HOW CRAZING OCCURS

For crazing to take place, the sheet must have residual stress and be attacked by a solvent or cleaner. Both stress and chemical exposure must be present for crazing to occur. For example, a flat acrylic sheet when exposed to a solvent will not develop crazing. However, this same sheet when cold bent will develop craze when exposed to a solvent. Acetone and IPA (isopropyl alcohol) are two common solvents used in the spa industry.

STRESS CREATION

These are possible producers of stress during production of an acrylic spa:

Cold Forming

- » Pulling the sheet too early before reaching the recommended forming temperature.
- » Oven zone temperatures unbalanced leading to sections of the sheet at the proper temperature while other sections of the sheet being too cold.

Cooling

- » Mold too cold.
- » Sheet cooled too rapidly or unevenly after forming will result in locking in stress.

Mechanical

- » Pulling the sheet too fast will create stress from rapid stretching.
- » During fiber glassing, incorrectly holding the spa down to prevent distortion creates stress in the formed spa.

Actions you can take (with help from your Plaskolite Technical Service Representative):

- » Check out your thermoformer and molding.
- » A Plaskolite Representative can help you.
- » Heat the spa mold to 130°F.
- » Walk through the process to see areas where stress may be imparted.

SOLVENT EXPOSURE

During Production

- » Cleaning the surface prior to FRP with a solvent like Acetone or IPA.
- » Cleaning FRP overspray or masking residue with solvent.
- » Excessive FRP gel time.

After Production

- » Cleaning with a solvent or strong cleaner.

Actions you can take

- » Clean the back surfaces with water dampened cloth to remove dust prior to FRP and refrain from using solvents.
- » Encourage users to use just a damp cloth to clean the spa surface.

Craze in Continuous Cast Acrylic

» Clean the spa with just mild soap and water and place those instructions in the spa owner's manual.

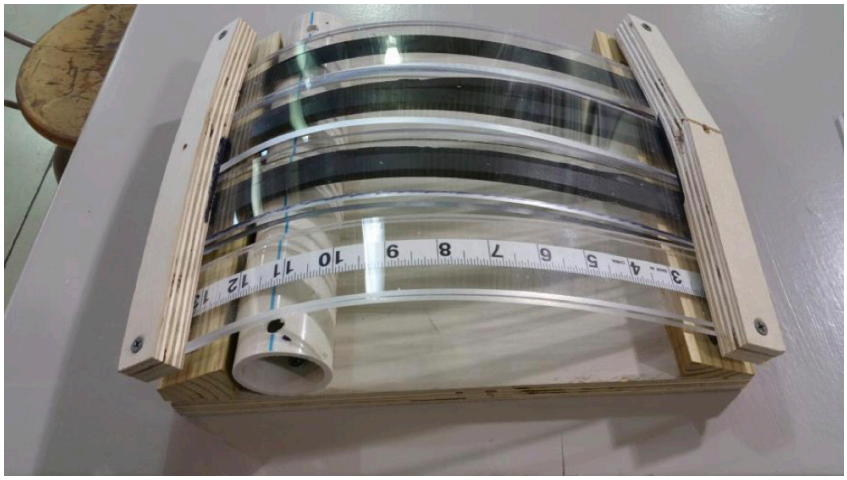
ACCELERATES CRAZING

Environment

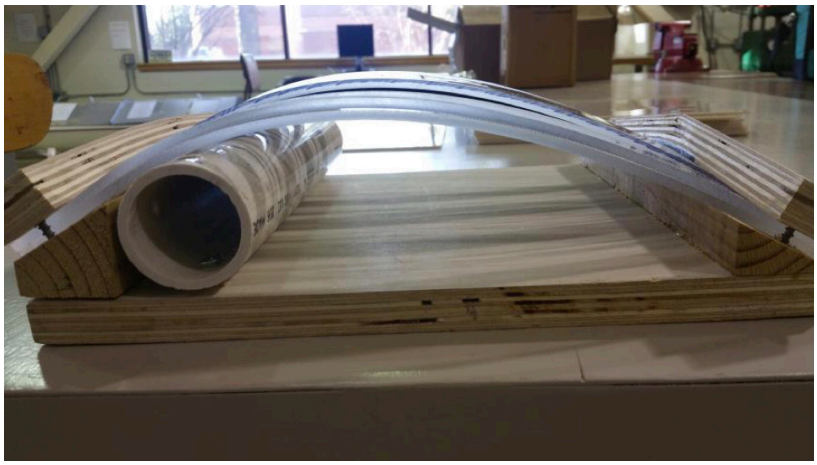
» Leaving the cover of a spa off for long periods of time. We've seen spas that had crazing and cracks in only one area – the area exposed to the sun.

Actions you can take

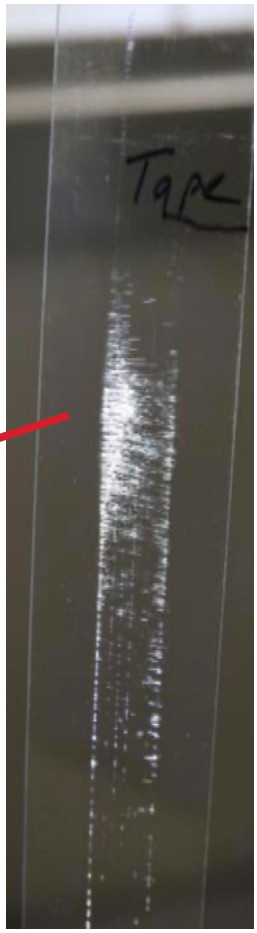
» With each spa sold sell a good cover and encourage users to keep covered when not in use.



Craze elliptical test jig for craze test on insulation foam. PVC vinyl tape and electrical tape were also added to the test as comparison.



The elliptical shape delivers varying amount of stress to the acrylic piece. This jig was designed to deliver very high stress to the acrylic right above the PVC pipe and less stress at the other end. In this test we were testing different PVC pieces. Please note, no crazing would occur if there was no stress present.



Area of greatest stress

Vinyl measuring tape showed the most craze.

HBM foam tape only showed craze in the highest stressed region.

Foam on edge

This foam tape didn't show much craze.

Black electrical tape had 5" of craze.

Placing acrylic sheet under stress can lead to craze in the highest areas if exposed to chemicals or solvents from solids. If no stress is present, no craze occurs.

Severe craze and even cracks can develop if a spa is left uncovered for prolong periods of time. The spa should be covered when people are no longer in the spa.

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