

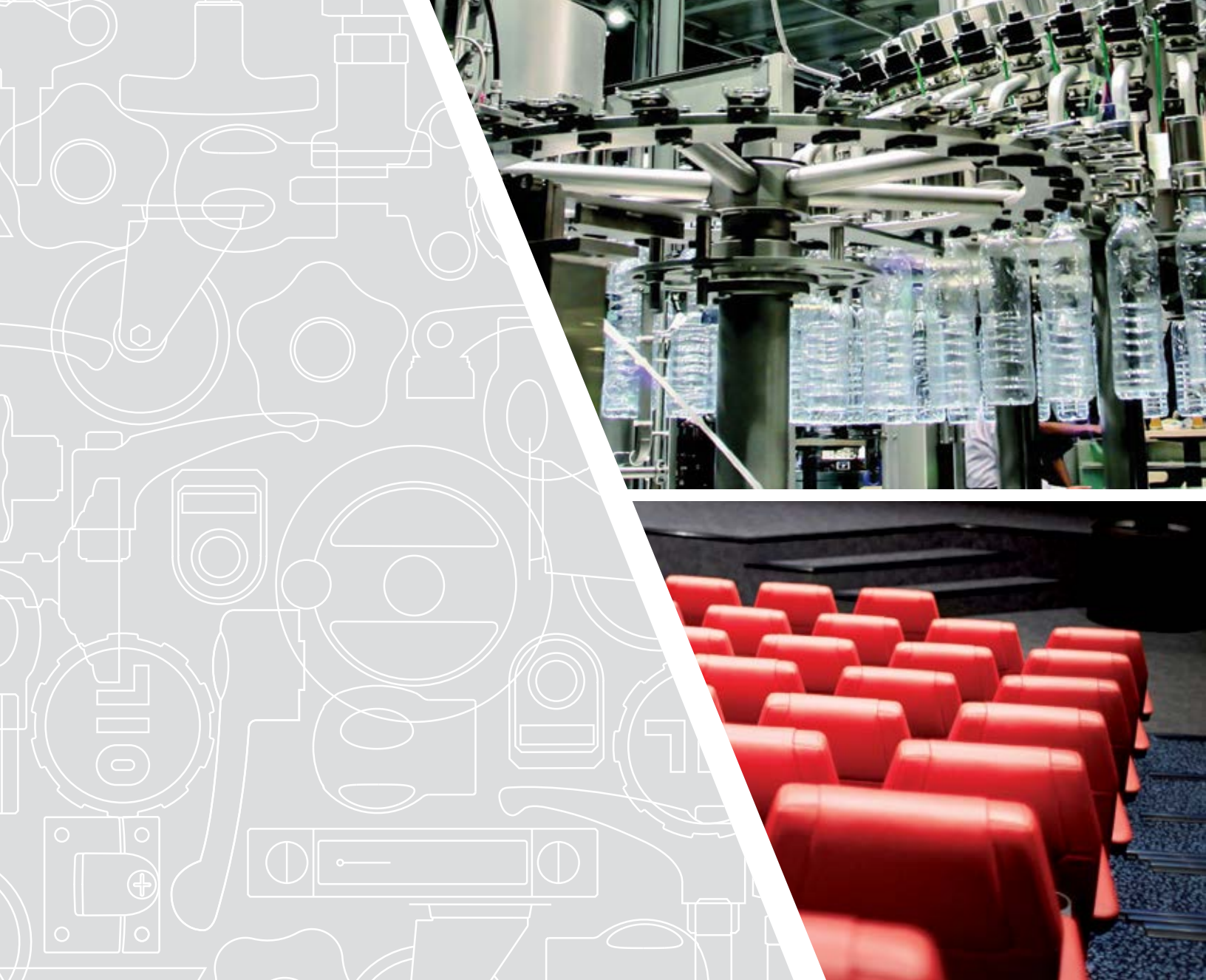


Industrial Handles: The "How To" Guide for Engineers

STANDARD MACHINE ELEMENTS WORLDWIDE



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The “How To” Guide for Engineers to Specify Industrial Handles

How to Get it Right the First Time

Industrial Handles

Safety. Convenience. Performance. Value.

