



**MEDICAL GRADE
SOLUTIONS**

Boltaron® Thermoplastic Materials

SIMONA
boltaron

www.boltaron.com | +1 800 342 7444

RELIABILITY MEETS INNOVATION



Boltaron® Medical Grades Materials

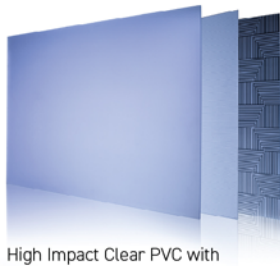
SIMONA Boltaron has several grades of high performance plastics to choose from for medical applications depending on your flammability, chemical resistance and processing requirements.

Characteristics

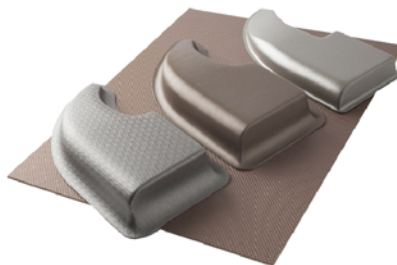
- High impact strength
- Durability
- Scratch resistant
- Can withstand harsh cleaners and chemicals
- UL 94 V-0 compliant
- Meets Class 1/A building code requirements
- Excellent thermoformability

Uses

- Medical device enclosures
- Orthotic braces
- Thermoformed electronic device enclosures
- Protective wall linings
- Hospital bed and lavatory components
- Diagnostic imaging
- In vitro diagnostic covers



High Impact Clear PVC with transparent blue tint



Discover our selection of Metallic Effects



MATERIALS

Medical Grade	Flammability	Material
Boltaron® 4335	UL 94 V-0, ASTM E-162	PVC/ABS Alloy
Boltaron® 6530	UL 94 V-0	PVC/ABS Alloy
Boltaron® 4300	UL 94 V-0	High Impact Clear PVC with a Transparent Blue Tint
Rigiwall® Boltaron® 4333	UL Standard 723 Listed, ASTM E84	Acrylic PVC/Alloy Wall Covering Grade, Class 1/A Rated
Rigiwall® Boltaron® 4333W	UL Standard 723 Listed, ASTM E84	Acrylic PVC/Alloy Wall Covering Grade, Class 1/A Rated and Corona Treated for Abrasion Resistance
Rigiwall® Boltaron® 4353	UL Standard 723 Listed, ASTM E84	Acrylic PVC/Alloy Wall Covering Grade, Class 1/A Rated up to .125 in

BIOCOMPATIBILITY TEST

Medical Grade	Test (ISO 10993-5/10993-10)	Results
Boltaron® 4335 with SIMOGUARD®	Intracutaneous Reactivity Test (IRT)	Certified
Boltaron® 4335 with SIMOGUARD®	MTT Cytotoxicity Assay	Certified
Boltaron® 4335 with SIMOGUARD®	Sensitization	Certified

EFFECTIVE **MATERIAL DEFENSE** WHERE IT MATTERS



SIMOGUARD® Antimicrobial Technology

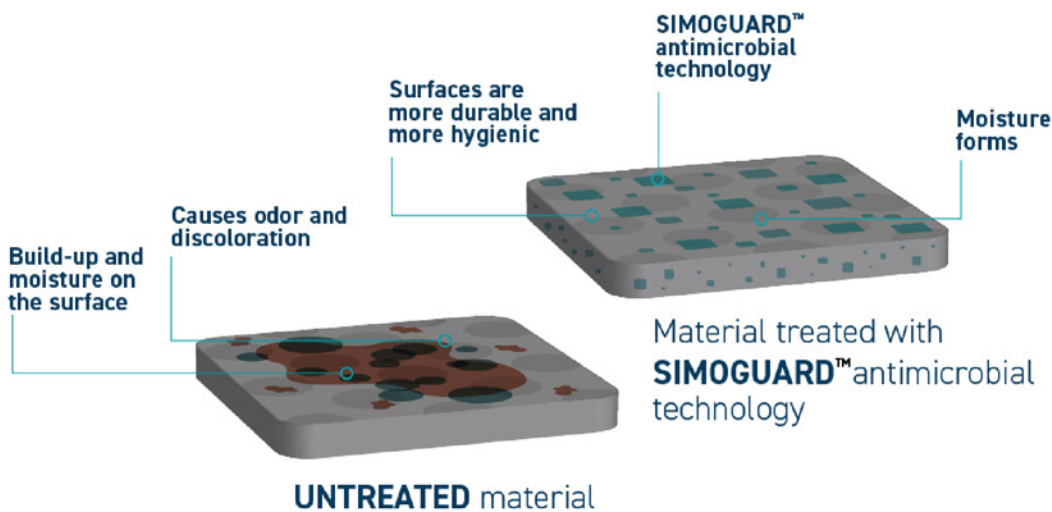
PROTECTION BY DESIGN

SIMONA Boltaron now offers antimicrobial SIMOGUARD® Technology. Offer built-in hygiene protection for material surfaces with this EPA registered antimicrobial that leads to a cleaner looking surface over time.

