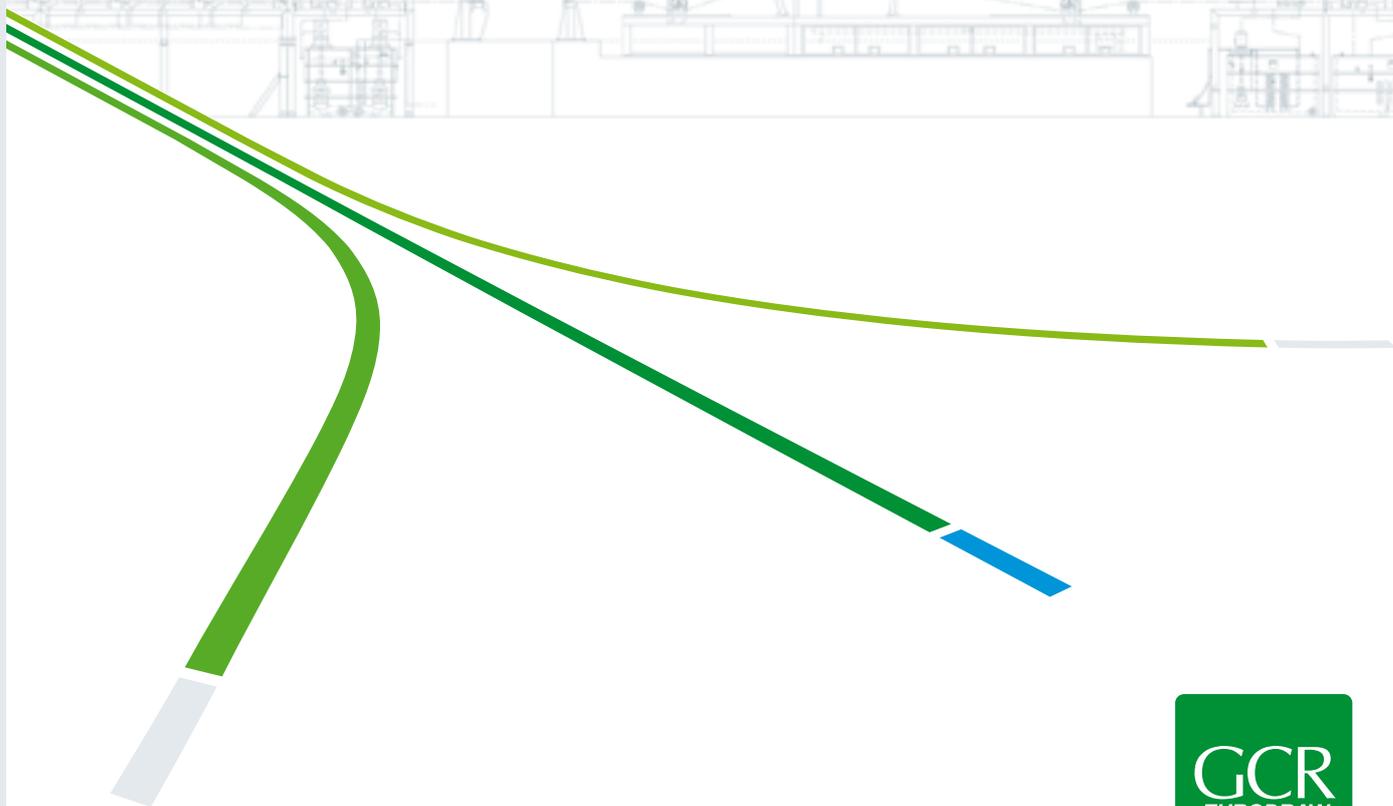
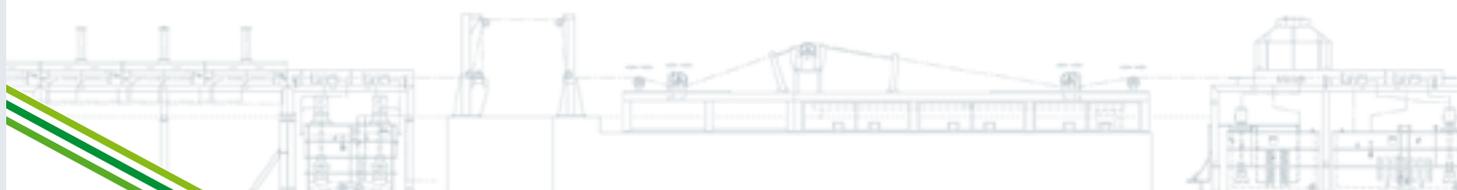


01

PLANTS FOR PRODUCTION OF TIRE STEEL CORD, BEAD WIRE, HOSE WIRE, STAPLE WIRE AND WIRE ROPE

CLEANING AND PLATING LINES, DOUBLE-TWIST AND TUBULAR STRANDERS AND CABLING MACHINES, WET DRAWING MACHINES, PAY-OFFS AND TAKE-UPS



