Standard Execution:
Basic device with standard bending shaft for material thickness of 12 x 3 mm up to 25 x 4 mm, minimum inside measurement of the collar 12 mm.
Interior and exterior length stopper, hand lever
weight: 10 kg

No. 2043
Additional Bending Shaft
Additional bending shaft for material thickness of 10 x 5 mm up to 30 x 5 mm or 25 x 6 mm, minimum inside measurement of collar 16 mm.
weight: 1.5 kg

Iron Twister GDW 2 (No. 2002)



Standard Accessories
Twisting and clamping jaws
for 12 mm □ and 20 x 6 mm ▱

Iron twister for manual twisting of square bars and flat iron and for manufacturing of 12 mm twirls. Easily exchangeable twisting and clamping jaws enable twisting of different cross-sections of materials.
The GDW 2 consists of a basic body which is mounted to a workbench.

A twisting block for twisting bars is situated on the front. The turning handles are screwed into the twisting block. One of the handles is black to facilitate counting of the rotations. On the inside the twisting block contains the clamping jaw for the bar to be twisted.

The body contains a counter support block. The counter support is widely adjustable. A twisting length between 10 and 580 mm can be selected.
The upper part of the counter support can be taken off for the fitting of the clamping jaw. Then the upper part is tightened by eccentric clamping screws (quick clamping device).

A variable adjustable length stopper is situated behind the counter support block.

Twisting and clamping jaws from 6 to 20 mm are available for twisting square bars. For flat irons, twisting and clamping jaws from 12 x 6 mm to 30 x 10 mm can be supplied. The jaws are constructed in such a way to enable twisting square as well as flat iron with the same set of twisting and clamping jaws.

The basic version comprises one set twisting and clamping jaws for 12 mm square bars and 20x5-6 mm flat iron.
The twisting and clamping jaws are always supplied in pairs.
Twisting and clamping jaws for different cross-sections of material on request.

A pressing, twisting and upsetting set is available for manufacturing 12 mm twirls. A twirl is produced along the following steps:

- cutting the material
- pressing the cut material with pressing device
- welding of the blanks diagonally to a twirl blank (at the ends)
- twisting and upsetting the twirl blank in one process with the twisting and upsetting set 2067

The Iron Twister GDVV 2 is converted with a few adjustments.

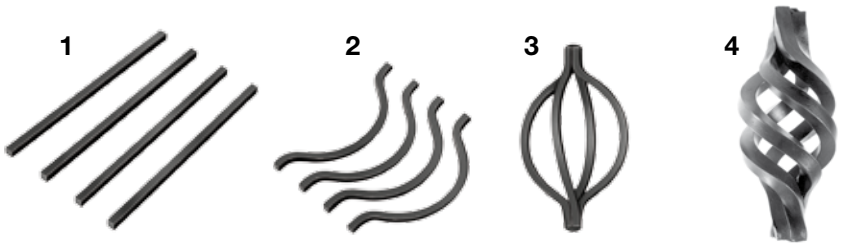
To date the Iron T wister GDW 2 has been sold over 3500 times!

weight: 26 kg

Twirl production

A twirl is produced along the following steps:

1. cutting the material
2. pressing the cut material with pressing device
3. welding of the blanks diagonally to a twirl blank (at the ends)
4. twisting and upsetting the twirl blank in one process with the twisting and upsetting



GDW 2 with twirl upsetting set

GDW 2 with twirl blanks pressing set

No. 2067

Extra accessoires
Twirl Pressing, Twisting and Upsetting Set for production of 12 mm twirls.
weight: 17,6 kg

The following twisting and clamping jaws are available:

Number	Twisting and clamping Jaws
2006	square bar 6 mm
2007	flat iron 12 x 6 mm
2008	square bar 8 mm and flat iron 16 x 5 mm
2009	flat iron 20 x 8 mm
2010	square bar 10 mm and flat iron 20 x 5 mm
2012	square bar 12 mm and flat iron 20 x 6 mm
2013	flat iron 16 x 8 mm
2014	square bar 14 mm and flat iron 25 x 5-6 mm
2016	square bar 16 mm and flat iron 25 x 8 mm
2018	square bar 18 mm and flat iron 30 x 8 mm
2020	square bar 20 mm and flat iron 30 x 10 mm

Angle Bender GWB 100 — No. 2100

	bending capacity	cold mm	hot mm
▬	flat iron DIN 1017	100 x 10 65 x 12 50 x 14	100 x 22 75 x 25 35 x 30
■	square iron DIN 1014	22	30
●	round iron DIN 1013	25	30
⌐	angle iron DIN 1028	110 x 10	100 x 20
▬	copper (flat bars) DIN 1768 DIN 46433 for max. strength category F 25 = 250 N/mm²	120 x 12	
▬	aluminium (flat bars) DIN 1769 DIN 46433 for max. strength category F 16 = 160 N/mm²	120 x 15	

The Angle Benders GWB 100 is out of steel cast integral. It enables hot- or cold-bending of flat, square and round iron.

The angle benders contain a self-arresting eccentric quick-clamping device for material gripping.

The bending range is adjustable at an angle buffer from 0 to 120 degrees.
A piece of 11/4 gas-pipe extends the bending lever (not sup-plied).

A length stopper can be connected to both angle benders.

The bending jaw contains a pointed and a rounded off bending edge. It can be mounted in two different positions. Flat iron is bent with the pointed bending edge, square and round iron with the rounded off edge.

The working height of the Angle Bender GWB 100 is 100 mm. It enables cold-bending of flat iron up to 100 x 10 mm and hot-bending up to 100 x 22 mm.

Angle Bender GWB 20 — No. 2200

Angle bender for exact bending of flat, square and round iron. The bending height is 100 mm. The angle bender bends flat iron up to 100 x 7 mm cold and 100 x 15 mm warm.

The bending angle is adjustable and readable up to 180 degrees.

A piece of 1" gas-pipe extends the bending lever (not supplied).

Standard Accessories:
1 material stopper

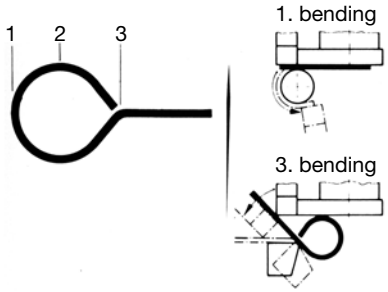
weight: 40 kg

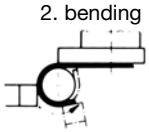
Collet for GWB 20 — No. 2205

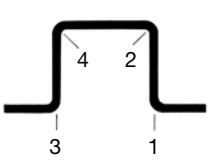
Minimum distances

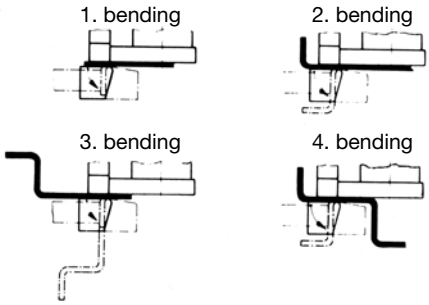
The collet clamps the bending jaws of the Angle Benders GWB 20 and GWB 20 E auxiliarily on the upper end, thus obtaining an exact parallelism of the bending jaws even with large cross-sections of material. The clamping of the jaws is effected by an eccentric lever.

weight: 1.2 kg









Pipe notchers GRA

GRA 46

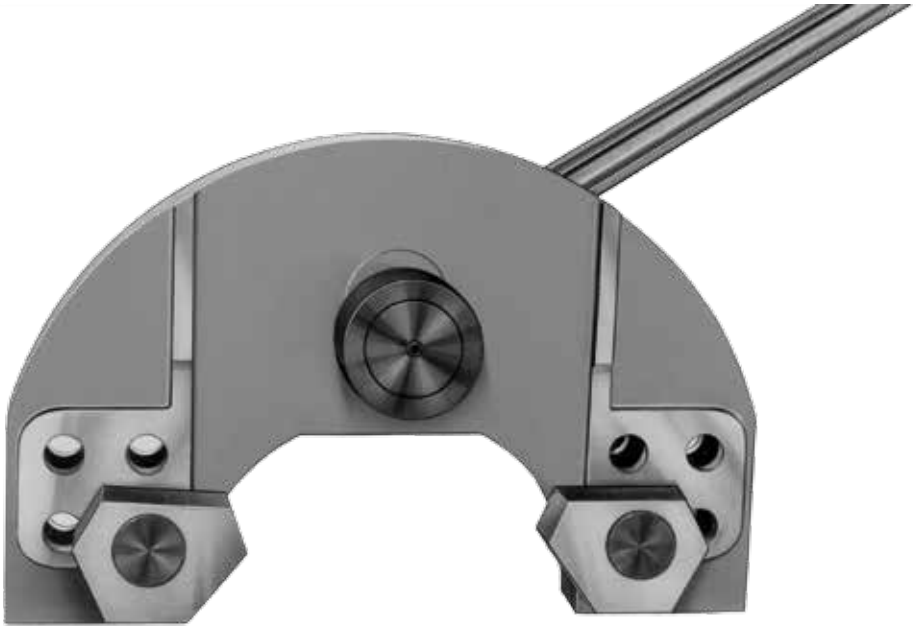
GRA 46 and 47 can be used to notch pipes with an external diameter from 27,9 up to 61,0mm.
Simple and rapid operation, a number of diameters are available immediately, ideal for double corner joints.
The hand-operated machines can be easily wall mounted. Filling or milling pipes has become a thing of the past.

