

# What's wrong with water barrels?

By Maura Paternoster



When you mention water barrels within earshot of tent safety experts or insurance representatives, they noticeably cringe. Why is that? For the insurance folks, it's about liability. If a tent manufacturer's instructions don't include water barrels as an option for anchoring a tent, and a water-barreled tent comes down, there is no question that the rental store is liable.

Historically, tent manufacturers have instructed customers to stake tents into the ground to anchor them. Instructions specified the number and size of stakes to use, and the stakes themselves may have been included when the tent was purchased. Recently, however, some manufacturers have begun indicating required holding power for their tents in terms of weight. Since water is essentially weight, doesn't that mean water barrels are adequate for anchoring tents? For tent safety experts, it's a matter of mathematics.

Experts recommend installing tents so that the holding power is 1 ½ to 2 times the forces imposed on the tent. In 45 mile-per-hour wind – much less than that produced during a severe thunderstorm – a tent withstands about nine pounds of force per square foot of area. For a 20-foot by 20-foot frame tent, that's 400 square feet and 3600 pounds of force, so the minimum holding power needed is 5400 pounds.

A gallon of water weighs 8.34 pounds, so a plastic 55-gallon barrel full of water weighs approximately 480 pounds, including the barrel itself. So, how many barrels would it take to achieve a holding power of 5400 pounds – 11, right? Nope.

As a fairly smooth material, plastic's friction coefficient is only .4, so the effective weight of a full water barrel is only 40 percent of its actual weight, or 192 pounds. The number of barrels needed for our example tent increases to 28, but we're not done yet.

When tents are staked, the guy lines are attached close to the ground. When they're attached at a height of three feet, as with water barrels, the anchors lose about a third of their holding power. You need a third more barrels to secure the tent, or a total of 37 in our example.

Sure, water barrels are adequate for securing tents, if you're willing to use enough of them. But if you must use weight instead of stakes, consider concrete – a block the same size as a water barrel weighs 3600 pounds and has double the friction coefficient of plastic.

© 2008 Reprinted from *ARA Event Pros*, September 2008, page 4

For more information on this or other safety measures for your rental operation, call Maura Paternoster, ARA Insurance Services at 800/821-6580.

