

PE-UHMW Wear Resistance



PT Sugison Senada
Jl. Pinangsia III No. 26-A
Jakarta 11110
Indonesia
T +62 21 6230 2486
+62 21 625 9958
+62 21 625 9127
F +62 21 6230 2485
+62 21 625 9159
W www.sugison.com

Wear Resistance

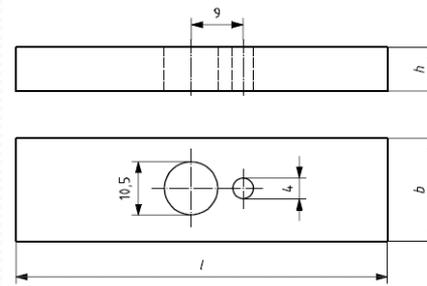
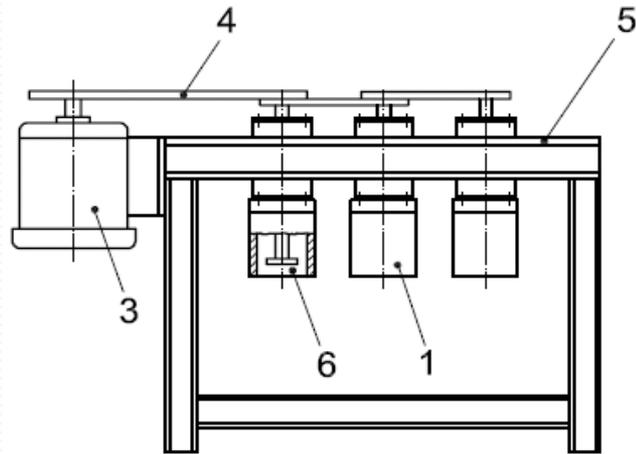
Engineers have many factors as consideration to choose material in mechanical engineering design, one of the most important factor is wear resistance.

Wear resistance is the ability of a material to resist the gradual wearing away caused by abrasion and friction with another material.

Many method used to measure material wear resistance, for thermoplastics wear resistance use sand slurry test by ISO 15527 reference.

By sand slurry test method, specimens rotated at 200 – 2400 rpm for 3 hours inside test cup that containing slurry abrasive material (silica sand or aluminum oxide). After testing, the loss in mass of the test specimens calculated and compared to another material specimens and specify percentage of mass loss.

FIG 1. Sand Slurry Test for PE-UHMW by ISO 15527



Thickness, h : 6.35 mm

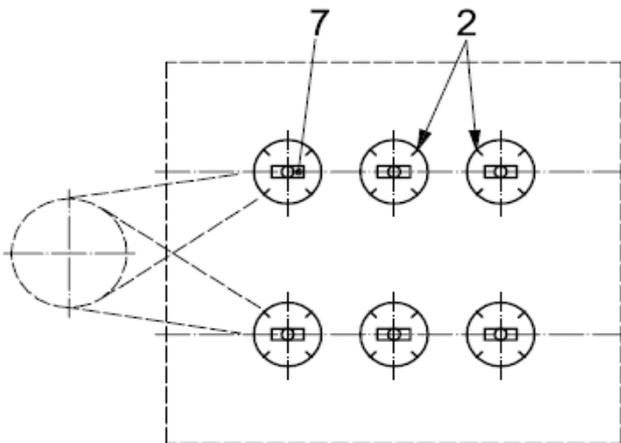
Width, b : 25.4 mm

Length, l : 76.2 mm

Specimen

Key:

1. Abrasion test cup (diameter 120 mm, rust-proof steel, with cooling jacket)
2. Baffles
3. Drive Motor (1200 rpm)
4. Belt drive
5. Supporting structure
6. Slurry of abrasive in water (silica sand or aluminium oxide)
7. Specimen



*Source: ISO 15527, "Plastic - Compression-moulded sheets of polyethylene (PE-UHMW, PE-HD) - Requirement and test method"

PE-UHMW Wear Resistance

PTFE that Indonesian engineers known as Teflon® Dupont, with its lowest coefficient of friction (0.1) among the other thermoplastics have been applied for application that need resistance to abrasion in many years. But the outcome of PTFE application is worse than the expectation.

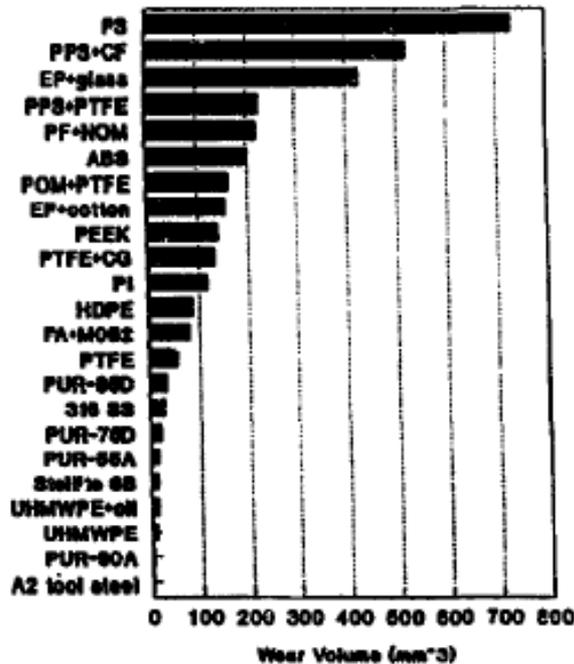


Fig. 2. Wear volumes for plastic candidates in a modified ASTM G 65 abrasion test.

Need to remember, PTFE is soft thermoplastic caused by bond between PTFE molecule chain bond not strong enough, and cannot withstand abrasive force (easy to wear).

In the other hand, material that close to PTFE in concerning coefficient of friction is PE-UHMW with coefficient of friction 0.25, but PE-UHMW wear resistance is 8 times better than PTFE. And that's why PE-UHMW nick name is "the poor man's Teflon".

So, PE-UHMW is the ultimate material for application that need excellent sliding properties as well as excellent wear resistance.



sugison
plastics

THANK
YOU

www.sugison.com