



ESTEVES
GROUP



WIRE DIE SOLUTIONS

Made for high-performance
wire drawing



ESTEVES
GROUP

Introducing Esteves Group

Shaping the Future with Precision Tooling

Esteves Group is the world's leading manufacturer of high precision wire drawing dies, cabling dies, and extrusion tooling for the wire and cable industry.

Customers count on our customized tooling to manufacture a wide range of products and components that are essential to daily life and enable the energy transition. Some of these products and components are electrical wiring, communication cables, bonding wire used in cell phones and computers, saw wire for solar panels, cables in aerospace industry, and medical devices such as stents and hypodermic needles.

Additionally our tooling is used in the manufacture of welding wire, nails, fasteners, and concrete reinforcement rods that are used to hold our houses, roads and cars together.

As your dedicated partner, we are committed to building lasting relationships based on a comprehensive understanding of your goals. Our mission is to exceed your expectations by tailoring our products to meet your specific requirements, ensuring perfect integration into your production processes.

With manufacturing facilities strategically located across Europe, the Americas and Asia, we guarantee proximity and accessibility. Our local service representatives are always ready to support you in today's dynamic market environments.

Choose Esteves Group for unmatched precision and expertise. Together, we are shaping the future of technology, and enabling the transition towards a more sustainable world.



Capabilities

Esteves Group manufactures tooling with ultra-hard inserts for the wire and cable industry.

Below is an overview of products offered by Esteves Group. Check www.estevesgroup.com or contact your local representative for more details.



Wire drawing dies

- Round wire drawing dies
- Recut dies
- Elongation sets
- Shaped profile wire drawing dies
- Shaving dies
- Guide dies



Cabling tools

- Bunching, stranding and compacting dies
- Split dies
- Extrusion tips and dies



Miscellaneous tooling

- Tubing dies
- Conform dies
- Wipe dies
- Coating dies
- Enameling dies
- Eye-lets

Specialty products

- Calibrating dies
- Spray jet and gas injection nozzles
- Micro-pierced products
- Fiber optic coating dies
- EDM guides
- Go/no-go gauges

Die shop equipment and supplies

- Ultrasonic polishing machinery
- Wire polishing machinery
- Wire pullers
- Die and extrusion tool cleaning systems
- Microscopes
- Consumables
- Ancillary equipment
- Check pins



Industries

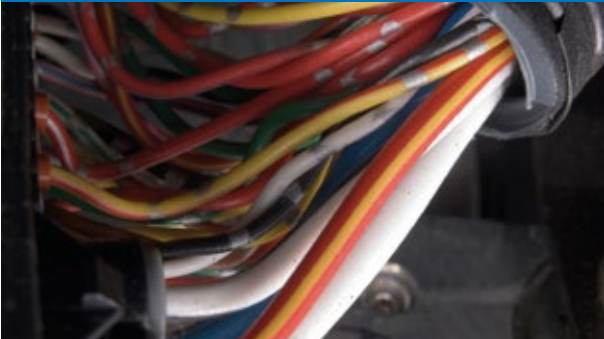
ENERGY



Powering the Future

Electricity powers our world, sourced from both renewable energies like wind and solar to traditional fossil fuel and nuclear plants. Our high, medium, and low voltage cables ensure efficient transmission across diverse landscapes. Esteves Group is at the forefront of reducing production costs for these essential wires and cables, also contributing significantly to the energy transition by enabling the manufacturing of critical components for renewable energy solutions.

AUTOMOTIVE



Driving Innovation

Esteves Group fuels automotive innovation, from tire cord wire to wire harnesses and onboard cabling. Our pivotal role in electric vehicles (EVs) extends to crafting the essential wires for electro motors, driving EV performance. Committed to sustainable mobility, we're a key player in the EV revolution, offering compact, efficient solutions for today's automotive challenges.

CONSUMER ELECTRONICS



Enhancing Everyday Life

Esteves Group's tools are behind the scenes in the realm of consumer electronics, from smartphones to computers, enabling the production of ultra-fine wires. These advancements help devices become more compact, efficient, and energy-saving, reflecting our commitment to innovation and quality.

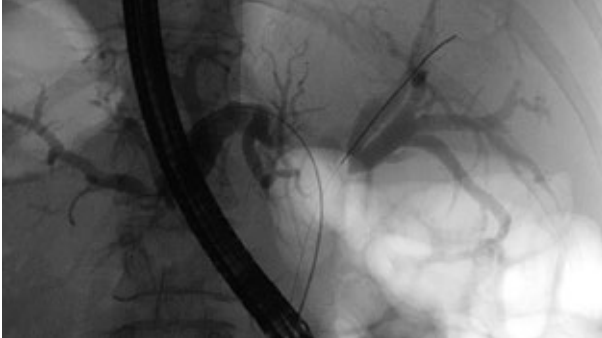
AEROSPACE



Advancing Air and Space Exploration

Esteves Group is globally recognized as a certified partner of many leading suppliers of the aerospace industry. From commercial flights to space exploration, our high-precision tools enable manufacturing wiring and high-strength, lightweight fasteners, showcasing our commitment to this high-tech industry.

