THE CARBOY BUMPER

Straight answers on the capabilities, benefits, and limitations

With careful handling, a quality glass carboy can last for decades, making it a popular choice for fermenting beer, wine and mead. But...

- Glass is fragile, prone to breakage if mishandled, and potentially dangerous if broken
- Glass carboys weigh up to 70 pounds when full and are frequently picked up and set down in normal use
- The stresses of repeated contact with hard floors can gradually weaken carboys, causing them to fail unexpectedly in some circumstances



Up to 70lbs full!

There are many ways accidents can happen when handling glass, and injury is not uncommon if a carboy does break. Many brewers choose glass carboys despite these risks because they are affordable, easy to clean, hard to scratch, and are great for aging and secondary fermentation.

The Carboy Bumper makes glass carboys a more attractive choice for fermenting beer, wine, cider, and mead. It makes carboys less likely to break while and inhibits creeping structural decline that comes with repeated set-downs on hard surfaces over the time. It does this by affixing a permanent layer of <u>engineered shock absorption</u> on the bottom of the carboy, which provides a strong measure of protection to cushion its landing each and every time it is set down.

Capabilities: High performance materials

The Carboy Bumper protects any shape or size of glass fermentor with a unique shock absorbing material called PORON®. The exceptional performance of this engineered material makes a protected carboy safer and more comfortable to use by absorbing up to 90% of any impact energy as tested in accordance with ASTM-F1614-C, a standardized test method for measuring impact protection.

In order to stay attached to your carboy, the Carboy Bumper utilizes a water and chemical resistant specialized adhesive from 3M[™].

Other benefits

- The Carboy Bumper protects the entire carboy from three common but often overlooked causes of long-term structural decline: cyclic fatigue, microfracture, and crack propagation. (More info below.)
- The Carboy Bumper provides peace of mind by providing safer, softer landings every time you put it down. (There's an "aah" factor to setting down a carboy with a soft cushion of protection.)
- The Carboy Bumper allows you to <u>roll a carboy</u> on a cushioned edge without the glass ever touching the ground. This means less lifting, easier handling, and fewer impacts on hard surfaces.



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How does PORON® Shock Absorbing Foam work?

PORON® Shock Absorbing Foam was developed by a leading innovator of extreme impact protection materials such as those used in concussion prevention and other safety equipment. Using something called Reactive Protection Technology, this new highly engineered material absorbs impacts and keeps it from reaching the object being protected in a way that's never been done before.

When at rest in a normal state, the molecules within the material repel one another, which is why the material is soft and pliable. But when subjected to an energy-inducing event such as contact between a heavy carboy and the floor, the molecules temporarily realign to absorb the impact and disperse the energy before returning to their normal pliable state

As a result, a slim ¼" piece of this material offers superior protection over much larger and thicker pieces of conventional rubber or foam. Don't take our word for it. For more about PORON® Extreme Impact Protection please visit:



Or watch it in action on its very own YouTube Channel

Limitations: (This is important!)

The Carboy Bumper offers an unprecedented level of protection for yourself, your carboy, and your brew, but not without limitations. This product does not protect carboys from direct impacts on the sidewalls, top, or any surface other than the bottom, where contact with hard surfaces is

most frequent. It will increase the odds of your carboy surviving many common mishaps but cannot save the carboy from careless handling, drops, sideways bangs, or temperature shock.

The Carboy Bumper is not a substitute for careful handling or other safety precautions and best practices. Always follow your carboy manufacturer's instructions and always be careful when handling glass!



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Cyclic fatigue, microfractures, and crack propagation: A slow and silent killer of glass fermentors

Glass carboys are typically made of Soda Lime Type III glass. This is an affordable but softer and weaker variety of glass that can break down structurally over time under the stresses of repeated impact. This is called <u>cyclic fatigue</u>. The simple act of setting an unprotected carboy on the ground, no matter how carefully, is a stress-inducing event at a microscopic level. It causes some degree of microfracture development. These microfractures can easily go unseen and do worsen over time (sometimes many years) until a failure occurs. In the field of Fracture Mechanics, this phenomenon is called a sudden and rapid crack propagation. (Meaning: It breaks!)

Cracks, even at the microscopic level, are inherently unstable. They worsen with time, temperature fluctuation, and repeated stress. Once your glass reaches its cyclic fatigue limit, even the smallest stress can cause a catastrophic failure. This explains a familiar scenario to brewers who have seen the bottoms of their carboy fall out under the weight of a full load or the top of the carboy break off unexpectedly-often just by being picked up or moved. Examples of this have been documented *extensively* in homebrew forums and online communities. (Google "my carboy broke for no reason" for many examples.) Cyclic fatigue can affect the carboy anywhere in the structure of the glass body, not just the bottom where the carboy is constantly in contact with the ground. It can happen anywhere in the material especially in the location of a stress riser, such as a scratch, inclusion (void or air bubble in glass), or where microfractures develop.

With repeated use comes repeated stress, and with this comes structural decline throughout the body of the carboy. By protecting your carboy from the most common source of cyclic fatigue-repeated impact to the bottom of the carboy as it is set down-the Carboy Bumper extends the life of your carboy and reduces the chance of a catastrophic carboy failure due to fatigue and hard landings.

So why have you not seen this in your carboy?

Carboys can take a lot of abuse. With very careful handling and a little luck, a quality glass carboy with no manufacturing defects should a very long time. (That said, a regular careful inspection of your carboy is never a bad idea. You might be surprised by what you find.)

But quality is on the decline across the carboy industry. Accidents do happen. And cyclic fatigue is a very real problem. An unprotected carboy is only one common mishap away from disaster. A protected carboy stands a much better chance of surviving accidents and avoiding the gradual structural decline that leads to unexpected failure.

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no liability for damages or accidents that may occur with its use.

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