SIMOGUARD® technology is an antimicrobial treatment incorporated into the material, which helps keep the treated surface cleaner between cleanings. Durable, chemical- and stain-resistant, Boltaron® thermoplastics are ideal for high touch areas such as checkout stands, counter tops, point of sale, healthcare furniture, medical devices, kiosks, tray tables, and wall coverings.

SIMOGUARD ADVANTAGE

- Active ingredient registered by the EPA
- Inhibits the growth of microorganisms* that cause product degradation, staining or odors
- Leads to a cleaner looking surface over time
- Integrated into the sheet
- FAR-rated grades for aerospace
- Chemical resistant and easy to clean
- Easy to fabricate
- No painting required
- Outstanding durability
- Thermoformable
- Custom colors available
- Knowledgeable technical team



SIMOGUARD

- Antimicrobial
- Safe to clean with aviation cleaners
- UV-C safe
- Durability and long service life
- Thermoformable
- Industry's widest range of textures/colors

*The antimicrobial properties are intended to protect the product from degradation due to mold, and fungi and do not protect users or others against bacteria, viruses, or other disease-causing microorganisms. Always follow proper cleaning practices with this product. Boltaron® thermoplastics incorporate an advanced EPA-registered antimicrobial for the protection and preservation of our polymeric and plastic materials. Boltaron® thermoplastics are treated only to protect the polymeric and plastic materials and do not confer protection from bacteria to users of our products. Always clean the product thoroughly after use.

DISCLAIMER AND LIMITATION OF WARRANTY: All information contained herein is believed by SIMONA BOLTARON Inc. to be reliable. Typical properties are based on laboratory tests conducted on material samples in accordance with standard test methodology. SIMONA BOLTARON Inc. makes no express or implied warranty that its products will perform in accordance with the data in all conditions and circumstances. To determine suitability for use, users must test applications under actual operating conditions. As a result, ALL EXPRESS OR IMPLIED WARRANTIES IN CONNECTION WITH SIMONA BOLTARON Inc. PRODUCTS INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY DISCLAIMED. RI 3.16.21



www.boltaron.com | +1 800 342 7444

RELIABILITY MEETS INNOVATION

Boltaron® Medical Cleaning Guide

TESTED WITH BOLTARON 4335

SIMONA Boltaron has manufactured its industry leading thermoplastic materials for more than 25 years, continuously testing new cleaning products to verify their safe impact on material color and performance properties. The following 12 different medical grade cleaners were evaluated on Boltaron 4335.

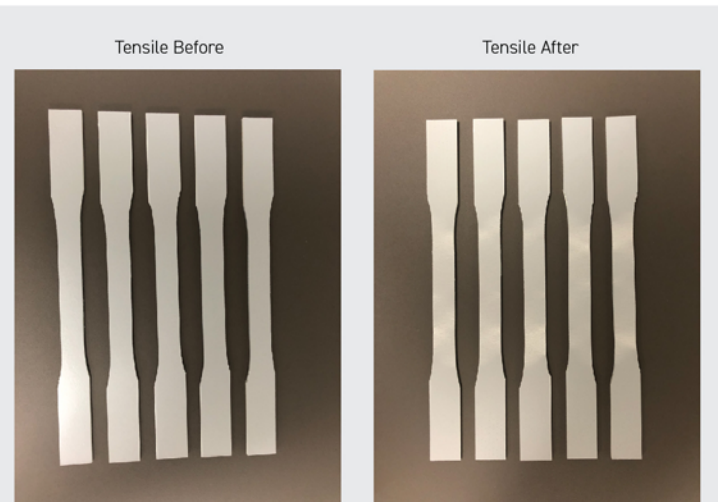
We followed ASTM D543 Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents. ASTM requires for the material to be submerged in the cleaner for 7 days or 168 hours. The material is then evaluated for weight and dimension changes, along with tensile strength changes (ASTM D638). We also performed a staining evaluation while leaving the cleaner on the surface at an elevated temperature.