MEDICAL



Innovating for Health

Our high precision wire drawing dies are crucial for manufacturing minimally invasive surgical products, stents, and hypodermic needles, supporting the needs of the medical industry for reliable and precise components made from advanced materials. Leading manufactures of highest quality wires, from stainless steel to nitinol and titanium alloys, count on our dies to meet the demanding specifications of today's medical devices.

WELDING



Enhancing Performance and Efficiency

In the evolving welding consumables industry, with a growing number of applications and materials available, Esteves Group stands out by supplying engineered wire drawing dies and strings. Our solutions are designed to optimize die life, improve wire surface condition, and increase efficiency, addressing the specific needs of welding applications.

BUILDING & CONSTRUCTION



Building tomorrow's infrastructure

The modern industry of building, construction and renewable energy infrastructures counts on high speed fastener application systems to lower cost whilst increasing quality. Additionally, the industry is increasingly using concrete steel reinforcing fibers to dramatically increase structural strength. Enabling those trends, end-products such as nails, staples, fasteners, and steel fibers have been long made with Esteves Group's wire dies for construction related wire.

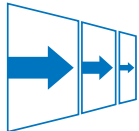
COMUNICATION & DATA



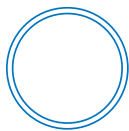
Connecting the World

The construction of modern data communication infrastructures relies on Esteves Group's expertise. From copper wires to deep-sea optical fibers protected by steel strands, our tooling solutions support the manufacture of cables that transmit data at unprecedented speeds, connecting people and businesses globally.

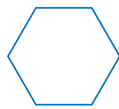
Products



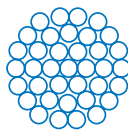
Wire drawing



Tube drawing



Shape drawing



Bunching/Stranding



Extrusion



Equipment

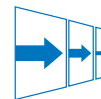


Inspection

Benefits

- Optimal die material selection for your process
- Optimal die profile, engineered to your process
- Tapered draft engineering available
- Elongation set engineering available
- Homogeneous wire deformation

Wire Drawing Dies



Esteves Group drawing dies are renowned for their quality, reliability, and extraordinary value in a wide and diverse variety of rod and wire drawing applications. To meet all market requirements, Esteves Group offers a large selection of dies, from ultra-fine bonding wires to intermediate and rod size wires. Count on successfully using our diamond and carbide wire drawing dies for all types of bare or plated ferrous and non-ferrous wires.

PCD Die	ND Die	SSCD Die	TC Die	DC for Steel	DC Inserts for Steel	EZero
						
Polycrystalline diamond	Natural diamond	Synthetic single crystal diamond	Tungsten Carbide	Diamond coated tungsten carbide	Diamond coated tungsten carbide	Nano-crystalline diamond
0.040<Ø<35.0mm .00157<Ø<1.378"	0.007<Ø<2.000mm .00028<Ø<.0787"	0.007<Ø<2.150mm .00028<Ø<.0846"	Ø>0.127mm Ø>.0050mm	0.650<Ø<40.00mm .02559<Ø<1.575"	1.500<Ø<21.60mm .05906<Ø<.850"	0.020<Ø<0.800mm .00079<Ø<.0315"

Polycrystalline Diamond (PCD)

PCD dies are ideal for long production runs and for drawing abrasive wire materials as they outlast TC, SSCD and ND dies.

Polycrystalline diamond dies are available in various grains sizes, both in supported and unsupported configurations. Thermally stable blanks are available for high temperature applications. PCD dies provide uniform hardness and extended wear resistance in all directions.

Natural Diamond (ND), Synthetic Single Crystal Diamond (SSCD)

ND and SSCD dies are an excellent option for manufacturing fine and ultra-fine wires. Single crystal diamond dies provide superior quality, hardness, accuracy and a long service life for each die.

They yield precision wire with an excellent surface finish, enabling high drawing performance and reduced power usage due to low friction.