One unit can be used to notch a series of diameters without needing to change parts for each diameter.

The GZA48 can be used to notch a sink outflow in pipes with an external diameter of 27 mm to 61 mm.

Number	Type	For tubes	weight
2446	Pipe notcher GRA 46	26.9 / 33.7 / 42.4 mm	8 kg
2447	Pipe notcher GRA 47	48.3 / 60 mm	15 kg
2448	Zinc-Nose notcher GZA 48	27 mm to 61mm	7 kg

Profile- and Tube-Alignment Press GRP 160 No. 2160

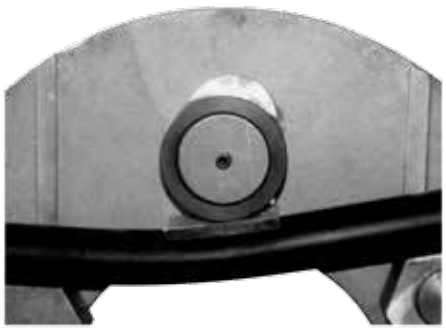


Light, portable alignment press for aligning round and rectangular profiles as they are used for wrought-iron railings, doors and gates.

The alignment press is built in light-weight construction. Casing, handlever and support blocks are made of alloy-steel. This is an alloy usually applied in aircraft construction, with high strength and low specific gravity.

Technical Data

- vertical lifting of pressure roll: max. 12 mm
- pressure: up to 5 tons
- diameters of material to be processed (max.): gas pipes: 2"
  square tubes: 70 x 40 mm
  solid material, square and round: 50 mm
  flat iron, edgewise: 70 x 15 mm
  angular and T-irons: 80 x 80 x 10 mm
- weight: 12 kg



No. 2161
The accessory for the Tube-Alignment Press GRP 160
thrust plate for round pipe

Hoop Roller and Eye Bender GOB 100 — No. 2110

The Hoop Roller and Eye Bender GOB 100 cold- or hot-bends eyes out of flat, square and round iron. The working range is 100 mm max. The diameter of the eye is destinated by easily exchangeable bending mandrels.

During the bending process the material end is automatically tightened by a clamping device.

Both halves of the Eye Bender GOB 100 are connected by a link. The bend-ing mandrel is inserted into the link. Additionally a sleeve is provided at the bottom enabling the adaptation to the different diameters of the bending mandrels. Bending mandrels of 10 to 32 mm diameter with the necessary sleeves are on stock (see schedule).

On demand bending mandrels of 6 to 9 mm or of intermediate diameters can be supplied.

The diameter of the bending mandrel No. 2135 can be extended on demand by additional sleeves.

The standard execution of the GOB 100 comprises a bending mandrel with a diameter of 18 mm Ø.

No. 2121 with the corresponding sleeve No. 2137.

Technical Data
working width max. 100 mm
The bending capacity depends on the material to be used and on the installed bending mandrel.
weight: 21 kg

Bending Mandrels		Sleeves	
2114	bending mandrel 10 mm Ø with sleeve for bending mandrel 10 mm Ø		
2115	bending mandrel 12 mm Ø	**2136**	12 mm Ø
2117	bending mandrel 14 mm Ø		14 mm Ø
2119	bending mandrel 16 mm Ø		16 mm Ø
2121[1]	bending mandrel 18 mm Ø	**2137** [1]	18 mm Ø
2123	bending mandrel 20 mm Ø		20 mm Ø
2125	bending mandrel 22 mm Ø		22 mm Ø
2127	bending mandrel 24 mm Ø		24 mm Ø
2129	bending mandrel 26 mm Ø		26 mm Ø
2131	bending mandrel 28 mm Ø		28 mm Ø
2133	bending mandrel 30 mm Ø		30 mm Ø
2135	bending mandrel 32 mm Ø	necessitates no sleeve	

sleeve > 32 mm Ø for bending mandrel 32 mm Ø on demand

[1] standard execution

Forging Furnaces GSO 28 and GSO 29

GSO 28 No. 5081

The Forging Furnace GSO 28 is equipped with one tough, backfiringsafe injector burner.

Technical Data

Dimensions in the clear of the working space	
Width	210 mm
Height	160 mm
Depth	250 mm
Number of burners	1
Nominal capacity	18 kW
Type of gas	Propane
Gas supply	bottle
Gas consumption at 1,5 bar	1,4 kg/h
Gas pressure regulator infinitely variable	0,5 - 2,5 bar
Maximum temperature	1250 °C
Weight	20 kg

without supporting frame

General

The Forging Furnaces GSO 28 and GSO 29 are modern, mobile forging furnaces used in workshops and on building sites. Both forging furnaces work with liquid gas (propane or butane) but differ in their number of burners and in the depth of their working space. The forging furnaces are delivered without a supporting frame.
The forging furnaces are made in stainless steel construction. The inside of the combustion chamber is covered with high temperature ins ulation. At the bottom there are ceramic-chips for supporting the treated material. At the front side an adjustable holder helps to place long material. The back side can be opened on demand for inserting and warming up special material parts. The Forging Furnaces are equipped with a tough, backfiring-safe injector burner. The burners can reach a temperature up to 1250 °C and contain a DVGW-tested safety equipment.
weight: 20 kg

GSO 29 No. 5082

The Forging Furnace GSO 29 can be operated by choice with one or two burners.

Technical Data

Dimensions in the clear of the working space	
Width	210 mm
Height	160 mm
Depth	500 mm
Number of burners	2
Nominal capacity	36 kW
Type of gas	Propane
Gas supply	bottle
Gas consumption at 1,5 bar	2,8 kg/h
Gas pressure regulator infinitely variable	0,5 - 2,5 bar
Maximum temperature	1250 °C
Weight	38 kg

without supporting frame

No. 5099 ceramic-chips
for all Forging Furnaces 1 kg

Forging Furnaces GSO 30 and GSO 31

GSO 30 No. 5095

The Forging Furnace GSO 30 is fired by liquid gas (propane or butane). The combustion air is automatically absorbed by preceding injectors. Working temperatures up to max. 1100° C can be reached.

The necessary gas pressure is approx. 2 bar.

Weight: 150 kg

Technical Data

Internat Dimensions od Working Space

Width			150 mm
Height			100 mm
Depth			300 mm
depth mm without working opening			200 mm
gas rate			
propane kg/h	-	F	4

All dimensions are subject to the usual allowances.

General

The Forging Furnaces GSO are gas-fired furnaces substituting the traditional forging fire. They simultaneously heat up a large number of pieces keeping them hot for mass-production. The Forging Furnaces GSO 30 and GSO 31 are industrial furnaces. They are open at the front and the rear side, enabling the optional Insertion of long iron pieces and the heating up of just a certain part of them. The part of the piece being in the furnace can be well observed.

The injection nozzles of the burner are placed an both sides and the upper fireclay plate can be taken off. By this well-considered construction it is possible to put large forging pieces into the furnace from above.

Both furnaces are equipped with a ceramic-chips bed for depositing the working pieces.

