

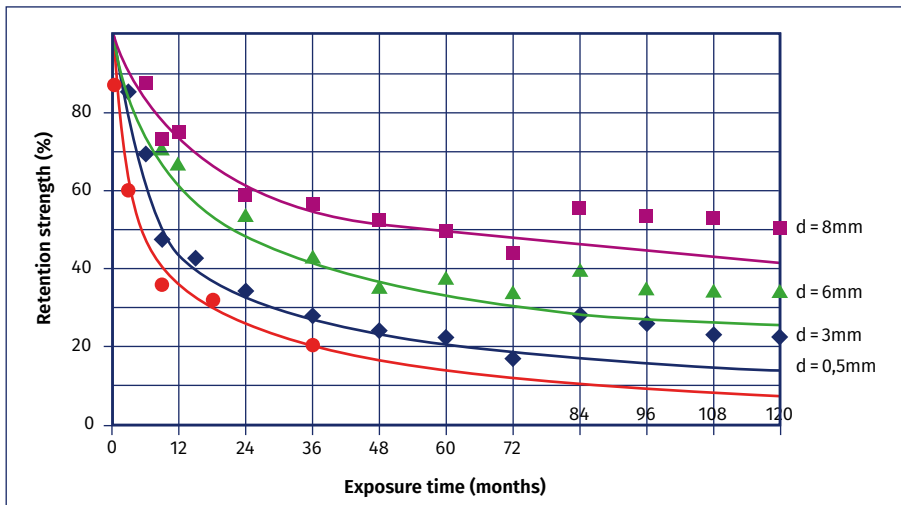
Outdoor Use of Ropes Made with Dyneema® Fiber from Avient

Good retention strength of ropes made with Dyneema® fibers

The degradation of polymers is mainly induced by oxidative reactions. UV 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 at our research lab in the Netherlands, a 10-year outdoor exposure of small diameter rope samples made with Dyneema®, showed a logarithmic decay of the retention strength. Other regions might have more sunlight intensity resulting in a faster drop in strength. Experience however shows that oil tanker mooring lines, used over 23,000 mooring hours in ten years' time still had a 75% strength retention despite the influences of weather, abrasion and tensile loading.

Outdoor Exposure on Braided Rope Samples Made with Dyneema® Fiber



Although, theoretically, large diameter ropes are less sensitive to UV radiation, the rope's construction is what ultimately determines its sensitivity. In most laid and braided rope constructions, each rope strand comes to the outer surface every lay length or braiding period. These are potential areas where the detrimental effects of UV radiation can occur. For rope applications with UHMWPE fiber, in which the rope could be exposed to sunlight, it is advisable to use protective measures such as coatings or non-load bearing jackets.

Disclaimer

All information, data, recommendations, etc. relating to Avient Protective Materials' products (the Information) is supported by research. Avient Protective Materials however assumes no liability arising from (i) the application, processing or use made of the Information or products; (ii) infringement of the intellectual or industrial property rights of third parties by reason of the application, processing or use of the Information or products by the Buyer. Buyer shall (i) verify the Information and the products before applying, processing or use; (ii) assume such liability. Dyneema® and Dyneema®, the world's strongest fiber™ are trademarks of Avient Protective Materials. Use of these trademarks is prohibited unless explicitly authorized in writing.