Significant factors are at stake as engineers specify industrial handles. Though small, these components can make a big impact on the functionality of entire systems.

This guide details the crucial considerations that engineers must take as they decide what type of handle to specify for each application.



Function

Industrial handles allow users to manipulate objects or perform a specific task. The aim of the user is a top consideration for specifying the type of handle to create or install.

The basic purpose of the handle should form the foundation for handle specification. It is the starting point that should guide the rest of the process. Once this is established, it must be determined what is necessary for the handle to successfully fulfill that function. Engineers must consider multiple performance factors.

Ask: What is the function of the handle?

Opening and Closing



Pushing and Pulling



Pulling and Carrying



Lifting



Grasping and Pulling



Tightening



Turning



Adjusting



Operating



Performance Requirements

Ask: What is required to deliver top performance in the targeted environment?

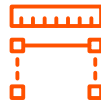


1. Safety

The potential hazards of a handle's environment are key to determining specs for the component. Engineers should consider what might affect the safety of the application and what features must be in place to ensure optimal safety levels.

Components useful for the operator's protection in the workplace

- Handles with an antirotation assembly system of the tube to the handle shanks, to offer a firm and safe grip during handling.
- Guard safety ledge handles with a closed design which protects the operator's fingers.
- Safety adjustable handles with "PUSH" printed on the lever body and characterized by a mechanism that enables the lever to be disengaged from the clamping device, so it can turn freely without affecting the clamping action in case of accidental shocks.
- Safety fold-away handle with a return mechanism to automatically retract the handle when the operation has been completed.
- Handles for heat insulation for applications on surfaces subject to high temperatures.
- Tubular handles for electrical insulation.
- Handles with an electrical switch or pneumatic valve.



3. Mounting

Where will the handle be mounted? Handles for enclosures require different features than machine doors and workstations. Is space available for assembly access? Is there clearance for fastener heads?

- Installation: Should the handle feature snap-in, press-fit or screw-mount to best fit the application? Should it be mounted from the back or from the front?
- Type: Flush handles are ideal for certain applications, while surface mount or offset are best for others.
- Versatility: Some handles offer modular or adjustable mounting options. Is this important for the application?



4. Ergonomics

OSHA* defines this term as the science of fitting the job to the worker. In this case, the engineer's task is to fit the handle to the job. The design should ensure a secure, comfortable grip that minimizes the risk for injury and maximizes productivity.

Some handles are designed and manufactured to offer a non-slip grip, even in applications where moisture or grease are present.



5. Aesthetics

The application will determine the priority level of aesthetics. The handle's environment should guide the choice of color, finish and proportions that affect the aesthetics of the component.

If appropriate, look for designs featuring elegant and modern lines with rounded shapes, glossy to semi-matte surface finishes and the use of color.



2. Design

Does the design require welding? What are the radii for any bends and folds involved? Are holes necessary for attachment or adjustment? Various design elements affect the complexity and cost of the handle, so these must be taken into consideration.



* <https://www.osha.gov/SLTC/ergonomics/>

Performance Requirements (continued)

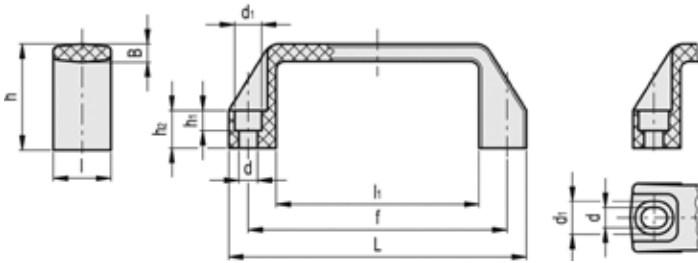


6. Size

The overall size as well as the proportions of each part of the component are essential to consider. Each of these characteristics will affect the performance of the handle.

