

Quick guide

COMPONENTS FOR **LABORATORY** EQUIPMENT



The demands on in vitro diagnostics and laboratory processes have inspired an array of increasingly automated equipment. This equipment is used to heat, cool, stir, shake, process and analyze medical samples, along with cleaning and sterilizing instruments. Yet despite the introduction of new techniques and diagnostic medical devices, a range of standard equipment can be found in almost all laboratories.

Designing and engineering laboratory equipment must take into account precision, safety, speed and capacity. Equipment can be grouped into three main areas:

- Heating & refrigeration
- Preparation & analysis
- Sterilization & cleaning

Laboratory equipment manufacturers around the world rely on Essentra Components to supply the critical items that make their medical devices and equipment work, from ultra-low temperature freezers to spectrophotometers.

We've designed this guide to help you select the components you'll need for your:

- Cold storage
- Hotplates & incubators
- Clinical analyzers
- Centrifuges
- Sterilizers & washers
- Other laboratory equipment

Most of the components we've recommended can be used across different devices and equipment. If you're not sure which solutions will work best for your application, let us know. We're happy to provide guidance and expert advice.



FREE SAMPLES AND CAD DOWNLOADS

To make your job easier, we've also made available [free samples](#) on most of our solutions, so you can try before you buy. You can also [download free CADs](#) of our solutions to help with your laboratory equipment development.

HEATING AND REFRIGERATION

Many laboratory processes and experiments involve heating or cooling samples to a specific temperature by boiling, cooling or freezing.

Incubators

Laboratory incubators control climate, contamination and temperature. Examples include: dry block, hatching, refrigerated, and direct-heat or water-jacketed CO₂ incubators, just to name a few.

Water baths

A laboratory water bath is used to maintain a constant temperature for a wide range of lab procedures. This is done by applying a gentle heat to test tubes, beakers, and other vessels.

Ovens

Electrically heated laboratory ovens are commonly used to remove water or other solvents from samples and even to dry glassware. Applications include drying, baking, aging and sterilization.

Hotplates and stirrers

When steam or water baths are not appropriate, these benchtop tools are used to heat liquids. Hotplates are for heating only, while combination hotplate stirrers are able to heat and mix simultaneously. Infrared hotplates are an energy-efficient alternative. Laboratory hotplate accessories include temperature probes, external digital displays, and heating blocks.

Heaters and heating mantles

Used as an alternative to lab hotplate stirrers and Bunsen burners, heating mantles provide safety and flexibility. The heating element is typically insulated from the container and can be used with various shapes and sizes. The temperature

is usually controlled by a rheostat, which makes maintaining temperature simpler.

Microwave ovens

Microwave ovens designed for the laboratory have built-in safety features and operation procedures in order to mitigate hazards not commonly encountered with other heating methods. Examples include rapid temperature and pressure rise, superheating, arcing, and microwave leakage.

Circulators and chillers

Used to heat or cool liquids which can then be transferred via tubing to another location or device. A laboratory chiller can meet temperature ranges of -13 °F to 266 °F, allowing them to heat as well as cool.

Refrigerators

General-purpose laboratory refrigerators are used for cold storage of materials within a specific temperature range, usually between 35.6°F to 46.4°F. Features can range from access ports and interior lighting to alarms for temperature change and door ajar.

Freezers

Used for short or long-term, laboratory freezers store biological, pharmaceutical, and other laboratory samples typically down to -4°F. Ultra-low laboratory freezers operate between -112°F and -58°F. Your design will need integrated temperature recording capabilities to comply with regulations from the FDA and other agencies. Styles vary, as do structural options. Think about shelving or drawers, and solid or clear doors, for example.



The components you'll need for heating and refrigeration equipment include:

L-HANDLE LATCH

[View online](#)

Ideal for laboratory cold-storage equipment. Standard key cylinder locking to prevent tampering. Made from zinc alloy with chrome plated or black power coated finish. Also available: [recessed handles](#)

Typically used: doors on freezers and refrigerators



P-CLAMPS WITH RUBBER CUSHION

[View online](#)

Perfect for holding larger diameter cables, tubes and pipes. Simply bend the P-clip open, place tubing in and refasten. Operating temperature range: -40°F to 302°F. Cold-rolled steel, neoprene cushioning.

