

# COLD WEATHER TRAINING

## INFORMATION SHEET ON HANDWARMERS

### CHARCOAL BURNER (Combustion)



- Works by igniting and burning a charcoal stick, which is secured in the insulated case.
- Heat level can be adjusted by lighting one or both ends of the charcoal stick.
- Ash has to be cleaned out after use.
- **Risk of Carbon Monoxide if burned in small/enclosed spaces.**
- **Avoid use in sleeping bags.**
- **Risk of burns/fire if case opens unexpectedly.**
- Last 4-8 hours.
- Costs about \$20, plus fuel supplies.

### LIGHTER FLUID BURNER (Combustion)



- Works by filling with lighter fluid then igniting the metal catalytic wick.
- Inexpensive to refill/reuse.
- Slight odor when burning.
- Catalytic wick needs to be replaced after about 100 uses.
- **Risk of Carbon Monoxide in small, enclosed spaces.**
- **Avoid use in sleeping bags**
- **Must use caution when refilling & lighting (liquid fuel).**
- **Risk of burns if not used with insulating pouch (provided).**
- Lasts 6-12 hours.
- Costs \$15-\$15, plus fuel supplies.

### CHEMICAL HEAT GENERATOR (Oxidation)



- Works when the package is opened air oxygen (air) passes through the pouch's fabric membrane. Air/water causes the iron to oxidize (rust) creating heat. Salt acts as a catalyst to speed up the chemical reaction.
- Most popular style in use today.
- Low cost, but single use. Shelf-life varies with packaging.
- Creates waste/trash, not pack-in/pack-out friendly.
- **Risk of burns if pouch opens unexpectedly (additional oxygen significantly increases reaction rate, increasing heat level).**
- Lasts 6-12 hours, depending on size.
- Costs about \$0.50 each, when bought in bulk.

### CHEMICAL HEAT GENERATOR (Supersaturated Solution)



- The liquid in the pouch is a supersaturated acid salt solution. "clicking" the metal coin stimulates the solution to crystalize and release heat.
- Can be re-used by "melting" crystals in boiling water, then reactivating coin.
- Nothing to refill, no waste.
- Last 30-120 minutes, depending on size.
- Cost is higher than oxidation-types (about \$5.00 each).

### USB-RECHARGEABLE (Electric)



- Radiant electric heat from battery power, USB rechargeable.
- Nothing to refill, no waste.
- Last 1-4, depending on unit.
- Costs range from \$10-\$40.
- New product on the market.
- Many poor ratings about amount of heat.
- Not currently designed/suitable for outdoor cold weather.