USER INSTRUCTIONS AND INFORMATION FOR

ARBORMASTER® LOW STRETCH KERNMANTLE ROPE

ArborMaster® ropes meet or exceed European Standard EN 1891:1998 Personal Protective Equipment for the Prevention of Falls From a Height — Low Stretch Kernmantle Ropes. ArborMaster® ropes are intended for work associated with tree pruning, trimming, climbing, and other arborist related work.

IMPORTANT POINTS TO FOLLOW WHEN USING ARBORMASTER®

- Refer to EN 892 should the risk for free fall arise *(i.e., free climbing, line rescue, etc.)*
- The use of ArborMaster® as a component of a fall arrest system or other PPE voids the conformity to EN 1891:1998.
- Samson recommends that if this product is used in conjunction with other components that they and the "system" be CE approved.
- Misuse of this product or use with incorrect hardware may cause serious injury.
- ArborMaster® should be used only by qualified personnel and by those who do not have a medical condition that could affect the safety of the user.
- ArborMaster® should be inspected after and prior to each use.
- In case of fall, rope should be replaced.
- When in doubt of condition, the rope should be replaced
- Rope should be inspected periodically, according to usage, by a competent person authorized by the manufacturer. At minimum, the rope should be inspected every 12 months. This inspection should also include the legibility of all product markings.
- Read all accompanying information provided by the manufacturer.
- Rope cut to shorter lengths must be remarked as on the original rope.
- Before and during use, consideration should be given as to how any rescue could be performed safely and efficiently.
- It is essential for the safety of the user that if the product is resold outside the original country of destination, the reseller shall provide instructions for use, for maintenance, and for periodic examination in the language of the country in which the product is to be used.

ARBORMASTER® PHYSICAL PROPERTIES	
Actual diameter	12.9 mm
Sheath slippage	0%
Elongation	2.5%
Mass of sheath	77.1%
Mass of core	22.9%
Total Mass per Unit Length	110 g/m
Minimum static strength without terminations	32.4 kN
Static strength with terminations	15 kN over 3 min
Shrinkage	.5%
Type	A
Materials of construction	Polyester, nylon, polypropylene
Standard	EN 1891:1998

Records must be kept that detail each use and the results of the inspections. Samson recommends that the records be maintained by the same person who uses the rope.

The record should contain the following information:

- Trademark (ArborMaster®)
- Type of product (low stretch kernmantle rope)
- Serial batch number
- Year of manufacturing
- Compatibility
- Purchase date
- Date of first use
- History of product inspections and/or repairs, including the details of the inspection/repair, name and signature of the person who performed the inspection/repair, and the due date for the next inspection
- User name
- Comments

TERMINATING

ArborMaster® should be terminated using a "figure 8" knot.

The system should incorporate an anchor point that has a minimum strength of 15kN. The anchor point should be located above the user and any slack between the anchor point and the user should be avoided.

MARKINGS

CE	Indicates rope conforms to PPE European Directive
0082	Indicates notified body that is in charge of PPE control
A13	Indicates rope type and its diameter (Type A, 13 mm)
ArborMaster®	Brand name assigned to product by manufacturer
Date Section 2009 2010 2011 01 02 03 04 05 06 07 08 09 10 11 12 1 2 3 4	Indicates batch number—appropriate numbers will be punched. For example, the shown batch number would be 2011011

Notified body that performed EC type examination:
CETE APAVE SUDEUROPE
B.P. 193 • 3322 Marseille • Cedex 16 France • 0082

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STANDARDS FOR STRENGTH AND USAGE

WORKING LOADS

The safe working load (SWL) is the maximum static load the rope is designed to sustain during normal use. WARNING: This product is a low-stretch rope and not a dynamic or climbing rope. It is therefore necessary to avoid slack between the anchor and the load. Any rope that has sustained a shock load should be immediately retired (see page 3).

DANGER TO PERSONNEL

Persons should be warned against the serious danger of standing in line with a rope under tension. Should the rope part, it may recoil with considerable force. In all cases where any such risks are present, or where there is any question about the load involved or the condition of use, the working load should be substantially reduced and the rope properly inspected before every use.

ROPE INSPECTION

Do not use rope showing signs of aging and wear as described herein. If in doubt, destroy the used rope. No type of visual inspection can be guaranteed to accurately and precisely determine the actual residual strength. When the fibers show wear in any given area, the rope should be replaced. For more details, see the Retirement section on page 3.

AVOID ALL ABRASIVE CONDITIONS

All rope will be severely damaged if subjected to rough surfaces or sharp edges. Carabiners, descenders, pulleys and other rope contact surfaces must be kept in good condition and free of burrs, corrosion and rust. Pulleys must be free to rotate and should be of proper size to avoid excessive wear. Avoid any sharp or rough edges that the rope may come into contact with.

AVOID CHEMICAL EXPOSURE

Rope is subject to damage by chemicals, especially solvents, acids and alkalis. Any rope that has been exposed to solvents, acids, or alkalis (either fumes or actual contact) should be immediately retired.