01.01 WIRE ROD PREPARATION LINES

IN-LINE DESCALING, PICKLING AND COATING

01.02 MTS AND MTX WIRE DRAWING MACHINES

IDEAL TO PROCESS HIGH AND LOW CARBON WIRE

01.03 BRASS-PLATING LINES

SINGLE OR MULTI-WIRE WITH WIRE-BY-WIRE, TRAY-BY-TRAY PLATING CONTROL

01.04 BEAD WIRE COPPERING/BRONZING LINES

FAST, EFFICIENT AND FLEXIBLE MULTI-WIRE LINES FOR BEAD WIRE

01.05 ELECTRO-GALVANIZING LINES

FOR LIGHTLY GALVANIZED CARBON STEEL WIRE AND GALVANIZED COPPER WIRE

01.06 WET DRAWING MACHINES

DIFFERENT MODELS FOR ALL MEDIUM AND FINE WET DRAWING REQUIREMENTS

01.07 STEEL CORD AND WIRE ROPE STRANDING, BUNCHING AND CABLING MACHINES

DOUBLE-TWIST AND TUBULAR CONFIGURATIONS FOR STRANDS AND ROPES

01.08 MULTI-WIRE PAY-OFFS AND TAKE-UPS

FOR HEAT TREATMENT AND PLATING LINES

01.09 KNOW-HOW, ACCESSORIES AND SERVICES

KNOW-HOW AND TECHNOLOGY FOR STEEL CORD AND RELATED PRODUCTS

WIRE ROD PREPARATION LINES

IN-LINE DESCALING, PICKLING AND COATING

Before any wire drawing, wire rod must be descaled and/or pickled. In case of low carbon wire rod, it is generally sufficient to use a mechanical descaler and a brushing unit; however for high carbon wire descaling alone may not be sufficient to assure efficient wire drawing.

For the production of tire steel cord and hose wire GCR Eurodraw offers a rod preparation line that includes mechanical descaling, steam pickling or H_2SO_4 electrolytic pickling and hot rinsing; and finishes with borax coating and drying. This line can be installed either in-line with a wire drawing machine or can be used as a stand-alone unit where the wire is wound on large capacity spools.

GCR Eurodraw offers four types of mechanical descalers suitable for low or high carbon rod and for small or large diameter wire rod. Descalers for high carbon, large diameter wire rod are equipped with descaling rollers that are mounted on a hydraulically operated swiveling support so that threading is very simple. Descalers can be followed by brushing units. The GCR Eurodraw brushing unit is available in single or double configuration for high speed brushing.

GCR Eurodraw has designed a unique steam pickling unit. The unit works on the simple principle that if the skin of the wire is heated very quickly, the hard scale present on the surface expands and falls off. The unit uses only overheated steam and is very effective and environmentally friendly.

For wire that is very rusty or with thick layers of scale, GCR Eurodraw can supply an electrolytic pickling line. The unit can be designed for a single wire or even up to five wires. The line consists of four main parts: A pickling tube in which electrolytic pickling takes place, an acid recycling tank where the acid is stored and pumped to the pickling tube, a rinsing unit and an electrical cabinet that contains the rectifiers necessary to perform the electrolytic process. Electrolytic pickling is the most effective way to clean rod; it ensures consistent quality of the product and has very low operating costs, comparable to mechanical descaling and brushing.

Prior to wire drawing the rod should be coated to neutralize the surface and facilitate subsequent drawing operations. In-line wire rod preparation usually uses borax or lime. The coating unit consists of an insulated and heated tank where the borax or lime

is circulated by a pump. The borax or lime is generally heated by electric resistances; stem coils can be used as an alternative if steam is available.

In order to limit the space necessary to dry the borax or lime before the wire proceeds to the wire drawing machine, GCR Eurodraw has developed an induction dryer that heats the wire to instantly dry the borax or lime solution coating.

Heating power is automatically adjusted with the speed of the wire and can be further controlled with an optical pyrometer that reads the wire surface temperature and adjusts the power accordingly.





MTS AND MTX WIRE DRAWING MACHINES

IDEAL TO PROCESS HIGH AND LOW CARBON WIRE

GCR Eurodraw is one of the world leaders in the manufacture of wire drawing machines. The range of MTS-MTX machines can process wire rod of up to 16 mm down to finished wire diameters as small as 0.10 mm.

MTS-MTX machines are ideal to process high and low carbon wire, they have inclined axis-drawing blocks and loop synchronization sensor arms. The machine structure is made of normalized electro-welded steel. They are heavy enough so that special foundations are not necessary; they are simply placed on the factory floor and attached with suitable anchoring bolts. The only outstanding difference between the MTS and MTX machines is that the electrical cabinet of the MTX is an integral part of the machine rather than a separate unit. Due to the strong and

rigid structure, the complete machine can be transported as a single unit.

The drawing blocks are made of forged C50 carbon steel, induction tempered to obtain a surface hardness of 62 HRC. This makes them three times more wear resistant than cast iron blocks. The block and gearbox form one easily removable assembly.

The blocks are driven by Siemens motors and power is transmitted by high performance parallel axis reduction gears sourced from major internationally recognized gearbox manufacturers that produce thousand of these units every year. This is a guarantee of quality and performance, as GCR Eurodraw will always adopt the latest design and innovations in the field.