Five measurements are integral to handle specifications.

- 1. Bore diameter:** This is the diameter of the mounting holes, which directly affects the method by which the handle can be mounted.
- 2. Center spacing:** For handles with two attachment points, the center spacing is the distance between the mounting holes. This measurement affects the location and style of the handle mount.
- 3. Diameter:** If the handle is tapered, this measurement must be considered. The diameter is determined by the width of the largest knob on the handle.
- 4. Height:** This encompasses the overall measurement of the mounting surface. Engineers must strike a balance between user comfort, functionality and space limitations of the environment.
- 5. Length:** As with height, the length must be suitable for use but fit within the constraints of the application.



7. Load

How much force will be required to perform the desired function? Both magnitude and direction are essential considerations.

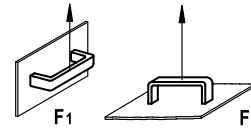


8. Strength

Some operations rely on handles to withstand extreme forces. Other applications require little strength from the handles themselves. Engineers must determine what level of strength is necessary to make the appropriate specifications.

Handles are manufactured from a wide selection of basic polymers and their combinations, with reinforcing fillers or other different additives.

The mechanical properties of a molded plastic component may vary significantly according to its design, geometry and the technological level of the manufacturing process.



9. Durability

What lifespan is reasonable to expect for the handle's application? What specifications must be made to ensure that longevity? What application environmental factors might affect overall durability?

Look for handles which have been subjected to specific resistance tests carried out using accelerated aging testing, in accordance with the ISO 4892-2 standard.



10. Material exposure

If the handle will come into contact or experience close proximity to substances such as oils, grease or salt spray, the effects of this exposure must be considered. The handle must be able to withstand these materials and maintain reliable functionality.



11. Temperature

Extreme temperatures require robust solutions. If the application will involve high or low temperatures, the handle must be able to withstand these harsh conditions.

For example, handles made from certain technopolymers feature a maximum working temperature of 200°C (390°F).



12. Cleanliness

Some environments require pristine conditions for safety and hygienic purposes. Handles for these settings must offer high clean-ability.

- Components with compact shapes – without protrusions or cavities – prevent the deposit of dirt, dust and machining residues. In addition, a white color facilitates identification of any dust or dirt traces on the surface.
- Components containing antimicrobial additives prevent the proliferation of unhealthy organisms such as microbes, bacteria and fungi.
- Handles made from materials suitable for contact with food (FDA CFR.21 and EU 10/2011) and/or fabricated with a unique blue color, naturally absent in the environment in which these components are applied, contribute to increase the levels of safety in food production processes.



13. Precision control

Certain applications require precise adjustments, while others are less demanding. For safety and performance, the necessary precision control level must be established. The surface finish and precision adjustment features of certain handles aid the operator to better control or adjust the equipment.



14. Compliance with international standards

Regulatory authorities have established regulations for the control of substances that are harmful to people or the environment.

- European Directive 2002/95/CE RoHS (Restriction of Hazardous Substances)
- European Regulation n.1907/2006 - REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals)
- European Directive 2000/53/CE - ELV (End Life of Vehicles)
- RAEE (WEEE) Directive
- ATEX Directive 94/9/CE

Types of Handles

Once it has been established which performance factors are key, the next step in specifying handles is to determine which style meets those performance measures.

Ask: Which handle style offers the best fit for the application?



Crank handles

Available in fixed, revolving and folding styles of various shapes and sizes. Suitable for wide range of applications, including material handling, construction and packaging. Material options include cast iron, stainless steel, steel, phenolic thermoset materials and engineering thermoplastics.

Benefit: Versatility for multiple applications



Adjustable handles

Ideal for settings with limited space and tasks that require repetitive ratcheting. Frequently feature ergonomic grips for ease of adjustment. Typically available in engineering thermoplastic and steel varieties.

