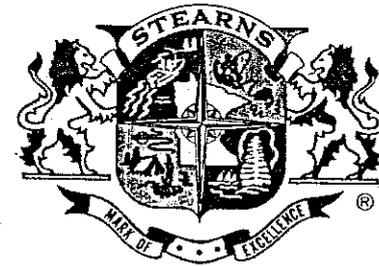


# STEARNS®



## HYPOTHERMIA AND COLD WATER SURVIVAL FACTS

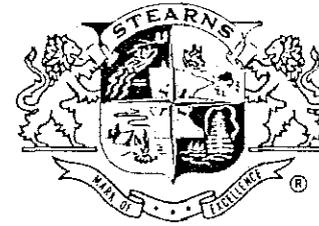


IFS-580 Industrial Flotation Suit



FS-7580 Recreational Flotation Suit

# Time runs out fast in a freezing sea.



## FOREWARD

In water-related activities there is always an element of risk. Falling into even relatively warm water can soon lead to cooling of the body (Immersion Hypothermia), resulting in disorientation, unconsciousness, and ultimately heart failure. Other threats in a survival situation include despair and trauma . . . any of which is harmful and may lead to death depending upon the specific situation.

The scientific studies at the Hypothermia-Cold Water Institute at the University of Minnesota - Duluth School of Medicine, and human subjects immersion tests conducted in the frigid waters of Lake Superior have contributed significantly to our efforts to increase the survival time and raise the level of safety and protection of the mariner against unreasonable risks associated with cold-water immersion.

In a survival situation, your personal water safety relies significantly on your knowledge and ability to meet life-threatening conditions. **There is no substitute for preparedness.** The following information requires your careful consideration, and should improve your chances for survival in cold water.

5 minutes to realize you're missing.  
5 minutes to organize the search.  
5 minutes to pull you to safety.

Every second counts when the water is shocking cold. Flotation gear alone will keep you afloat, but offers minimal protection against hypothermia. *Stearns Rule of 50* illustrates the danger of cold water: "In water of 50°F, you have a 50-50 chance of surviving beyond 50 minutes."

That's why Stearns developed "The Work Suit" (IFS-580). This industrial flotation suit looks and wears like an ordinary work coverall. But it's much, much more.

Core-Guard® design features high-buoyancy PVC to meet U.S. Coast Guard Type V requirements. This closed-cell foam also acts as insulation to help retain the body's core temperature.

"The Work Suit" features a foam lined hood, inflatable head support, Vislon® zippers, plus take-up straps around wrists, thighs and ankles.



Refers to Work Suit coverall — available for use on R/V John Dempsey

## MEANING OF SPECIAL USE APPROVAL

This pamphlet explains the "Special Use Approval" of this PFD by the United States Coast Guard . . . and provides additional information about the performance, protection and safety features afforded by this product which may not be provided by the more conventional PFDs discussed in the accompanying PFD information pamphlet.

1. **Special approvals** are granted by the United States Coast Guard for PFDs which do not meet all the requirements for approval under Types I, II, III and IV . . . but which offer other safety features.

2. **What is meant by "restricted approval" of this Type V PFD?**

This device cannot be donned as quickly as a conventional PFD and, therefore, it must be worn at all times to be accepted as a U.S. Coast Guard approved device.

This PFD provides significant Hypothermia protection as explained in this pamphlet. **For recreational use**, this device may be used to meet the requirements for carrying a Type III PFD. **For use on commercial inspected vessels**, it may be carried only as additional equipment, such as a work vest.

3. **What is the purpose and use of the head support on this Type V Buoyant Suit?**

The head support is designed to increase the amount of freeboard, and to improve the field of vision by placing the head at an angle which enhances the wearer's ability to sight search and rescue craft and floating debris.

It also keeps more of the head (which is a high heat loss area) out of the water.

4. **How do I care for the head support?**

Before each use the head support should be inspected to ensure satisfactory operation in a possible emergency:

- **CHECK THAT IT IS FREE FROM RIPS, TEARS OR PUNCTURES. THE INFLATABLE SHOULD BE CHECKED FOR LEAKAGE.**

To check for leaks, inflate the device until firm and leave overnight. If the device has not lost its shape overnight, it is fine. If it has lost its shape, a leak may be looked for by holding the device under water.

A leaking valve can be easily detected and may be washed or blown clear to work again. A leak in the inflation chamber may be recognized by an increase in bubbles with an increase in pressure on the chamber. Anything more than a mild squeeze is unnecessary.

