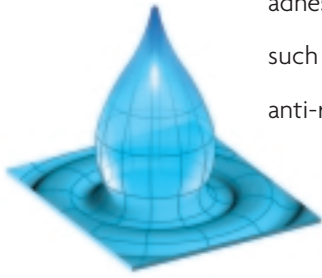


Surface Treatment for Medical Devices





BioLAST™ Technology –
 Water Makes the Difference

BioLAST is a unique water-based polymer coating technology. The cross-linked base polymer forms strong adhesion to the substrate surface while functional compounds are easily incorporated to impart characteristics such as lubricity, anti-microbial activity, hydrophilicity, anti-thromogenicity, anti-encrustation activity, and anti-restenosis activity.

Water-Based

Water-based BioLAST formulation provides a versatile platform for developing coatings of various surface characteristics. Without the presence of organic solvents, BioLAST is the unmatched choice to attain desired surface functionality without compromising the safety of the device or manufacturing environment.

Simple to use, easy to process

Water-based formulation is extraordinarily flexible to incorporate bioactive ingredients and easy to modify for custom-fit. Only low heat curing is used in the process so there is no need for special ventilation and explosion proof equipment.

Substrate friendly

BioLAST is compatible with nearly every biomaterial and is especially suitable for solvent sensitive substrates. Organic solvent free technology eliminates any residual solvent concerns on coated devices.

Environmental friendly

Solvent free technology is safe for technicians to use and incurs none of the additional costs associated with the disposal of organic solvent wastes.

Biocompatibility

BioLAST coatings are used on FDA approved blood and tissue contacting devices in the market. Independent studies for tissue biocompatibility and hemocompatibility have been conducted for BioLAST coatings alone. Written reports of these studies are available to demonstrate BioLAST coatings passing in vivo and in vitro biocompatibility challenges.

Sterilization

BioLAST coated devices are stable through conventional sterilization methods such as e-beam, gamma radiation, and ETO.

Shelf Life

BioLAST coating solutions are stable under normal storage conditions. The coatings maintain long-term integrity on devices because of the strong bonding of cross-linked polymer network.

Quality

Whether AST works with customers in feasibility studies, reagent supply preparation or production coating services, product and process control are maintained by our adherence to the ISO 9001/2000 quality standard and the upkeep of our GMP facilities.

Proven track record

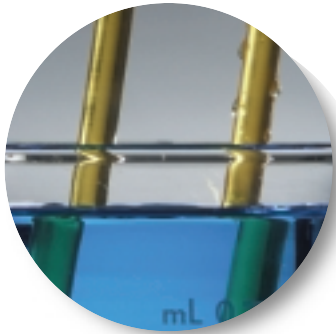
BioLAST coated devices have received FDA, Japanese, and European regulatory approvals. Applications include PTA catheters, PTCA catheters, sterilization devices, intravascular catheters, IOL delivery devices, and ISC catheters..

Water-based BioLAST Makes the Difference

FEATURES	BENEFITS
Water-based formulation	Easy to incorporate bioactive ingredients
Organic solvent free formulation	Eliminates concerns of solvent residual on device after coating.
Organic solvent free processes	Safe for technician to work with and incurs no additional cost for solvent waste disposal
Versatile formulation	Flexible for custom-fit modifications.
Cross-linked polymer network forms strong bonding.	Long shelf life for solution and coated devices.
Simple process with low-heat curing.	Easily adapted to existing manufacturing systems.
Coating does not affect underlying substrate properties or change surface appearance.	Enhanced surface performance and maximized device potentials.

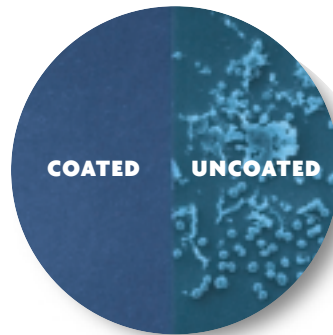
Surfaces with AST Medical
Coatings Make a Difference

AST medical coatings can impart a number of different surface characteristics without affecting the bulk properties of the device materials. AST works with customers to define specifications and to optimize the performance of the coating. Our goal is to bring the best results to the surface.



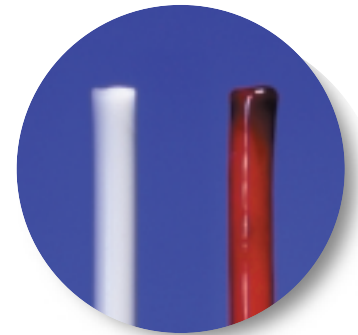
**LubriLAST™ —
lubricious coating**

LubriLAST is a patented, lubricious coating formulated on the BioLAST platform. LubriLAST coating eliminates surface friction when exposed to water or body fluid. Its superior lubricity facilitates device insertion and removal, minimizes patient/tissue trauma, and improves patient comfort. LubriLAST is biocompatible, durable, and can incorporate a variety of bioactive ingredients within its polymer matrix for maximum surface functionality.



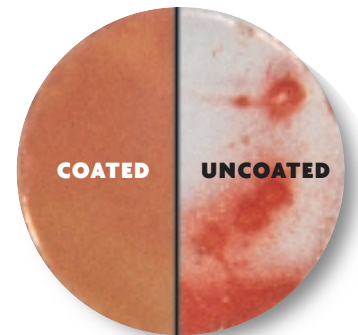
**RepelaCOAT™ —
anti-microbial coating**

Developed on BioLAST platform, RepelaCOAT is an infection-resistant medical device coating with a patent pending, ion-exchange release mechanism. Unlike most antimicrobial coatings that have only a brief, initial spike of activity, RepelaCOAT allows the customization of release pattern to exhibit a controlled, initial “peak release” followed by a sustained release of anti-microbial agents in the presence of blood or urine.



