

Outdoor use of ropes made with UHMWPE fiber from DSM Dyneema

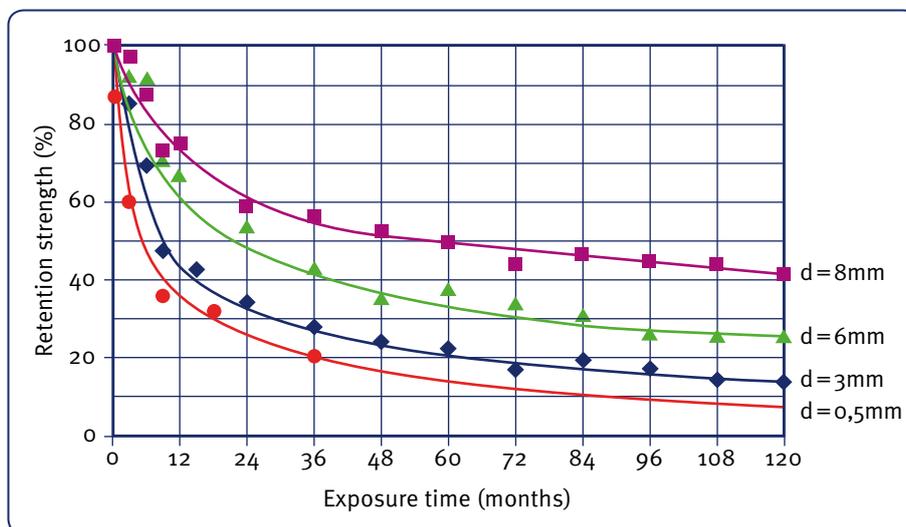
Good retention strength of ropes made with UHMWPE fibers.

The degradation of polymers is mainly induced by oxidative reactions. Ultraviolet radiation from sunlight accelerates this process. Besides sunlight intensity, other factors such as temperature, humidity and the polymer type also can influence the degradation rate.

The retention strength of ropes with UHMWPE fiber, subjected to UV-exposure, is dependent upon rope size, rope construction and use of protective measures such as coatings or non-load bearing jackets. Ultraviolet radiation only penetrates to shallow depths, causing small diameter ropes to be affected much more than large diameter ropes. Testing in our research lab in the Netherlands, a 10 year outdoor exposure of small diameter rope samples ranging from 0.5 mm to 8 mm made with UHMWPE fiber from DSM Dyneema, showed a logarithmic decay of the retention strength.

Experience however shows that oil tanker mooring lines made with UHMWPE fiber from DSM Dyneema, used over 20000 mooring hours in nine years time, had a 75% retention strength despite the influences of weather, abrasion or tensile loading.

Outdoor Exposure on low diameter braids made with DSM Dyneema® UHMWPE fiber



Large diameter ropes are less sensitive to ultraviolet radiation. For rope applications with UHMWPE fiber, in which the rope could be exposed to sunlight for very long periods, it is advisable to use protective measures such as coatings or non-load bearing jackets.

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