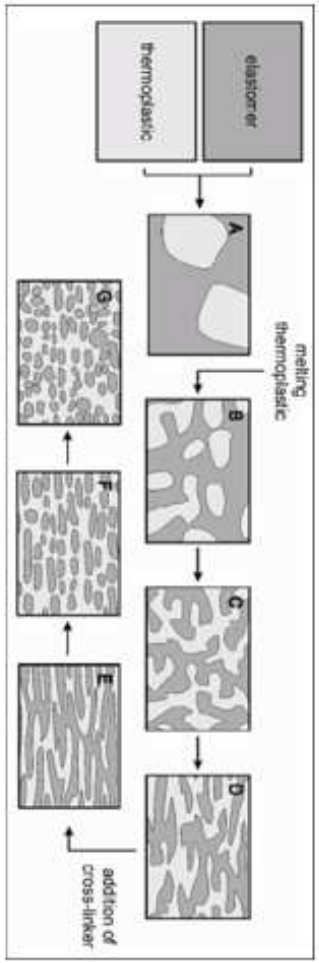
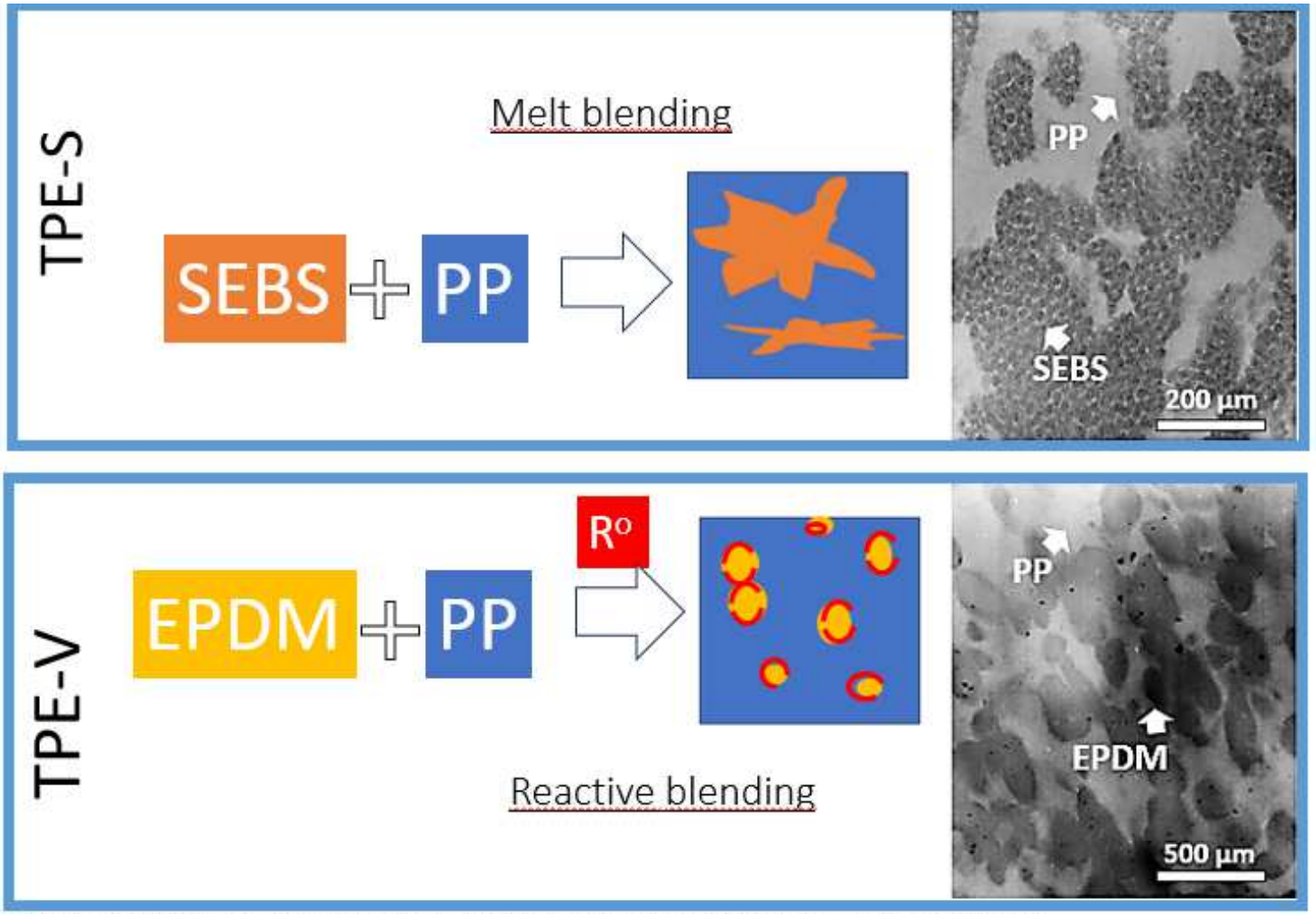
Technical comparison between styrenic-based TPE and TPV, with particular reference to our ST110/75 grades and the competitor’s TPV grade