### • STORAGE

When not in use, the suit should be stored on a coat hanger in an area where it will not be damaged. A cool, dry area is ideal.

Prevent sharp or heavy objects from coming in contact with the suit and head support.

A wet suit should be allowed to dry naturally but not allowed to remain damp for long periods. Do not dry in a dryer or in front of a direct source of heat such as a radiator.

5. **Can I wear an additional conventional PFD with this Type V Buoyant Suit?**

Yes. When this Buoyant Suit is worn with a PFD it is recommended that the conventional PFD be placed over this Type V Buoyant Suit.

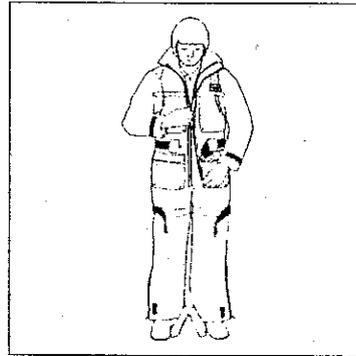
**NOTE: ANY "TURNING MOMENT" WHICH MAY BE PROVIDED BY THE CONVENTIONAL PFD WILL BE DECREASED WHEN WORN WITH THIS TYPE V BUOYANT SUIT.**

# INSTRUCTIONS FOR USE DONNING

It is recommended that all closures be secured as shown before entering the water, where possible, or immediately after immersion to ensure maximum Hypothermia protection.



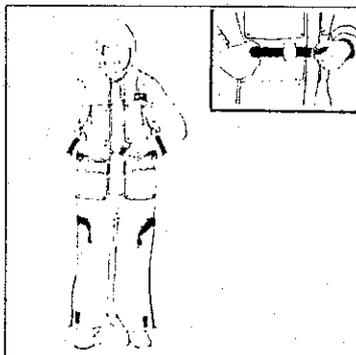
1. Pull on as you would a pair of coveralls.



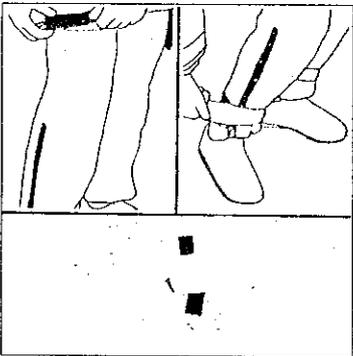
2. Close chest and leg zippers with a slow even pull. Secure velcro storm flap.



3. Pull hood over head. Adjust draw cord to a snug position.



4. Close waist belt and adjust to snug fit.



5. Adjust thigh, wrist and ankle take-ups to a secure fit.



6. Inflate head support after entering water.

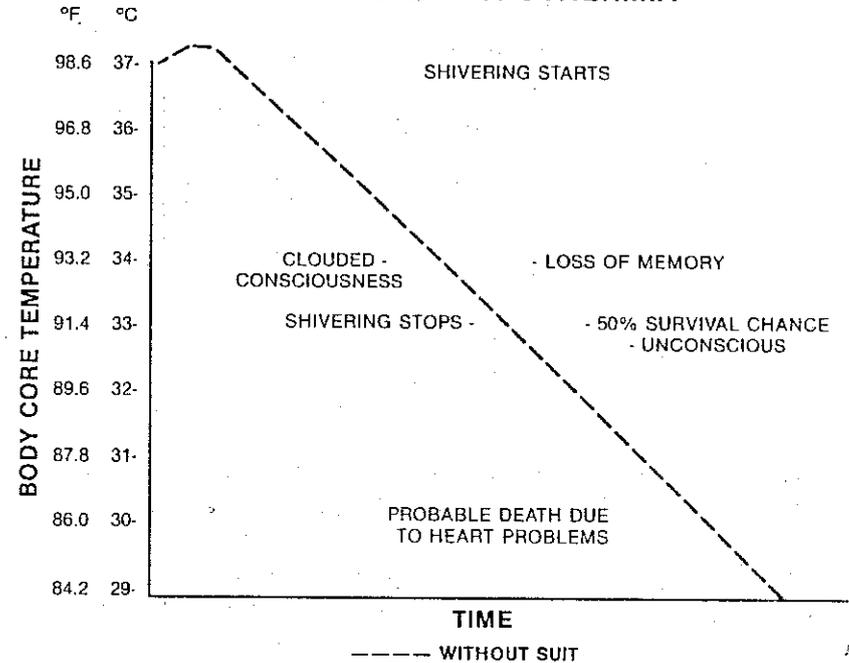
NOTE: ACTUAL DONNING AND IN-WATER TESTING IS RECOMMENDED.