GSO 31 No. 5096

The Forging Furnace GSO 31 is equipped with an air blower and can be used as forging and tempering fire. Working temperatures up to max. 1400 °C can be reached.
The GSO 31 can be fired by liquid gas, natural gas or town gas. The gas-type has to be indicated with the order, in order to adapt the furnace respectively. The normal execution of the GSO 31 is for liquid gas.
The gas pressure has to be reduced to 50 mbar by the customer.
Weight: 171 kg

Technical Data

Internat Dimensions od Working Space

Width			150 mm
Height			100 mm
Depth			300 mm
depth mm without working opening			200 mm
gas rate			
natural gas kg/h	-	N	6
propane kg/h	-	F	4
town gas m3/h	-	S	12
with blower for three-phase current 220/380 V 50 Hz - kW			0,37

Also for different voltages and frequencies.
All dimensions are subject to the usual allowances

Drop-Forged Standard Anvils and Tongs

The anvils are drop-forged, the face is tempered. The anvils are supplied with one er two beaks.
They are provided with a pierced square hole for mounting anvil tools.

Forge hammer weight 2000 g
No. 5021

No. 5094
Anvil Block GAU 12
W x H x D 42 x 55 x 34

GAB 150 No. 5093

Anvil GAB 150 with two beaks
length 800 mm · weight 150 kg

GAB 90 No. 5093

Anvil GAB 90 with two beaks
length 700 mm · weight 90 kg

Blacksmiths' Tong

No. 5025
Length 400 mm, for material 19 - 20 mm
No. 5026
Length 600 mm, for material 33 - 36 mm

Blacksmiths' Tong, round nosed

No. 5030
Length 400 mm, for material 12 mm
No. 5031
Length 600 mm, for material 20 mm

No. 5022

Bottom Fuller path round
face Ø 15 mm · shaft 25 mm □
weight 850 g

Blacksmiths' Tong, flat nosed

No. 5027
Length 400 mm, for material 8 - 10 mm
No. 5028
Length 600 mm, for material 17 - 18 mm

Blacksmiths' Tong, wolf's jaw

No. 5032
Length 400 mm, for material 3 -12 mm
No. 5033
Length 600 mm, for material 15-30 mm

No. 5023

Hardie
face Ø 50 mm · shaft 25 mm □
weight 1150g

Blacksmiths' Tong

No. 5029 – Length 500 mm,
for material 21 - 23 x 11 - 13 mm

Blacksmiths' Tong for rivets

No. 5034
Length 500 mm rivet diameter 10 mm

No. 5024

Anvil Horn
shaft 25 mm □ · weight 1000 g

Air Hammers GSH

General
Main bars, forged bars, intensively profiled ornamental bars, the ends of ornamental scrolls, front ends of hand-rails, lamp stands, ornamental leaves and Ornament must be hot-forged with a forging hammer. Four Air Hammers GSH are available for this pur-pose, differing in forging capacity and blow force.

Characteristics
The Air Hammers GSH are free-form forging machines. All hammers are welded steel constructions. Compression and wor-king cylinders are fully integrated into the machines. Lubrication is done automatically via a central lubricating system.
The Hammers GSH are noise-reduced and meet all requirements to human working con-ditions such as low noise, protection against oily air exhausts and simple operation.

Function
The motor drives a large flywheel via V-Belts. As with an internal combustion engine, a connecting rod connects the camshaft-shaped flywheel with the compression piston. The compressed air is fed to the working cylinder via a control-slider and lifts the ram.
The control-slider is operated by a treadle, allowing an accurate adjustment of the blow-ing force.

Installation
The hammers must be set up vibrationless. A static foundation plan is supplied for all hammers.

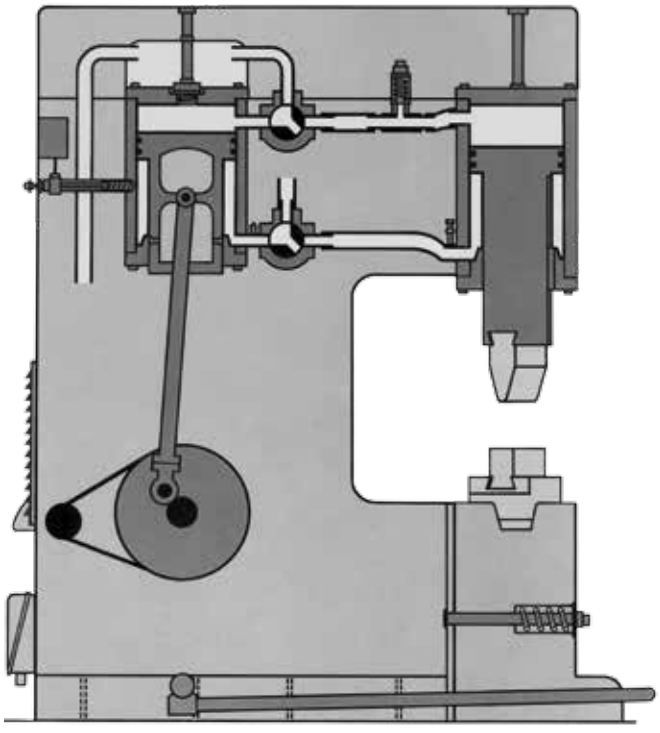
The accessories for mounting, such as shock absorbers, vulkollan plate and stone screws are supplied for extra charge.

Dies
Easily exchangeable dies are inserted in anvil and ram for forging. A variety of standard dies is available and is permanently extended. Spe-cial shapes and untempered dies are supplied an request alter clarifying technical details.

Our forging dies are made of high-tensile chromium steel. If the geometric shape allows for it, they can be used for both cold- and hot-forging.

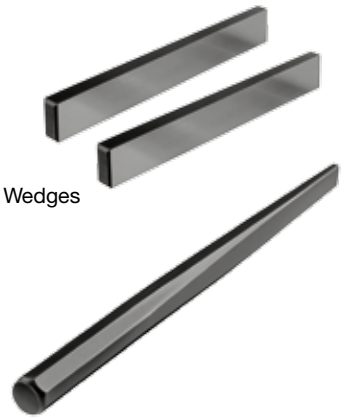
Example for dies for cold-forging:
No. 5116/5216 and No. 5146/5246
Bars can be evenly cold-forged with dies No. 5106/5206 and No. 5139/ 5239. If the bars are to be conically-forged, they have to be heated first.
Example for dies that cannot be used for cold-forging: No. 5128/5228, No. 5129/5229 and No. 5147/5247.

The dies are fixed to the anvil resp. ram with a wedge. Wedges with different sizes are available.
A wedge-ejector is supplied for removing the wedges.



Cross-Section of an Air Hammer GSH

example of use



No. 5020 wedge-ejector

Air Hammer GSH 41 (No. 5041) and GSH 51 (No. 5051)

General to GSH 41

The Air Hammer GSH 41 is employed for light and medium-weight forging, such as forging the ends of ornamental scrolls and handrails as well as hotand cold-forging of ornamental bars.
The delicate-forging dies and the dies from series No. 51xx are applied with Air Hammer GSH 41.

General to GSH 51

The Air Hammer GSH 51 is specially suited for medium-and heavyweight forging, such as forging the ends of handrails as well as hot- and cold forging of heavy ornamental bars and frames.
The dies from series No. 52xx are applied with Air Hammer GSH 51.