Dieboxes assure efficient, direct die cooling and ease of operation. MTS-MTX machines can be equipped with three types: Rotating dieboxes, fixed dieboxes equipped with the exclusive, easily removable GCR Eurodraw die cartridge that does not require any tools to change the dies and, on request, specific custom-designed dieboxes for production of plating quality or shaped wire.

GCR Eurodraw's MTS-MTX wire drawing machines are recognized worldwide for their exceptional cooling capacity.

The exclusive GCR ALUCOOL system provides high turbulence narrow gap cooling and uses materials that are highly resistant to corrosion so that maintenance is reduced to a minimum.

Electronics used on GCR Eurodraw machines are supplied by world-renowned manufacturers such as Siemens, General Electric, Allen Bradley. Machine wiring can be analogical or digital to limit the number of wires between the machine and the electrical cabinet.

All MTS-MTX machines can be highly customized with a wide range of options that make them suitable for production of a very wide variety of wire products. Such options include: OTO blocks, final stripper blocks, tungsten carbide or ceramic-coated blocks, soap mixers, laser wire diameter gauges, rolling cassettes, dustproof guards and many more.

Machine model		MTS 400	MTS 480	MTS 560	MTS 630	MTS 710	MTS 900
Block diameter	mm	400	480	560	630	710	900
Max. installed power	kW	18.5	30	45	60	74	105
Max. HC Inlet Ø	mm	3.80	4.80	5.50	7.00	9.00	14.0
Max. LC Inlet Ø	mm	4.20	5.50	6.50	8.00	9.00	14.0
Min. wire outlet Ø	mm	0.60	0.80	1.20	1.50	1.80	3.00
Max. speed	m/sec	30	30	30	25	20	15

Machine model		MTX 180	MTX 250	MTX 350	MTX 400	MTX 450	MTX 500
Block diameter	mm	180	250	350	400	450	500
Max. installed power	kW	4	7.5	13	18	22	34
Max. HC Inlet Ø	mm	2.20	3.00	3.50	4.00	4.50	4.80
Max. LC Inlet Ø	mm	2.60	3.20	3.80	4.20	4.50	4.80
Min. wire outlet Ø	mm	0.10	0.25	0.40	0.50	0.80	1.00
Max. speed	m/sec	30	30	30	30	30	28

BRASS-PLATING LINES

SINGLE OR MULTI-WIRE WITH WIRE-BY-WIRE, TRAY-BY-TRAY PLATING CONTROL

The GCR Group has been building plating lines for the last 35 years. Initially GCR Engineering built plating lines for their own tire cord production plants; then the plants were sold to international tire companies.

GCR Eurodraw is now the leader in the supply of such equipment to tire cord manufacturers worldwide and no other company in the world has as many references in the field.

The GCR Eurodraw brass-plating line has been designed taking into account our brass-plated wire production experience accumulated over the years.

Feedback from our own production plants has been translated into the design of the plating lines that are offered to our customers today.

GCR Eurodraw is one of the first companies to offer wire-by-wire, tray-by-tray plating control or a combination of the two on the same line, electro-plating with insoluble anodes, efficient pressurized rinses, a choice of electro-pickling with sulphuric acid or fumeless hydrochloric pickling and Joule effect, induction or fluidized bed thermodiffusion.

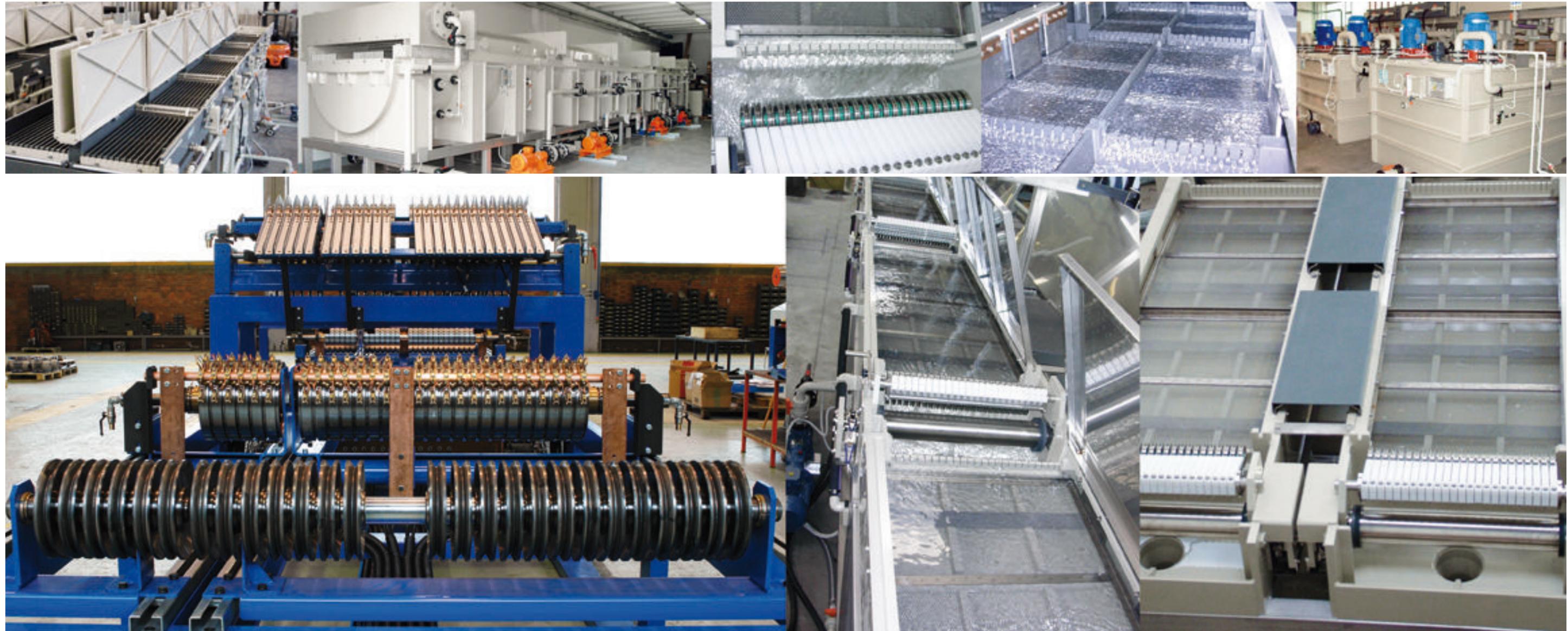
Brass-plating lines are available in high speed single-wire configuration or in multi-wire configuration. Single-wire configuration is the best option for plants with capacity up to 6000 t/year. For large plants multi-wire plating lines are the best choice.