AVOID OVERHEATING

Heat can seriously affect the strength of synthetic ropes. The temperatures at which 50% strength loss can occur are: Nylon 350° F, Polyester 350° F. When using rope where the temperature exceeds these levels (or if it is too hot to hold), consult the manufacturer for recommendations as to the size and type of rope for the proposed continuous heat exposure conditions. When using ropes with rappel/belay devices or other friction hardware, care should be exercised to keep the rate of rope slippage within the hardware manufacturer's recommendations. The friction from the slippage can cause localized overheating which can melt or fuse synthetic fibers, reducing durability and tensile strength.

STORAGE

All rope should be stored in an area that is cool, clean, dry, out of direct sunlight, well-ventilated, and away from any heat sources. Never store ropes on a concrete or dirt floor, and under no circumstances should rope or cordage be stored near acid or alkalis.
The use of rope for any purpose subjects it to friction, bending and tension. All rope hardware, pulleys, rollers, descenders, carabiners, as well as knots are, in varying degrees, damaging to the rope. It is important to understand that rope is a moving, working, strength member and even under the most ideal conditions will lose strength during use in any application. Maximizing the safety of rope performance is directly related to how strength loss is managed and making sure ropes are retired from service before they can create a dangerous situation. Ropes are serious working tools and used properly will give consistent and reliable service. The cost of replacing a rope is extremely small when compared to the physical damage or personnel injury a worn out rope can cause. When transporting, the same care should be taken.

ROPE LIFE FACTORS

There are basically three steps to consider in providing the longest possible service life, the best conditions and long range economy for ropes: **Selection, Usage, and Retirement.**

SELECTION
Select the right rope for the job in the first place.

Selecting a rope involves evaluating a combination of factors. Some of these factors are straightforward like comparing rope specifications. Others are less qualitative like a preference for a specific color or how a rope feels in your hand. Cutting corners, reducing application factors, sizes or strengths on an initial purchase creates unnecessary replacements, potentially dangerous conditions and increases long term costs. Fiber and construction being equal, a larger rope will outlast a smaller rope because of the greater surface wear distribution. By the same token, a stronger rope will outlast a weaker one because it will be used at a lower percentage of its break strength with less chance of over stressing.

STRENGTH

When given a choice between ropes, select the appropriate size for a given application. A load of 200 pounds represents 2% of the strength of a rope with a breaking strength of 10,000 pounds. The same load represents 4% of the strength of a rope that has a breaking strength of 5,000 pounds. The weaker rope experiences greater strain and as a result will have to be retired sooner.

FIRMNESS

Select ropes that are firm and round and hold their shape during use. Soft or mushy ropes will snag easily and abrade quickly causing accelerated strength loss. A loose or mushy rope will almost always have higher break strengths than a similar rope that is firm and holds its shape because the fibers are in a straighter line which improves strength but compromises durability.

ROPE INSPECTION AND RETIREMENT

USAGE
Use rope properly; do not abuse or shock load it, observe recommended usage factors for bending and work loads. Keep ropes clean and eliminate abrasion contacts.

SYSTEM COMPATIBILITY

The performance of rope hardware (belay/rappel devices, rope grabs, pulleys…) may be adversely affected by rope construction, condition, diameter, age, and other factors. It is your responsibility to check before using it at height and that this rope is compatible with the other components of your equipment and their standards. In particular, you have to check that the rope hardware is suitable for the diameter of rope being used. Please refer to EN 353-2.

BENDING

Any sharp bend in a rope under load decreases its strength substantially and may cause premature damage and failure. Such sharp bends can occur in knots and hitches or when the rope is run through a carabiner, pulley, or other hardware. To retain maximum rope strength, the bend radius should be at least 8 times the rope diameter. In actual use, however, it is difficult to maintain such a high bend radius because any knot in the rope will produce a smaller bend radius and thus weaken the rope. The strength loss is a result of the tight bends that occur in the knot. With some knots, ropes can lose up to 50% of their strength. It is vital that the reduction in strength by the use of knots, carabiners, pulleys, and other hardware be taken into account when determining the size and strength of a rope to be used in an application. Note that bends produced by most pulleys or carabiners can also reduce rope strength, but not as much as a knot.

SHOCK LOADS

Shock loads are simply a sudden change in tension from a state of relaxation or low load to one of high load. Any sudden load that exceeds the work load (SWL) by more than 10% is considered a shock load. The further an object falls, the greater the impact. Synthetic fibers have a memory and retain the effects of being overloaded or shock loaded and can fail at a later time even though loaded within the work load range. Any rope that has sustained a shock load should be immediately retired.

WET CONDITIONS

Rope can lose up to 15% of its strength when wet and is more susceptible to abrasion. This must be taken into account when using rope in wet conditions.

RETIREMENT
Inspecting your rope should be a continuous process of observation before, during and after each use.

In synthetic fiber ropes the amount of strength loss due to abrasion and/or flexing is directly related to the amount of broken fiber in the rope's cross section. After each use, look and feel along every inch of the rope length inspecting for damage as listed below. Caution: dirt on your rope can conceal damaged areas; it is a good idea to clean excess dirt off the rope prior to inspection.