Standard Accessories

- die No. 5101 / 5201
- die No. 5115 / 5215
- 2 wedges
- wedge-ejector No. 5020

Technical Data (GSH 41)

- weight of ram: ca. 40 kg
- ram lifting height: ca. 200 mm
- blowrate per min.: ca. 220 min^{-1}
- power of motor: 4 kW (5,5 PS)
- voltage supply: 380 V three-phase current, 50 Hz
  different voltage or frequency on request
- power consumption: ca. 4 kW
- length: 1100 mm
- width: 840 mm
- height: 1350 mm
- anvil weight: ca. 200 kg
- net weight: ca. 850 kg

Technical Data (GSH 51)

- weight of ram: ca. 50 kg
- ram lifting height: ca. 230 mm
- blowrate per min.: ca. 220 min^{-1}
- power of motor: 5,5 kW (7,5 PS)
- voltage supply: 380 V three-phase current, 50 Hz
  different voltage or frequency on request
- power consumption: ca. 4 kW
- length: 1410 mm
- width: 840 mm
- height: 1600 mm
- anvil weight: ca. 300 kg
- net weight: ca. 1200 kg

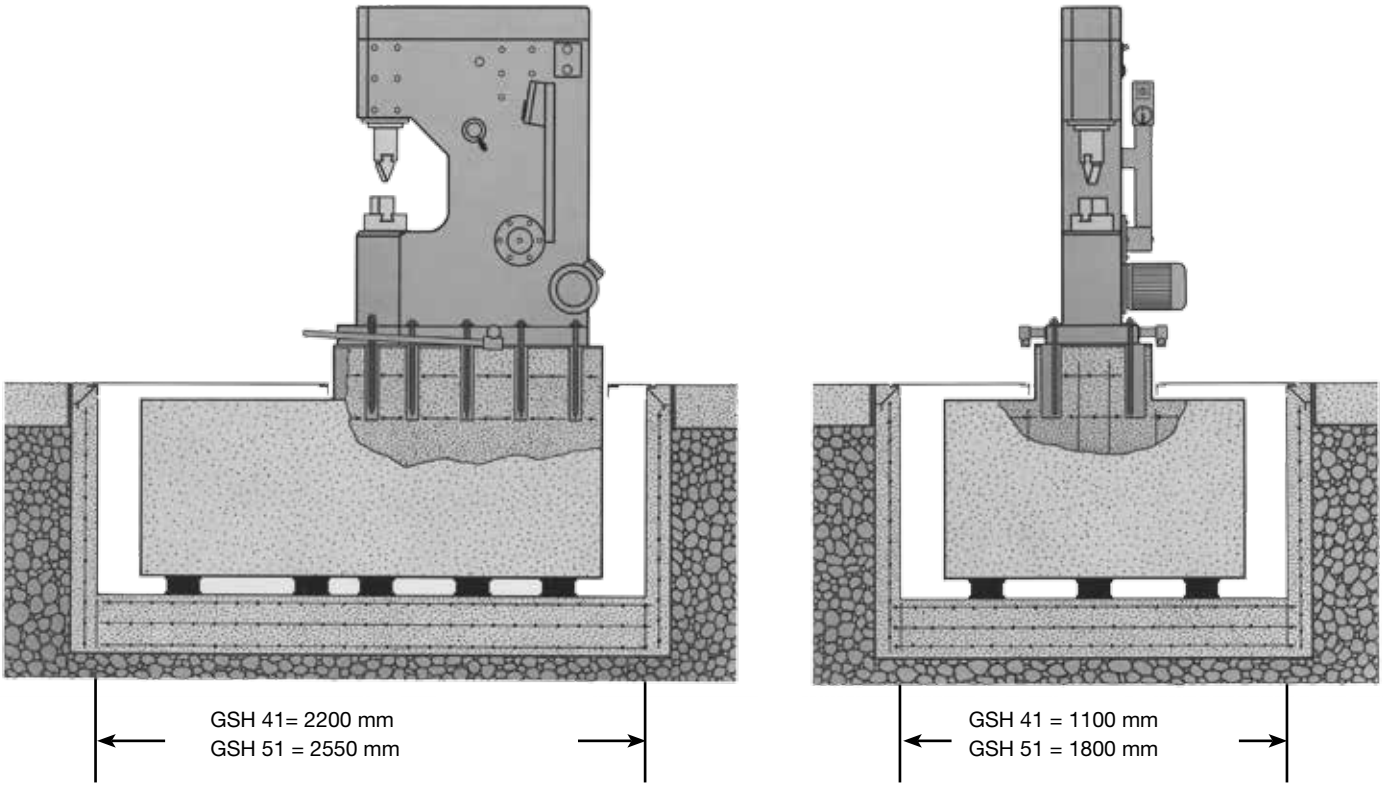
wedges for GSH 41

wedges	size	height
5160	6 mm	20 mm
5161	8 mm	20 mm
5162	10 mm	20 mm
5163	12 mm	20 mm

wedges for GSH 51

Keile	size	height
5260	6 mm	25 mm
5261	8 mm	25 mm
5262	10 mm	25 mm
5263	12 mm	25 mm

Vibration-Free Position of Air Hammers GSH (front- and lateralview)



Foot-pedal Cover

No. 5042 for GSH 41, **No. 5052 for** GSH 51

Vulkollan Plate

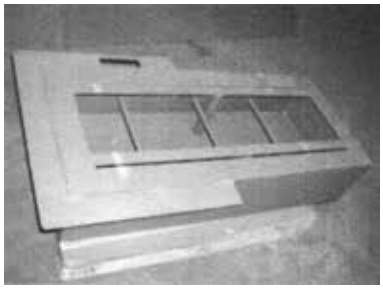
No. 5037 for GSH 41, **No. 5053 for** GSH 51

Prefinished Fundament

for **No. 5046** GSH 41, for **No. 5057** GSH 51

The foundation case for air hammer is pre-finished and has to be filled with concrete. After hardening the concrete establish the polyurethane pad on the foundation case and install the air hammer.

Weight: 400 / 500 kg



8 Stone Screws No. 5040

with spring and screw-nut for fixing the anvil, for GSH 41 and GSH 51

Set Anchor Screws No. 5056

with spring and screw-nut for fixing the anvil, for GSH 41 and GSH 51

Delicate-Forging Dies

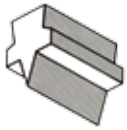
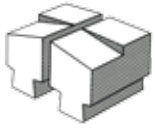
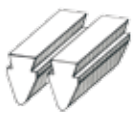
For the production of cold- or hotforged ornamental pieces and leaves, such as door lock coverings, hingen or other metal fittings, a set of delicateforging dies is available.

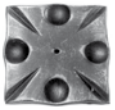
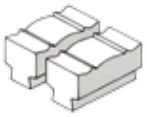
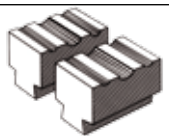
5001 5002 5003 5004 5005 5006 5007 5008 5009

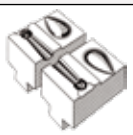
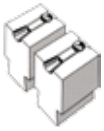
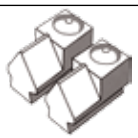
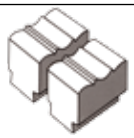
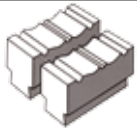
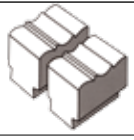
No. 5011 Die holder

Special Die for Delicate-forging 5125 for GSH 41 and 5225 for GSH 51

The supply includes
3 delicate-forging dies

number	for GSH	dimensions (in mm)	die	number	for GSH	dimensions (in mm)	die
5101	41	120 x 60		5119	41	100 x 60	 Recksattel
5201	51	120 x 60		5219	51	100 x 60	
5102	41	130 x 80		5115	41	120 x 80	
5202	51	160 x 80		5215	51	120 x 80	
5103	41	Ø 175	 Special die, not hardened	5146	41	100	
5203	51	Ø 200		5246	51	110	
5106	41	100 x 60		5110	41	130 x 100	
5206	51	120 x 60		5210	51	130 x 100	
5116	41	120 x 60		5121	41	120 x 60	
5216	51	120 x 60		5221	51	120 x 60	

number	for GSH	W x H (in mm)	material (in mm)	die	example
5128	41	100 x 60	12 x 6 ▱		
5228	51	100 x 60			
5129	41	120 x 60	16 x 8 ▱ and 12 □		
5229	51	120 x 60			
5147	41	120 x 80	20 x 6 to 25 x 8 ▱		
5247	51	120 x 80			
5140	41	130 x 80	40 x 8 to 30 x 12 ▱		
5240	51	130 x 80			
5141	41	80 x 80	for rosettes 60 x 60 mm		
5241	51	80 x 80			
5242	51	100 x 100	for rosettes 80 x 80 mm		
5245	51	160 x 80	Central part pre-forged by dies No. 5206		
5139	41	120 x 60	Vine-shaped bars Ø 12, Ø 16 und Ø 20		
5239	51	120 x 60			
5112	41	120 x 60	to 14 □ round bars Ø 12 - 14		
5212	51	120 x 60			
5143	41	130 x 80	to 16 and 20 □ round bars Ø 16 und 20		
5243	51	130 x 80			
5131	41	110 x 80	12 to 14 □ round bars Ø 12 - 14 pre-forged by dies No. 5112 or No. 5212		
5231	51	120 x 60			
5144	41	130 x 80	16 to 20 □ round bars Ø 16 - 20 pre-forged by dies No. 5143 or No. 5243		
5244	51	130 x 80			
5123	41	120 x 100	12 bis 14 □ and Ø 12 - 14		
5223	51	120 x 100			