GCR Eurodraw builds multi-wire plating lines for 12 wires to 60 wires and dV up to 95.

GCR Eurodraw line units are fully assembled and tested in our plants prior to shipment. All pumps, sensors, valves, etc. are assembled on the units and pre-wired to terminal boxes.

All frames are made of stainless steel and all tanks are made of high quality PP or other suitable material. State-of-the-art electronics specifically designed for this application ensure perfect wire plating.

GCR Eurodraw brass-plating lines can be supplied with in-line patenting sections manufactured by selected, certified GCR Eurodraw suppliers and, of course, with the specific GCR Eurodraw pay-offs and take-ups designed for patenting and tire cord/hose wire brass-plating lines.



ELECTRO-GALVANIZING LINES

FOR LIGHTLY GALVANIZED CARBON STEEL WIRE AND GALVANIZED COPPER WIRE

GCR Eurodraw builds single-wire or multi-wire electro-galvanizing lines.

These lines are generally used to produce staple wire; lightly galvanized high and low carbon steel wire and galvanized copper wire.

Both single-wire and multi-wire lines are composed of an electrolytic degreasing or pickling unit, followed by a double rinse and an acidic surface activation unit and then into the electro-galvanizing cells. After galvanizing the wire passes through a double cold/hot rinse and is then taken up into coils or onto spools.

Electro-galvanizing can be done with either soluble or insoluble anodes. In the case of

insoluble anodes a zinc dissolution tank is provided and positioned near the line. The plating solution is prepared in the dissolution tank and pumped to the working trays.

Galvanizing with insoluble anodes ensures the best possible coating, as the zinc concentration is uniform all around the wire; and it is easily manageable as there are no anodes to be checked and changed.

Rinsing units are cascade type to minimize water consumption. The last rinse is always hot in order to dry the wire quickly.

Multi-wire galvanizing lines can be combined with annealing furnaces in order to obtain soft galvanized wire.

GCR Eurodraw also builds electro-plating line for nickel and other pure metals as well as chemical wire plating lines such as copper-plating lines for the production of welding wire.





NOT ONLY A
MACHINERY MANUFACTURER.

01.06

WET DRAWING MACHINES

DIFFERENT MODELS FOR ALL MEDIUM AND FINE WET DRAWING REQUIREMENTS

GCR Eurodraw builds four main types of wet wire drawing machines.

TB - TB models have a swivel transmission assembly with vertical axis step cones immersed in the drawing lubricant during operation and swiveled out of the lubricant tank for threading. TB models are available in double-cone and four-cone configuration depending on the number of drawing steps. The cones can be raised manually or as an option the assembly can be motorized. The TB4 model, specifically designed for tire steel cord production, is available with 19, 21, 23 and 25 drafts.

MB models have similar configuration but are suitable for larger diameter wires and can be equipped with motors of up to 150 kW.

TCO - TCO models are designed with horizontal axis step cones that are submerged in the lubricant only during operation; during machine stops the lubricant drains back into the recycling tank. This model is available in three different configurations, with two, four or six cones depending on the number of drafts.

The TCO can be combined with a 2-step dry drawing machine. The combination of dry and wet drawing makes this machine particularly suitable for the production of stainless steel wire at high speeds.

One TCO model has been especially designed for the production of hose wire where particular requirements of cast and helix are necessary.

The TCO models are equipped with two motors. The main motor drives the drawing cones, a second motor controlled by a small dancer arm located inside the machine drives the final cone. This configuration makes it easy to skip dies and considerably reduces slipping of the wire on the cones.