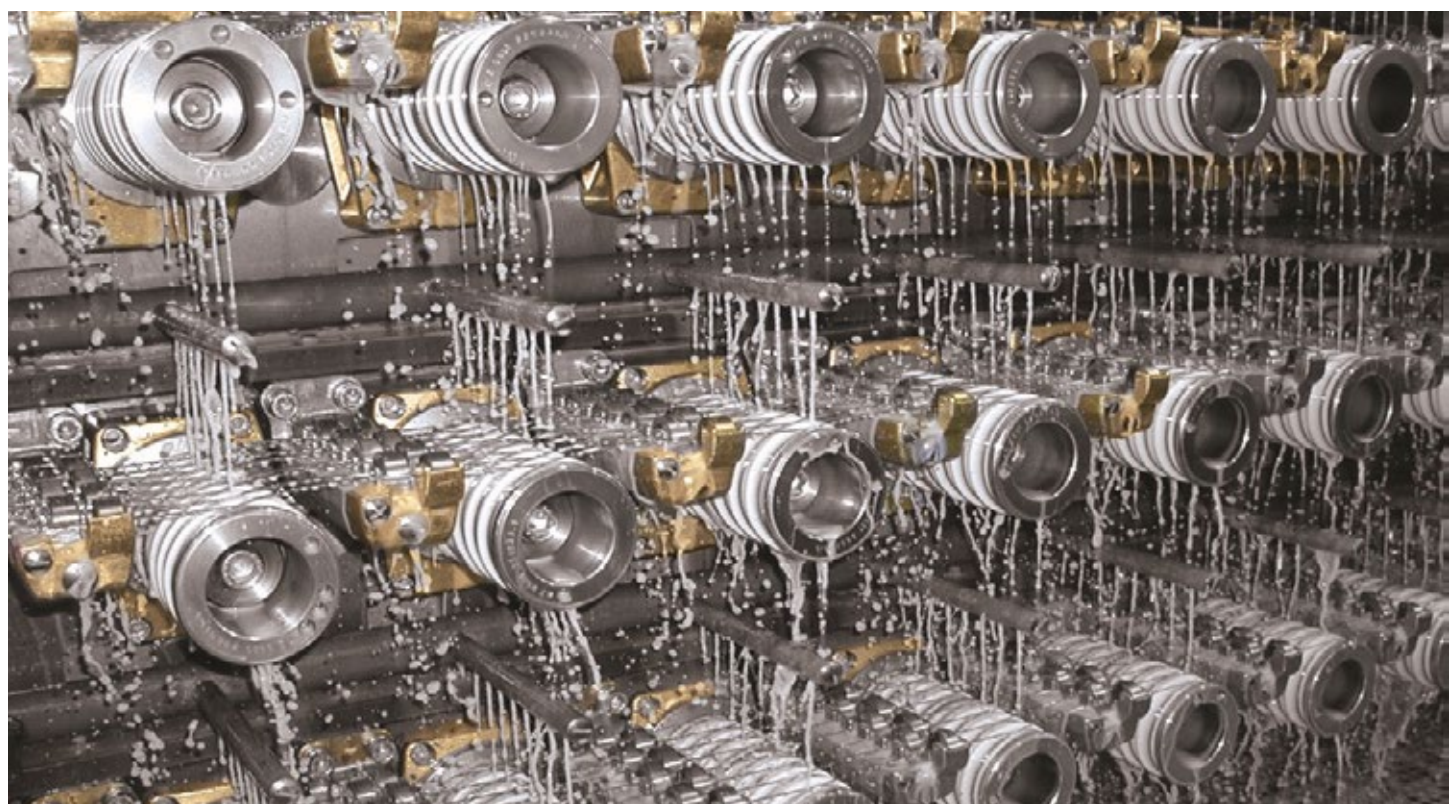
Tungsten Carbide (TC)

TC dies are an excellent option for manufacturing ferrous rod-size wires, and for relatively short production and trial runs.

Tungsten carbide blanks have extreme density, hardness, and strength. Drawing dies are available in all round sizes. Special shape dies including, but not limited to, oval, square, triangle or hexagon design can be made to order. Split-die configurations are also available.



Wire Drawing dies for Rod Breakdown machines (PCD)



Wire Drawing dies for multiwire machines (PCD, ND and SSCD dies)

Benefits

- Improved diameter stability
- High machine uptime
- Reduced energy consumption
- Excellent wire surface
- Maintenance-free (no recuts, easy handling)

DC for Steel



High-performance steel drawing

DC dies are ideal for manufacturing steel wire and steel welding wire. Outlasting over 10x the lifetime of tungsten carbide dies, our DC dies deliver outstanding productivity improvements thanks to fewer changeovers and higher machine uptime.

Excellent durability, extremely smooth wire surface, and energy savings due to low friction drawing

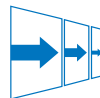
The ultra-smooth layer of diamond on a tungsten carbide die ensures the smoothest wire surface that is possible today. The diamond coated die is the perfect combination of large-size availability of tungsten carbide and the ideal surface properties of randomly oriented synthetic diamond. Higher throughput, fewer die changes, less scrap, and higher quality all add up to more profit for the wire and cable manufacturer.