# HYPOTHERMIA

## 1. What is Hypothermia?

It is the lowering of the body-core temperature (heart, brain and other vital internal organs) of approximately 2°C or more (from the normal 37°C). The skin and muscles cool rapidly in cold water, while the temperature of the heart, brain and other vital internal organs generally begin to fall after 15 to 20 minutes. The body attempts to increase heat production by shivering, but the effort yields only a small amount in comparison to the heat loss from the body when exposed to cold water.

## SIGNS OF HYPOTHERMIA



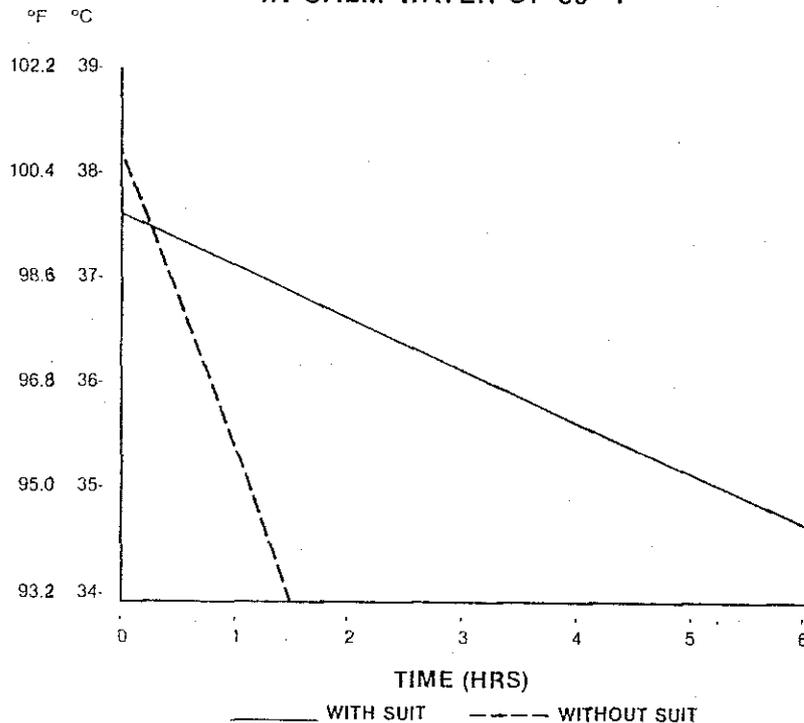
The absence of shivering at a core temperature of approximately 33°C indicates that the body has given up its defenses against the cooling. A state of unconsciousness follows shortly thereafter. Death, as a result of body cooling, may occur when the heart temperature falls below 30°C.

## 2. How long can I survive in cold water while wearing this Buoyant Suit?

Wearing a PFD of any kind will not ensure survival in water, although all types can help. Several other factors will influence the length of time a person can survive in water, including body-type, body-attitude, physical condition, amount of subcutaneous (beneath the skin) body-fat, clothing, temperature of the water and the will to survive. There is no universal rule as to temperature and survival time, as resistance to cold and instinct for self-preservation differ greatly.

However, the predicted survival time for average adult humans immersed in calm water of 50°F (10°C), wearing this Type V Buoyant Suit over light clothing, is about 14 hours; whereas, without the suit the predicted survival time is approximately 3 hours. Times derived from human subjects testing of this type are only approximate.

AVERAGE RECTAL TEMPERATURES  
IN CALM WATER OF 50° F



An individual unexpectedly immersed in cold water without a flotation device or PFD has virtually no chance of conserving or minimizing heat loss. In fact, many individuals, upon capsizing, seem to lose the ability to clamber back on board or to hang onto some craft or object, as there is a progressive decline in muscle strength following immersion in cold water.

An individual with a vest-style PFD can reduce the rapid heat loss by assuming a heat conservation position in the water, depending on the type of PFD being worn (see page 8).

## 3. While awaiting rescue, should I attempt to get out of the water?

Yes. Heat loss to cold air is much less than that to cold water . . . even when the air temperature is much lower than the water. Always try to get out of the water.

## 4. Will I have difficulty climbing out of the water while wearing this Buoyant Suit?

You may. Even an immediate effort to climb aboard a capsized boat, a floating piece of wreckage, or a life raft is difficult because of increased bulk and temporary entrapment of water in the suit. Your extremities are quickly numbed by cold since the body reduces its blood supply to the skin, arms and legs.

You can reduce the difficulty of climbing out of the water by opening the arm and leg closures . . . which will allow much of the entrapped water to escape from the suit.