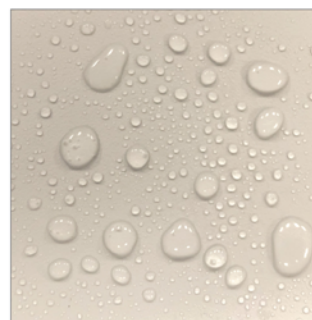
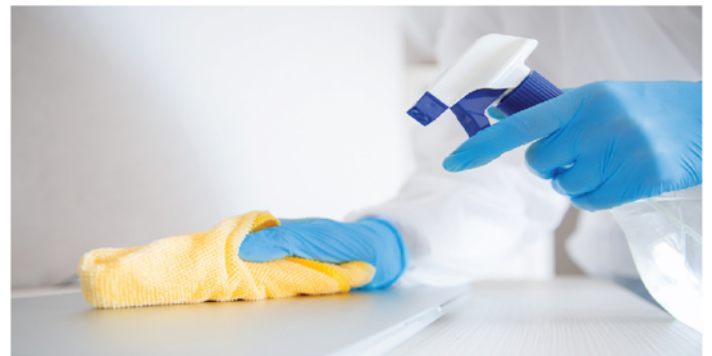
Tensile Submerged

Cleaning Product List	Manufacturer	Active Ingredient
Birex	Biotrol	o-phenylphenol / p-tertiary amylpheneol
Cavicide	Metrex	Diisobutylphenoxyethoxyethy dimethyl benzyl ammonium chloride / Isopropanol
Caviwipes 1*	Metrex	Didecyldimethylammonium chloride / ethanol / Isopropanol
Clorox Hydrogen Peroxide	The Clorox Company	Hydrogen Peroxide
Pro-cide D	Metrex	Glutaraldehyde
Rapicide	Medivators	Hydrogen Peroxide / Peroxyacetic Acid / Trisodium phosphate
Sani-cloth AF 3*	PDI	n-Alkyl dimethyl ethylbenzyl ammonium chlorides / n-Alkyl dimethyl benzyl ammonium chlorides
Sani-Cloth Bleach*	PDI	Sodium Hypochlorite
Sporicidin	Contec	Phenol / Sodium Phenate
Virex Tb	Diversey	n-Alkyl dimethyl benzyl ammonium chlorides / dimethyl ethylbenzyl ammonium chlorides
Sani-cide EX3	Celeste	L-Lactic Acid
NG Interior Cleaner Complete SP-NG85000 Series	Celeste	Alcohols, C9-11, ethoxylated

*Wipes wrapped around samples in jars



The ASTM D543, submerged testing demonstrated that none of the cleaners showed more than a 3% loss in tensile strength when compared to a control sample. All weight and dimension changes were under 0.6% change. The 4335 was also evaluated for visual warping and color changes. No warping or color changes were detected.



Leave on test

The leave on test was performed at 100 °F. The cleaner was applied on the surface while in a 100°F oven. The material was then washed with water. No staining was observed after 16 hours with any of the cleaners.



www.boltaron.com | +1 800 342 7444

RELIABILITY MEETS INNOVATION

ISO 9001:2015 and AS9100D Certified

DISCLAIMER AND LIMITATION OF WARRANTY: All information contained herein is believed by SIMONA BOLTARON Inc. to be reliable. Typical properties are based on laboratory tests conducted on material samples in accordance with standard test methodology. SIMONA BOLTARON Inc. makes no express or implied warranty that its products will perform in accordance with the data in all conditions and circumstances. To determine suitability for use, users must test applications under actual operating conditions. As a result, ALL EXPRESS OR IMPLIED WARRANTIES IN CONNECTION WITH SIMONA BOLTARON Inc. PRODUCTS INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY DISCLAIMED. RI 3.16.21



Boltaron® Antibacterial and Antifungal Properties

TESTING FOR RESISTANCE TO BACTERIAL AND FUNGAL DEVELOPMENT

Boltaron® thermoplastic sheet material does not support the growth of common bacteria and fungus under a variety of conditions. Refer to the results below for specific test results under ASTM G21 and G22 protocol. The tests conclude that Boltaron sheet materials perform well in preventing the growth of bacteria and fungus, even without the addition of an antimicrobial additive.

