

HAND SANITIZER FORMULA AND PRODUCTION PROCEDURE

For a 10 liter batch (formula modified from World Health Organization recipe:

- Ethyl alcohol, 200 proof: 7500 ml
- 3% hydrogen peroxide: 417 ml
- Glycerol (90%): 1000 ml
- Sterile water: q.s. to 10,000 ml

Supplies:

- Graduated cylinders (glass): 1 liter and 100 ml sizes
- 5 gallon polypropylene drum with dispenser spigot
- 2.5 or 5 gallon polypropylene drums
- Clean plastic bin or other container (for caps)
- Access to compressed air or non-flammable inert gas
- Empty Purell dispenser containers
- Alcohol hydrometer (Fisher Scientific, Cat. # 11-590, \$81.90)

Safety, personal protective equipment, engineering controls:

- Disposable nitrile gloves or other gloves resistant to ethyl alcohol
- Safety glasses
- Lab coat or chemical apron
- Chemical fume hood or well-ventilated work area
- Control sources of ignition
- Keep spill response material available

Procedure:

1. Wearing gloves, remove Purell container collar and cap; a channel lock wrench may be needed to loosen some caps; reserve in a clean container
2. Inflate Purell container to original size with compressed air or nitrogen gas.
3. Wearing PPE, sanitize glassware and drums with ethanol.
4. Wearing PPE and working inside a chemical fume hood, add ingredients according to the recipe into the 5 gallon drum in the following order: ethyl alcohol, hydrogen peroxide, glycerol, water (the water will help rinse glycerol left previously in the graduated cylinder.
5. Mix drum contents by agitation (15 – 20 vigorous shakes)
6. Dispense ~70 ml of product into 100 ml graduated cylinder.
7. CAREFULLY immerse the alcohol hydrometer (fragile glass). The hydrometer floats in the solution. Read the alcohol concentration scale, 0 – 100% (not the “Proof” scale 1 – 200). Target final concentration of alcohol is 68 – 78%. Add more 200 proof ethyl alcohol if needed to reach target concentration range. Re-measure concentration.
8. Dispense ~ 1 liter of product to each empty Purell container



9. Screw the cap onto the container. Fasten the collar ring in place.
10. Invert each container for a leak test. Re-fasten caps/collars as needed to maintain leak-free condition.
11. Mark container labels with a slash “ / ” each time it is refilled.
12. Rinse all cylinders.
13. Collect unused material for disposal according to hazardous waste procedures

Remove PPE. Wash hands.

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