MTCOR - The MTCOR is the wet drawing machine with horizontal capstans specifically designed for the production of galvanized staple wire. This machine is a combined dry and wet machine and its particular design allows for very high production speeds (above 25 m/sec).

STEEL CORD AND WIRE ROPE STRANDING, BUNCHING AND CABLING MACHINES

DOUBLE-TWIST AND TUBULAR CONFIGURATIONS FOR STRANDS AND ROPES

GCR Eurodraw has more than 30 years of experience in the design and construction of plant and machinery for the production of strand and rope for every application; and offers a complete range of double-twist, tubular and wrapping machines for the production of steel cord to reinforce tires. Some of the most interesting developments pursued by GCR Eurodraw have centered on continuing research into the principle of the double-twist; not only for production of more or less complex strands but also, through indirect cabling, for production of wire ropes assembled with different layers of wires and/or strands.

This has resulted in double-twist machines that assure extremely high productivity with improved resistance to fatigue; that are, in

fact, far superior to results obtained with classic tubular machines.

Double-twist stranders for steel cord production

DT2 - "in-out" type stranding machine with two inner spools and two outer spools, for production of 1x2; 1x3; 2+1; 2+2; standard, open, ST and HT.

DT3 - "in-out" type stranding machine with three inner spools and up to four outer spools for, production of 1x2; 1x3; 1x4; 2+1; 2+2; 2+3; 3+2; 4+3; 4x4 HE; 3x7 HE; standard, open, ST and HT.

DTU - "out-in" type buncher, for production of 1x4; 1x5; 1x7; 1x12 ST and HT; 1x19 ST strands and cord.

DTS - "in-out-in" type buncher, for production of 2+7; 3+9; 3+6 ST and HT cords.

DTA - "in-out-in" type cabling machine, for production of 7x3; 7x4; 7x7; 7x19; 3+9+15; 1x19; 1x27; ST and HT cords.

Pay-off spools used on GCR machines vary depending on customer requirements, ranging from 190 to 400 mm flange diameter and weighing 20 to 140 kg.

Production speeds of GCR machines are among the highest available on the market; while at the same time they are, for all practical purposes, absolutely silent during operation. Specific solutions have been adopted for tensioning/back pull of the filament and core pay-off wires or strands and for passage of the

twists at deviation points of the wires/strands and their contact with the machine organs.

GCR machines offer numerous solutions in order to obtain products with very specific characteristics (diameter, lay, linearity, twists, flare, break elongation, elongation to fixed load, stiffness, etc.) that, in particular, are required by every producer of radial tires.

Tubular machines for strand and rope production

CTR - tubular stranding, cabling machines with a rotating tube, for production of every type of strand and rope.

The number of spools depends on customer requirements and can vary from 4 to 12. The pay-off wire spools used on these machines

correspond to DIN standards and range from 195 to 250 mm flange diameter. The take-up spools can be made of metal, plastic or wood in a vast range of flange diameters. Filament diameters can range from 0.175 to 0.30 mm, with strand/rope diameters ranging from 0.58 to 0.78 mm.

Other configurations are available with variations at the request of the customer.

All the machines are driven by AC motors supplied by vectorial frequency inverters, with digital synchronization of the various installed motors. PLC or microprocessors for management of the functions and visualization of the operating parameters are an integral part of the electrical/electronic equipment.

MV1/MV2 wrapping machines

The range of machines for production of steel cord also includes wrapping machines for laying of the spiral wrap on the finished cord construction; more precisely:

MV1 wrapping machine for cord constructions with diameters of 0.60 to 1.20 mm

MV2 wrapping machine for cord constructions with diameters of 1.00 to 4.00 mm.





MULTI-WIRE PAY-OFFS AND TAKE-UPS

FOR HEAT TREATMENT AND PLATING LINES

GCR Eurodraw builds specific pay-offs and take-ups for every application: Coil to coil, spool to coil, coil to spool or spool to spool.

Every product has its own pay-off and take-up.

Available models include:

PAY-OFFS SSF and SSFM

Flyer arm type for pay off from spools or coils; a motorized version is available for fine wire pay-off.

PT and PTM

Vertical axis rotating platform pay-off suitable for spools or coils, motorized or with back pull adjustment.

PT-DB

Vertical axis rotating platform pay-off with accumulation block, suitable for spools or coils.

PAY-OFFS AND TAKE-UPS FOR SPECIFIC APPLICATIONS

SBW and ABW

Specific pay-off and take-up for bead wire lines where wire straightness is a must.

SB-DB and AP-DB

Specific pay-off and take-up for brass-plating lines, from spool onto spool with accumulation system for non-stop operation.

MLT coilers

Specific take-up for oil tempering wire line.

TAKE-UPS

MSV coilers

Static coilers particularly suitable for coiling of hot dip or electro-galvanized wire into pattern laid coils; or for patented wire.

MRV coilers

Live coilers particularly suitable for coiling of stainless steel wire or large diameter high carbon wire. Can be equipped with skin pass diebox.

GCR Eurodraw also designs other types of pay-offs and take-ups to suit every wire application, with or without accumulation system for continuous operation.