ASTM G21- RESISTANCE TO FUNGUS GROWTH

ASTM G21 is designed for the qualitative determination of mildew (fungus) resistance of synthetic polymeric materials. The method is conducted over a 28 day period by a third party lab, during which Boltaron sheet was placed in petri dishes on nutrient salts agar (in triplicate) and inoculated with the test fungi.

ORGANISM	TEST USED BY INOCULUM
Aspergillus Brasiliensis	ATCC 9642
Chaetomium Globosum	ATCC 6205
Penicillium Funiculosum	ATCC 11797
Trichoderma Virens	ATCC 9645
Aureobasidium Pullulans	ATCC 15233

CONCLUSION

The Boltaron sheet samples did not show any signs of fungus growth after four weeks.

ASTM G22- RESISTANCE TO BACTERIAL GROWTH

ASTM G22 is a qualitative test method designed to assess the ability of plastics to resist bacterial attack. The method is conducted over a 21 day period during which Boltaron sheet was placed on inoculated agar, incubated, and then compared to a positive and negative control.

The test microorganism used was Pseudomonas Aeruginosa. This is the most common disease-causing species, according to the Center for Disease Control and Prevention (CDC).

In this study, Tryptic Soy Agar was used as a positive control. This medium has no antimicrobial efficacy, and is known to support the growth of the test microorganism. The positive control confirmed the test microorganism was viable and pure. The negative control in this study used nutrient salt agar, which does not support bacterial growth. The negative control confirmed that it did not support the growth of the test microorganism. See below for results. The Boltaron sheet samples did not show any signs of bacterial growth after three weeks.

SAMPLE	INCUBATION (TIME AND GROWTH SCORE AT DAY 21)
Boltaron Sheet (Sample 1)	No Growth
Boltaron Sheet (Sample 2)	No Growth
Negative Control	No Growth
Positive Control	Growth

CONCLUSION

The Boltaron sheet samples did not show any signs of bacterial growth after three weeks.

ANTIBACTERIAL AND ANTIFUNGAL PROPERTIES



www.boltaron.com | +1 800 342 7444
RELIABILITY MEETS INNOVATION

DISCLAIMER AND LIMITATION OF WARRANTY: All information contained herein is believed by SIMONA BOLTARON Inc. to be reliable. Typical properties are based on laboratory tests conducted on material samples in accordance with standard test methodology. SIMONA BOLTARON Inc. makes no express or implied warranty that its products will perform in accordance with the data in all conditions and circumstances. To determine suitability for use, users must test applications under actual operating conditions. As a result, ALL EXPRESS OR IMPLIED WARRANTIES IN CONNECTION WITH SIMONA BOLTARON Inc. PRODUCTS INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY DISCLAIMED. RI 3.16.21

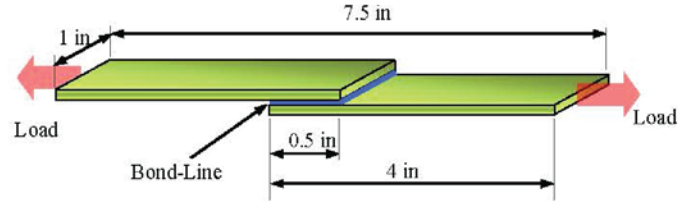
Fabricating Boltaron® 4335

BONDING AND THERMOFORMING RECOMMENDATIONS

Many types of adhesives can be used to glue or adhere Boltaron materials to a substrate. A study was performed to see which adhesives created a proper bond when adhered to a specific substrate. Types of adhesives that can be used include 2 part acrylics, contact cement, cyanoacrylates, foam acrylic tape, 2 part polyurethane, instant adhesives, multi-purpose cement, solvent based and structural adhesives. SIMONA Boltaron does not recommend the use of epoxy. For a complete list of **General Adhesive Guidelines**, visit: boltaron.com/careandmaintenance/adhesive-guidelines

Boltaron materials can be adhered to:

- Plywood
- Cement board
- Aluminum
- Particle board
- Polystyrene
- Stainless steel
- Drywall
- PVC
- ABS
- Acrylic



Schematic of a lap-shear specimen showing tensile loading

ADHESIVE TESTING - ASTM D3163 THERMOPLASTIC LAP SHEAR

Adhesive	Adhesive Manufacturer	Substrate	Lap Shear Avg.	Failure Mode
W031	IPS Adhesives	Boltaron 4335	626.6 psi	100% substrate
W045	IPS Adhesives	Boltaron 4335	615.2 psi	100% substrate
MA300	Plexus	Boltaron 4335	1540 psi	100% substrate
MA310	Plexus	Boltaron 4335	1525 psi	100% substrate
MA8110	Plexus	Boltaron 4335	1244 psi	100% substrate

SIMONA Boltaron recommends to verifying with the manufacturer for the best adhesive solution for a specific substrate.

