

Professor POU/POE

By David M. Bauman, Technical Editor

Q: What causes glassware etching in dishwashers?

A: First, you should be sure that there is not a deposit on the glass.

To confirm a water soluble film, run water over the spotted area and blot dry with a paper towel. Examine the spot to see if the residue has been removed.

Removal indicates water soluble deposits.

To confirm a hardness deposit, determine if the film can be scratched off with a knife or similar object.

Causes of etching

If it is not a deposit, it is probably a type of etching. There are two different causes for what appears to be etching on glassware:

1. Silica film

In the early stages, glassware develops an amber to multicolored film, similar to an oil-on-water film. Lines of white or different colors commonly break the film's uniformity. These lines follow deformities or stress lines in the glass.

As the process continues, the glassware develops patches of clouded glass (etch). Neither the films or the etch will respond to acid or bleach.

Scratching with a pin or knife will remove the colored phase but not the white or etched areas.

Generally, silica film occurs in softened hard water and is worsened by:

- High water temperatures;
- Poor rinsing caused by overloading the dishwasher;
- Use of high phosphate detergents, which are more aggressive to glassware in softened water; and
- Some glassware is more prone to this problem.

Damage done to the glassware cannot be reversed, but the process can be slowed by:

- Lowering the water temperature to less than 140 degrees Fahrenheit;
- Not overloading the dishwasher;
- Using the minimum amount of detergent that will provide clean dishes; and
- Using detergents that have low phosphorous (ask for one that is made for soft water).

2. Deterioration by hot water and detergents

A second but similar problem is etching whereby some of the material is removed from the glass.

First, try to confirm the etching. The glassware will appear cloudy; this can be a uniform haze or blotchy, as in the last stages of a silica film problem.

Again, scratching or treatment with water, acid or bleach will not remove the apparent film.

The deterioration of glass by the action of hot water and detergents:

- is more prevalent with softer water;
- is very common in softened water as part of the silica film process;
- is accelerated by high water temperature; and
- is worsened because the detergents are more aggressive in removing metal ions from the glass, causing microscopic roughing of the surface.

Remember, these detergents must be aggressive to work with very hard water.

To minimize the deterioration rate:

- Reduce the water temperature to less than 140 degrees Fahrenheit;
- Use much less detergent (sometimes as little as 1/3 of each maximum fill mark); and
- Look for a soft water detergent.

David M. Bauman is technical editor of Water Technology and a water treatment consultant in Manitowoc, WI.

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