

# COOL SHIRT®

*Personal Cooling Systems*



## Industrial Applications Overview

Shafer Enterprises LLC – **COOL SHIRT®**  
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Stockbridge, GA 30281  
800-345-3176  
[www.coolshirt.net](http://www.coolshirt.net)

# SHAFER ENTERPRISES, LLC



**Personal Cooling Systems**

**10 Andrew Drive Suite 200**

**Stockbridge, GA 30237**

**(800) 345-3176 FAX (678) 289-4325**

**[www.coolshirt.net](http://www.coolshirt.net)**

Since 1987, Shafer Enterprises' **COOL SHIRT®** has been the world leader in personal cooling systems. Our mission has been to create innovative products that help people manage body heat in extreme environments. After more than 20 years experience in the medical field and extensive research on cooling the human body, we have developed systems specifically for surgeons, racecar drivers, football players, fire/emergency services/hazmat and industrial applications.

Utilizing NASA study guidelines, our *temperature-controlled* cooling systems utilize ice and water circulated through a variety of cooling garments, including heavy-duty lightweight shirts and reusable/disposable ponchos. **COOL SHIRT®** Systems reduce heat stress, heat fatigue and exhaustion, all while increasing safety, productivity and reducing heat-related illnesses.

Numerous studies have proven that covering 30-40% of the body with 45-55 degrees F cool water is the most effective way to cool the body, relieve heat stress and help maintain a safe core body temperature. Our temperature-controlled systems developed for industry are available in single, dual and multi-user units and can be used ongoing where applicable or as a remote cooling station for pre-cooling and periodic cool downs. The **COOL SHIRT®** staff can design systems using our various cooling garments and cooling units to fit any company's unique cooling situation and needs. All systems can be powered by 110V or 12V battery.

More information on all personal cooling systems can be viewed on-line at:

**[www.COOLSHIRT.net](http://www.COOLSHIRT.net)**

# COOL SHIRT®

*Personal Cooling Systems*

*“We make working safer”*

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800-345-3176

## *Shafer Enterprises LLC – COOL SHIRT®*

- Over 30 years experience in the medical field
- Cooling products developed from NASA Guidelines
- Personal Cooling is our only business - it's *all* we do
- Distributed domestically and internationally in over 20 countries –now in use by the US Army in Iraq and Walt Disney World in Orlando, Florida
- 60,000 square foot manufacturing facility
- Cooling for all facets of industry, surgeons, racecar drivers, football players, firefighters....hundreds of applications





*How does*

**COOL SHIRT**®

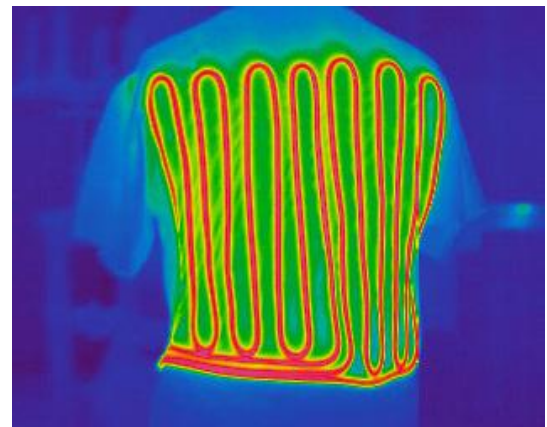
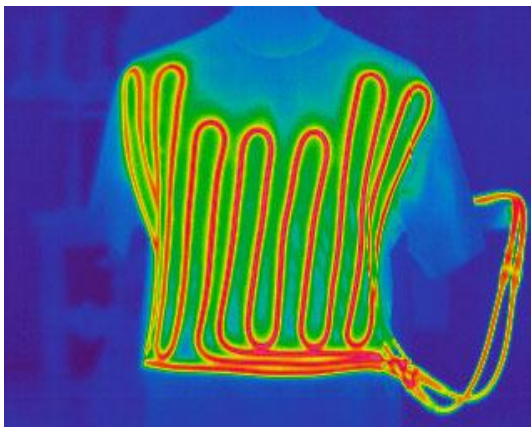
*work?*