**HemoLAST™ —
anti-thrombogenic coating**

HemoLAST is an anti-thrombogenic coating formulated on the BioLAST water-based platform. It contains both releasable and covalently bonded anti-thrombogenic agents to provide short and long-term protection against thrombus formation. This is an especially beneficial characteristic for implanted devices. HemoLAST can deliver Heparin as well as other anti-thrombogenic agents such as proteins or peptides



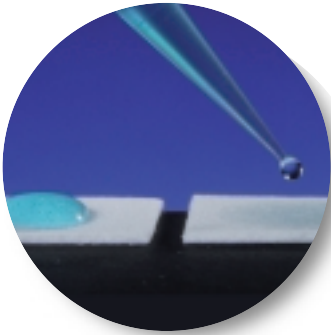
pHreeCOAT™

pHreeCOAT is a new, patent-pending anti-encrustation coating in the BioLAST family. It prevents mineral deposition on indwelling medical devices. pHreeCOAT can be used in any application where calcification of a device compromises performance, patient comfort or safety. By modulating surface pH and chemistry, pHreeCOAT renders the device virtually invisible to the calcification process.



VascuLAST™

Another new coating in the BioLAST family, VascuLAST is a surface treatment used to prevent the re-narrowing of vessels after medical intervention. While this usually happens during angioplasty surgery, it may also occur in other procedures. AST-sponsored animal trials have demonstrated the successful use of VascuLAST to incorporate anti-restenosis agents into implantable devices.



HydroLAST™ — hydrophilic coating

HydroLAST coatings improve the wettability and wicking of most polymeric biomaterials. Many diagnostic and biotech substrates are hydrophobic; this may cause reactants to "bead up" on the surface leading to inaccurate diagnoses. Unlike conventional hydrophilic treatments that yield only temporary results, HydroLAST produces a stable, sub-micron coating that makes a hydrophobic substrate permanently hydrophilic. This lends the coating to a variety of diagnostic, biotech, and industrial applications.



ParyLAST™ — plasma enhanced parylene coating

ParyLAST is a patented process that enhances parylene deposition with plasma activation. While parylene coating is an effective chemical and electrical barrier for sensitive device components, it is often susceptible to delamination. ParyLAST overcomes parylene's adhesion limitation by creating molecular level binding between the substrate and parylene. The process integrates the traditional parylene process with gas plasma molecular activation, all in one process chamber without breaking the containment. The result is a coating with maximized performance, lifetime resistance to delamination, and minimized component failure due to liquid propagation into the coating/substrate interface.

Contract Coating Services

While many customers choose to bring the technology for in-house production, others find that it is more cost effective to outsource coating operations. For those companies, AST provides contract coating services in its and ISO 9001/2000 registered, GMP facilities. Housed in over 20000 square feet, AST offers state of the art processing in certified class 100000 clean rooms. A trained staff of technicians, chemists, and engineers work closely with customers to ensure compliance with all product specifications. For continuous improvement and commitment to customer satisfaction, we welcome and respond to all feedback throughout the design, development, and manufacturing of a device.



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Partnership Approach

The overwhelming array of choices in biomaterials as well as the increasing complexity of device design often poses surface performance challenges for device manufacturers. Maximizing the device performance while minimizing costs is a delicate balance that can determine the success or failure of the device in the marketplace. Rather than becoming just another vendor, AST partners with its customers from beginning to end in order to ensure the successful and timely launch of the product.



Upon the identification of coating requirement and feasibility approval, AST's technical team maintains close contact with the device designers. Our customers have complete access to AST's considerable technical expertise throughout the device design/development process. Many have found this devoted partnership to be very cost-effective since potential problems are identified and eradicated before significant investment has been made in a design. By working with customers every step of the way, small design changes can be made early in the process to prevent huge delays and overruns late in the game.

Our partnership support does not end with the finalization of coating formulation or product design. A customized, easy-to-use process is developed under strict ISO design control. We work with customers to ensure smooth and trouble-free implementation at their or AST's manufacturing facility. To accelerate the approval of new devices, AST's experienced staff continues to provide assistance throughout the regulatory approval process and product introduction.



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About AST



Since 1989, AST (Advanced Surface Technology) has dedicated itself to providing surface modification solutions to the medical industry by offering superior technology with a partnership approach. Our proprietary water-based technology, BioLAST, provides a flexible and easy-to-use platform to create single or multiple surface properties without changing the characteristics of the bulk materials. The coatings offer biocompatibility, lubricity, durability, adhesion and drug delivery. Requiring only simple processing, BioLAST eliminates the complication of waste handling and concerns of solvent residues on the products.

AST's comprehensive research and development capabilities provide a solid foundation for its personalized approach to customer service. We work as development partners and offer customers access to our substantial coating expertise throughout the design/development process. The diversity of available coatings combined with our customized approach enables the successful attainment of product specifications and accelerates the launch of a new product in the competitive medical device market.

AST's contract coating capability extends our partnership to customers seeking the outsourcing of initial or routine production needs. Operating in clean room facilities under GMP and ISO 9001 standards, our experienced staff works with customers from process development/qualification through the logistics necessary to the arrangement of the just-in-time, quality coated products.

As technology continues to advance in medical and diagnostic device products, AST is committed to continually improving and expanding the BioLAST platform as well as building successful partnerships with established and emerging companies in the industry.