



U.S. Army Northern Warfare Training Center

Battle Cold and Conquer Mountains
Fort Wainwright, Alaska

Cold Weather Smart Card

The Army's Premier Cold Weather Experts

GTA 20-01-011 (1 FEB 2013)

U.S. Unclassified
For Official Use Only

Beaufort Scale: USE THIS CHART TO APPROXIMATE WIND SPEED

| Wind Speed (mph) | Term | Effects on Land |
|------------------|-----------------|---|
| Under 1 | Calm | Calm; smoke rises vertically. |
| 1-3 | Light Air | Smoke drift indicates wind direction; vanes do not move. |
| 4-7 | Light Breeze | Wind felt on face; leaves rustle; vanes begin to move. |
| 8-12 | Gentle Breeze | Leaves, small twigs in constant motion; light flags extended. |
| 13-18 | Moderate Breeze | Dust, leaves and loose paper raised up; small branches move. |
| 19-24 | Fresh Breeze | Small trees begin to sway. |
| 25-31 | Strong Breeze | Large branches of trees in motion; whistling heard in wires. |
| 32-38 | Moderate Gale | Whole trees in motion; resistance felt in walking against the wind. |
| 39-46 | Fresh Gale | Twigs and small branches broken off trees. |
| 47-54 | Strong Gale | Slight structural damage occurs; slate blown from roofs. |
| 55-63 | Whole Gale | Seldom experienced on land; trees broken; structural damage occurs. |
| 64-72 | Storm | Very rarely experienced on land; usually with widespread damage. |
| 73 or higher | Hurricane Force | Violence and destruction. |

IF USING AN ANEMOMETER, WIND SPEED BASED ON MEASURES AT 33 FEET HEIGHT. IF WIND SPEED MEASURED AT GROUND LEVEL, MULTIPLY BY 1.5 TO OBTAIN WIND SPEED AT 33 FEET AND THEN UTILIZE CHART.



Risk Of Frostbite

| DEGREES IN FAHRENHEIT | WIND SPEED(Use Beaufort Scale) | | | | | | | | | |
|-----------------------|--------------------------------|----|----|----|----|----|----|----|----|----|
| | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| 10 | >120 Minutes or (>2H) | | | | | | | | | |
| 5 | >2H | | | | 42 | 28 | 23 | 20 | 18 | 16 |
| 0 | >2H | | 33 | 23 | 19 | 16 | 14 | 13 | 12 | 11 |
| -5 | >2H | 28 | 20 | 16 | 13 | 12 | 10 | 9 | 8 | 8 |
| -10 | 31 | 19 | 15 | 12 | 10 | 9 | 8 | 7 | 7 | 6 |
| -15 | 22 | 15 | 12 | 9 | 8 | 7 | 6 | 6 | 5 | 5 |
| -20 | 17 | 12 | 9 | 8 | 7 | 6 | 5 | 5 | 4 | 4 |
| -25 | 14 | 10 | 8 | 8 | 6 | 5 | 4 | 4 | 4 | 3 |
| -30 | 12 | 9 | 7 | 6 | 5 | 4 | 4 | 3 | 3 | 3 |
| -35 | 11 | 7 | 6 | 5 | 4 | 4 | 3 | 3 | 3 | 2 |
| -40 | 9 | 7 | 5 | 4 | 4 | 3 | 3 | 2 | 2 | 2 |
| -45 | 8 | 6 | 4 | 4 | 3 | 3 | 2 | 2 | 2 | 2 |

Times represent occurrence of frostbite in the most susceptible 5% of personnel.

GREEN = LITTLE DANGER

(Frostbite occurs in >2 hours in dry, exposed skin)

YELLOW = INCREASED DANGER

(Frostbite could occur in 45 minutes or less in dry, exposed skin)

RED = GREAT DANGER

(Frostbite could occur in 5 minutes or less in dry, exposed skin)

Wet skin significantly decreases the time for frostbite to occur

Chilblain

Non-freezing cold weather injury



Symptoms

- Occurs in cold & wet conditions below 50° F
- Small, red, itchy or painful lesions appear on the skin
- No long lasting effects

Treatment

- Re-warm the affected part using skin to skin contact
- Contact medical personnel for further evaluation

DO NOT

- Rub or massage affected areas
- Place the affected part close to a direct heat source

