

Hand Sanitizer Compounding: A Photo Essay

by Dave Grinder, RPh, MS



Above: Badger State Ethanol in Monroe, WI was contacted on March 18, 2020 to see if they could provide ethanol to us so we could make ethanol-based hand sanitizer. That morning, Badger received a letter from the Alcohol and Tobacco Tax and Trade Bureau allowing them to provide de-natured ethanol, tax free, for the production of hand sanitizer. Badger produces 85 million gallons of ethanol annually. They were excited to help. This is a picture of Stephanie Schmidt, PhD, lead chemist at Badger dropping off the first batch of ethanol.



Above: On March 20, 2020 we quickly went to work calculating quantities of ingredients needed to make bulk hand sanitizer. McKinsey Clark and Kyle Arnoldsson, Pharmacy Residents, quickly begin to perform those calculations.



Left: Once we knew what we needed Badger agreed to provide almost 100 gallons of ethanol. Michelle White, from the DMG warehouse purchased 28 x 5 gallon gasoline jugs from Farm and Fleet in Monroe. Rob Homerding delivered the 28 containers to Badger on Friday morning March 20. In the afternoon, he picked up 5 containers, each with 5 gallons of ethanol denatured with isopropyl alcohol.



Below: We only had enough raw ingredients to make 10 gallons. Those 10 gallons were delivered to the DMG warehouse on March 23. Here is McKinsey and Kyle with our first 5 gallons of sanitizer.



Above: Badger was kind enough to store the remaining ethanol at their plant. Dean Nelson and Shawn Uschan from Supply Chain found 4 gallons of hydrogen peroxide and 60 pounds of glycerin that would be needed to produce the remaining sanitizers. That's a lot of glycerin!

Above: On Tuesday March 24 Rob picked up the remaining ethanol from Badger and we went into full production mode. Fortunately, we had an old hospital building with very few people in it. We used it as the factory to make sanitizer. Our first attempt including measuring quantities but that proved very time consuming.



Left: We realized that this project was going to take a long time. Using specific gravities of ethanol and isopropyl alcohol we decided to weigh 15 liters of the denatured alcohol rather than measure this quantity in a 1-liter graduated cylinder. The scale and a 5% allowance for variation worked just fine. Laura Segnar, Pharmacy Technician, used her experience on her families dairy farm to pour product.

Above: Fuel grade ethanol has an odor that isn't anything like a fine vodka. We needed a large amount of essential oils to make the product more approachable. As luck would have it, Anna Taylor and Cyndi Aurland from our Emergency Department sell essential oils and supplied us with over 200 mLs of oils.

Right: By the end of the day on Tuesday, March 24 we had made an additional 88 gallons of sanitizer. Eighty gallons were distributed to the DMG warehouse on March 25 and 26.

