is regained on cooling to normal temperature At an increased initial cost, nylon of higher melting point can be secured

Nylon more than any other rope material, will absorb and store energy in the same manner as a spring This energy, released at break, will make the moving ends as dangerous as a projectile Caution must therefore be exercised when working lines around corners, capstans, timber heads, and the like

Polyester makes probably the best general-purpose rope available, especially for critical uses Polyesters stretch about half that of nylon, so energy absorption is also about half It is not weakened by rot, mildew, or prolonged exposure to sea water It retains its full strength when wet and shows little deterioration from long exposure to sunlight It has good resistance to abrasive wear and to most alkalis and acids, except benzoic acid

ROPE CHECKLIST

Strength	Ruggedness in shape
Stretch with load	Temperature resistance
Permanent stretch	Friction melting
Recovery from stretch	Combustibility
Length	Sunlight resistance
Size	Marine growth resistance
Yardage	Rot resistance
Floatability	Chemical resistance
Flexibility	Color
Twist direction and torque	Ageing
Flex life in bending	Contamination
Slipperiness	Uniformity
Texture	Service Cost
Water repellency	
Hygroscopicity	
Toughness against wear	

FIG 23-1 — Factors that may be of significance when specifying rope for a specific use

Polyolefin ropes, in general, are strong and inexpensive, they float and are unaffected by water Polyolefins, like the polyesters, are not hygroscopic, therefore, they do not shrink or swell with water Movement of crossed ropes must be avoided because of a very rapid friction sawing with even modest loads as well as other types of abrasion They are unaffected by rot, mildew and fungus growth and are highly resistant to a wide variety of acids (except nitric) and alkalis, as well as to alcohol-type solvents and bleaching solutions They swell and soften by hydrocarbons, particularly at temperatures above 150 F There are two types

- *Polypropylene, with a specific gravity of* 0 91 and a softening point of 300 F, is made in several different size filaments and from film with or without longitudinal fracturing Polypropylene rope is about 50 per cent stronger than manila, size for size Pure polypropylene ropes have relatively poor rendering properties

- Polyethylene, with a specific gravity of 0 95 and a softening point of 250 F, is characteristically slippery and has very little springiness Stretch is low and strength is good It has a comparative low softening point and low coefficient of friction

Composite ropes (combining several types of synthetic fibers or synthetic and natural fibers) are available in all sizes They result from attempts to give the surface of the rope or strand more wear resistance, internal tensile strength, or structural strength to resist deformation Many of these ropes are made to match the requirements of specific jobs These ropes can be expected to perform to the ends their makers declare

Other types of rope are available but enjoy only a small percentage of the market for reasons of cost, limited use, or short supply These ropes include in various modifications paper, glass, acrylic, rayon, polyvinyl chloride, fluorocarbon, rubber, cellulose acetate, and polyurethane

Table 23-A lists breaking strengths and safe loads (working load limits) for manila and synthetic ropes Fig 23-1 gives a checklist of factors that may be of significance in a specific application

Inspection

New rope should be thoroughly inspected along its entire length to determine that no part of it is damaged or defective before being