Superficial Frostbite

Freezing of the upper layers of skin only



Symptoms

- **Lighter skin types:** Skin is white, waxy and pale
- **Darker skin types:** Skin is red, pale or darkened
- Skin is numb
- Skin moves over underlying layers
- Skin is relatively soft and pliable

Treatment

- Re-warm the affected part using skin to skin contact
- Administer ibuprofen
- Contact medical personnel for further evaluation/ evacuation

DO NOT

- Allow the injury to re-freeze
- Rub or massage the affected area
- Place the affected part close to a heat source
- Allow tobacco or alcohol use

Deep Frostbite

Freezing of deep tissue up to and including bone



Symptoms

- Skin is similar in coloration to superficial frostbite
- Tissue is not pliable – remains dented when you apply pressure
- Patient describes 'wooden' feeling
- Skin is pale white and frozen solid in extreme cases
- Blebs (blisters) often form after re-warming

Treatment

- Same as for superficial frostbite
- If re-freezing is a possibility you may elect to leave it frozen
- Protect blebs with dry sterile dressings
- Cover ruptured blebs with antibiotic ointment and sterile dressing
- Contact medical personnel for further evaluation and evacuation

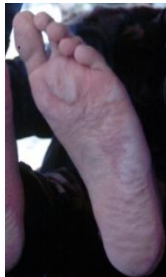
DO NOT

- Rupture or drain blisters (bleb)

Immersion Syndrome

Non-freezing cold weather injury that usually involves the feet

Requires prolonged exposure to cold & wet conditions;
at least 12 hours but usually 4-5 days



Symptoms

- Blood flow is reduced to the extremity by the cold
- Foot is cold to touch, with some swelling, and is white or bluish; may be numb
- When re-warmed there will be increased swelling, red discoloration, and blisters may form accompanied by tingling pain
- Symptoms and increased perspiration of the foot may last several months

Treatment

- Re-warm the affected part by gradually exposing to warm air
- Clean and dry the affected part carefully
- Administer ibuprofen
- Contact medical personnel for further evaluation

DO NOT

- Rub or massage affected areas
- Place the affected part close to a direct heat source
- Use tobacco or alcohol
- Allow walking on the injured foot

Hypothermia

Loss of the body's core temperature

Symptoms

| Mild Hypothermia | Moderate Hypothermia | Severe Hypothermia |
|---|----------------------------|---|
| Core temperature: | Core temperature: | Core temperature: |
| 90-95 F | 80-89 F | Below 80 F |
| Shivering | Uncontrollable shivering | Shivering stops |
| "Umbles": stumbles, fumbles, grumbles and mumbles | Worsening of the "Umbles" | "Umbles" stop |
| Lack of sound judgment, confusion, apathy | Increased confusion | Stupor progressing to unconsciousness |
| Increased heart rate | Increased heart rate | Slowed heart rate (may not be able to find a pulse) |
| Increased respiratory rate | Increased respiratory rate | Slowed breathing |
| Cool and pale skin | Cold and pale skin | Bluing of lips and nails |

Treatment

| Mild and Moderate Hypothermia | Severe Hypothermia |
|---|--|
| Move to warm dry environment | Handle carefully; rough treatment may cause heart to stop |
| Replace damp clothing with dry clothing | Use supplemental O2 or begin rescue breathing if breathing has stopped |
| Add extra insulation under and around casualty | Move to warm dry environment |
| Provide food and warm liquid | Replace damp clothing with dry clothing |
| Exercise | Package in a hypothermia wrap |
| Package moderately hypothermic casualty in a hypothermia wrap | Evacuate using gentlest means available |