Benefits

- Increased die life
- Improved wire surface finish
- Reduced die maintenance cost
- Reduced energy cost
- Increased productivity

DC inserts for Steel



Esteves Diamond Coated (DC) drawing inserts are the ideal choice for customers manufacturing steel wire and welding wire with existing pressure die systems. This revolutionary technology replaces tungsten carbide inserts previously used in the ferrous industry.

Expect improved productivity compared to using tungsten carbide dies. DC inserts have an improved lifespan of +10x over TC dies, leading to fewer changeovers and higher machine uptime; in addition, they require less power for production, due to the decreased friction force when drawing wire.

The DC drawing insert offers a winning combination of large sizes like those of tungsten carbide, plus superior surface properties thanks to its randomly oriented synthetic diamond layer that ensures optimum smoothness on the finished product.



Benefits

- Increased die-life
- Superior wire quality
- Cost savings through vastly increased machine uptime
- Complimentary dedicated logistics software

EZero



Superior wire quality and higher performance.
Draw better, draw more!

Ezero dies are made of a diamond **innovation** consisting of carbon nanoparticles that reduce production costs by improving die-longevity and increasing machine uptime.

EZero boasts **clear advantages** compared to other alternative products: radically improved die-life and diameter stability, coupled with consistent roundness through its die life-cycle. These advantages are particularly apparent in ferrous wires and demanding hard-wire alloys.

EZero is available in the diameter range from 0.020 to 0.800 mm*

** Other diameters might be available on request.*

EZero Wire Drawing Die performance comparison

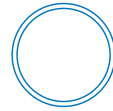
Parameter	Performance increase		
Diameter stability	ND/SSCD	PCD	EZero
Die longevity	ND/SSCD	PCD	EZero
Wire roughness	PCD	EZero	ND/SSCD
Wire ovality	ND/SSCD	PCD	EZero
Wire friction	PCD	EZero	ND/SSCD



Benefits

- Smooth tubing surface
- Die life increase when using diamond dies

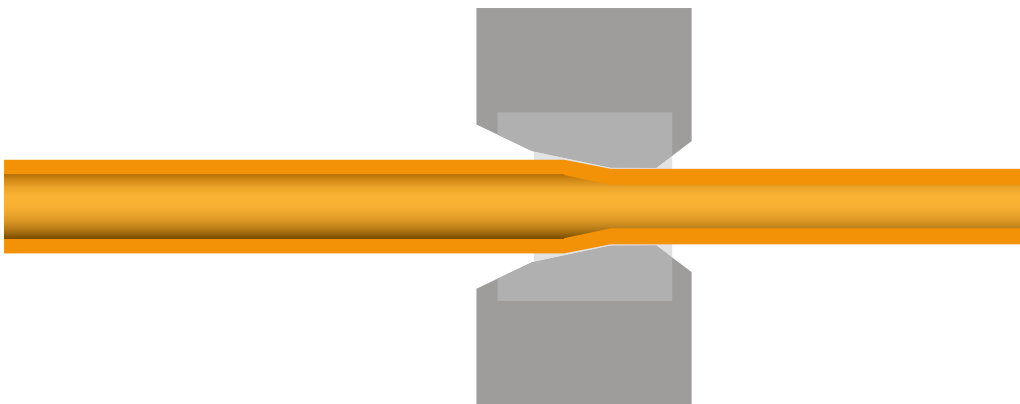
Dies for tube manufacturing



A large selection of ultra-hard inserts allow for an almost infinite range of tube sizes that can be manufactured. If you have difficulties obtaining the correct wall thickness and a high quality tube surface finish then we can help you.

High performance tubing dies allow tube manufacturers to meet surface quality and dimension standards

Wire drawing dies are commonly used to reduce the diameter of various ferrous and non-ferrous rods and tubes. Applications include automotive, medical wire, superconducting, and welding wires. Our tubing dies give the manufacturer the ability to maintain a uniform tube roundness, wall thickness and minimize material usage. We offer a complete line of drawing dies for manufacturing tubing, fully customizable to match your requirements. Esteves Group tubing dies are manufactured to your specifications with a mirror polish and a smooth wire entry to ensure optimal die life.



Shaped Profile Drawing Dies



Trapezoidal dies



Flat Wire (rectangular)



Sectorial die
Miliken



Trolley dies



Other special shapes



Benefits

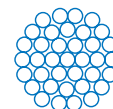
- Gradually deform from one shape into another
- Die set engineering available
- Tight dimension tolerances
- Superior rod and wire finish

Esteves Group shaped dies are customized to match your requirements and are available in virtually any form. Shapes include square, rectangular, hexagonal, triangular, oval, half-round, trilobular, transmission cable, and trolley wire.

