

# Using Hand Sanitizer as a Fuel for the ESBIT Stove

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## Introduction:

The concept of using **hand sanitizer gel** for fuel is not new. The gel contains 60% alcohol and it should burn when ignited. This experiment was to determine how long it would take to heat 1 cup of water to boiling using 1 tablespoon of gel, and whether it could be an alternative fuel for emergency use.

## Materials used:

ESBIT stove. The ESBIT stove dimensions when folded down are 4in x3 in x 3/4in (10.2cm x 7.6cm x 1.9cm) making it an excellent prospect for an emergency preparedness kit or back pack. Cost: approximately \$3.00 at surplus stores.

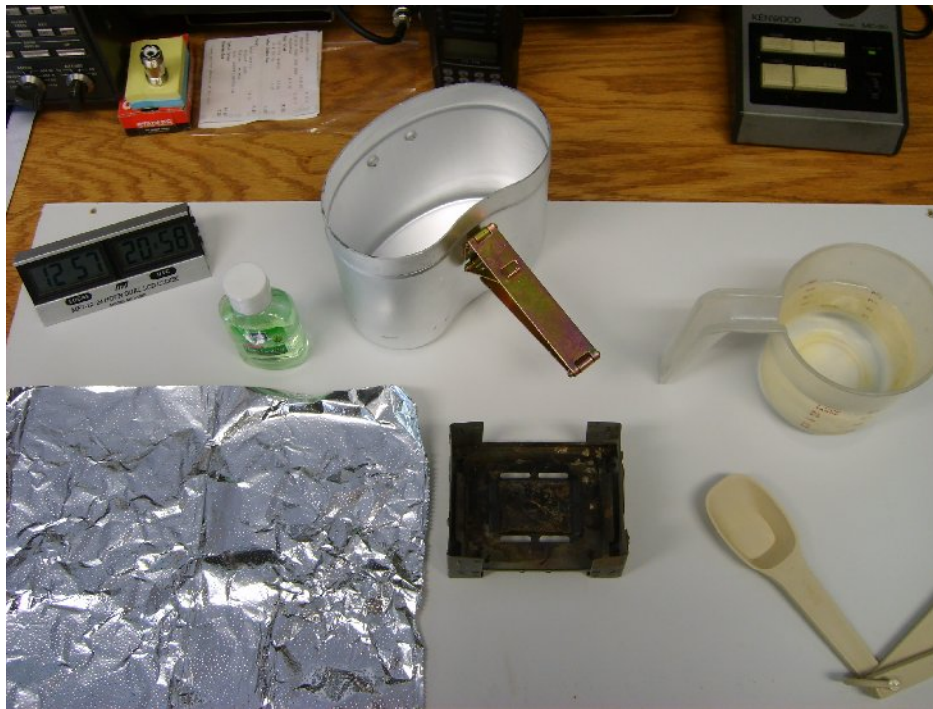
GI style aluminum canteen cup.

2 ounces (4 tablespoons) (29.6 ml) Hand Sanitizer. Cost: \$.99 at a dollar store.

Aluminum foil: 10 in x 9 in (25.4cm x 22.9cm) piece, folded to make a 3 in by 2 in (7.6cm x 5.1 cm) tray to contain the gel and distribute the flame evenly under the cup.

Measuring cup and measuring spoons

Digital clock

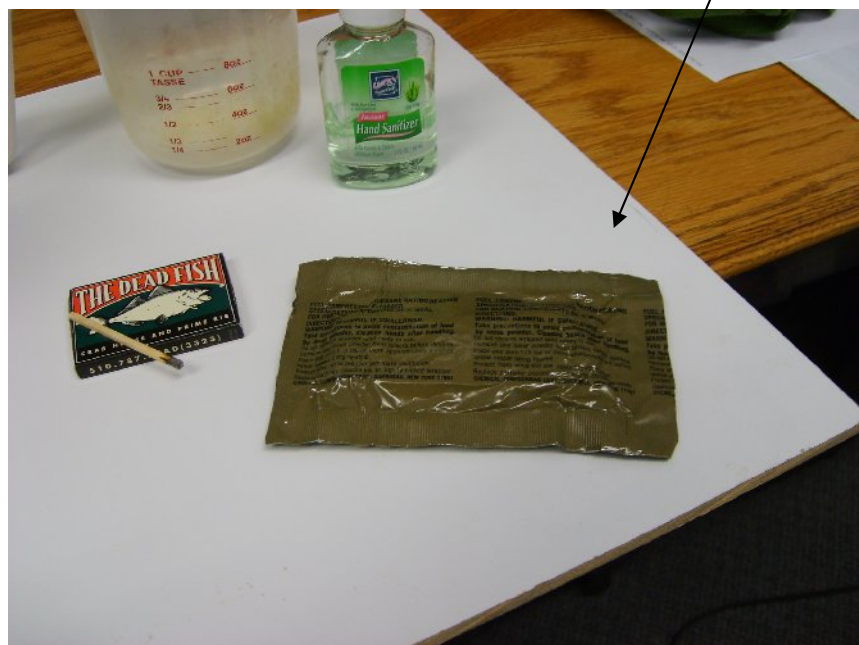


**Materials used in experiment: clockwise: clock, hand sanitizer, canteen cup, measuring cup, tablespoon measure, ESBIT stove, aluminum foil**



ESBIT stove folded. Instructions show use with military issue trioxane heating fuel.

