

## Test housing material performance using this simple 4-step test.

Choosing plastics for medical device housings and hardware can be challenging. Many commonly used materials can crack, craze, discolor, and become sticky after being exposed to commonly used or aggressive disinfectants and drugs.

To better understand why plastics fail and how different plastics perform in the real world, Dr. Yubiao Liu, Eastman medical application development scientist, developed a simple 4-step testing protocol based on modified ASTM D543 and ASTM D4812 standards (step 4 only).

This test was developed from publicly available literature on standards to provide a repeatable, uniform testing tool. This quick, simple screening test is the most effective way to mimic failures from typical hospital usage conditions.

### **Our 4-step test method uses a 1.5% constant strain jig together with wet patches for applying chemical reagents.**

All sample bars used in this test were molded according to the raw material manufacturers' specifications. Improper molding could result in early failure and inaccurate results. Using a minimum of 4 replicates is recommended to substantiate your data. More replicates may be needed depending on the standard deviation of observed results.

To best interpret the results, record the impact strength of exposed and control samples to calculate the percentage of reverse side impact strength **retention**. Higher retention translates to better reliability after exposure.

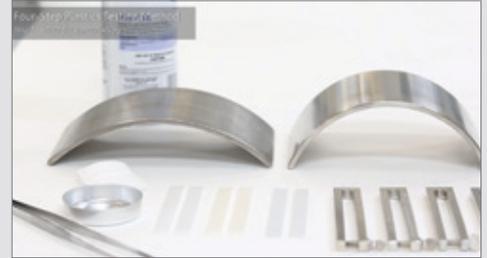
### **Tell a more complete story.**

*Step 4 is the differentiating step in this testing protocol.* Visual inspection after step 3 may reveal changes in some plastics. However, there may be cracks or crazes that are not visible to the naked eye or identified by weight or dimensional changes. By performing Step 4, the reverse side impact test, you are better able to predict the reliability of a device after exposure.

Ultimately, this test should help you confidently choose the best material for your next project.

To learn more about Eastman Tritan™ copolyester in medical device housings and hardware, visit [Eastman.com/medicalhousings](http://Eastman.com/medicalhousings).

### 1 Select the appropriate jig.



Choose the strain level that most appropriately reflects environmental stress cracking.

### 2 Load the flex bars onto the job.



Remember to load some control samples that will not be exposed to chemicals.

### 3 Apply chemicals to the flex bars using presoaked pieces of cotton.



Chemicals such as commonly used hospital disinfectants, lipids, drugs, or drug carrier solvents can be used. Enclose the entire sample jig in a plastic bag to prevent evaporation and leave at room temperature for 24 hours.

### 4 Perform reverse side impact test. *This is the differentiating step.*



Unload the samples and run a reverse side impact test on the exposed and control samples



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