Additionally we can help you with engineering the series of dies that will gradually transform your wire or rod from one shape into another. Let us know your shaped rod or wire requirements and have our specialists design the series for you.

Product name	TC Shape Die	PCD Shape Die
Available sizes	≥ 0.6 mm ≥ .0236"	≥ 0.1 mm ≥ .0039"
Available shapes	Virtually any shape is available	
Standard tolerance	+0/-1.5% of the hole diagonal	
Available angles	8 - 28°	
Standard angle tolerance	± 2°	
Blend and radius	Blends between profile parts depend on required shape	
Blank (nib) material	Tungsten Carbide (TC)	Polycrystalline Diamond (PCD)





Benefits

- Optimal die profile, tailored to your process
- Available in a wide size range
- Superior performance and cable quality



Bunching, Stranding and Compacting Dies

Esteves Group stranding products have well blended profiles and highly polished surfaces enabling superior performance and cable quality.

A wide variety of materials are available for you to choose from to meet your cabling requirements.

Polycrystalline Diamond (PCD) are recommended for very high compaction ratios. Tolerances achieved with PCD dies are tighter than with Diamond Coated (DC) or Tungsten Carbide (TC). Geometries obtained with PCD dies are limited to blank dimensions.

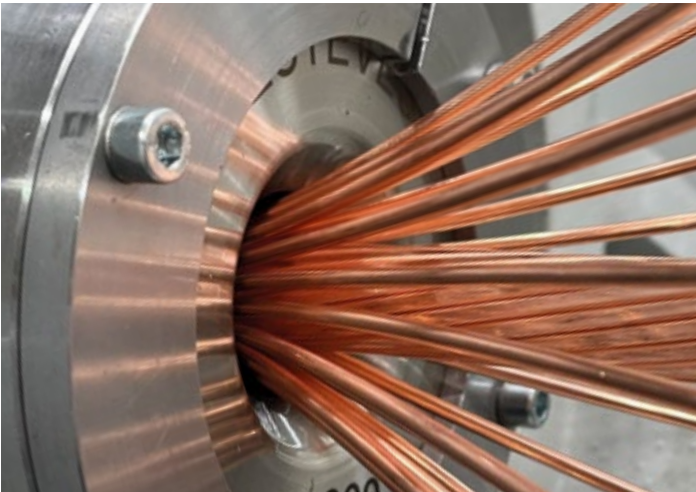
A Diamond Coated die (DC) is the ideal combination of large-size availability of tungsten carbide and the ideal surface properties of synthetic diamond. Savings in conductor wire or cable material and lower power usage add up to more profit to your stranding process. DC allows longer-lasting diameter stability and high machine uptime.

Ultra-smooth wire and cable surfaces with excellent conductivity are achieved through the use of Esteves Group diamond coated dies, enabling you to reduce cost.

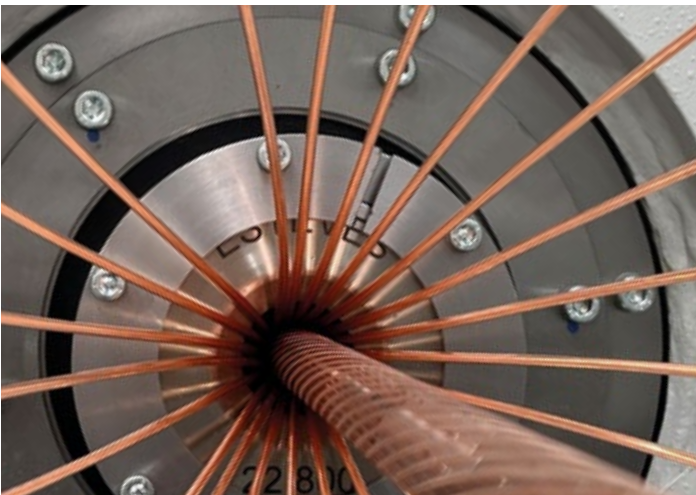
Tungsten Carbide (TC), recommended only for shape and split dies.

Product name		Bunching Die	Stranding Die	Compacting Die
Standard size range	Polycrystalline Diamond (PCD)	Up to 35 mm 1.38"		
	Diamond Coated Tungsten Carbide (DC)	8 – 77 mm .315 – 3.03"		
	Tungsten Carbide (TC)	≥ 0.127 mm .005"		
Standard tolerance		Tolerance depends on hole diameter		
Available angles		Matched to bunching, stranding and compacting process		
Standard angle tolerance		± 2°		





Esteves Stranding and Compacting die (PCD)
 Ø 22.8 mm

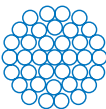


Stranding and Compacting process for a 500mm² conductor

Benefits

- Dramatically cut your setup time
- Eliminates restringing
- Optimal die profile, tailored to your process
- Available in a wide size range

Split Dies



Made in a wide range of configurations and designs, split dies can dramatically cut your setup time by eliminating the need to restringing a stranding or cabling machine when changing sizes.