Stove courtesy Greg Lee, HS0ZHM



ESBIT Stove dimensions are 4 in by 3 in by  $\frac{3}{4}$  in. (10.2cm x 7.6cm x 1.9cm)



**1 cup (236.6 ml) room temp water**



**1 tbs (14.8 ml) hand sanitizer gel & foil tray**

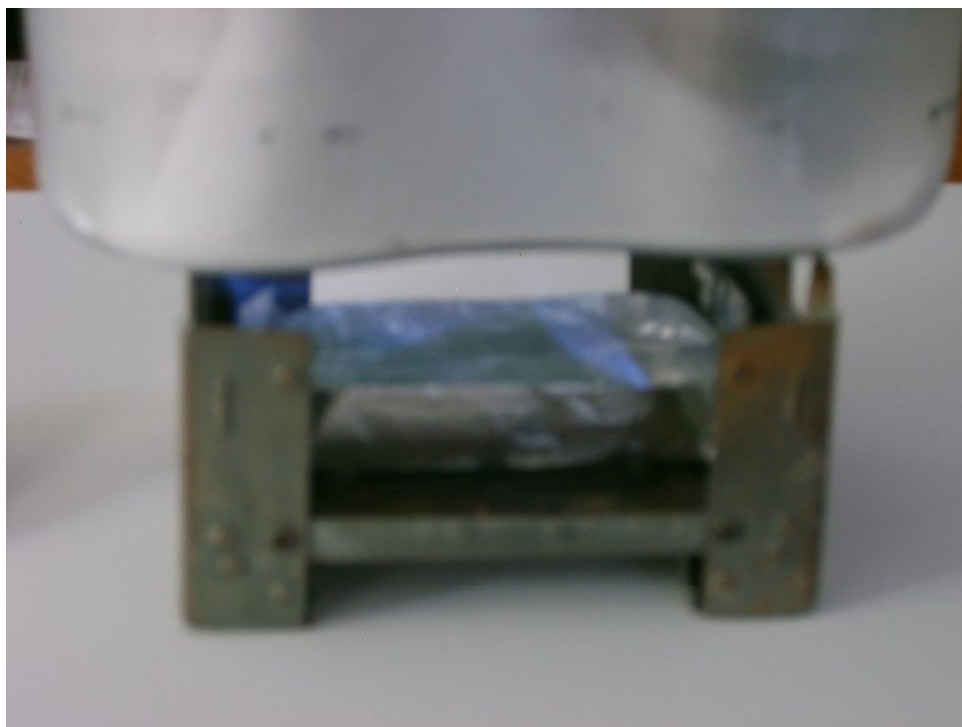


**Tray with gel placed on ESBIT stove**



**Gel ignited and canteen cup of water placed on stove at 1:04 pm**





**Notice clean-burning blue flame. Use a pinch of table salt if a yellow flame is wanted for greater visibility**



**Water begins to boil !**



**Time to boil was just 7 minutes! However the fuel ran out so it was not possible to keep the water boiling after 12 minutes.**



**Residue left in tray was minimal**

## **Conclusion:**

**It is relatively easy to get a cup of water to boiling in approximately seven minutes using a tablespoon of an inexpensive hand sanitizer gel.**

**Pros: Off-brand Hand Sanitizer Gel is very inexpensive and readily available in dollar stores.**

**Cons: The heating ability of hand sanitizer gel is not as great as commercial or military heating tablets or gel therefore larger quantities of gel would be needed.**

**Recommendations: Use approximately 2 to 4 tablespoons (29.4 ml – 59.1 ml) of hand sanitizer gel for prolonged heating ability of a cup of water or soup. Carry several 6 ounce to 8 ounce (177.4 ml to 236.6 ml) bottles of gel in a 72 hour kit.**

## **Summary:**

**We have shown that hand sanitizer gel can be an important emergency fuel for a 72 hour kit. When combined with an ESBIT stove it is a satisfactory alternative fuel, but should not replace heating fuels that are designed for these stoves.**

## **References**

Hand Sanitizer as a Camp Stove Fuel

<http://www.youtube.com/watch?v=CYXxeEwsOmU>

ESBIT Stove

<http://www.youtube.com/watch?v=UePLS0cZ7js>

Using the ESBIT stove

<http://www.youtube.com/watch?v=ooZ33avCZ7g>