Ahkiio Packing List



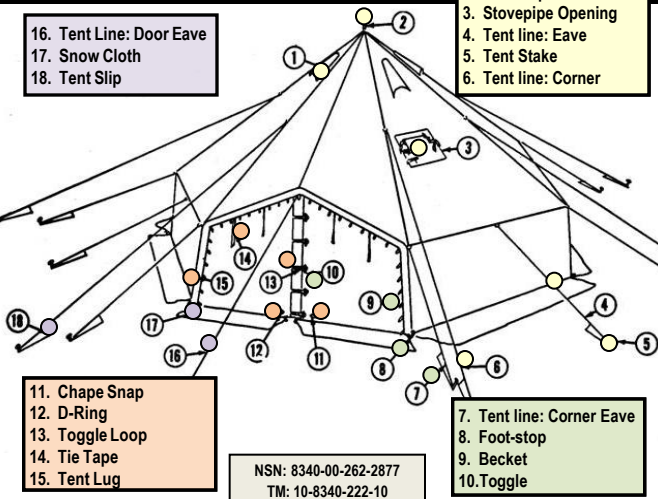
- 1x Scow-Sled, 200 lbs. capacity (ahkiio)
- 1x Tent, Ten-Man Arctic
- 1x Telescoping Pole (center pole)
- 1x Pole Board
- 2x Door Poles (wood or telescopic)
- 13 Tent Pins (stakes)
- 1x Space Heater Arctic w/stove board
- 1x Five Gallon Fuel Can *(not in picture)
- 1x Five Gallon Water Can
- 2x Coal Shovel
- 2x Machetes
- 2x Hammers
- 1x Axe
- 1x Bow Saw
- 1x Fuel Can Stand
- 1x Lantern w/case
- 1x Fire Extinguisher
- 18 2x Cook Sets
- 19 2x Squad Stove w/pump
- 20 2x MSR Fuel Bottle
- 21 4x Harness
- 22 1x 100 Ft Rope
- 23 1x 27 Ft Rope w/carabiners
- 24 3x 9 Ft Rope w/carabiners
- 25 1x Ammo Can (repair Kit)
 - 1x Phillips Screwdriver
 - 1x Flathead Screwdriver
 - 1x Pliers
 - 1x Wire Brush
 - 1x POL Gloves
 - 1x Small Funnel
 - 1x Wrench 1/4 x 5/16
 - 1x Wrench 3/8 x 7/16
 - 1x Wrench 1/2 x 9/16

Recommended Ten-Man Packing List

Ten-Man Arctic Tent

1. Ventilator
2. Telescopic Tent Pole
3. Stovepipe Opening
4. Tent line: Eave
5. Tent Stake
6. Tent line: Corner

16. Tent Line: Door Eave
17. Snow Cloth
18. Tent Slip



11. Chape Snap
12. D-Ring
13. Toggle Loop
14. Tie Tape
15. Tent Lug

NSN: 8340-00-262-2877
TM: 10-8340-222-10

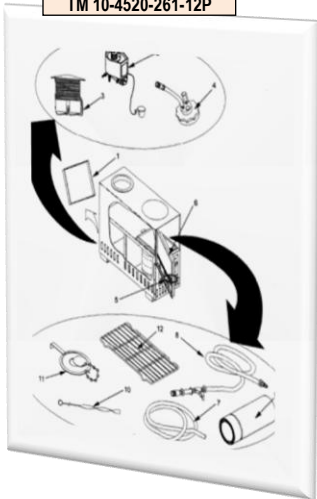
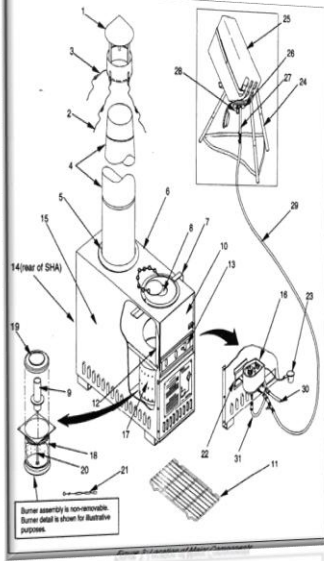
7. Tent line: Corner Eave
8. Foot-stop
9. Becket
10. Toggle

Erect a Ten-Man Arctic Tent

- (1) Remove snow to ground level to the diameter of the tent plus area to extend snow cloth.
- (2) Extend the tent out and position stovepipe opening down wind.
- (3) Zip both door entrances (to include liner) shut.
- (4) Fully extend all corner eave lines (7). Mark spots on the ground approximately six feet, (two steps), from each corner of the tent. Drive tent stakes on the marks.
- (5) Extend the center pole to a length between 6 and 8 feet and lock it in this position. Place the stud at the top of the center pole through the hole in the perforated metal plate at the roof apex. Erect the tent by holding the pole vertically and placing the pole board underneath the base of the telescopic tent pole.
- (6) Attach and tighten the corner eave lines, then the corner lines (6) to the same stake.
- (7) Attach and tighten the four eave lines (4) to a stake.
- (8) Place door poles three feet from tent. Clove hitch door eave (16) line at five feet in height. Attach line to a stake six feet from tent.
- (9) Spread the snow cloth (17) on the ground outside the tent (**DO NOT ANCHOR!**) and open the four ventilators from the inside by pushing them outward.