ABRASION

When the rope is first put into service the outer filaments of the rope will quickly fuzz up. This is the result of these filaments breaking and this roughened surface actually forms a protective cushion and shield for the fibers underneath. This condition should stabilize, not progress. If the surface roughness increases, excessive abrasion is taking place and strength is being lost. As a general rule for braided ropes, when there is 25% or more wear from abrasion the rope should be retired from service. In other words, if 25% or more of the fiber is broken or worn away the rope should be removed from service.

GLOSSY OR GLAZED AREAS

Glossy or glazed areas are signs of heat damage with more strength loss than the amount of melted fiber indicates. Fibers adjacent to the melted areas are probably damaged from excessive heat even though they appear normal. It is reasonable to assume that the melted fiber has damaged an equal amount of adjacent unmelted fiber.

INCONSISTENT DIAMETER

Inspect for flat areas, bumps or lumps or areas that are otherwise different in texture, size, or feel from the majority of the rope's surface. This can indicate core or internal damage from overloading or shock loads and is usually sufficient reason to replace the rope.

DISCOLORATION

With use, all ropes get dirty. Be on the lookout for areas of discoloration which could be caused by chemical contamination. Determine the cause of the discoloration and replace the rope if it is brittle or stiff.

INCONSISTENCY IN TEXTURE AND STIFFNESS

Can indicate excessive dirt or grit embedded in the rope or shock load damage and is usually reason to replace the rope. The critical and melting temperatures for synthetic fibers are listed below:

TEMPERATURE

FIBER TYPE	CRITICAL	MELTING
Nylon	325º F	425–490º F
Polyester	325º F	480–500º F

High temperatures can be achieved when rope is allowed to run over a friction surface, such as in a descending device. Each rope's construction and fiber type will yield a different coefficient of friction (reluctance to slip) in a new and used state. It is important to understand the operational demands and insure the size, rope construction and fiber type be taken into account to minimize heat buildup. Never let ropes under tension rub together or move relative to one another. A particularly dangerous situation can develop when a moving rope under tension rubs over a stationary rope (note that "rope" can be any synthetic load-bearing component, such as webbing). Enough heat to melt the fibers can quickly build up and cause the rope to fail. Always be aware of areas of heat buildup and take steps to minimize it; under no circumstances let any rope come in contact with an exhaust muffler or any other hot object.

ROPE HANDLING

REMOVING ROPE FROM REEL OR COIL

The rope should be removed from the reel by pulling it off the top while the reel is free to rotate. This may be accomplished by passing a broom handle through the holes in the ends of the reel and placing each end of the broom on a chair. Rope should never be taken off a reel by pulling it over the end(s) of the reel. If the rope is supplied in a coil, it should be uncoiled in the same direction it was coiled. To do this, cross your arms through the middle of the coil (arms entering from opposite sides of the coil) and rotate them slowly (one over the other) to uncoil the rope. Do this slowly to avoid tangling. If the end of the rope becomes unwieldly, it may be taped to itself (forming a loop) until uncoiling is complete. Never pull the rope off the coil as this causes kinking.

CUTTING YOUR ROPE

Rope should always be cut with a hot knife. If you do not have access to one, use this alternative: wrap one or two layers of masking tape around the rope with a knife or razor blade. Leaving the tape on, melt and fuse the fibers at the cut ends with a heat source such as a candle.

CLEANING YOUR ROPE

If your rope gets dirty, you may clean it by using warm tap water and a mild soap and gently scrubbing with a sponge or cloth.

COILING AND FLAKING

The best method to prepare kernmantle rope for storage or transport is to stuff or flake it into a rope bag. If you choose to coil the rope, use a method that does not impart a twist to it.

ROPE INSPECTION CHECK LIST

It would be suggested the ROPE INSPECTION CHECK LIST be performed and dated *prior* to each use of an individual rope and retained in a permanent file for the life cycle of each rope.

– ROPE INSPECTION CHECK LIST –

INSPECTION DATE

MONTH _____ DAY_____ YEAR _____

CONDITION	DISCARD POINT	PASS (KEEP)	FAIL (DISCARD)
1 **ORIGINAL ROPE BULK REDUCED BY ABRASION** *COVER BY 25%*	✓		
2 **FIBER STRANDS CUT** *ONE OR MORE*	✓		
3 **DIAMETER INCONSISTENCY** *LOCALIZED DIAMETER REDUCTION* *FLAT AREAS* *LUMPS AND BUMPS IN ROPE*	✓ ✓ ✓		
4 **GLOSSY OR GLAZED FIBER** *LOCALIZED OR EXTENDED AREAS*	✓		
5 **INCONSISTENCY OF TEXTURE** *LOCALIZED OR EXTENDED AREAS OF STIFFNESS*	✓		
6 **DISCOLORATION** *LOCALIZED OR EXTENDED AREAS CAUSED BY CHEMICAL CONTAMINATION*	✓		

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