



WHITE PAPER:

THE SERVICE LIFESPAN OF A VULKOLLAN WHEEL

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During our research into the use of Vulkollan, we have discovered that the material has a nominal service life of two years before it begins to break down. The principal reason for this is that Vulkollan is hygroscopic, which means it absorbs water. During its life span the material pulls moisture from the surrounding air which, when combined with heat, begins to break down the polymer chains that give it the strength we know Vulkollan for.



After making this discovery, we consulted with our supplier on the subject and they confirmed our findings. Our representative was quick to point out that the standard Vulkollan is an ester-based polyurethane and that if humidity is a major issue, there is an ether-based version that can be used (apparently the ether-based version is used in India where humidity is a major problem). Ether-based urethanes are much more resistant to humidity.

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As was said earlier in this paper, the heat and moisture break down the material's polymer chains. These chains are what give urethane its strength and in the case of Vulkollan, its strength comes via its ability to flex internally. As time passes the material loses this ability and as a result when it flexes it deforms slightly while turning the remaining energy into heat. This process is known as Hysteresis. So when the wheel is made to flex under normal usage it generates more heat and thus reaches its failure point sooner. It should be noted that the same will be true for any Vulkollan wheel.

It should also be noted that the two year lifespan is not a hard limit. Obviously the environment in which the Vulkollan wheel is used will factor into how long it will be useful. A low-humidity environment will result in longer life, while a very high humidity environment can result in a much shorter life. Under normal circumstances, when a Vulkollan wheel reaches the two year point it is recommended that the wheel be monitored more closely for signs that it needs to be replaced.