Benefit: Small footprint for tight spaces



Lever handles

Can be specified for a range of sizes and threads. Crafted from engineering thermoplastics, phenolic thermoset materials, cast iron, steel and stainless steel. Suitable for broad spectrum of applications including molding machines, office equipment and packaging machines.

Benefits: Simple operation; Spring-load option for auto position reset



Tubular handles

Appropriate choice for large machinery, doors and handrails. Available in plastic and metal options.

Benefits: High-functionality; Ease of customization



T-handles

This style is available in adjustable and safety models, constructed of technopolymer or aluminum. Suitable for pulling operations in clamping applications with limited space and high safety concerns.

Benefit: Free rotation to avoid accidental operation



Fixed handles

Available in a wide range of finishes and shapes in engineering thermoplastic and metal varieties. Styles include sphere, cylindrical, conical, mushroom and knurled. "Soft-touch" options are ideal for fitness applications, gardening tools, precision instruments, disability equipment and goods handling.

Benefits: Comfort; Aesthetics



Pull handles

Available in flush, pocket and concealed varieties. Typically constructed of plastic or metal. Appropriate design for machine panels and doors.

Benefits: Ease of assembly; Ergonomic design; Noise reduction; Operator safety



Offset (ledge) handles

Manufactured in engineering thermoplastics and aluminum. Fit for automation systems and machine guards.

Benefit: Injury risk reduction



Folding handles

Available in various materials for multiple applications. Construction can be of engineering thermoplastics, steel, aluminum, or stainless steel. Cavity-free styles are apt for medical environments.

Benefits: Durability; Optimal cleanability



Revolving handles

Materials include engineering thermoplastics, phenolic thermoset materials, steel and aluminum. Ideal for precision instruments and fitness equipment.

Benefits: Secure grip; Comfort



Fold-away handles

Made of phenolic plastic or polymer. Suitable for hand wheels, actuating levers, rods and cranks for maneuvering or rotating operations. Ideal for applications with limited space. Automatic return to rest position increases safety.

Benefits: Space-saving; Safety feature

Handle Applications

Ask: Which handle is designed to work in the intended application?



Construction/Material Handling Systems

The construction/building industry requires components for a wide range of equipment and material handling systems. For these applications, components that are reliable in functionality, quality and performance are of the utmost importance. Handles in these environments will come into contact with chemical substances and be exposed to extreme temperatures, high pressure and high humidity.



Lighting/Electronics

Handles for electronic components are essential for a wide range of equipment and operations. Photography, lighting and electrical equipment incorporate adjustable handles and other styles to perform repetitive tasks. The use of technopolymers in these environments provides the advantage of non-magnetic, light-weight and corrosion-resistant solutions.



Food/Pharmaceutical Handling

For catering and food processing equipment, handles that offer compact shapes, corrosion resistance and ergonomic designs are ideal. Ease of cleaning is also a top concern for these applications.



Machine Tools

These environments require components with high quality standards for resistance to chemicals, vibration and mechanical stress. Handles used for these applications should provide high precision. Due to exposure to various harsh substances, the exterior finish and required care are also key.



Medical/Precision Instrumentation

Appropriate handles are crucial for precision instruments, medical equipment and disability aids. In these environments, hygienic standards are key, as well as corrosion resistance. Engineered plastics and durable metals, crafted for high safety levels, are ideal for these applications.



Textile Equipment

The equipment, machinery, casters and handling trolleys that are key to this industry require handles that facilitate interaction between machine and operator. Incorporating varied color schemes in the components can aid in identifying machine functions and improving safety.



Packaging Equipment

Packaging, bottling and labeling involve a variety of machine functions. Appropriate handles must be selected for clamping, maneuvering and control operations. Compliance to rigorous hygienic laws is a top priority and corrosion-resistant materials are crucial.