- **COOL SHIRT**™ covers 30 to 40% of the skin surface
- 40-50 feet of tubing is stitched onto the front and back
- Temperature-controlled cool water...45 to 60 degrees is circulated through the shirt

*What does* **COOL SHIRT**® *deliver?*

Independent testing has proven that **COOL SHIRT**® provides:

- *Significant* reduction in sweat rate
- *Significant* reduction in dehydration
- *Significant* reduction in cramping attributed to dehydration and electrolyte loss



*Thermal imaging*  
demonstrates the *unsurpassed* cooling power and  
coverage area of **COOL SHIRT**®

# COOL SHIRT® *Independent Study*

## *TEST RESULTS*



An *Independent Study* was conducted at a major university in Sept '04 on the effectiveness of **COOL SHIRT®** for maintaining *core body temperature and accelerating cool-down*.

The subject was a 20 year-old marathon runner, 6' tall, 190 lbs in excellent health.

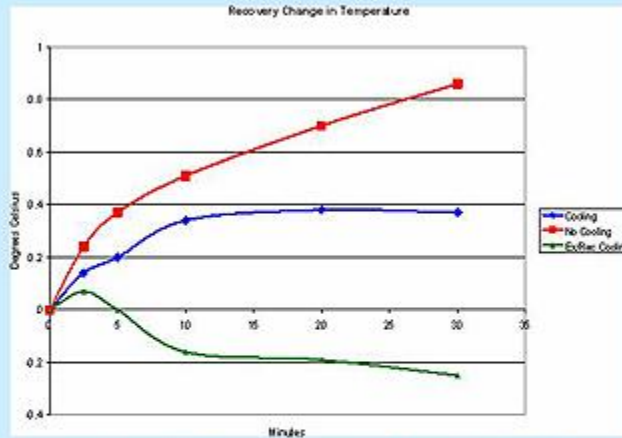
Fully encapsulated in a Tyvek suit and a **COOL SHIRT®**

### *How was the COOL SHIRT™ tested?*

- *Subject ran 6.5 mph on treadmill*
- *14 minutes*
- *30 minutes sitting in a resting position*
- *Room temperature was 86 degrees*
- *Room humidity was 45%*
- *Heat Index  $85 + 15 = 100 = \text{Category 2}$*

*No other cooling method except the COOL SHIRT™*

## CORE TEMPERATURE OBSERVATIONS DURING RECOVERY



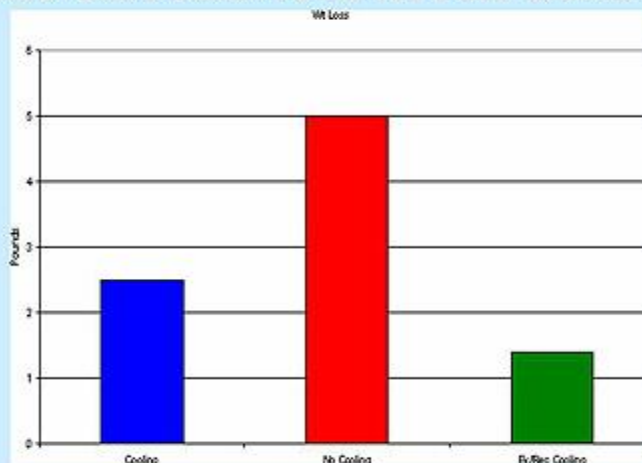
- Subject stopped running and rested 30 minutes

Heat Index = 100

- Used loose fitting XL **COOL SHIRT™**

**Red = No cooling**      **Blue = Cooling once resting**  
**Green = constant cooling, start to finish**

## WEIGHT DIFFERENTIAL AFTER EACH TRIAL



- During the trial with no **COOL SHIRT™** used (*red bar on graph*), weight loss was 5.0 pounds or 2.6%
- **COOL SHIRT™** used *only* while the subject was at rest (*blue bar on graph*), weight loss was 2.5 pounds or 1.3%
- **COOL SHIRT™** used during the treadmill exercise *and* while at rest (*green bar on graph*), weight loss was 1.4 pounds or .7%