Morphological differences between TPE-S and TPV

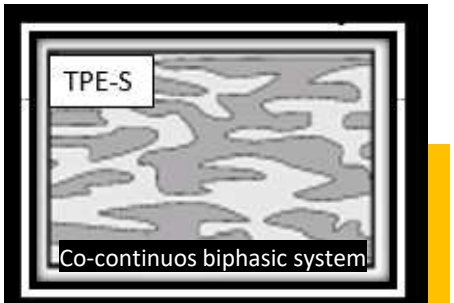




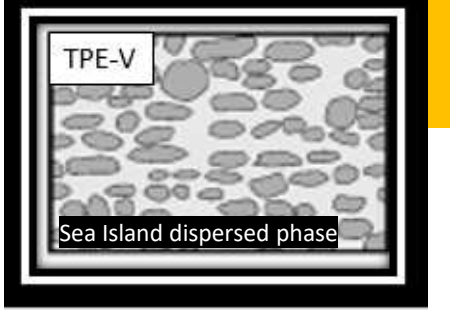
l'Abee, Roy Martinus Adrianus. "Thermoplastic vulcanizates." The Rubber Particle Size to Control the Properties-Processing Balance, Gildeprint Drukkerijen, The Netherlands (2009): 17-41.

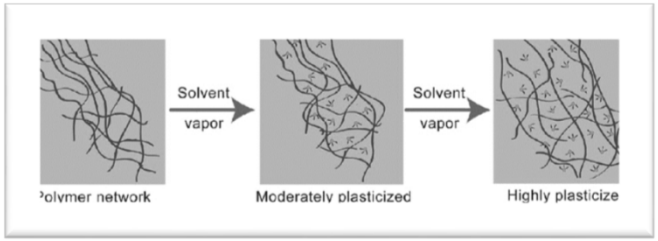
Consequences of morphological differences