Summary: Specification Checklist

Quick guide to handle specification

Specification Factors	Strategic Guide	Key Considerations	
Function	<i>What is the function of the handle?</i>	<ul style="list-style-type: none"> ■ Opening and closing ■ Pushing and pulling ■ Carrying ■ Lifting ■ Grasping 	<ul style="list-style-type: none"> ■ Tightening ■ Turning ■ Adjusting ■ Operating
Performance Requirements	<i>What is required to deliver top performance in the targeted environment?</i>	<ul style="list-style-type: none"> ■ Safety ■ Design ■ Ergonomics ■ Aesthetics ■ Size ■ Load ■ Strength 	<ul style="list-style-type: none"> ■ Durability ■ Material exposure ■ Temperature ■ Cleanliness - Antimicrobial Detectability ■ Precision control ■ Traceability
Type	<i>Which handle style offers the best fit for the application?</i>	<ul style="list-style-type: none"> ■ Crank handles ■ Adjustable handles ■ Lever handles ■ Tubular handles ■ T-handles ■ Fixed handles 	<ul style="list-style-type: none"> ■ Pull handles ■ Offset (ledge) handles ■ Folding handles ■ Revolving handles ■ Fold-away handles
Application	<i>Which handle is designed to work in the intended application?</i>	<ul style="list-style-type: none"> ■ Construction/ material handling ■ Lighting/electronics ■ Food/pharmaceutical ■ Machine tool 	<ul style="list-style-type: none"> ■ Medical ■ Textile ■ Packaging ■ Other

ELESA Technology and Design

Since the 50s, ELESA has been actively involved in the cultural revision of machine tool aesthetics that were taking shape around that time, by innovating the design of accessories and components for the mechanical industry, machinery and industrial equipment.

An ongoing commitment to which ELESA has always been loyal to, over the decades, as proven by the 43 industrial design awards received over the last 40 years from the most prestigious juries.

- 200 patents and registered designs
- 43 industrial design awards
- Worldwide distribution
- Full stock availability
- Customized solutions
- Technical competence at the customer's service
- ISO 9001 - ISO 14001 - ISO 45001



IF Design Award
(25)



Design Center
Baden-
Württemberg
(5)



Compasso
d'Oro
(2)



reddot design award

Red Dot
Design Award
(3)



Fluidtrans
Compomac
(1)



Good Design
Award
(1)



Produkt Roku
(3)



HaPes Award
(1)



PPMA Industry
Awards
WINNER
(1)



FM 23747



EMS 518430



OHS 584384

ELESA Standards

ELESA presents an extensive range of standard machine components for the mechanical industry available in a variety of production materials, including technopolymer, SUPER-Technopolymer, aluminium, steel and stainless steel. Design and ergonomics make them able to meet the most varied market demands.

Whether they are standard or customized, ELESA standard components can be applied in many industries, from fitness, to entertainment, to food, medical and many other markets.



Customized Solutions

If you can't find the product that fits your needs in the standard range, contact us!

In addition to the widest range of standard machine elements available on the market, Elesa offers on-demand customized technical solutions to meet customers' specific needs. Production flexibility, technical know-how, R&D, and customer care allow for quick answers and competitive solutions.

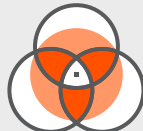
All customized solutions are subjected to rigorous testing carried out in the Elesa laboratory, to guarantee the same quality and reliability as our standard products.

Our sales staff will take care of your requests with quick answers and competitive solutions.