Space Heater Arctic

NSN 4520-01-444-2375
TM 10-4520-261-12P



Lighting the stove

- (1) Tip fuel can and let stove prime for 2 to 5 minutes.
- (2) Hold the priming cup under priming valve on fuel supply hose. Open the valve slowly and fill the cup with fuel.
- (3) Pour fuel into the bottom of burner. If the outside temperature is below -25°F , pour one additional cup.
- (4) Take one square of tissue or paper and soak up any excess fuel that may remain in the cup.
- (5) Light the fuel soaked tissue and toss it into the bottom of the burner. Use the cleaning tool, if necessary, to make sure that the burning tissue reaches the bottom of the burner where it can ignite the priming fuel. Close the Lid Assembly.
- (6) When the heater has warmed up sufficiently and begins to give off heat, gradually adjust the flow adjustment knob to desired heat output.

***Operators require license to operate SHA**

Weapons: Common Problems and Solutions

Sluggishness:

- CLP thickens in cold conditions and freezes at -35°F
- Utilize LAW (Lubricant Arctic Weapon) to lubricate weapon below zero degrees (NSN 9150-00-292-9689)
- Other options are graphite or fire the weapon dry without any lubricant

Condensation:

- Occurs when weapon is brought from cold into heated shelter and freezes when taken back into the cold (condensation occurs when heated)
- If brought inside, let weapon warm up, then wipe dry or store weapon outside

Fouling from Snow and Ice:

- Utilize muzzle cover or improvise
- Use a de-icer for frozen weapons
- Operate action frequently to break small amounts of ice loose on the bolt

Visibility:

- Weapon fire may cause ice fog; obscures gunner vision and reveals friendly position to enemy
- Change observer position to spot/adjust rounds

Breakage and Malfunctions:

- Extreme cold increases the chance of metal/plastic component failure
- Slow/adjust firing rates to allow the weapon to warm gradually

Emplacement Issues:

- Deep snow and frozen ground may prevent normal use of bipods and tripods
- Adjust to establish stable firing position (snow shoes or ahkio can be used)
- Frozen ground can add additional shock and stress to the weapon

Reduced Velocity and Range of Projectiles:

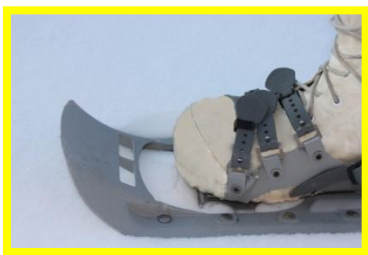
- As temperature drops so does muzzle velocity and the range of projectiles
 - Internal Ballistics
 - External Ballistics
 - Terminal Ballistics
- Weapons data should be collected and logged at different temperatures
- Re-zero when feasible for extreme temperature changes

Snowshoe, Assault, Military with 8" Tail

NSN 8465-01-558-9958



Center VB boot on snowshoe.



Front of VB boot about $\frac{1}{4}$ into the window.
Tighten toe straps, (do not restrict circulation) from front to back.



Heel strap goes above lug on VB boot,
buckle to outside.

Extended Cold Weather Clothing System Overview

- **Base Layer** – also known as *inner or wicking layer*, the base layer(s) are designed to wick excess moisture away from your body
- **Insulation Layer** – intermediate layer(s) that provides volume to enable you to trap warm air between your body and outer garments
- **Outer Shell Layer** – external layer that protects you from the elements providing protection from wind and moisture

Clothing Guidelines

- C- Keep it Clean
- O- Avoid Overheating
- L- Wear clothes Loose and Layered
- D- Keep clothing Dry

Movement TTPs

- Start movements comfortably cool (dress down prior to movement)
- Adjust movement rate to prevent profuse sweating
- Take a brief halt, 10-15 minutes after movement begins to adjust clothing
- Keep clothing upgrade items easily accessible – adjust on the move
- Carry a minimum of 2 quarts of water (close to body)
- Drink and eat on the move (more calories are burned in cold weather)
- Take a brief 5-10 minute halt every hour; long halts lead to injury
- When exposed during vehicle movements, cover all exposed skin and wear **double pane** goggles