number	for GSH	W x H (in mm)	material (in mm)	die	example
5107 5108	41	120 x 70	Ø 12 - 14 Ø 15 - 18		
5207 5208	51	120 x 70	Ø 12 - 14 Ø 15 - 18		
5137	41	60 x 60	12 x 6 ▱		
5237	51	60 x 60			
5138	41	135 x 60	12 x 6 ▱		
5238	51	135 x 60			
5104 5105	41	70 x 60	Ø 12 Ø 16		
5204 5205	51	70 x 60	Ø 12 Ø 16		
5126 5127	41	70 x 60	Ø 12 Ø 16		
5226 5227	51	70 x 60	Ø 12 Ø 16		
5122	41	70 x 60	Ø 12		
5222	51	70 x 60	Ø 12		
5124	41	120 x 60			
5224	51	120 x 60			
5133	41	120 x 60			
5233	51	120 x 60			
5132	41	120 x 60	20 und 30 ☐ or round bars Ø 30		
5232	51	120 x 60			
5135	41	130 x 60	40 x 8 or 50 x 10 ▱		
5235	51	130 x 60			
5234	51	160 x 80	30 ☐ or round bars Ø 30		
5236	51	160 x 80	30 ☐ oder round bars Ø 30		

Rolling of Handrails for Spiral Staircases with Solid or Open Newel

Normally Arch- and Ring-Bending Machines are equipped with split standard steel rolls, by which most profiles of structural steel, such as flat iron, cross- and edgewise, T-shaped and angular iron, rectangular and square tubes, can be bent to arches and rings. Eventual deviations from the desired radius due to the material characteristics can be corrected by re-rolling or mechanical readjustment.

For the rolling of round tubes out of structural steel special rolls with res-pective profiles are applied avoiding an oval deformation of the tube crosssection during the rolling process. Also in this case eventual deviations from the desired radius due to the material characteristics can be corrected by re-rolling or mechanical readjustment.

The rolling of handrails, underrails and cross bars out of stainless steel and brass for spiral staircases with solid and open newel makes high demands on an accurate execution. For this task the usual Arch- and Ring-Bending Machines have to be equipped with a Pitch Arm. Furthermore special mechanical and electronic measuring devices are available.

1. Pitch Arm
When rolling handrails, underrails and cross-bars for spiral staircases it is necessary to work out a certain pitch of the handrail, besides the arch. For this purpose a Pitch Arm is provided.

The Pitch Arm is open on top so that the rolled material can easily be taken out. There is no problem even with a high pitch. Depending on the rolling of handrails for right- or left-turning staircases, the Pitch Arm is mounted either on the left or the right side of the machine.

The position of the Pitch Arm is adjusted by a handwheel and can be read on a digital display or a scale.

2. Plastic Rolls
It is recommendable to use highstrength plastic rolls for the rolling of stainless steel- and brass-tubes. In case of steel rolls steel particles might eventually be transferred to the surface of the tubes, which may promote future corrosion. Rolling with plastic rolls avoids nearly any damage of the stainless steel- and brass-tubes.

3. The correction of a spiral arch is practically almost impossible
The correction of a spiral arch is almost impossible, for the reason that rolling of an arch by means of a Pitch Arm deforms the material in the third axis, which makes the spiral arch very hard to handle. The first rolling process is a defined rolling, the second one an undefined rolling.
The solution of this problem is accurate rolling by GLASER's auxiliary technical attachments. Due to a Measurement Scheme where the staircase data are defined the desired arch with the respective pitch can perfectly be rolled.

4. Measuring of the bending radius
The radius of the rolled material is indirectly measured resp. calculated by a Radius Sliding Caliper as follows-. First the distance "chord - arch" is measured. Then the radius is read from a radii-table. This is applied to inside and outside radii.
In addition to the radii-table GLASER developed a special Radii Calculation Program.

5. Measuring of the pitch in the rolling process
When rolling spirals the tube continuously twists. Before rolling the tube is divided into parts of e.g. 300 mm (control measurement). Then during the rolling process the twisting grade per control measurement is measured in angle degrees at the not yet rolled tube end with a Twisting Measuring Device. From the twisting grade per control measurement results the pitch of the rolled handrail.

6. The radius of a spiral arch
The radius of a spiral arch is larger than the radius of a plain arch due to the pitch. The dimensions, adjustment of the Radius Sliding Caliper as well as the actual radius, are calculated by the Spiral Calculation Program.

7. Spiral Calculation Program
Some years ago GLASER opened a bending centre where handrails, underrails and cross-bars for spiral staircases with open and solid newel as well as various frames are manufactured. The total production program is manufactured according to customer's requirements. Mathematics and technical experience are combined in a Spiral Calculation Program. Experience also induces the Input of the different parameters.

A Measurement Scheme (on the opposite) shows the floor height, the number of steps, the step width and the step radius. The calculated pitch height is compared with the value measured on site for controlling purposes. The Spiral Calculation Program additionally comprises two further Calculation programs for the balustrade construction: a Radii Calculation Program and a Bar-Distance Calculation Program.

The Radii Calculation Program has two functions: first it calculates the actual radius from the distance "chord -arch" measured by the Radius Sliding Caliper and on the other hand a desired radius is pre-set and the adjustment of the Radius Sliding Caliper is calculated.
The Bar-Distance Calculation-Program determines the number of the necessary balusters calculated from the staircase data-. length, angle and max. bar distance (e.g. 120 mm width in thä"~, clear) and the clear distance between two bars. An even or odd number of balusters is optional.

Arch- and Ring-Bending Machine GBR 603-K — No. 6003

The Arch- and Ring-Bending Machine is placed on an underframe with an integrated tool box. A link connecting machine and frame enables the optional vertical or horizontal Installation. The horizontal position is important for the rolling of work pieces with a large radius (such as handrails for spiral staircases with solid or open newel).

The Arch- and Ring-Bending Machine GEBR 603-K is operated by a double foot-switch.

Weight: 230 kg

Standard Accessories

- 1 set of standard split rolls
- 1 double foot-switch
- 1 spanner SW 22
- 1 spanner SW 30

The Arch- and Ring-Bending Machine GEBR 603-K is universally applicable for mang purposes in the metal working industry. The muck proven and solid construction has been developed further and adapted to the modern requirements by GLASER. The result is a multi-functional Arch- and Ring -Bending Machine with an optimal price-efficiency balance.

Various attachments enable the accurate rolling of handrails for spiral staircases with solid or open newel.

The Bending Machine GEBR 603-K is driven by a pole-reversible gear motor with two different Speeds. It comprises two stationary, driven bending shafts and one floating pressure shaft with feed motion.

The bending shafts are optionally driven with 6 or 12 revolutions per minute (rpm). The position of the adjustable pressure shaft is shown on a scale. The feeding motion is done by means of a threaded spindle. It is recommendable to note the Chosen adjustment of a certain radius, in Order to facilitate a later repetition.

The bending shafts are manufactured from a special steel, hardened and polished. The shafts are/6upported by two precision taper roller bearings.

The guiding of the mechanical bearing Support of the upper bending shaft are also hardened and polished.

On both shaft outlets there are guiding rolls, which are adjustable crosswise to the rolling direction, thus enabling a traverse motion of the material.

The standard type contains a set of split steel rolls for the bending of arches and rings from flat and square materials, thick-walled square tubes as well as T-shaped sections and angle sections. The rolls can be opened step by step up to max. 40 mm. For round tubes special rolls with adequate diameters are supplied.

Mechanical Twisting-Measuring Device GVM 610 — No. 6012

When spiral rolling the fed tube is continuously twisting. This twisting grade in relation to a certain length of the rolled tube gives the Information about the pitch of the spiral rolled tube. By means of the Twisting-Measuring Device GVM 610 the particular twisting can be measured.

The Twisting-Measuring Device GVM 610 is screwed on the not yet twisted tube end. The twisting effect is then shown by a movable pointer on a fix scale.

For the adaption of the Twisting-Measuring Device to the different tube radii the respective adapters are available. An adapter for a tube of 11/4" is part of the delivery.