PS = 0,88 g/cm3



PS = 0,95 g/cm3

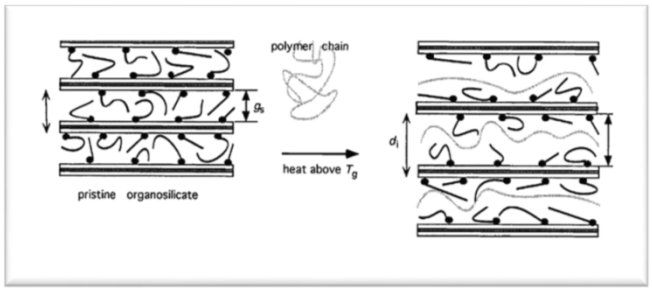


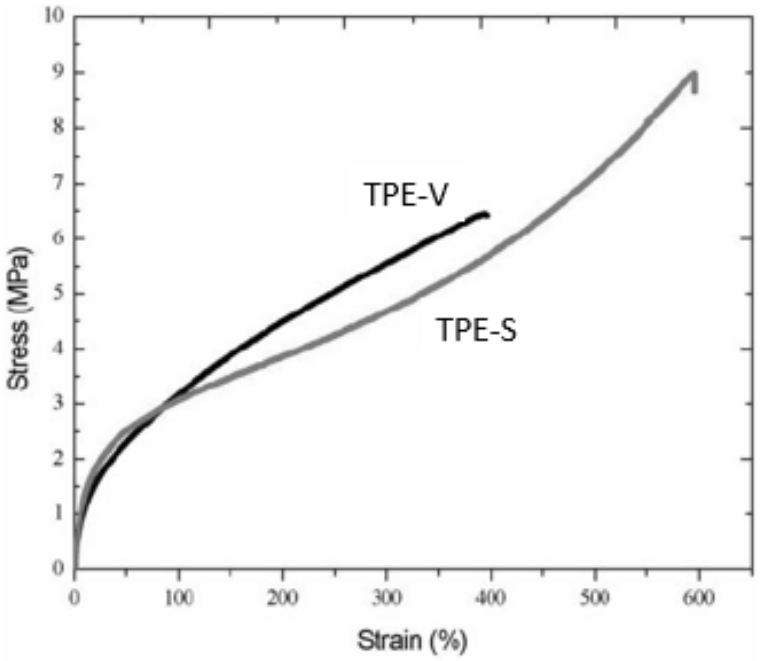


Swelling with solvent

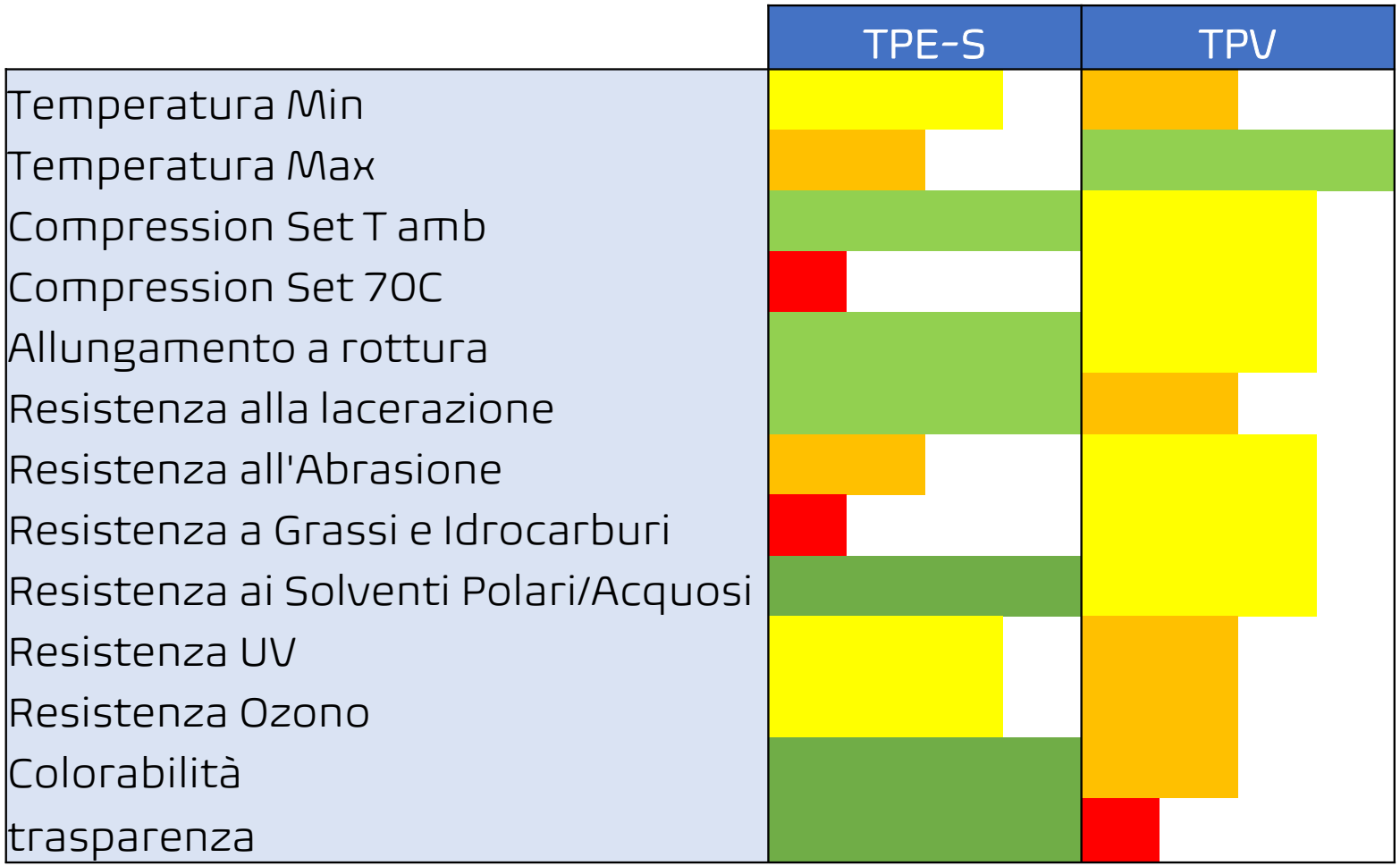
mechanical behaviour

