Light Fastness Studies on Vulcanization Accelerator System VulcaMix® vs DM

Technical Note

台翔耐黃變促進劑®和DM促進劑的比較

Light fastness predicts a material's resistance to yellowing, fading, darkening or even physical degradation such as cracking or shrinking when exposed to sunlight. VulcaMix® is produced by optimized mixes a proprietary light stabilizing agent with accelerator. Polymer cured with VulcaMix® can meet the most stringent light fastness test with intense artificial light sources (both visible and UV light). The use of VulcaMix® represents an attractive to conventional accelerators from the point of view on safety, cost, and good yellowing resistance properties.

耐黃變試驗檢測材料耐黃變性能。通常也能預測曝露於日光下導致的橡膠光老化。眾所週知橡膠老化黃變會使得製品的外觀和物理機械性能變壞。台翔綜合促進劑®藥膠混入特製光穩定劑於橡膠促進劑中。使用台翔耐黃變綜合促進劑®硫化的橡膠能夠符合最嚴格的耐黃變測試(測試光源, 包括可見光和紫外線)。台翔耐黃變促進劑®具有極高的加工安全性。耐黃變效果佳。同時價格具競爭力。能取代傳統的硫化促進系統。

Laboratory tests in this application note compared the influence of VulcaMix® and industry commonly used DM accelerator system on light fastness test, vulcanization characteristics, and cured stock properties. The following compound was used:

本實驗測試中我們比較台翔綜合促進劑®藥膠和DM促進劑使用於硫化促進系統中, 硫化曲線 , 硫化膠的物性以及耐黃變的功效。

Compound

實驗測試配方

	Test1 配方一	Test2 配方二	Test3 配方三
BR 9000	80	80	80
IR 2200	20	20	20

Ultasil VN3 Silica	45	45	45
DEG	4.5	4.5	4.5
Stearic Acid	2	2	2
ZnO	5	5	5
VulcaPellet®TiO_2-80	12	12	12
VulcaPellet®S-80	1.7	1.7	1.7
VulcaPellet®TS-80	0.3	0.3	---
DM accelerator	2.0	---	---
VulcaMix®#2-75	---	2.5	---
VulcaMix®#3-75	---	---	2.5

Cure Properties
硫化數據

	Test1 配方一	Test2 配方二	Test3 配方三
Scorch Time t2, min	1.55	1.33	1.47
Cure Time t90, min	2.29	1.56	2.21

Physical Properties and Light Fastness Test
耐黃變測試及硫化膠機械性能

	Test1 配方一	Test2 配方二	Test3 配方三
Tensile Strength, kg/cm^2	133	132	135
Elongation, %	609	906	857
Tear Strength, kg/cm	34	59	49
Shore Hardness A	67	62	63
Gravity, g/c.c	1.167	1.165	1.164
Abrasion loss, c.c Lower is better	0.22	0.29	0.21
Discoloration, ASDM D1148 higher is better	3.5	4.0	5.0

The data clearly demonstrates that polymer cured with VulcaMix® are all with a better yellowing resistance over traditionally DM cured accelerator system. Among them, the addition of VulcaMix® #3 obtained a grade 4.5 in the light

fastness test, which shows very little yellowing after a long intensive high energy UV light exposure. In addition to a good light fastness property, polymer cured with VulcaMix® is equal or superior in cure characteristics and physical properties over the conventional cured accelerator system.

實驗測試顯示使用台翔綜合促進劑®藥膠的優點。所有的台翔綜合促進劑®藥膠相較於DM促進劑顯著地改善材料耐黃變性能。台翔三號綜合促進劑®功效達到耐黃變 4.5 級的要求。添加台翔三號綜合促進劑®藥膠的硫化膠經過長時間及高能量的紫外線照射幾乎保持原的白色。使用台翔綜合促進劑®藥膠的硫化膠同時也具備良好抗張強度,硬度等機械性能。