IPSA chose the W030 series and W045 adhesives to be tested for bonding performance. ASTM 3163 – IPS Adhesives bonded rigid plastic lap-shear joints in shear by tension loading. Five lap shear each of W030 series (W031 used) and W045 bonded Boltaron 4335. Adhesive bond dimensions per ASTM D3163: 1"x1"x0.03". Substrate per ASTM D3163: 4"x1".

CONCLUSION

Both W030 series (W031 used for testing) and W045 performed as expected on the Boltaron 4335 panels. All five W031 bonded specimens resulted in the substrate breaking. All five W045 bonded specimens resulted in the substrate breaking. With most of the test pieces, the Boltaron 4335 substrate deformed significantly, before breaking at ~620 psi.

Please see pictures on the right for broken specimens.

As a result of testing, it was found that Plexus MA300, MA310 and MA8110 yielded the overall best performance for all plastics.

THERMOFORMING GUIDELINES

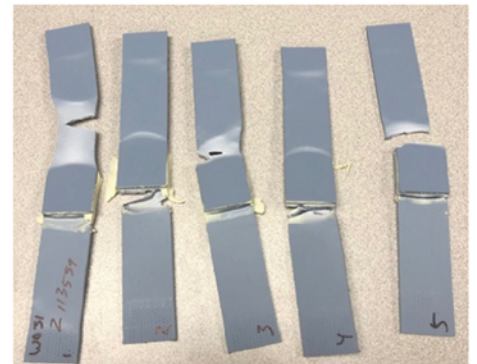
Mold Shrinkage	0.5 - 0.7%
Forming Temperature	335 - 370 °F (168 - 188 °C)
Typical Heater Settings	30 - 50% Top 50 - 70% Bottom
Drying	Not required

QUALITY GUARANTEE

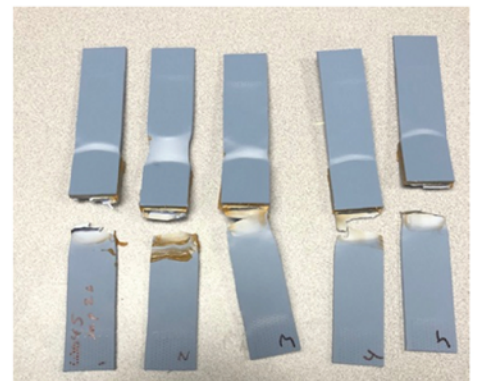
SIMONA Boltaron is ISO 9001:2015 and AS9100 Rev D certified and maintains strict systems for quality control including management of sheet dimensions, color consistency, thermoforming surface appearance and material property stability using visual checks and in-house state-of-the-art testing equipment. For more information, visit www.boltaron.com/quality.

DISCLAIMER AND LIMITATION OF WARRANTY: All information contained herein is believed by SIMONA BOLTARON Inc. to be reliable. Typical properties are based on laboratory tests conducted on material samples in accordance with standard test methodology. SIMONA BOLTARON Inc. makes no express or implied warranty that its products will perform in accordance with the data in all conditions and circumstances. To determine suitability for use, users must test applications under actual operating conditions. As a result, ALL EXPRESS OR IMPLIED WARRANTIES IN CONNECTION WITH SIMONA BOLTARON Inc. PRODUCTS INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY DISCLAIMED. RI 3.14.21

W031 specimens



W045 specimens



SIMONA
bolton

www.boltaron.com | +1 800 342 7444

RELIABILITY MEETS INNOVATION

USA

Renee Vinsick

+1 330 260 1382

renee.vinsick@boltaron.com

Continental Europe

Thomas Bulirsch

+49 9571 9479070

tbulirsch@boltaron.de

France

Cedric Dehainault

+33 6 77 16 72 53

cedric@boltaron.eu

UK, Ireland & Asia

John Inman

+44 1763 288177

jinman@boltaron.com

SIMONA
bol Sharon

www.boltaron.com | +1 800 342 7444

RELIABILITY MEETS INNOVATION

Have a question about how to clean Boltaron® materials?

Call +1 800 342 7444, email info@boltaron.com or visit www.boltaron.com/care-and-maintenance