Split dies allow for quick changeovers without cutting the wire, providing ease of use and higher throughput.



Product name	TC Split Die	Steel Split Die
Available sizes	≥ 0.50 mm ≥ .020"	Made to order
Standard tolerance	Tolerance depends on hole diameter	
Available angles	Matched to stranding process	
Standard angle tolerance	± 2°	
Blank (nib) material	Tungsten Carbide	Hardened Steel

Benefits

- Insulation material savings
- Even insulation thickness all around
- Wire perfectly centered within insulation material
- Optimal insulation flow
- Long lasting tools

Extrusion Tools



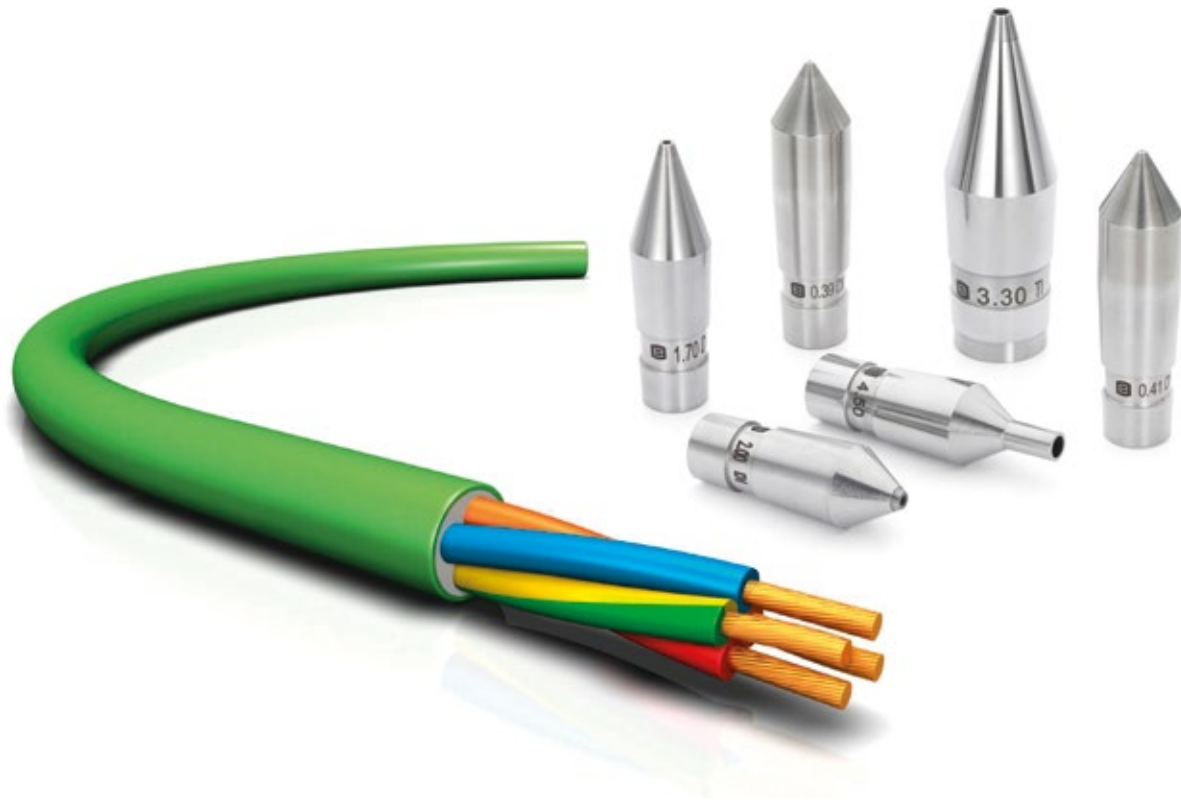
Esteves Group's superior extrusion tool concentricity allows you to meet the demands of today's super thin-wall constructions by maintaining uniform insulation thickness, minimizing material usage and scrap.

Super-hard material inserts in the wire guides, primarily diamond and carbide, ensure long tool life even at high extrusion process speeds.

Virtually any extrusion tooling shape for any type of crosshead is available from Esteves Group. Contact us to discuss your extrusion tool requirements.

