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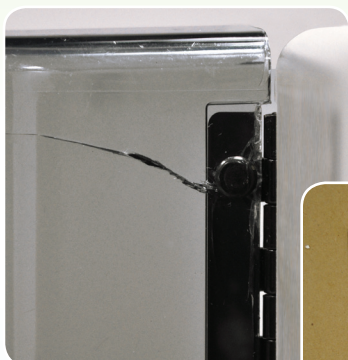
SES Medical Technologies

Cleaning Chemical Compatibility:

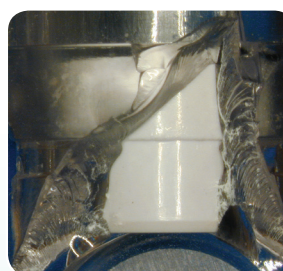
Eliminate polymer device cracking caused by aggressive cleaning agents and disinfectants

Chemical-based Cracking of Polymer Housings on Medical and Dental Devices

Manufacturers of diagnostic machines, infusion pumps, medication management systems, mechanical ventilators, dental equipment and other devices are faced with a growing problem...chemical induced cracking of the polymer housings. The cleaning solvents and disinfecting agents used in hospitals and other healthcare-related facilities can result in a phenomenon known as Environmental Stress Cracking of the polymer.



ABS test specimens cracked by exposure to a quaternary disinfectant



Environmental Stress Cracking of the housing can lead to failure of the device through ingress of fluids and loss of electrical connections. The amount of time required to cause cracking is dependent on the chemistry of the cleaning/disinfecting agent, the polymer system used and the design/assembly of the device.

Disinfectants and Disinfectant Cleaners

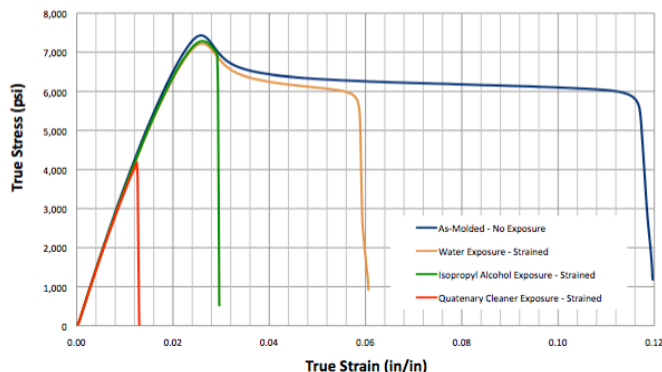
The problem of cracking as a result of chemical exposure is not new. However, the expanding use of polymers in devices coupled with the growing number of aggressive cleaning and disinfecting chemistries being developed and used to combat the threat of resistant bacteria has resulted in an increased occurrence of device cracking.

The existence of a crack poses several serious problems for manufacturers:

- creates a location that may not be reached by cleaning/disinfecting fluids, allowing bacteria to flourish,
- for devices requiring an International Protection Rating for water ingress, a crack poses an electrical hazard to the user and increases the potential for electrostatic discharge to sensitive electronics,
- causes a loss of clarity in transparent materials,
- increases warranty claims that, in reality are not attributable to the device
- damages their reputation



ABS Compatibility Test Results



Data illustrating the degradation in ABS performance as a function of exposure to cleaning chemicals.

SES Offers an Affordable Approach to Identify Damage-Producing Cleaners

Stress Engineering has developed comprehensive, affordable test methods to identify cleaners that can damage polymer components. Acting as an independent 3rd party testing agency, individual cleaning products are submitted by either the cleaning product producer or the device manufacturer. (In most cases device manufacturers refer manufacturers of cleaners and disinfectants for testing at their expense). Once received an array of tests are completed using the solutions submitted. Testing is also completed with reference cleaners to provide a baseline for comparison.

Test specimens are most often obtained by molding custom samples of the specific polymer (and colorants), but can be extracted from the device housing itself, when possible. The testing procedures can include cyclic or continuous exposure of the samples to the cleaning/disinfecting solution for a range of mechanically derived strains that are imposed by the assembly of the device. Stress Engineering can review your design to tailor the test protocol to your exact application, or provide the assessment as a relative comparison to quickly screen out the fluids that cause damage.

All parties benefit from SES's services...

For a device manufacturer:

It is critical to provide your customers with a list of cleaners compatible with your device. Restricting the use of damaging cleaners protects your brand and reduces warranty issues related to chemical attack.

For the cleaner/disinfectant manufacturer:

It is critical to have your product listed as an acceptable cleaning agent on as many devices as possible so that hospitals and labs can easily use your products. SES can efficiently conduct screening tests on an array of commonly used, medical grade plastics. The results of this testing will provide your sales force with the quantitative evidence needed by device manufacturers to approve cleaners.

To Ensure Cleaning and Disinfecting Fluids
Don't Cause Your Device to Crack
Call SES Today at 513-336-6701

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