**REMEMBER: THE MORE OF YOUR BODY YOU CAN GET OUT OF THE WATER THE SLOWER YOUR HEAT LOSS.**

## 5. Will swimming increase my survival time?

No. An average adult in light clothing cannot swim more than approximately 350 feet in water temperatures of 10°C (50°F) before losing consciousness as a result of body cooling. A person wearing a vest-style PFD can survive about 30% longer when completely still in cold water than when moving vigorously or swimming.

## 6. What should I do in the event of accidental immersion?

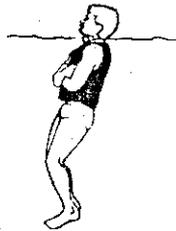
Try to climb back into the boat, on top of an overturned craft or onto any other floating wreckage, since water draws heat from the body as much as 30 times faster than air of the same temperature.

If you are wearing a PFD, stay in place quietly. For maximum heat conservation, press the PFD to your chest, hold both arms against your body, and keep your legs tightly together.

TYPE V BUOYANT  
SUIT POSITION



TYPE III POSITION



## 7. What is the proper treatment of Hypothermia?

Since there is no simple, universal method of treatment, it is not possible to state which method is best. When possible, it is advisable to call a doctor as quickly as possible.

The following section is designed to offer general guidelines for use by the medically inexperienced person who must attempt to rewarm a victim without the benefit of monitoring equipment. **THE TREATMENT OF HYPOTHERMIA IS REWARMING.**

Every victim of Immersion Hypothermia is a candidate for passive rewarming. The following points should be considered in all situations of Immersion Hypothermia.

- If at all possible, lift the victim out of the water horizontally (a person lifted vertically out of the water may suffer sudden heart failure).
- Avoid rough handling (this may open the blood vessels in the skin, sending warmer blood from the body's core to the cooler regions, leading to sudden further drop in temperature).

A cold heart is very sensitive to mechanical disturbances. Rough handling may contribute to heart failure.

### If conscious:

- Gently remove the victim's wet clothing; and,
- If possible, re clothe in dry clothing . . . cover the head and wrap a scarf around the neck; and,
- Encourage movement . . . to stimulate shivering and subsequent generation of heat; and,
- Give warm sweet drinks . . . but under no circumstances is alcohol to be used.
- If the victim is unable to walk, consider wrapping the victim in blankets or a sleeping bag.
- Apply external warm compresses to the head, neck, trunk and groin.

### If unconscious:

- Make certain the victim has an open air passage . . . is breathing . . . and has a pulse.

**BREATHING AND PULSE MAY BE SLOW AND SHALLOW, AND DIFFICULT TO DETECT. TAKE UP TO A FULL MINUTE TO MEASURE THESE VITAL SIGNS.**

- Seek immediate medical assistance.
- **Remember:** Never try to give an unconscious or semi-conscious person anything to swallow.

#### **If Lifeless:**

... don't assume the person is dead just because he is very cold.

One of the human response patterns to immersion in cold water is the oxygen-conserving dive reflex ... an involuntary suspension of respiration. This is triggered by the sudden contact of very cold water with the face. It serves to help protect the brain from severe oxygen deprivation ... and even though the person may not be breathing, the reflex directs oxygenated blood to the trunk of the body, thereby prolonging critical function of the life support organs.

- **CLEAR THE AIR PASSAGE WAYS.**
- **APPLY CPR.**  
Perform artificial ventilation (moving air into and out of the lungs).  
Perform external chest compression.
- **TRANSPORT TO A MEDICAL FACILITY.**

**DON'T GIVE UP!**

## **ALCOHOL**

### **1. Does the use of alcohol contribute to the effects of Hypothermia?**

Yes. It can lead to Hypothermia because it reduces the shiver response ... another source for heat production; and, it alters the thermal regulatory process, reducing the effectiveness of the body's cold stress response mechanisms ... to a point so drastic as to trigger the onset of severe Hypothermia with a thermal stress.

Also, research studies at the Hypothermia-Cold Water Institute indicate that the use of alcohol intensifies disorientation which may cause death.