Generation III ECWCS Level 1: Base Layer



- Lightweight Cold Weather Undershirt and Drawers
- Long sleeve top and full-length bottom constructed from silk weight moisture wicking polyester
- Material aids in movement of moisture from the skin to the outer layers

Generation III ECWCS Level 2: Base/ Insulation Layer



- Mid-Weight Cold Weather Shirt and Drawers
- Long sleeve top and full-length bottom garments constructed out of polyester 'grid' fleece
- Grid fleece provides an increase of surface area for transportation of moisture away from the wearer during movement
- Can be worn next to skin or over Level 1 for additional insulation

Generation III ECWCS Level 3: Insulation Layer



- Fleece Jacket is the primary insulation layer for use in moderate to cold climates
- Thermal Pro, animal fur mimicking insulation provides an increase in warmth to weight ratio along with a reduction in volume when packed
- Level 3 Fleece is not an outer layer

Generation III ECWCS Level 4: Outer Shell



- Wind Cold Weather Jacket is made of a lightweight, wind resistant and water repellant material
- Acts as a minimum outer shell layer, improving the performance of moisture wicking layers when combined with Body Armor and/or the ACU

Generation III ECWCS Level 5: Outer Shell



- Soft Shell Cold Weather Jacket and Trousers
- Made of a water and wind resistant material that increases moisture vapor transfer
- Increased breathability improves performance of insulation layers by decreasing saturation due to moisture vapor accumulation
- Provides a reduction in weight, bulk and noise signature during movement
- Designed for cold/ dry climate

Generation III ECWCS Level 6: Outer Shell




- Extreme Cold/ Wet Weather Jacket and Trousers
- A waterproof layer for use in prolonged or hard rain and cold/ wet conditions
- Designed for cold/ wet climate

Generation III ECWCS Level 7: Outer Shell



- Extreme Cold Weather Parka and Trousers
- Provides superior warmth with low weight and low volume
- Water and wind resistant, provides moderate wind and moisture protection
- Sized to fit over body armor
- For extreme cold weather climates; the outer most layer of protection
- Meant for static positions or halts in movement

Modular Sleep System (MSS)

- 
- The complete MSS system weighs about 7 pounds and includes:
 - Patrol Bag rated (50° F to 30° F)
 - Intermediate Bag rated (30° F to -10° F)
 - Vapor Permeable GORE-TEX® Bivouac Cover
 - Combined system provides protection for 4 hours of sleep (-10° F to -40° F)
 - The newer ACU style is rated to -45° F
 - Soldier sleeps in level 1 base layer

Gloves



Glove Inserts

- Not a stand-alone item; to be worn inside of a glove or mitten shell
- When sizing glove shell, ensure the gloves fit comfortably while wearing insert and do not restrict circulation



Glove Shell; effective to 14° F

- Every Soldier reacts differently in the cold and may need to change gloves at varying temperatures



POL Handling Glove

- Only glove authorized for wear when handling fuel products



Trigger Finger Mittens; effective to -20° F

- Can be worn with either type of insert
- Some Soldiers need to wear shells only during physical activity to prevent over sweating



Arctic Mittens; effective to -60° F

- Can be worn with either type of insert
- Gloves must be stored under Gen III shell to keep warm and prevent accumulation of snow inside the mitten
- Do not wear with Trigger Finger Mittens

Visit the NWTC website for information on gloves not recommended for cold weather operations

Camouflage



- Approximately waist high vegetation
- Soldier incorporates over-white Kevlar cover, top and gloves



- Used for trails or road systems
- Soldier wears over-white bottoms, with standard top and helmet cover

- For open fields or above tree line
- Soldier wears entire over-white system



CAUTION!

Do not use camouflage paint in cold weather; conceals warning signs of cold weather injuries



CONTACT US AT:



Northern Warfare Training Center

1063 Apple St.

Fort Wainwright, Alaska 99703

(907) 873-4098 Black Rapids

(907) 353-1304 Fort Wainwright

<http://www.wainwright.army.mil/nwtc>

<https://www.facebook.com/USANWTC/fref=ts>

The Army's Premier Cold Weather Experts