Extra Accessories

- **No. 6075**
  Adapter for the tube diameters of 10 mm, 12 mm, 14 mm, 16 mm, 21,3 mm, 26,9 mm, 33,7 mm, 40 mm, 42,4 mm, 48,3 mm und 50,8 mm.

Auxiliary Device GLZ 611 — No. 6074

When spiral rolling the control measurement is indicated on the tube before the rolling is started. By means of the Auxiliary Device GLZ 611 the control measurement can be read exactly.

Pitch Arm for Spiral Rolling — No. 6034

When rolling handrails, Grossbars and underrails for spiral staircases with solid or open newel, the tube has to be bent in the horizontal plane as well in the vertical live. This enables an additional Pitch Arm, which is fixed on the Arch- and Ring-Bending Machine GEBR 603-K behind the outlet of the arched tube. It presses by means of its guide roll the arched tube out of the plane. The guide roll can easily and accurately be adjusted in height.

When bending a tube in the third axis the not yet treated part of the tube is automatically twisting. This twisting effect can be measured at the end of the tube with the Mechanical Twisting-Measuring Device GVM 610 (attachment) or with the Electronic Twisting-Measuring Device GBWZ 609 (attachment).

Standard Accessories

- socket screw hexagon wrench SW 17

The radius of the rolled tube arch is indirectly measured with the Radius Sliding Caliper No. 6092 (attachment).
In the Spiral Calculation Program (attachment No. 6093) the pitch of the rolled tube can be calculated from the twisting effect of the non-rolled tube per a certain length (e.g. 7° per 290 mm).

Arch- and Ring-Bending Machine GEBR 603-KD No. 6013

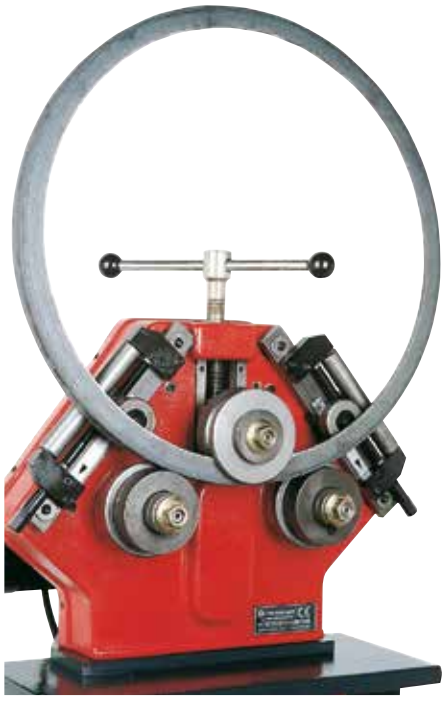
The design of the Arch- and Ring-Bending Machine GEBR 603-KD is the same as of the type GEBR 603-K.
The Arch- and Ring-Bending Machine GEBR 603-KD additionally contains an Electronic Position-Measuring-Device giving an absolute measurement of the position of the adjustable pressure shaft, which is shown on a digital display. The definition is 0.1 mm. The operative range of the Measuring Device is 100 mm. The display is mounted on the double foot-switch in a small deck.
The Arch- and Ring-Bending Machine GEBR 603-KD has the same standard accessories and can be provided with the same special accessories as the type GEBR 603-K.

Technical Data

- Dimensions: 800 x 500 x 1400 mm
- Rotation speed I:
  6 revolutions per minute (rpm)
- Rotation speed II:
  12 revolutions per minute (rpm)
- Voltage supply:
  380-400 V three-phase current with loadable central conductor
  (220-230 V), 16 A, 50 Hz
  Different voltage or frequency on request.
- Power consumption-. ca. 0.85 kW
- Weight: ca. 225 kg

No. 6041
Special rolls for angle sections, vertical plate inside or outside.

No. 6042
Special guiding rolls, vertical plate inside



Extra rolls steel hardened

6014	6015	6016	6017
½" and ¾"	3/8" and 1"	1¼"	1½"

Extra rolls special plastic

6046	6047	6048	6049
½" and ¾"	1"	1¼"	1½"

Table Bending Performance (depend on the quality of material)

Profile	max. Dimensions	min. Ø	Rolls
	50x10	400	N[1]
	80x15	350	N
	30	600	N
	30	600	N
	50x50x8	500	S[2]
	50x25x5	300	S
	50x25x5	400	N
	30	600	N
	40x40x5	400	N
	40x40x5	400	N
	3/8 1", ½"	300 400	S S
	60x2	1000	S
	40x40x3	1000	N
	50x30x3	1200	N

[1] Normal [2] Extra

Arch- and Ring-Bending Machine GEBR 605 — No. 6005

Table Bending Performance (depend on the quality of the material)

Profile	max. Dimensions	min. Ø	Rolls
	20 x 10 60 x 10	300 600	N
	50 x 10 100 x 15	500 500	N
	15 30	300 500	N
	20 35	350 500	S
	30 x 30 x 3 60 x650 x 6	450 750	S
	30 x 30 x 3 60 x 50 x 6	600 300	S
	60 x 60 x 7 30 x 30 x 3	600 300	N
	50 x 50 x 6 30 x 30 x 3	600 350	N
	30 x 45 x 6 30 x 15 x 4	800 300	N
	80 x 45 x 6 30 x 15 x 4	120 300	N
	21 x 2,3 60 x 2,9	250 100	S
	25 x 1,5 70 x 2	400 1200	S
	20 x 20 x 2 50 x 50 x 3	400 120	S
	60 x 15 x 2 70 x 30 x 3	400 180	N

The Arch- and Ring-Bending Machine GEBR 605 is an universal bending machine enabling the rolling of round and square tubes as well as most of the current sections into arches and rings.
All three bending shafts are driven by an electrical vario-drive. The rotation speed of the bending shafts can be selected infinitely variable between 5 and 13 rpm. Owing to the 3-shafts drive all kinds of rolling can be done with smooth faced bending rolls.
The bending shafts are installed in a triangular position. The both front shafts are stationary, the intermediate one is movable. The feed motion of the movable bending shaft is made by a 10-t-hydraulic cylinder. The oil flow of the hydraulic system is manually adjustable in fine doses or controlled automatically by the GLASER-Position Control GPS-2.
In automatic function the adjustable bending shaft is controlled by the GLASER-Position Control GPS-2.
The position of the adjustable bending shaft is registered by an absolute electronic measuring system and shown on a digital display.
By means of an additional Pitch Arm an accurate spiral rolling of the handrail tube for spiral staircases with solid or open newel is possible. For the measuring of the radius of the rolled tube and for the calculation of the pitch several technical devices are available, which are explained later on. The handrails have to be differently rolled for left- or right-turning spiral staircases. For this reason the Pitch Arm is optionally mounted on the one or the other side of the bending machine.
The Arch- and Ring-Bending Machine GEBR 605 is mounted on a swivelling underframe and can, on demand, be easily moved to the equivalent space required for rolling of big work pieces.
The underframe stands on four heavy-load rollers and can easily be moved. This feature allows to use the machine at the building site and in small workshops.
The standard type contains a set of split steel rolls for the bending of arches and rings from flat and square material, thick-walled square tube as well as some T-shaped and angle sections. The rolls can be opened step by step up to max. 40 mm. For round tubes special rolls with adequate diameters are supplied.
It is recommendable to use high-strength plastic rolls for the rolling of stainless steel and brass tubes. In case of steel rolls steel particles coulg possibly be transferred onto the surface of the stainless steel tubes, which may promote future corrosion. By rolling with plastic rolls nearly any damage can be avoided.