*SEVERAL IMPORTANT CONCLUSIONS  
ARE EVIDENT FROM THE TRIAL RESULTS*

*Simply put, the **COOL SHIRT™***

- *Speeds recovery times* significantly for individuals who are experiencing heat stress
- *Reduces the body's need to sweat* during periods of increased physical exertion by helping maintain a cooler, safer core body temperature
- *Reduces weight loss and dehydration* experienced during periods of increased physical exertion by reducing the body's need to sweat

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# COOL SHIRT™ *Personal Cooling Systems for Industry*

Multi-User System with **COOL SHIRT®**



Single Cooling Unit with 110V Adaptor



**COOL BLUE** Cotton Shirt with *no tubing on shoulders*  
(Patent Pending)



Standard Cotton **COOL SHIRT®**



Fire-Retardant **COOL SHIRT®**



*Carbonex*



*FireWear - SS*

Hooded **COOL SHIRT®**



Portable 12V **BAG SYSTEM**



*NEW FOR 2007*



*FireWear® LS*



**Safety Pull-Release Connectors**  
(Patent Pending)

**NEW FOR  
2007**

# **COOL BAG SYSTEM**

**NEW FOR  
2007**

## ***Portable Personal Cooling System***

The COOL SHIRT® **COOL BAG System** adapts a standard COOL SHIRT® to a small soft-side bag for total portability. The system is powered by a 12V battery and comes in two sizes, small and large. The bag is available with a shoulder strap or back-pack straps. Filled with ice and water, an internal pump circulates the cool water through the shirt, keeping the wearer safe, comfortable and cool.

The lightweight cotton COOL SHIRT® has over 50 feet of medical-grade capillary tubing stitched onto the fabric which circulates the cool water. The shirts are machine-washable, very durable and reusable.

This water-tight, lightweight, portable cooling system enables the user to remain completely mobile and cooling can last 2-4 hours. Shafer Enterprises LLC offers a full one-year warranty against defects in material and workmanship on all of our products.

### **COOL BAG SYSTEM**



**COOL SHIRT®**  
*Personal Cooling Systems*



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## Frequently Asked Questions

### *How does the shirt/poncho work?*

- **COOL SHIRT®** contains more than 45 feet of medical grade capillary tubing securely stitched on the front and back of the shirt. The Resposable Poncho is made from material containing a network of channels that the cooled water flows through. They are both connected to a compact cooling unit via insulated hose with quick, dry disconnects. The cooling unit contains ice, water and an internal pump that supplies cool water to the **COOL SHIRT®** as it covers up to 40% of the body.

### *How long will it keep the user cool?*

- It depends on what type of ice is used (block, crushed or cubed). All of the systems will cool for a *longer* period of time if BLOCK ice is used rather than crushed or cubed ice. Using block ice, the systems will cool for about 2-6 hours before requiring more ice.

### *How does the system operate?*

- The system connects to any standard outlet via a UL-approved 110V Adaptor or can be connected to a 12V battery .

### *How do you assemble the system for use?*

- Attach the hoses to the cooling unit and the shirt to the hoses. Be sure the quick, dry disconnect fittings are fully seated by listening for an audible “click”. Add a gallon of water to the cooling unit. Add ice to the top of the cooler. The **COOL SHIRT®** system is now ready for use. The system connects to any standard outlet via a UL-approved 110V Adaptor or to a 12V battery.

### *How do you adjust the temperature of the shirt or poncho?*

- The Temperature Controller is located on the insulated hose near the shirt/poncho. Simply adjust the roller on the controller to control flow and temperature on the shirt/poncho.

### *How can I tell that the shirt is working?*

- The shirt is designed to *cool* the user, not make them *cold*. The system is designed to maintain a *comfortable* temperature. As it is worn, the user can become very comfortable with the shirt or poncho and become unaware of the cooling it is actually providing. If unsure, the easiest way to see that it is working properly is to shut the system off. In less than two minutes, you will have the answer.