Typically used: water lines on refrigerators



HEAT STABILIZED LOCKING CABLE TIES

[View online](#)

Keeping cables orderly and easily accessible. Our heat-stabilized cable ties are flame-retardant, cost-effective and strong. Heat-stabilized nylon 6/6. UL94 V-2.

Typically used: within enclosed equipment



CABLE TIE MOUNTS

[View online](#)

Reverse mount. The dome cover offers more protection from heat, allowing it to cope more easily with high temperatures. Space saving with aesthetic qualities and excellent grip. Nylon 6/6. UL94 V-2.

Typically used: oven power cables



PUSH-IN FLEXIBLE GROMMETS

[View online](#)

Cable grommets solve the problem of awkward spaces, without the need to feed wires through. Quick and easy installation without tools. Operating temperature range: -40°F to 176°F. PP and TPE.

Typically used: to protect cables entering equipment panels



ROTARY DAMPER – WITH GEAR

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Simple to install, our rotary damper controls the speed and acceleration of movement in parts such as doors or buttons. Self-contained or can be fitted as part of an assembly. Operating temperature range: -40°F to 212°F. Made of polycarbonate and acetal.

Typically used: refrigerator doors

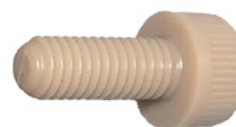


PEEK® SOCKET HEAD CAP SCREW

[View online](#)

Perfect for demanding applications. Made from PEEK® with outstanding mechanical properties and high-temperature stability. Resists heat up to 350°F. Ideal for electronics used in different environments.

Typically used: within extreme heating equipment



HEAT-RESISTANT PUSH RIVETS – SNAP

[View online](#)

The heat generated by laboratory equipment makes this a must-have, withstanding temperatures up to 266°F. These snap rivets are quicker to install than screws, and are also ideal for awkward spaces. Aesthetically pleasing from the outside, helping the finished product look stylish. Nylon 4/6.

Typically used: external equipment panels



PREPARATION & ANALYSIS

CLINICAL ANALYZERS

Used to test various properties of clinical samples such as blood, plasma, and bodily fluids to aid in patient diagnosis. A broad range of analysers can be found in a variety of settings, from clinics to research labs and high-throughput hospital labs. They are also used at the point-of-care, such as in physicians' offices and patient bedsides.

Analyzers are highly automated for speed, consistency, avoidance of contamination, protection of operators from hazardous materials, and walkaway capability. Most analyzers are designed for benchtop use but smaller models are designed for use at the bedside therefore need to be light-weight, compact and portable.



Centrifuges

Used to separate liquids or gases through the use of centrifugal force. They can be ventilated, refrigerated, or heated and include ultracentrifuges, refrigerated centrifuges, microcentrifuges and high-speed refrigerated centrifuges.

Shakers, rockers and rotators

Designed for gentle rocking for precise sample preparation. Also includes incubator shakers for temperature-sensitive samples. With variable speeds and tilt angles, add-on platforms, damping mounts, and more.

Pumps and tubing

Laboratory pump systems incorporate tubing and connectors to transfer fluids or gases.

Spectrophotometers

Instruments that measure a sample's ultraviolet and light absorbance. These are designed for benchtop and portable configurations.

Balances

Used to find the precise mass or weight of substances.

Microscopes

USB microscopes are increasingly popular. These are essentially a webcam with a high-powered macro lens using inbuilt LED light sources.

Bioreactor

A bioreactor is a vessel – often stainless steel – that provides the optimum growth conditions for raw materials and incorporates mixing, and control systems with sampling ports for periodic testing.

The components you'll need for preparation and analysis are:

GAS SPRINGS – ADJUSTABLE FORCE

[View online](#)

Ideal for medical and laboratory equipment for opening, closing, tilting and damping. These springs can be adjusted to the exact need without extra calculations, just de-gas on application to the required specification. Our team will be happy to help you order: [contact us](#) now.

Typically used: top opening lids of large analyzers



DRAWER SLIDES

[View online](#)

Our range offers a partial extension, such as 3/4 and full extension. The ball bearing drawer slides come in a choice of material to accommodate various industry environments. Ideal for medical and laboratory equipment. Our team will be happy to help you order: [contact us](#) now.

Typically used: drawers within large floor standing analyzers



CORNER HINGES

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Designed for fabricated doors and panels with formed corners. Compact, fixed, and simple to install with 180° rotation angle. Clean look with no protruding fastening hardware and a bearing style pin. Black powder-coated zinc alloy.