Arch- and Ring-Gending Machine GEBR 605 with extra accessories Pitch Arm and Plastic Roll

Extra Rolls, steel hardened

6080	6081	6082	6083
¾ " and 1 "	½ " and 1¼ "	1½ "	2 "

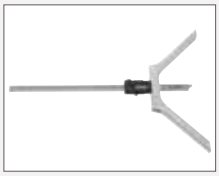
Extra Rolls, special plastic for brass and stainless steel

6084	6085	6086	6087
½ " and ¾ "	1 "	1¼ "	1½ "

Accessoires for GEBR 605

Attachment Spiral Rolling No. 6090

Electronic Twisting-Measuring Device No. 6009



Radius Sliding Caliper No. 6092

Spiral Calculation Program and Radius Sliding Caliper in Set No. 6093

Attachment Length-Measuring Device No. 6091

GLASER-Position Control GPS-2

The GLASER-Position Control GPS-2 is designed for series production and for repeated rolling of single pieces.
It comprises 10 program memories for the various adjustments of the third bending shaft. Each program memory stores max. 10 adjustments.
The variance comparison of the movable bending shaft is indicated by large numerical displays.
In case of hand rolling of the first workpiece the individual values of the feed motion can be transferred by button to one of the 10 program memories (learning process).
The values of the feed motion can be hand-noted in the single memories. Furthermore the values of the first learning function can be corrected.

As soon as the values of the feed motion are stored, the feeding of the third bending shaft can be program controlled. This is especially important for the series production.

When rolling handrails for spiral staircases the necessary twisting grade on a certain length of the tube (control measurement e.g. 7° per 290 mm) is pre-set by means of the Spiral Calculation Program. The GPS-2 evaluates the electronic signals and indicates the twisting angle.

Standard Accessories

- set standard split rolls
- double foot-switch
- socket screw hexagon wrench SW 10

Technical Data

- Diameter of the bending shafts: 50 mm
- Rotation speed: infinitely variable between 5 and 13 revolutions per minute (rpm)
- Voltage supply: 380-400 V three-phase current with loadable central conductor (220-230 V), 16 A, 50 Hz.
  Other voltage and frequency on demand.
- Power consumption-. ca. 3 kW
- Paintwork: Two-component varnish, blue
- Dimensions: 860 x 1100 x 1100 mm
- Weight: ca. 650 kg

Attachment No. 6090

The attachment Spiral Rolling comprises a Pitch Arm and an Electronic Twisting-Measuring Device with 7 m connection cable.

Pitch Arm
When rolling handrails and underrails for spiral staircases with solid or open newel it is necessary to work out a certain pitch of the handrail, besides the arch. For this reason a Pitch Arm is provided.

Standard Accessories

- socket screw hexagon wrench SW 14

GBWZ 609 No. 6009

Electronic Twisting-Measuring Device

During spiral rolling the tube is continuously twisting. The pitch results from the twisting grade according to a certain length of tube (control measurement). For a pre-set pitch the tube has to twist on a certain length (e.g. 290 mm) in a certain angle (e.g. 7°). This twisting grade is measured with an Electronic Twisting-Measuring Device and indicated on the GLASER-Position Control GPS-2. If the pre-set angle value per control measurement deviates, the Pitch Arm has to be readjusted accordingly.
An adapter adjusts the pendulum angle measuring system to the tube diameter. There are respective adapters for all usual tube diameters. The delivery program includes an adapter for a tube of 11/4". The pendulum angle measuring system and the electronic evaluation system are connected with a cable of 7 m.

Voltage supply: 220-230 V

Spiral Calculation Program No. 6093

Spiral Calculation Program

When spiral-rolling handrails, underrails and Grossbars for spiral staircases with open or solid newel it is necessary to work out a certain pitch, besides the arch, according to the specifications of the staircase.
The material is spirally rolled by means of a Pitch Arm.
Due to the pitch of the handrail the actual radius increases compared to the in-plane radius.
Together with the Spiral Calculation Program and the Radius Sliding Caliper the data required for the production can optimally be calculated and checked up after starting of rolling as well as continuously during the total rolling process.

Adapter No. 6075

Adapters for tube diameters

10 mm, 12 mm, 14 mm, 16 mm, 21,3 mm (1/2"), 26,9 mm (3/4"), 33,7 mm (1"), 40 mm, 42,4 mm (1 1/4"), 48,3 mm (11/2") und 50,8 mm.

Heavy-load rollers No. 6077

For the rolling of work pieces with large radius it is advisable to bring the machine into a horizontal position.
For the purpose 4 heavy-load rollers can be provided anabling an easy movment.

Attachment Length-Measuring Device No. 6091

When spiral rolling in the traditional manual way the tube to be rolled has to be graduated (control measurement) and also the twisting angle raust be measured per graduation.

With the attachment Length-Measuring Device it is possible to measure the length of the material already rolled (effective value) and to preset a length of the material still to be rolled (desired value). In the second Gase the machine is stopped automatically when the presst material length has been reached.

First the attachment Length-Measuring Device saves a lot of time for the graduation of the tube and second the Operator can fully concentrate on the tube twisting during the spiral rolling process.

Radius Sliding Caliper No. 6092

The Radius Sliding Caliper is a mechanical measuring device with digital display for measuring of the distance "chord - arch" of inside and outside curvature. The radius of the arch is either found out by means of a radiitable or calculated with the Spiral Calculation Program.
Furthermore the Radius Sliding Caliper can be used for controlling the actual value.
The necessary adjustment can also be determined by the radii-table or calculated with the Spiral Calculation Program.
Furthermore the Radius Sliding Caliper can be used for controlling the actual value.
The necessary adjustment can also be determined by the radii-table or calculated with the Spiral.

Pitch Arm for Spiral bending No. 6076

Handrails and under rails for spiral staircases with solid or open newel can be manufactured with our approved accessories.
The pitch arm which is open on one side to remove the finished tubes easily from the tool.
Mechanical-Twisting Device and Length-Measuring Device are shown in our main catalogue.

Standard Accessories

- socket screw hexagon wrench SW 14

Arch- and Ring-Bending Machine GEBR 645 (No. 6450), GEBR 645-P (No. 6451), GEBR 645-D (No. 6452) and GEBR 645-PD (No. 6453)

The Arch- and Ring-Bending Machine GEBR 645 is an efficient bending machine universally applicable for mang purposes. A feature of this machine is a simple but very strong construction and a powerful drive. It comprises two stationary, driven bending shafts and a floating pressure shaft with feed motion. The feed motion of the pressure shaft is dorre by means of a threaded spindle. The position of the adjustable pressure shaft can be read from a scale.

The machine enables a vertical and a horizontal Operation.

The Arch- and Ring-Bending Machine GEBR 645 is operated by a double foot-switch.

Standard Accessories

- set of standard split rolls
- double foot-switch with Emergency switch-off
- spanner SW 46
- locket screw hexagon wrench SW 10

Extra Accessories

Complete program of attachments for spiral rolling. For each round tube diameter a special set of bending rolls, either steel or plastic rolls, is available.

Technical Data

- Diameter of the bending shafts: 50 mm Rotation speeds 9 rpm
- (Model GEBR 645-P and
- GEBR 645-PD: 4.5 and 9 rpm)
- Voltage supply: 380-400 V three-phase current with loadable central conductor (220-230V), 16 A, 50 Hz. Other voltage and frequency on demand. Power consumption: ca. 1.5 kW
- Dimensions: 650 x 900 x 1200 mm

Table Bending Performance (depend on the quality of the material)

Profile	max. Dimensions	min. Ø	Rolls
	60 x 10 50 x 12	800	N
	120 x 15	750	N
	20 35	450 1200	N
	Ø 35	800	S
	50 x 5	850	S
	50 x 5	1200	S
	50 x 5	650	S
	50 x 5	900	S
	60 x 30 x 5	550	N
	60 x 30 5	700	N
	33,7 x 2,6 Ø 70 x 2	320 1200	S
	60 x 60 x 3	2000	S
	50 x 40 x 3	1500	N
	70 x 30 x 3	1800	S

Model GEBR 645- P

The mode) GEBR 645-P contains a pole-reversible motor for two different rotation speeds.

Model GEBR 645- D

The GEBR 645-D contains a digital display of the feed motion.

Model GEBR 645- PD

The Arch- and Ring-Bending Machine GEBR 645-PD has both a pole reversible motor for two different rotation speeds as well as a digital display of the feed motion.

Extra Rolls, steel hardened

6080	6081	6082	6083
¾ und 1"	½ and 1¼"	1½"	2"

Extra Rolls, special plastic for brass and stainless steel

6084	6085	6086	6087	6088
½" and ¾"	1"	1¼"	1½"	40 mm

Pipe grinder ALMI AL 100 U-02 No. 2449

The AL100U-02 can be operated with two hand-wheels or a lever. The machine is equipped with both options. The AL100 U-02 can grind material from Ø 20 mm to Ø 76 mm. The compound slide and carriage with rotatable clamp are continually adjustable, which means the machine can grind all pipe sections at every required angle between 30° and 90°.