Extrusion tip (extrusion wire guide) specifications

Product name	Diamond insert tip	Tungsten Carbide insert tip	Solid Tungsten Carbide tip	Solid Steel tip
Size range	0.25 – 1.90 mm .0098 – .075“	0.7 – 5.0 mm .0276 – .197”	1.20 – 8.0 mm .047 – .315”	1.0 – 35 mm .039 – 1.38”
Insert material	Diamond (PCD, SSCD, ND)	Tungsten Carbide (TC)	Solid Tungsten Carbide (TC)	Solid Steel
Body material	Steel			
Distance to product tip	≥ 0.6 mm ≥ .0236”	0 mm 0”		
Concentricity	± 0.005 mm .000197”			



Extrusion die specifications

Product name	Solid Tungsten Carbide die	Tungsten Carbide insert die	Solid Steel die
Size range	0.8 – 8.0 mm .031 – .315"	0.8 – 8.0 mm .031 – .315"	8.0 – 35 mm .315 – 1.38"
Insert material	Solid Tungsten Carbide (TC)	Tungsten Carbide (TC)	Solid Steel
Body material		Steel	
Concentricity		± 0.005 mm .000197"	



Benefits

- Ease of operation with minimal effort
- Quick and simple machine setup

Key Features

- Compact
- Designed to accommodate various case sizes
- Programable wire and ultrasonic polishing machines
- Durable design and components ensure long life with minimal maintenance

Equipment



Machines made for recutting and repolishing drawing dies meet the demands of today's die-shop operators

The reduction cone angle and bearing length of a drawing die wear during the wire drawing process. The EM-series ultrasonic polishing machines are used to recut and repolish these worn parts and to recut and polish the entrance and exit cone of drawing dies.

Proven technology ensures that the versatile Esteves Group EM-series ultrasonic polishing and wire polishing machines provide the die-shop operator the ability to return the quality of the wire drawing die to as good as new.

Esteves Group machines are manufactured with the goal of versatility, durability, and ease of use. Virtually any type of die-shop tooling is available from Esteves Group as well as in-house training for your recutting, repolishing and resizing needs.



Product name	EM107F	EM108L
Diameter range mm/inch	0.1-4.5 mm 0.0039-0.177"	2.0-8.00 mm 0.0787-0.315"



Product name	EM201F	EM201M	EM201L
Diameter range mm/inch	0.05-1.00 mm 0.0019-0.039"	0.10-2.5 mm 0.0039-0.0984"	2.0-10.0 mm 0.0787-0.393"

Benefits

- Superb drawing die cleaning
- Can also be used for extrusion tools

Key Features

- Perfect for cleaning dies and extrusion tools
- Easy to use
- 30 kHz rugged industrial transducer
- Mechanical timer with heater



Ultrasonic cleaners



Clean your wire and cable tooling with Ultrasonic Baths

All cleaning involves one or more processes: direct mechanical energy such as scrubbing or spraying, use of chemicals, heat, and time.

Ultrasonic energy, a form of mechanical energy, generates controlled, high-magnitude pressure fluctuations in liquids that produce a consistent, high level of cleanliness in a short amount of time.

Benefits

- Superb die evaluation
- Evaluation of ultra-fine to medium-size dies
- Also useful for wire surfaces inspection (binocular only)
- Whole drawing die geometry can be seen (binocular only)



Microscopes



Evaluate drawing die wear and determine if a die can be repolished or if recutting will be required. Also visually evaluate the quality of the wire that is being manufactured.

Binocular and Monocular microscopes for drawing die inspection meet the demands of today's die shop operators and die inspection personnel

Microscopes are widely used and considered as an essential tool to inspect drawing dies. High-quality optics enable the trained operator or die inspector to evaluate drawing die geometries and observe surface features in drawing dies.

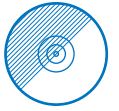
Services

Benefits

- Drawing die cost savings by re-using your dies
- Die wear feedback, die usage report available
- Fast turn-around time
- Easy ordering, one price per size



Drawing Die Recutting / Refurbishing / Repolishing / Resizing



At Esteves Group, we have spent years developing refurbishing processes that have helped the wire drawing industry reduce cost.

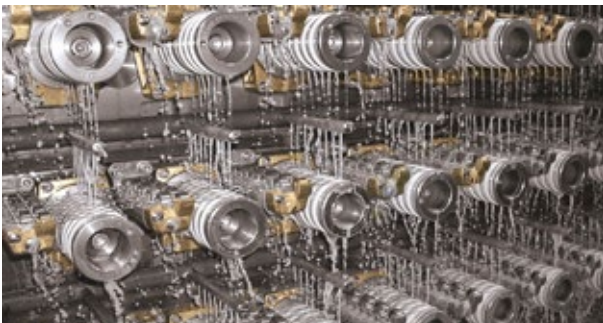
This experience delivers recutting, repolishing, and resizing capabilities that fully recover and sometimes enhance the initial drawing die performance.

You can count on us to find the most cost effective solution for your die recutting needs.