KNOW-HOW, ACCESSORIES AND SERVICES

KNOW-HOW

GCR Eurodraw's long experience in the production of steel cord and related products allows us not only to deliver equipment, but also to deliver know-how and guide our customers in the achievement of their production targets according to the specifications of the major tire manufacturers.

The GCR Eurodraw team of experienced engineers have been trained at modern steel cord facilities and are in full control of the latest plating, wet drawing and bunching technology and operating procedures for certification of the final products.

GCR Eurodraw expertise excels in tire cord, hose wire, bead wire and staple wire production where equipment, technology and know-how can be delivered by a single company without the need to share responsibilities among many vendors. Many greenfield operations have been set up by GCR Eurodraw in the past 30 years. Most major steel cord manufacturers have at least some equipment in their plants supplied by GCR Eurodraw.

The GCR Eurodraw team is composed of experienced mechanical engineers, chemists, process engineers and production management experts, all of whom are available to assist GCR customers whenever and wherever necessary.

ACCESSORIES

All GCR Eurodraw lines and machines can be supplied with a number of specific accessories either designed and produced by GCR Eurodraw or made by selected affiliated companies.

Pointers

Comapac produces a complete range of wire pointers suitable for the machines described in this catalogue.

Welders

GCR Eurodraw can provide wire butt welders suitable for every application, from high performance pressure welders with programmable annealers for high carbon rod for PC strand, to simple low carbon rod and wire welders equipped with grinders and shears.

Spool tilters

GCR Eurodraw can provide hydraulic spool tilters for every spool size.

Rolling cassette maintenance benches

A specific accessory for maintenance of DEM rolling cassettes is available as an option. The unit assures easy and precise roll alignment and easy dis-assembly and re-assembly of the cassettes.

Wire drawing accessories

Rotating dies, soap mixers, laser wire diameter gauges, GCR Eurodraw digital drawing data acquisition and supervision system, PROFIBUS machine-to-cabinet link, disc brakes on every block, wire presser rolls on every block, dustproof machine guards, water flow indicators and many more.

Die re-cutting and laboratory equipment

Through affiliated partners, GCR Eurodraw can provide all necessary die reworking equipment, as well as laboratory equipment for tensile and torsion testing and chemical analysis of pickling solutions and waste water.

SERVICES

GCR Eurodraw is not only a plant and machinery manufacturer but also provides production know-how and technology for PC strand, PC wire and many other products. GCR's long and varied experience in setting up turnkey wire production operations, and jointly managing the production with their customers during the start-up and commissioning phases, gives major added value to the project and ensures success.

AFTER SALES SERVICES

GCR Eurodraw is committed to total customer satisfaction. Our after sales service department is fully staffed with mechanical engineers, electronic engineers and process engineers that are able to solve any problems that may arise. Our spare parts service department is available to answer all spare parts inquiries, even for the very first machines ever built by the companies of the GCR Group.



KEY FACTS ABOUT THE GCR GROUP

In 1974 established as GCR Engineering SPA with the scope of designing and building equipment for the production of steel cord.

In 1982 acquired the company MILL, specialized in the production of wire drawing machines.

In 1988 established the company Eurodraw Srl for the production of straight through wire drawing machines.

In 1990 acquired the company OZ Cams and merged MILL and OZ Cams into Eurodraw.

GCR Engineering and Eurodraw work as a team for the supply of several turnkey steel cord plants in Europe, Asia, USA and South Africa; as well as supplying a wide range of equipment for different applications throughout the world.

In 1999 GCR Engineering is awarded ISO 9001 quality certification, further requalified in 2002 to VISION 2000 certification and now valid until 2011.

In 2002 GCR Engineering and Eurodraw Srl move to new premises.

In 2002 GCR Engineering and Eurodraw Srl merge into GCR Eurodraw to become one of the largest wire machinery manufacturers and with the widest production program.

In 2005 GCR Eurodraw opens a branch operation in China to consolidate its market position in the People's Republic of China.

In 2006 GCR Eurodraw is awarded construction of the largest PC strand operation in the Middle East, with a capacity of 100,000 tons/year.