The ALMI AL100U-02 can be used to grind square, rectangular and round pipes with a range of wall thicknesses and is suitable for all customary types of materials.

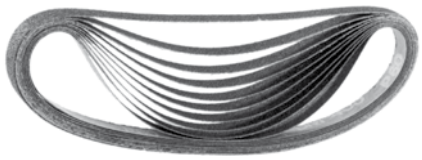
ALMI's belt tensioning system makes tensioning the grinding belt even easier. The belt is tensioned using the hexagonal spanner supplied with the machine.

The grinding belt can be tensioned quickly and the grinding rollers can be changed in seconds.

All pipe grinders are equipped with a deburring table.

Standard Accessories

- grinding rollers for tube diameters Ø 42,4 mm
- 2 pieces of special grinding belts, grain size 36



No. 29642
Standard band for stainless steel

rectangular prism/variable angle	
Tube-Ø	20,0 - 76,1 mm
Grinding belt	100 x 2.000 mm
Motor	3 kW
Band speed	30 m/sec.
Handwheel	hand gear and handwheel
Dimensions (WxHxD)	1.200 x 550 x 1.150 mm
Weight	220 kg

Press roll

29721	½ "	Ø 21,3 mm
29654	¾ "	Ø 26,9 mm
29655	1 "	Ø 33,7 mm
29722		Ø 40,0 mm
29656	1¼ "	Ø 42,4 mm
29657	1½ "	Ø 48,3 mm
29723		Ø 50,8 mm
29724	2 "	Ø 60,3 mm
29725	2½ "	Ø 76,1 mm

When you made a offer for the press roll, please to brag the year of construction or bearing diameter.

Grinding Machine for Tube Bows GRS 33 (No. 2433) and GRS 33-V (No. 2435)

General

When treating (bending) polished stainless steel tubes the surface is damaged. The Grinding Machine for Tube Bows GRS 33 regrinds the single or the lined up tube bows after bending. Of course straight tubes can be ground with the Machine GRS 33 as well. In both Gases the crosssection may be round or oval. The tube bow can be up to approx. 140°. (The exact angle depends on the tube diameter). With respective grinding belts surfaces can be ground of grain size 60 up to grain size 600 (polishing).
The grinding is done with two opposite grinding belts, each of which runs over three pulling rollers being positioned in a grinding head. The tube bow to be ground is put between the two grinding belts. The grinding head rotates together with both grinding belts around the tube bow. To achieve different polished sections there are various grinding belts available. The tube bows can be ground either dry or wet. For wet grinding the machine is equipped with a mechanical cooling pump.

Technical Data

- Driving motor: 2.2 kW
- Revolutions: 1450 rpm
- Voltage supply: 380-400 V three phase current, 16 A, 50 Hz
  Different voltage and frequency on request.
- Dimensions: 800 x 600 x 1450 mm
- Weight: ca. 165 kg

Standard Accessories

- wooden handle
- wooden isertion aid
- 5 liters of liquid addition to the abrasive
- 20 pieces of special grinding belts of different grain sizes

GRS 33-V No. 2435

The mechanical construction of the Grinding Machine for Tube Bows GRS 33-V is the same as the one of the Grinding Machine for Tube Bows GRS 33. However, the electric drive and the control are different.
The Grinding Machine for Tube Bows GRS 33-V is equipped with an electronic vario-drive for a variable number of revolutions, which can infinitely variable be reduced to half of the highest number of revolutions. This is advantageous for grinding of narrow bows, large tube diameters as well as for operating with Scotch belts.

Belts for wet-grinding		
29700	grain size 60	pack of 10
29701	grain size 100	pack of 10
29559	grain size 180	pack of 10
29560	grain size 240	pack of 10
29561	grain size 400	pack of 10
29562	grain size 600	pack of 10
Scotch-belts 30 x 735 mm		
29682	middle	
29683	fine	

Special Accessories	
29529	5 liters of liquid addition to the abrasive
29618	Wooden insertion aid
29619	Wooden handle
29636	Material guiding disc out of special plastic (In Gase of Order please indicate the material diameter.)

Step 1

The Flowdrill comes into contact with the material using relatively high axial pressure and rotational speed. The generated heat makes the material soft and malleable enough to be formed and perforated.
As the Flowdrill pushes into the material, some of the displaced material forms a collar around the upper surface of the workpiece. The rest of the material forms a bushing in the lower surf

ace of the workpiece.
All this happens in a matter of seconds.
The resulting collar and bushing can be up to 3 times the original material thickness.
The diameter of the bush is accurately determined by the cylindrical part of the Flowdrill tool.

Step 2

The Flowtap creates formed threads by material displacement. The material flows into the thread depression and crest of the tap

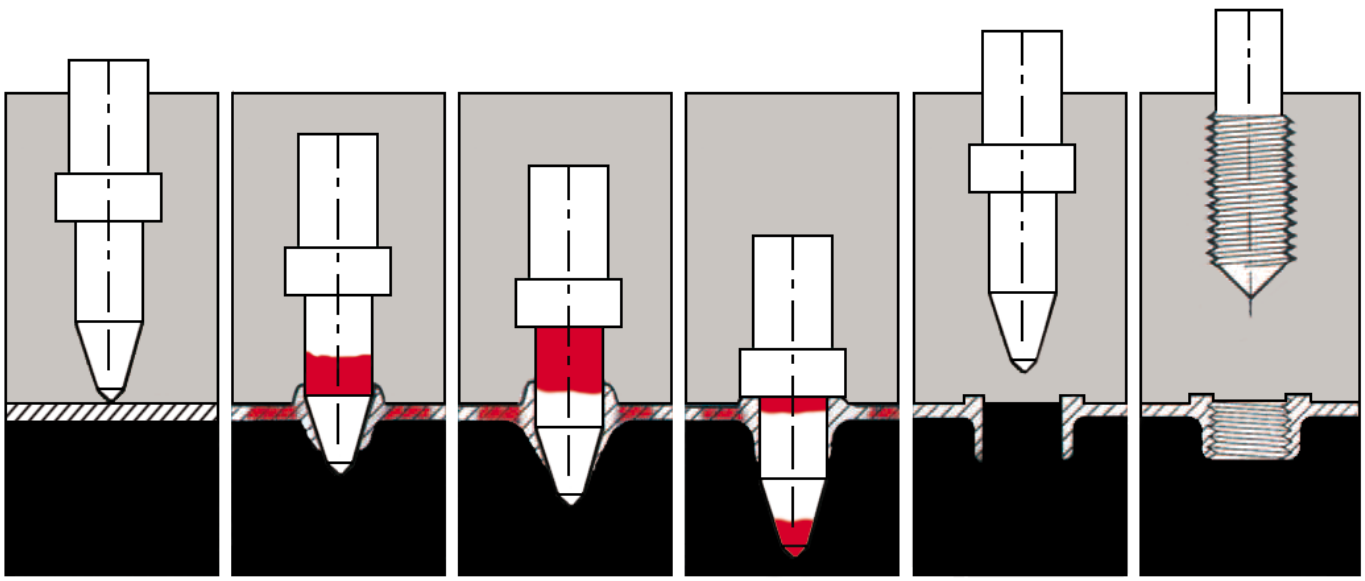
Flowdrill-Set No. 29640

Flowdrill-Set for M 6- and M 8-Thread

Flowdrill-equipment for application in a stand drilling machine. The delivery extent comprises a spanners' chuck, 2 spanners, 2 flowdrills, 2 flowtaps and a special lubricant with brush. The total set is delivered in a plastic case.

Weight 2,5 kg

29638	Flowdrill lubricant, thermal profile, 1 kg
29639	Flowdrill thread form oil, 1 kg
29640-ME 6	Flowdrill thread moulder
29640-ME 8	Flowdrill thread moulder



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Products from GLASER are hand made from the point of initially purchasing the raw materials up to the delivery date.

Our employees work with the metal in all stages of product development. Not surprisingly, new ideas develop through this close contact to the material. Trends in metal come from GLASER METALL.

Wrought iron machinery from GLASER makes the work of metalworkers easier and saves time. Components such as rods, scrolls and leaves can be machine-made and subsequently welded together to make complete main bars and decorative rods – a genuine help.

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