Esteves Group die refurbishing is available for all types of diamond and carbide drawing dies, regardless of the original manufacturer.

Benefits

- Elongation set tailored to your machine
- Reduced wire breaks
- Maximized die life
- Effortless multi-wire string-up
- Reduced capstan wear



Matched Elongation Die Sets



Today's high speed multi-wire drawing machines require maximum wire die precision.

Die strings are specifically designed and manufactured to match the mechanical draft of your machine. This ensures maximized die life and increased throughput and uptime.

The diameter of the finish die in the series is correlated to your finished wire size requirements.

Ask our sales professionals to help you minimize wire breaks.





Die seminars and die shop training



Several courses are available from Esteves Group that can be organized either within your company or within our factories. At our factory we invite you to view our manufacturing process and see how your tools are being made. We have several courses available for you to choose from:

- **Die basics:** Learn what drawing dies are and how they are used
- **Die usage:** Learn how to successfully use wire drawing dies
- **Die evaluation:** Hands-on training to learn how to evaluate dies and analyze wear



Delivery logistics matching your needs



DEX, Esteves Group Express Service, is a special delivery service provided to ensure that your tooling is delivered right when needed, even when this involves lead-times lower than 1 week.

Through planned and reserved capacity, stocking programs and communication between your staff and ours, we can meet your urgent die requirements.

Please contact your representative at Esteves Group for details on how we can help you.



Inventory stocking and die shop services

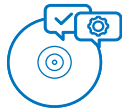
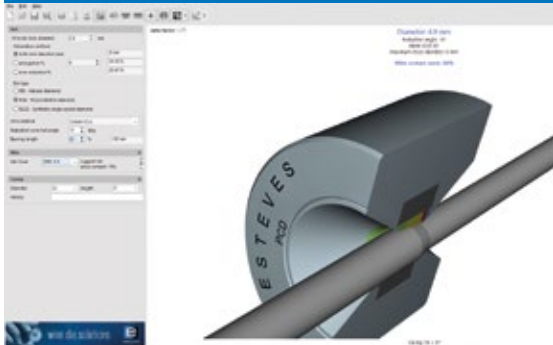


Let us help your company streamline your die logistics with a program custom designed for you.

Whether it is a simple Kanban stocking system, a recut die inventory at our location, or an integrated package of inventory at both your location and ours, we can help your company to efficiently manage your die and die maintenance needs.

Esteves Group also provides die maintenance solutions including helping you organize your die shop.

Die design software



The Drawing Die Wizard™ redefines wire drawing technology, becoming a staple among professionals for its detailed 2D and 3D visualizations. This tool not only allows for precise wire die customization with expert-recommended parameters but also excels as a training platform with essential insights into die design and functionality, fostering a deeper understanding of the wire drawing process. As a free, vital Windows app, it supports saving, printing, and facilitates seamless design exploration. Elevate your die design experience by leveraging this tool to enhance efficiency and expertise in your operations.

Eddie Vending System



The Eddie Vending System elevates inventory management in the wire and cabling industry with its industrial-grade, automated design engineered for efficiency. Featuring over 500 individually accessible bins, Eddie streamlines the restocking process, enables automatic reordering to prevent shortages, and eliminates the need for manual counts, ensuring tools are always available when needed. While it also captures interactions for insights, the focus remains

on simplifying logistics and inventory control, making Eddie the strategic choice for seamless operational efficiency.

Esteves Die Management System



EDMS

Is an innovative IT tool developed by Esteves to efficiently manage wire drawing dies stock. EDMS provides real-time inventory tracking and die lifecycle management, enabling preventive maintenance. It allows controlling stock, enables enhanced transfer of information between Esteves and customers, provides wire die usage statistics, and maintains a full history of each wire drawing die. By streamlining die management processes, EDMS helps customers reduce downtime, optimize die usage, and enhance overall productivity.

Wire Solutions on the Go



Esteves Eddie Wire Solutions is the ultimate, free companion app for wire industry professionals. It simplifies complex calculations, offering quick die sequence creation, production optimization, and accurate unit conversions. Adapt the app to suit different wire materials, aiding in accurate assessments of weight and manufacturing times. Eddie transcends being just an app - it's your partner in achieving productivity. Available on all major platforms, Eddie ensures convenient access and integration into your workflow, streamlining your wire drawing tasks effectively.





WIRE DIE
SOLUTIONS

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DIN EN ISO 9001:2008
Certificate: N° 01 100 4850

The presented information and data may change without notice and are typical values and not a guarantee of maximum or minimum values. Also other sizes and tolerances are available. Benefits suggested for products described herein are made to enable the reader to make their own evaluation and are not intended as warranties. Benefits may be affected by factors other than the tooling.

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