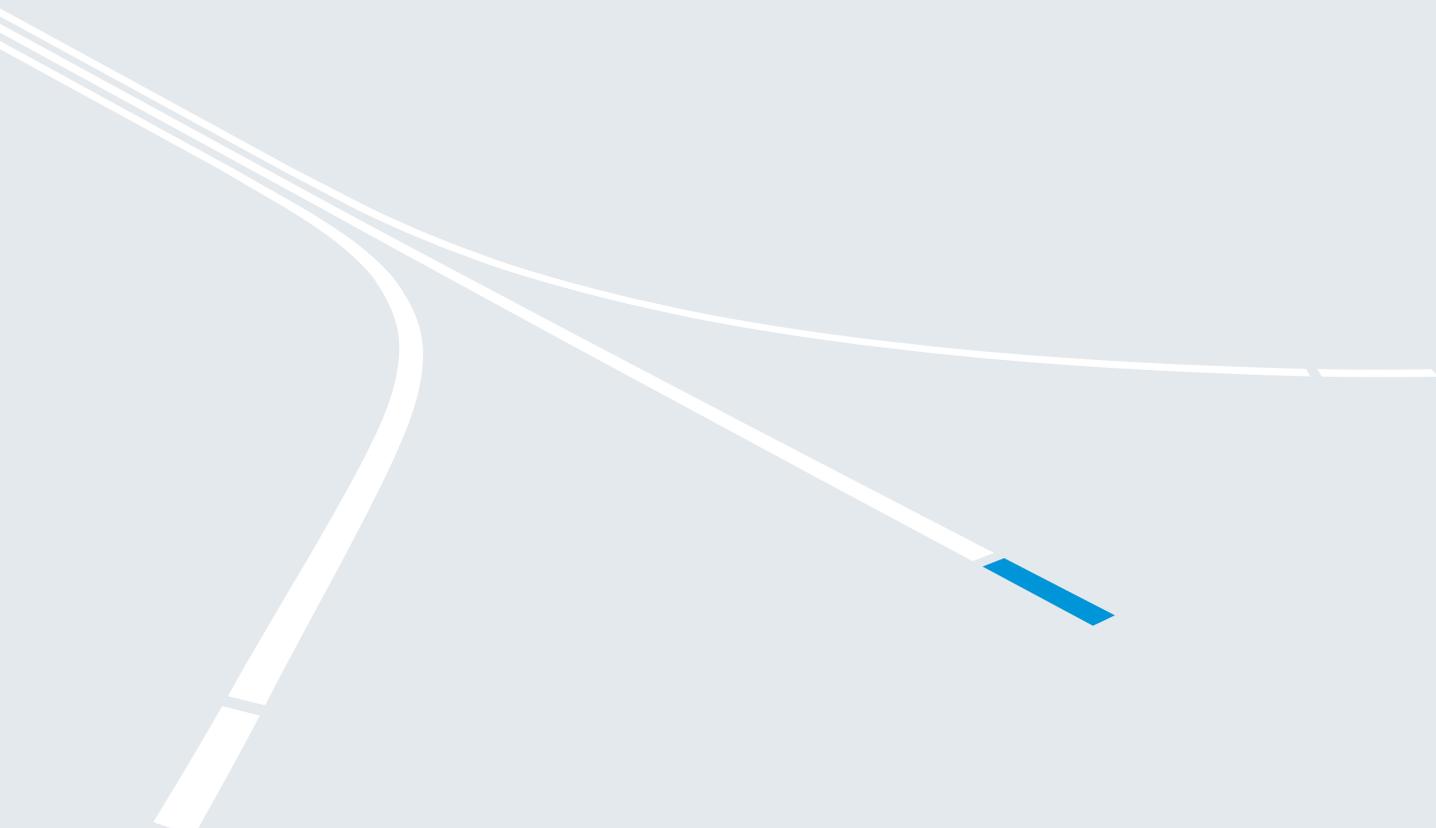
In 2007 GCR Eurodraw, in cooperation with EVG of Austria, purchases the company DEM located in Udine; with this acquisition the production program of the group also covers rolling cassettes and wire profile machinery.

In 2007 GCR Eurodraw purchases Comapac Wire Machinery Srl located near Lecco, a company specialized in the production of pay-offs and take-ups, competitive rolling machines and custom-designed wire drawing equipment for special applications.

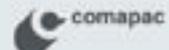




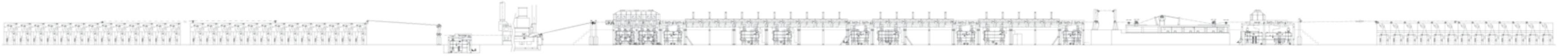
PLANTS FOR PRODUCTION OF TIRE
STEEL CORD, BEAD WIRE, HOSE WIRE,
STAPLE WIRE AND WIRE ROPE



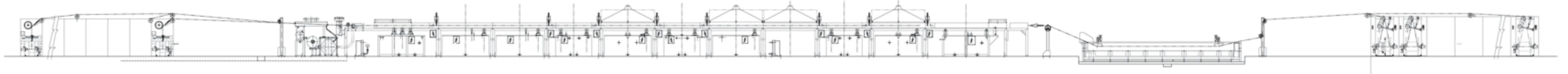
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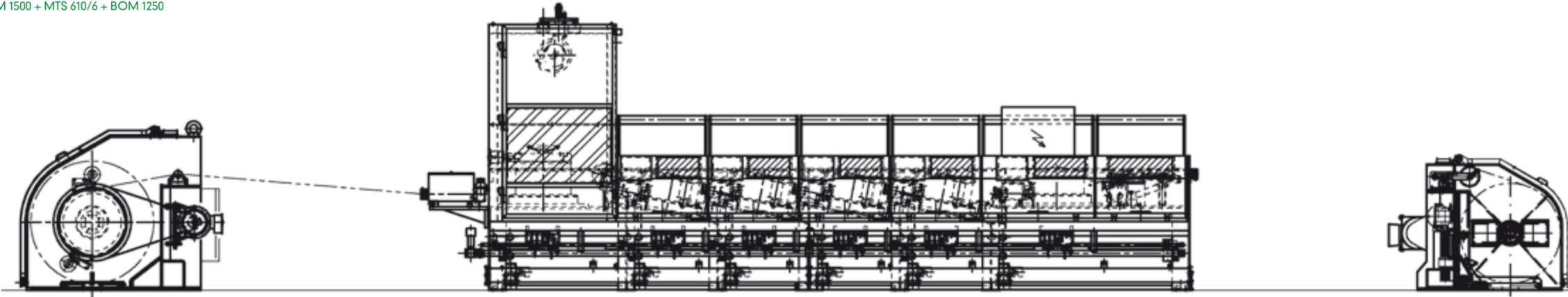
BRASS PLATING LINES