Thermal behaviour





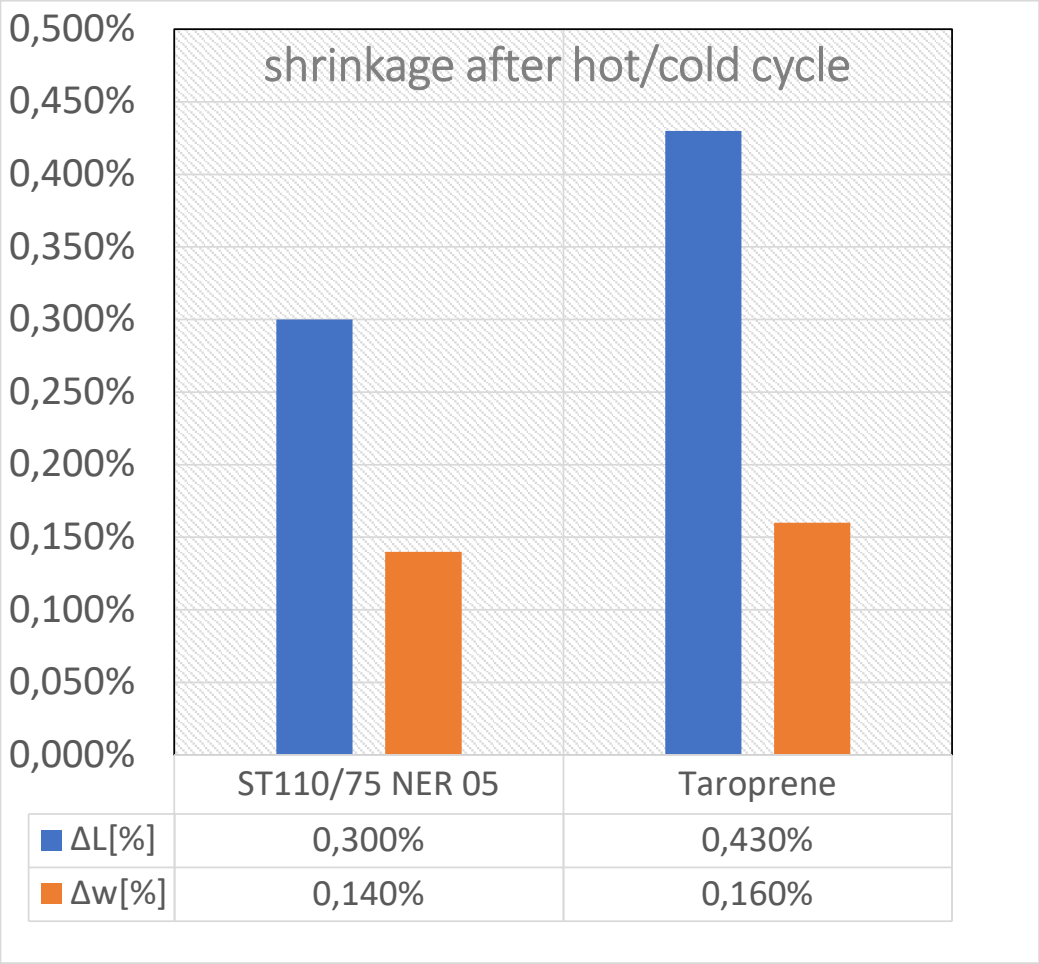
General scheme of differences between TPE-S and TPV



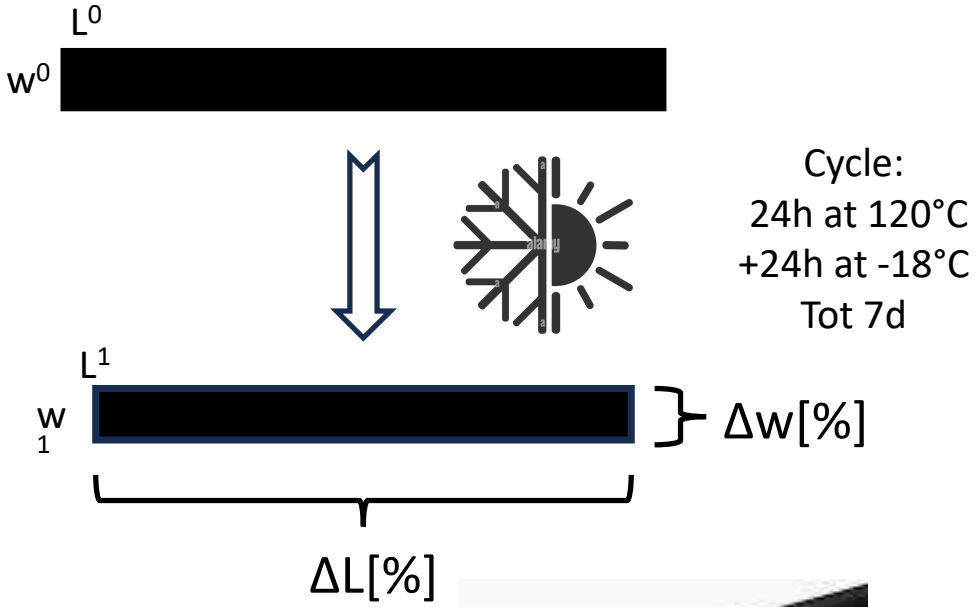
Jumping the obstacle: ST110/75 vs TAROPRENE 160

