

Vital thermal processing
solutions for the **medical**
and **dental** industries

 **Bodycote**

As the world's leading supplier of thermal processing services, Bodycote operates an international network of quality accredited facilities, improving the performance and longevity of medical implants, dental tools, surgical devices, and other critical medical equipment.

The medical and dental fields demand strict adherence to manufacturer's specifications in order to ensure the reliability of finished products.

Delivering thermal processing at the highest global standards, Bodycote is uniquely suited to handle this important work. Whether it is a stainless steel surgical device, titanium hip implant, or manufacturing equipment for medical devices, our team of experts will work with you to develop components that meet your mechanical and surface finish requirements.



Discover our interactive medical applications



The right treatment for metals, alloys and polymers...

Bodycote offers an extensive and unique range of heat treatments and specialist technologies to improve the performance and longevity of metal components and tools used by the medical sector.

MEDICAL IMPLANTS

The stress on a hip or knee joint when a person jumps off a chair is equal to around 100 tonnes per square inch. Our bones, effectively composites, absorb such stresses regularly and effectively for much of our lifetime. When joints fail, they are often replaced with metal alloy implants. These implants must be incredibly strong, biocompatible, and able to last the lifetime of the patient. A combination of heat treatment, hot isostatic pressing and coating makes this possible.



Many medical implants are made from cast cobalt chromium which require biomedical coating to promote bonding between the implant and body tissue, then Hot Isostatic Pressing to remove eliminate porosity, improve fatigue life and enhance the bonding of the coating. Solution and ageing heat treatment is also used to strengthen the implant.

- Hip implants
- Knee joints
- Capacitor cans
- Battery contacts
- Bone screws
- Maxillofacial implant
- Spinal fusion
- Medical stents

SURGICAL INSTRUMENTS

It goes without saying that the quality and reliability of surgical tools is of prime importance. A defective tool during a medical procedure could have dire consequences.



Many surgical tools require vacuum hardening in order to strengthen the tools whilst maintaining the fine surface finish. In addition, vacuum brazing is used to attach carbide cutting medium to surgical saws and other implements.

- Clamps
- Sidelock
- Modular tap
- Bone saw
- Surgical needles
- Bone and tissue cutting guides

The advantages of stainless steel make it a material of choice for surgical tools and implants. Yet, design teams often struggle with issues of galling, insufficient surface hardness, and wear resistance.

Bodycote's proprietary S³P processes provide surface hardening that increases key mechanical properties of stainless steel without sacrificing its corrosion resistance, ductility, and capacity for cleaning and sterilisation.

SEALS AND POLYMER ITEMS

Bodycote's ion implantation process can provide surface hardening and reduced friction coefficient for medical parts made from polymers, elastomers, ceramic and silicone materials, as well as metals.



- Syringe seals
- Silicone implants and prosthetics
- Medical devices
- Biomedical polymers

DENTAL PRODUCTS

Like any other medical tool or device, dental tools and appliances are manufactured to strict guidelines to ensure correct operation. The materials and processes utilized require specialized thermal processing solutions.



Bodycote provides various thermal processing treatments for use in dental and orthodontic component manufacture. To maintain the required surface finish, vacuum hardening or vacuum ageing is used to produce the required material properties. For attaching carbide inserts vacuum brazing is utilized. Many dental items are also treated by ferritic nitrocarburising ensuring a hardwearing surface and the ability to withstand numerous sterilization cycles.

- Orthodontic cutters and saws
- Tip inserts
- Clips
- Dental picks
- Crown components
- Cavity spreaders

COMPONENTS IN THE PHARMACEUTICAL APPLICATIONS OR PRODUCTION

Medical equipment manufacturing is an active and evolving market, driven by medical advances through the years.



Equipment must work faultlessly to meet demands of pharmaceutical production or medical equipment. Wear and galling of stainless steel components can occur, causing a risk of loss of performance and possible contamination by worn-off particles.

Bodycote solutions can eliminate surface wear, prolong product life and provide corrosion resistance.

- Pumps in blood analysis machines
- Nebuliser components
- Pill production - high pressure plungers
- Pain relief delivery system, injection pumps

A component journey

Inner Strength - Medical implants

Our bones, effectively composites, absorb stresses regularly and effectively for much of our lifetime. When joints fail, they are often replaced with metal alloy implants. These implants must be incredibly strong, biocompatible, and able to last the lifetime of the patient. Take a look at the journey of a medical implant component which demonstrates how a combination of heat treatment, hot isostatic pressing and coatings makes this possible.



Cobalt chromium alloy billets are precision cast to form implant shape.



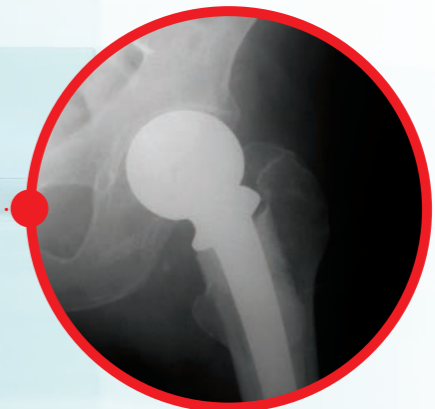
The castings are thermally sprayed with a biomedical coating to allow a bond to form between the implant and body tissue, promoting bone growth.



The implants then undergo Hot Isostatic Pressing to eliminate porosity, improve fatigue life and enhance the bonding of the biocompatible coating.



Solution and ageing heat treatment is used to strengthen the implant.



End application
Joint replacement.

Our offerings

Bodycote offers an extensive range of solutions designed to improve and ensure the reliability, performance, and longevity of components and tools used by the medical sector.

VACUUM HEAT TREATMENTS

Vacuum heat treatment of metallic materials makes it possible to increase the mechanical performance of the treated parts, increase of the hardness and the resistance to wear.

Heat treatment processes include case hardening, brazing, tempering, solution and aging treatment, ion implantation, annealing, and normalising.

SPECIALTY STAINLESS STEEL PROCESSES (S³P)

Specialty Stainless Steel Processes (S³P) on austenitic stainless steel, nickel-based alloys, and cobalt-chromium alloys ensure an increase in the hardening of medical equipment without negatively affecting the corrosion resistance, ductility, and capacity for cleaning and sterilisation.

HOT ISOSTATIC PRESSING (HIP)

Hot Isostatic Pressing (HIP) is a process used to eliminate the internal porosity of molded parts, sintered or derived from additive manufacturing thus increasing the mechanical properties (fatigue strength, ductility, impact resistance).

Our facilities process a wide variety of component sizes to exacting standards with reliable, repeatable results.

Our quality meets your standards

Bodycote has developed specialised treatments to provide corrosion protection and improve component wear resistance. We maintain the highest production standards for quality, safety and efficiency, holding an extensive list of accreditations from key global customers, platforms, and standard agencies across all market sectors including medical.

Some of our national and international accreditations are listed below. Please contact us to find out exact accreditations to satisfy your specific application.

- MedAccred
- ISO 9001
- ISO 14001
- OHSAS18001

Customers can be confident their demands can be met, however stringent, with assured quality, cost-effectiveness, and on-time completion every time. For applications in the medical sector, a FDA master file is available.





www.bodycote.com

Operating an international network of facilities and serving a wide range of industries, Bodycote is the world's largest and most respected provider of thermal processing services – a vital link in the manufacturing supply chain.

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