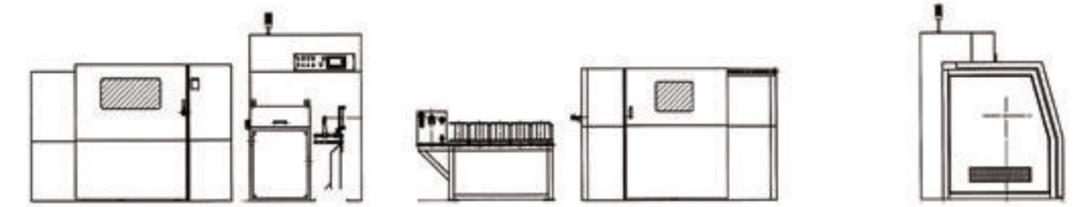
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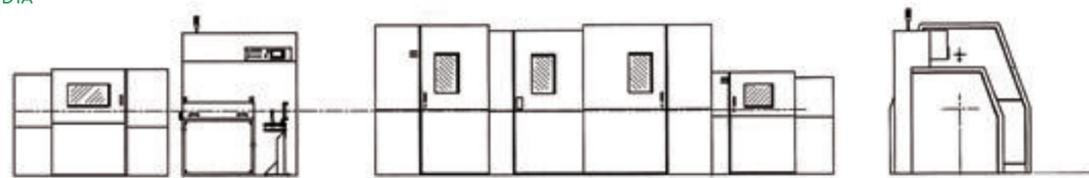
SOM 1500 + MTS 610/6 + BOM 1250



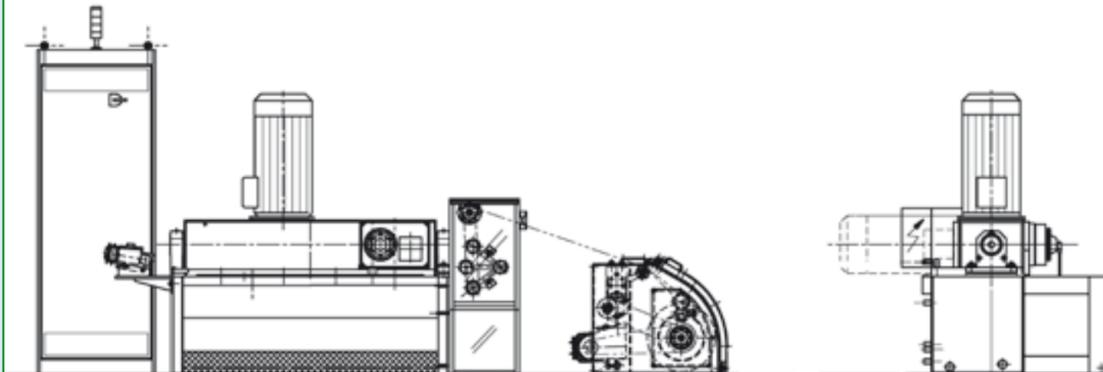
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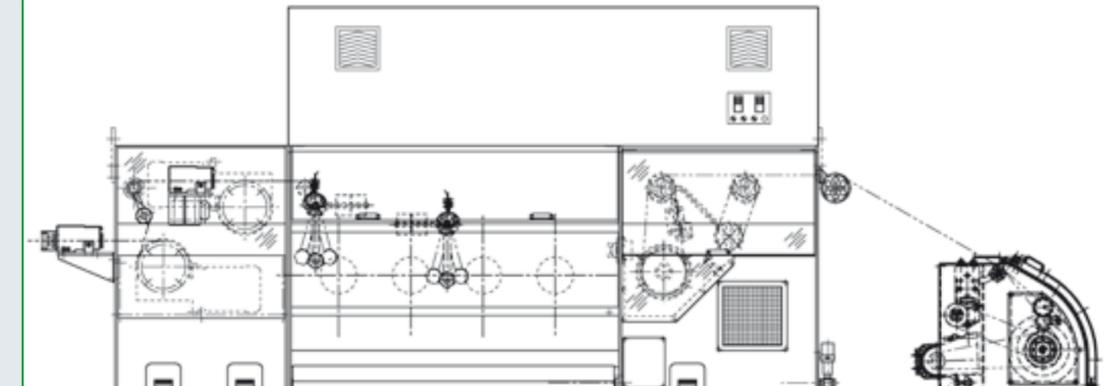
DTA



TB4



TCO



DT3

