LEODISPER SP1 High performance silica dispersant

Concept of LEODISPER SP1 1

The rubber used for tires tends to become difficult to mix due to the "increased concentration" of silica. As a result, (1) it becomes difficult to mix the rubber, and (2) even if it can be mixed, a significant amount of energy is required due to the increased number of mixing cycles and time. To improve this, we have developed a "silica dispersing agent" using LSC's dispersion technology, called "LEODISPER SP1".

Expected effect of LEODISPER SP1 2

Using the SP1 accelerator, the following can be expected:

(1) It becomes possible to produce high concentration silica rubber that was difficult to blend. 2 Blending of high concentration silica rubber, the number of blending cycles and time can be reduced ③Reducing the number of blending cycles and time, it becomes possible to reduce energy consumption and CO2 emissions.

(4) Improved productivity enables higher productivity and reduction of labor force.

Data of LEODISPER SP1 on high silica content 3

Compound recipes

Ingredient	phr	Stage
S-SBR	70	1st
BR	30	
Carbon black	5.6	
Silica	60	
Silane coupling agent	4.8	
Silica dispersant LEODISPER SP1	0/4 (*A.I. 2)	
Oil	10	
Silica	40	2nd
Silane coupling agent	3.2	
Oil	5	
Stearic acid	2	
Accelerator	1	
Zinc oxide	3	
Accelerator	3.7	3rd
Sulfur	1.9	

Mixing condition

Mixer

1st stage ↓ 2nd stage 2nd stage (remixing) ſ 3rd stage

Laboplast mill, 250mL

170℃ (338°F), 15min

Initial temperature: 100°C Discharge temperature: 150-160°C Rotation speed: 60rpm Mixing time: 0.5 minutes Kneading time: 1.5 minutes \Rightarrow CL \Rightarrow 6 minutes

Initial temperature: 60°C Discharge temperature: 100°C Rotation speed: 40rpm Mixing time: 2.5 minutes

*A.I. means Active ingredient

Viscosity after Each Mix Stage



Payne Effect after Each Mix Stage

Cure Conditon



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4 Rubber appearance after mixing





Bad: Some surfaces and edges are not smooth

Terrible : Cannot make sheet

Possibility for good productivity



Processability of rubber mixed in 3 stage with LEODISPER SP1 is better than BLANK in 4 stage. There are possibility to reduce the number of mixing.

Product information of LEODISPER SP1

Properties

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Appearance	Active Ingredient
White Powder	50%



*Numerical values in the table are eigenvalues, not standard values.

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