

# FIREHOUSE®

## Weekly Drill

### DRILL #98: ROPES & KNOTS: PART 1

#### Introduction

The fire service uses a plethora of different tools. One that is often overlooked, but worth its weight in gold, is the rope. When you think about it, ropes are one of the most important tools in the fire service. I hate to say it, but back in the day, manila rope was the only rope used in the fire service. Today, however, we can find a variety of materials being used for fire service ropes.

Manila rope is made from leafstalks found in the abaca plant. These fibers are twisted together to form the rope. What appears to be one long piece of rope, to us, is in reality many small strands of fiber weaved tighter to form the rope. Moisture is not a friend to manila rope and, in fact, will reduce the strength of the rope by 50 percent in some cases.

Two other fiber ropes that we might find in the fire service are sisal and cotton. Sisal fibers have 25 percent less tensile strength than do the manila fibers. Cotton fiber rope is nice to work with because it is very soft and pliable. However, its tensile strength is only about half the strength of manila. Both materials are susceptible to damage.

#### Synthetic Materials

Like everywhere else, synthetic materials are starting to work their way into the fire service. Many of the ropes used today by fire department personnel are made of synthetic materials.

Nylon rope started out being used by the military during World War II. This nylon material rope soon found favor in the fire service because of its high melting point and excellent abrasion resistance, along with having a high tensile strength. Additionally, nylon is resistive to many chemicals. But acids are not a friend to nylon.

Then there is polyester rope. This syntactic material holds up better than the nylon ropes around acids and alkalis. However, this rope does have its limitations and does not like being shock loaded!

Polypropylene ropes are used primarily with our water rescue teams, as water virtually has no effect on this material. Another feature that the polypropylene rope has, which benefits the firefighters, is the fact that this rope



will float in the surface of the water. Like many of the synthetic materials, polypropylene is resistive to most chemicals and acid exposures. Another feature this rope material has working in its favor is its ability to become wet, but still resist mildew and rot.

Another material that is working its way into the fire service is polyethylene. The similarity between polyethylene and polypropylene is they can both float in water indefinitely. However, the feature that many fire department personnel like about this material is that it can come in a variety of bright colors. This makes it nice when several rope lines are being used for controlling the correct line.

Keep in mind, when we are talking about ropes, they are generally going to be used as utility ropes or rescue ropes. Never should the two be used together. NFPA 1983 is the Standard for Life Safety Rope and System Components and should be referenced when your department is looking at making purchases.

*—Prepared by Russell Merrick*