TECHNICAL INFORMATION	TESTING METHOD	UNIT OF MEASURE	ST110/75	TAROPRENE 1A60E3L
Specific Weight	ISO 1183-1	g/cm3	1,18	0,95
Hardness	ISO 868	Shore A	55	57
Tensile Strength	ISO 527	N/mm2	7	5,5
Elongation at Break	ISO 527	%	450	425
Fluidity Index (190 °C/10 kg.)	ASTM D 1238	g/10 min.	41,6	14

Shrinkage after hot/cold cycle

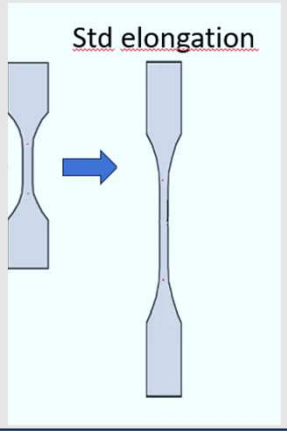


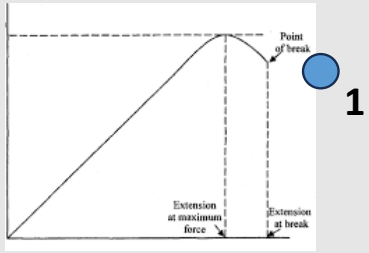
	ST110/75 NER 05	Taroprene
ΔL[%]	0,300%	0,430%
Δw[%]	0,140%	0,160%