Typically used: fume cupboards and chemical storage



PLASTIC HOSE CLAMPS

[View online](#)

Hose clamps are vital for preventing fluid and gas from leaking at the connection. Adjustable locking range. Available in black, white or natural. Nylon 6/6.

Typically used: to secure fittings over hoses



PUSH-FIT FEET

[View online](#)

Fir-tree mount easily pushes into equipment's chassis. Also protects from vibration and shock. Perfect for smaller applications, where space is limited. Made of elastomer, which are very similar to push-fit rubber feet.

Typically used: to securely mount benchtop equipment



SELF-ADHESIVE RUBBER BUMPER FEET

[View online](#)

Peel and stick square bumpers will not tarnish, scratch, or discolor any surface. Available in clear or black. Choice of polyurethane or PE foam. Also available [round](#), [hemisphere](#) and [cylindrical](#).

Typically used: on the base of bench-mounted equipment



PCB STANDOFFS – HEXAGONAL/INSULATOR

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These male-to-female hexagonal standoffs ensure high performance and can be installed by hand. Ideal for use when high mechanical strength is required and provide sturdy, insulated spacing for high-power electronic applications. Operating temperature range: -40°F to 185°F. Nylon and brass. UL94 V-2.

Typically used: printed circuit board designs



CATCH PLATE

[View online](#)

Door latch/striker is perfect for applications with a push-open and close feature, providing a lifecycle of 50,000 operations. Operating temperature range: -58°F to 203°F. Glass-filled nylon 6/6.

Typically used: centrifuge lids and doors



PCB SUPPORT POSTS – DUAL-LOCKING/METRIC MINI

[View online](#)

Locking PCB support with teardrop design, ideal for circuit boards in electronic laboratory systems. These snap into very small holes and leave a very low protrusion over the panel. Mounted on both sides with a low profile two-prong fastener. Operating temperature range: -40°F to 185°F. Nylon 6/6.

Typically used: touchscreens and peripheral electronic devices

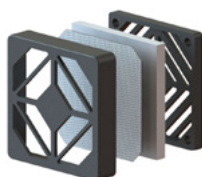


FAN FILTER SETS

[View online](#)

Keep your PCBs cool by preventing obstruction to your fan. This set includes one fan guard, fan filter cover, fan filter mesh sheet, and felt filter. Rated IP30 to protect against small objects from falling in. Fan guard and fan filter cover, 40% GF nylon 6/6. Filter, polyester. Mesh sheet, 304 stainless steel.

Typically used: internal circuit boards



CABLE WRAP – SPIRAL

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Organize wires in a single bundle with a more permanent solution than standard cable ties. Our rapid spiral cable wraps give you durable protection from wear and tear. Easy to install, enabling you to route cables through the wrap's slits at any point. Spiral wrap is available in heat-stabilized nylon or PE.

Typically used: to bundle and protect cables within an enclosure



VIBRATION MOUNT STANDOFFS

[View online](#)

Equipment with rapidly moving parts such as centrifuges and shakers produce vibrations and noise. These vibration mount standoffs act as a buffer, absorbing vibrations while reducing noise. Rubber and steel.

Typically used: within centrifuges and shakers



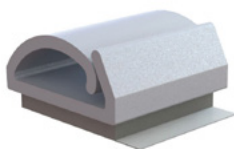


CABLE CLAMP – ADHESIVE BASE, D STYLE, LOCKING

[View online](#) 

Holds cables in place by clamping and affixing with an adhesive. Ideal if you're unable to perforate the mounting panel. Operating temperature range: 32°F to 122°F. PVC, UL 94 V-0.

Typically used: inside clinical analyzers

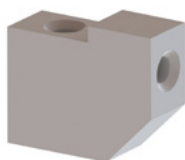


PCB MOUNTING BLOCKS

[View online](#) 

Mount printed circuit boards and small panels at right angles within equipment. These blocks are a quick and easy replacement for aluminum brackets for secure mounting.

Typically used: electronic devices, such as laboratory spectrophotometers



FERRITE SLEEVES

[View online](#) 

Used as suppression cores for round cable. These A5 material cores attenuate any form of EMI emission. The nylon case makes the assembly of the core halves a snap. Cores are easily installed in equipment where retrofit and test are a necessity. Our team will be happy to help you order: [contact us](#) now.