#### **SPECIAL TIPS:**

1. All PFDs increase survival time because they allow you to float without using energy. Some PFDs help because of the insulation they provide.
2. Life-support equipment must always be in serviceable condition.
3. A PFD with a well-insulating hood and gloves is recommended, as heat loss from the head and hands is substantial.
4. Before abandoning the ship, wear a PFD (properly donned) ... and put on as much warm clothing as possible.
5. If abandoning ship by direct entry into the water:
  - a. Be sure your PFD is secured correctly.
  - b. Use one hand to protect your nose, and the other to hold on to the PFD.
  - c. Keep your feet together, check below for obstructions, and jump feet first.
  - d. Survivors should remain together for distress relief.
6. Always try to get out of the water onto floating wreckage or an overturned boat.
7. Control your breath ... cold water in the face provokes choking and eventual panic.
8. Do not swim unless it improves your situation.
9. When in water: Keep your legs together, and your arms close to the body in order to reduce heat loss.
10. The will to survive is your best weapon. Concentrate always on how to improve the situation.

**NEVER GIVE UP!**

Questions to which this pamphlet may not have responded may be referred to:

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This informative booklet was prepared and printed by Stearns Manufacturing Company, as a service to the boating public in the interest of greater safety in and about the water through a better understanding of the proper use and function of life-support equipment.

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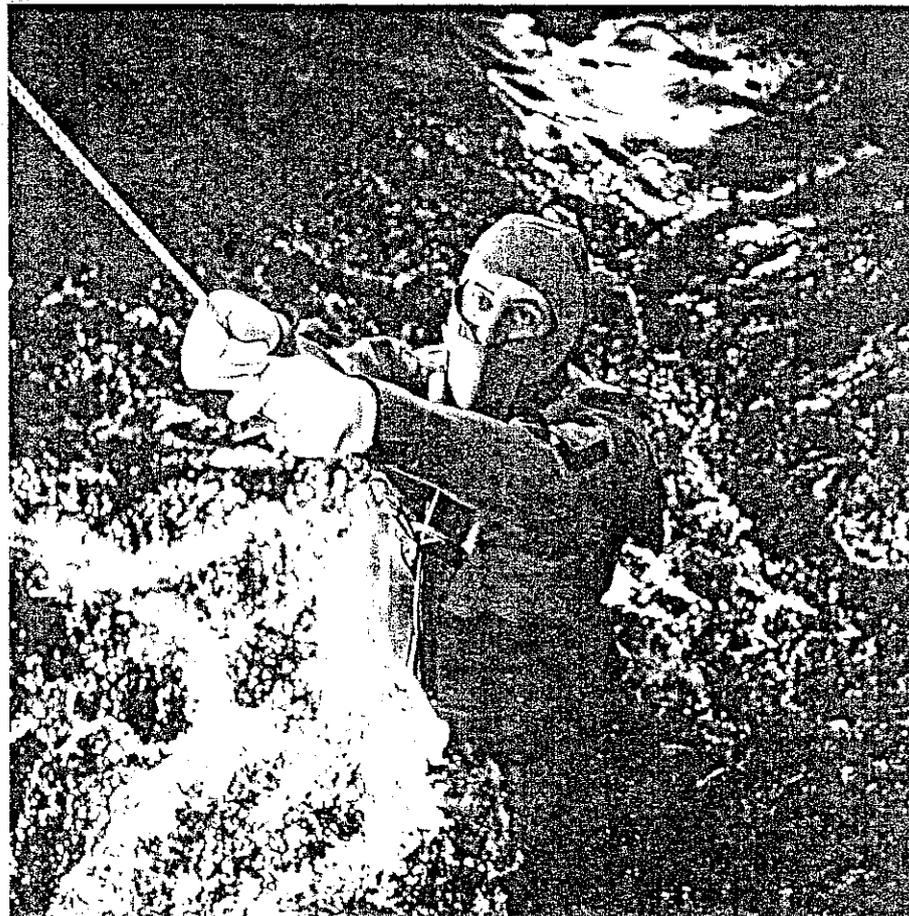


 an Anthony Industries company

FOR MAXIMUM  
HYPOTHERMIA PROTECTION...

Available for use  
on R/V John  
Dempsey

## COLD WATER IMMERSION SUIT



### "COLD WATER IMMERSION SUIT"<sup>™</sup>

ISS-590i

Designed for the most severe offshore conditions. U.S.C.G. and IMO requirements state that a temperature drop of no more than 2°C is to be experienced over a six hour period in 35°F (1.7°C) water. The Stearns ISS-590i worn over normal clothing, easily surpasses those specifications. Tests indicate the ISS-590i Cold Water Immersion Suit provides hypothermia protection for an extended period during cold water immersion.

Features include 100% neoprene construction, face shield that allows 120° unrestricted vision, waterproof zipper, attached full-finger gloves, marine whistle, light pocket, retro-reflective materials front and back. Each suit comes in its own storage bag, color-coded by size. Suits are International Safety Orange.