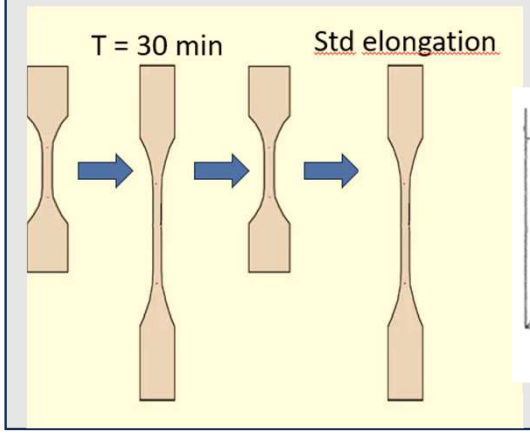
Hysteresis cycle

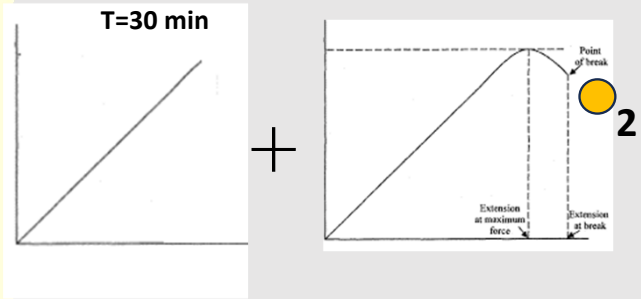
- Standard tensile test

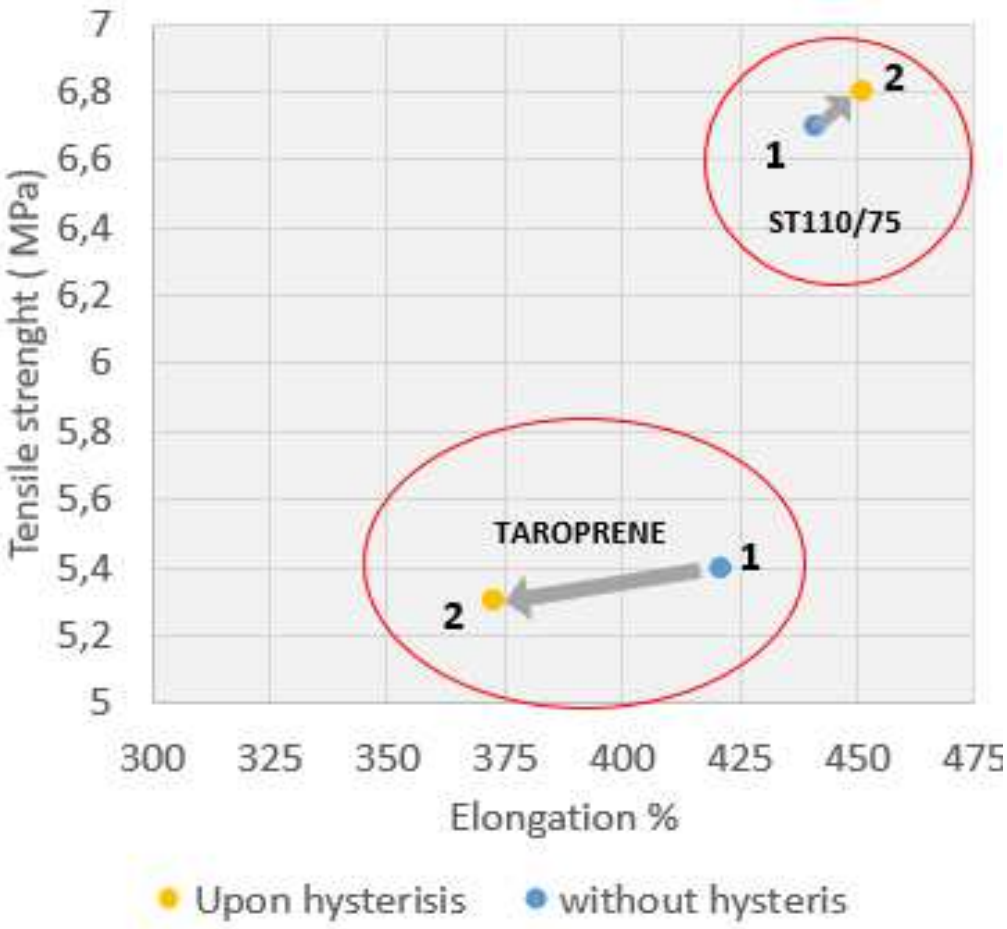




- hysteresis cycle

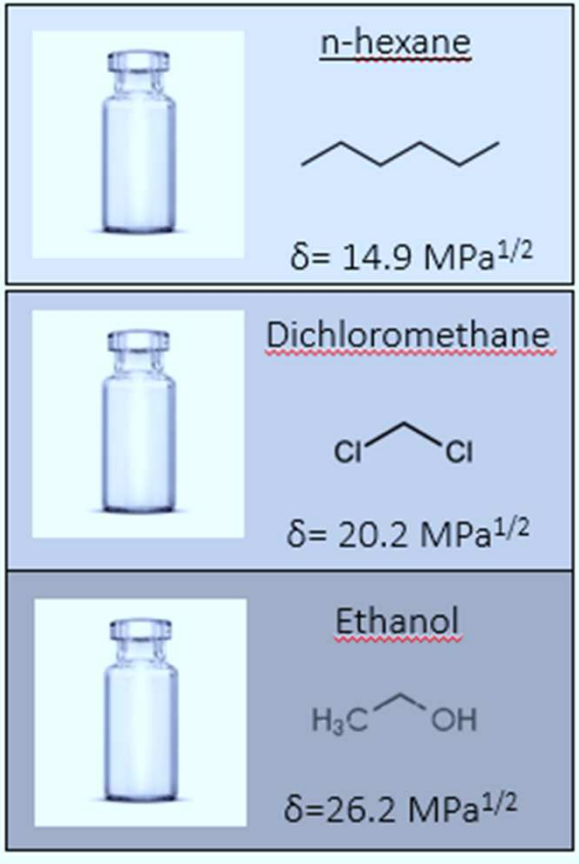






Swelling upon solvent contact

$$\delta = \sqrt{\frac{\Delta H_v - RT}{V_m}}$$



ST110/75	TAROPRENE
ΔL [%] 2,00% Δw [%] 5,00%	ΔL [%] 15,00% Δw [%] 12,00%
ΔL [%] 0,8% Δw [%] 2,4%	ΔL [%] 15,3% Δw [%] 11,3%
ΔL [%] 1,6% Δw [%] 2,4%	ΔL [%] 1,1% Δw [%] 1,4%