Typically used: where electronic emissions may interfere with sensitive instruments



STERILIZING & CLEANING



It's critical to disinfect laboratory equipment to ensure contamination is at a safe level. Laboratory sterilizers and autoclaves are used in controlled environments almost universally for this purpose.

Autoclaves

These are a specific type of laboratory sterilizer, using high-temperature steam within a sealed chamber to treat glassware, plasticware, and equipment. Most of today's autoclaves are controlled by microprocessors, which enable programmable sterilization cycles. They're designed as benchtop or floor standing models.

Glassware washers and dryers

Lab washers are similar to domestic dishwashers. They're designed mainly to clean flasks, bottles, test tubes, containers and instruments. They do not fully sterilize items and are not typically pressurised, but they do use hot water and special cleaning liquids.

X-ray, gamma-ray and UV sterilizers

X-rays and gamma-rays are considered cost-effective, efficient, chemical-free, and environmentally friendly ways to ensure sterilization. UV has limited penetration but is relatively safe so is primarily used to sterilize small areas. X-rays and gamma rays are more penetrating, which makes them more dangerous but very effective for large-scale sterilization of plastic items. Lights, lamps, handheld wands, and boxes or chambers are common applications for these methods.

The components you'll need for sterilizing and cleaning are:

STUD-MOUNT LEVELING FEET

[View online](#)

This stud mount leveling foot adjusts to uneven surfaces. The rigid base is ideal for securely and safely mounting your medical and laboratory equipment. Available in a wide range of materials.

Typically used: to support floor standing machines



SEALING GASKET – PVC

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Edge and trim seal is ideal for EMI shielding and protection. Environmental sealing, vibration isolation, sound dampening and shock-resistant solutions also available. Also made in EPDM.

Typically used: perfect for diverting fluids to avoid contact with critical areas

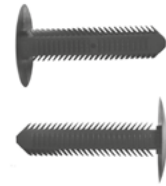


PUSH RIVETS – FIR TREE

[View online](#)

Fast, tool-free assembly. Ribbed design for easy installation. When pushed into a hole, the flexible ribs deflect then spring back to lock securely in place.

Typically used: connecting panels with blind holes with or without screw threads



METAL FAN GUARDS, SCREW MOUNT

[View online](#)

Fan guards prevent debris from falling into the fan blades, helping to keep air circulating and cool the equipment. Simple screw-mount application. Steel.

Typically used: small DC and AC fans for computing applications, such as benchtop autoclave lab equipment



VINYL-COATED SPRING CLIPS

[View online](#)

Lab glassware washers can also include this vinyl-coated stainless-steel spring clamp. It secures round cable, ribbon cable and tubing, while providing protection and insulation. It mounts with a screw and is flexible enough that the cable can be inserted and removed without taking out the clip.

Typically used: glassware washers and laboratory steam sterilizers



CABLE CLAMPS – SIDE ENTRY

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With the heat involved in sterilization you may need to give extra protection to your cables. These are ideal for when space is limited. Cupped base adds stability. Available with arrowhead or fir-tree mount. Operating temperature range: -40°F to 230°F. Nylon 6/6

Typically used: where heat and high temperatures need to be avoided



HINGED LOCKING CABLE CLAMP

[View online](#)

Black hinged locking clamp opens and closes while securely mounting cables or wires with the added benefit of providing strain relief, protecting wires and cables, and ultimately your laboratory equipment products. Operating temperature range: -40°F to 257°F. Nylon 6/6, UL94 V-2.

Typically used: to keep cables tidy in sterilizer parts



GROMMETS IP67

[View online](#)

Made of EPDM, IP67 sealing grommets are essential when a watertight seal is needed. Withstand vibration and quick and easy to install.

Typically used: in wet environments – can act as a blanking plug until cable is installed

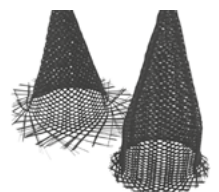


BRAIDED CABLE SLEEVES

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Typically used to enclose and protect high temperature cable assembly and wire harness applications. The open weave construction allows for easy installation reducing assembly cost. For flame-retardant, chemical-resistant and halogen-free properties, choose PPS material. Our wide range of cable management sleeves include cut- and abrasion-resistant versions with high-thermal properties.

Typically used: wire-harnessing applications where durability and low cost are essential



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