### *What are the maintenance requirements?*

#### **COOL SHIRT®:**

- The **COOL SHIRT®** can be hand or machine-washed and hung to quickly drip-dry or can be dried in a dryer using a laundry bag..



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## **Frequently Asked Questions** (CONT.)

### **Cooling Unit and Hoses:**

- **Interior:** Once per month, pour one pint Isopropyl Alcohol (rubbing alcohol) in the cooling unit *with the ice and water while the unit is being used*. This will keep the pump, hoses and shirt lines clear of the buildup that occurs naturally in water-circulation systems. Wipe out cooling unit after each use.
- **Exterior:** When deemed necessary, wipe cooling unit, cart and hoses down with warm soapy water (preferably antibacterial). Maintain the outside of these parts just as you would maintain any other equipment used in your environment.

### ***How long does the cooling last?***

- This depends on the size of users, the number of users connected to the system and the temperature settings. Expect many hours of use before adding ice.

### ***How are the COOL SHIRT® and the Resposable Poncho stored?***

- Hang the shirt or poncho on a large hanger. Coil the insulated hoses and store in the cooling unit or lay flat. Do not hang the hoses as this may damage them.

### ***Is the system electrically safe?***

- Yes. The pump is double-insulated and the UL-approved 110 adaptor prevents electrical overload. See specifications on adaptor.

### ***What is the warranty?***

- All products are guaranteed for one year from the initial date of purchase for defects in material and workmanship. If a product is found to be defective, we will repair or replace it. Products damaged through customer misuse or abuse are not covered by this warranty. If you have any questions, please call Shafer Enterprises Customer Service at (800)345-3176.



# BENEFITS AND FEATURES OF



*Personal Cooling Systems*

## **BENEFITS**

### ***SHIRT AND RESPONSABLE PONCHO***

- **COOL SHIRT®** and the Responsible Poncho keeps users safer, feeling refreshed and more alert by helping maintain a safe core body temperature.
- The heavy-duty yet lightweight **COOL SHIRT®** and Poncho can be worn under uniforms, HazMat suits, coveralls and all other outer wear.
- Ongoing cooling **can last as long as connected to help prevent heat exhaustion.**
- The **COOL SHIRT®** Systems (single user and multi-user) can also be used as remote cooling stations for on-demand cooling as needed. Single units can cool up to two users at once while the Multi-Systems can cool up to 6 users at once. Both make excellent remote cooling stations.
- The user can stand or sit while using the **COOL SHIRT®** or Poncho.

### ***COOLING UNIT***

- The **COOL SHIRT®** Cooling Unit is user friendly ...just add ice and water, connect the shirt/poncho and turn it on.
- Adjustable temperature controller hoses allow users to adjust the shirt/poncho temperature to their personal comfort level
- Quick-release, dry disconnects allow freedom of movement



*Personal Cooling Systems*



## FEATURES

### ***SHIRT AND RESPOSABLE PONCHO***

- Adjustable temperature controls are located on the insulated hose for easy access
- Lightweight durable shirt weighs only 10 ounces when full of water
- Continuous cooling while connected
- Standard hose lengths are 8', 10' and 12'
- Shirts come in many sizes to accommodate all users – S, M, L, XL, XXL, XXXL. Smaller and larger sizes available upon request.
- Ponchos are one-size-fits-all.
- Two vests can connect to one cooling unit with a Y-hose.
- Hooded **COOL SHIRT®** available in a variety of sizes
- Quick-release, dry disconnects allow freedom of movement
- Easy maintenance shirt, just wash occasionally and drip dry. Poncho can be washed or wiped down with a mild soap/disinfectant solution.

### ***COOLING UNIT***

- Complete user instructions are located on the lid for easy reference
- Quality construction that will provide years of trouble-free use
- Single Unit: Triple-insulated cooling unit with sealed lid and convenient handle
- Multi-System: 15 gallon cooling unit with wheels and retractable handle
- Manufactured with UL approved electrical components and motors
- Easy to refill
- Heavy-duty pump and cooling unit for durability and long-life
- Adjustable temperature controller hoses allow users to adjust the shirt/poncho temperature to their personal comfort level



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