PRODUCT CUSTOMIZATION

Logos and text by imprinting, laser-engraving and molding



SPECIAL COLORS

Non-standard color options



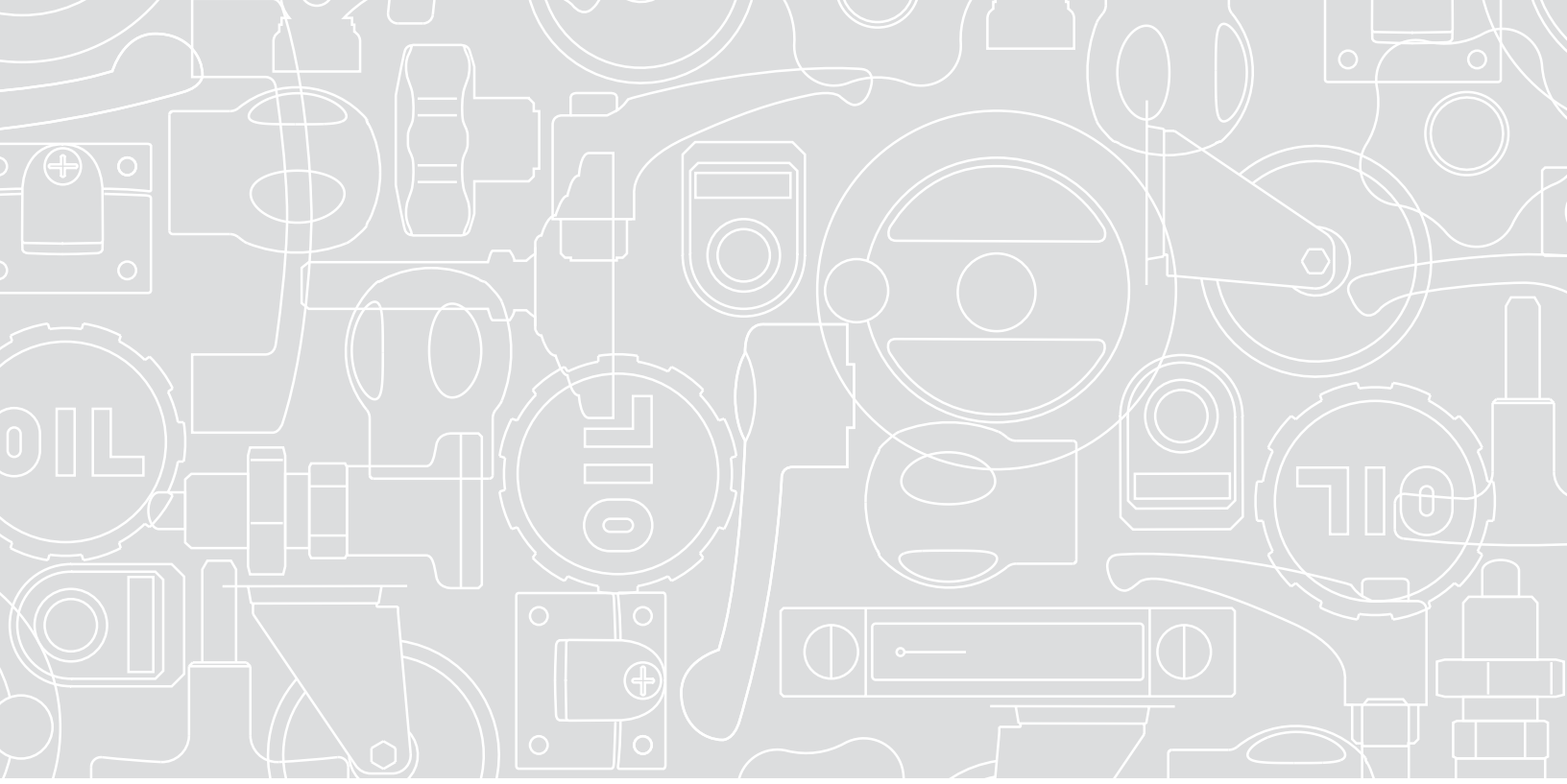
SPECIAL MATERIALS AND SHAPES

Special technopolymers, stainless steel and metals; special shapes, dimensions and metal inserts



SURFACE TREATMENTS

Black-oxide coating, zinc-plating, nickel plating, chrome-plating, anodizing, epoxy-resin coating



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elesa®

ELESA USA Corporation
1930 Case Parkway N.
Twinsburg, Ohio 44087
Phone: +1 330 405 1300
Toll Free: 800 374 7686
Fax: +1 330 405 1310
elesainfo@elesausa.com

elesa.com

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