

INFLUENCE OF PARTING AGENTS ON STICKING OF RUBBER PARTICLES

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ABSTRACT

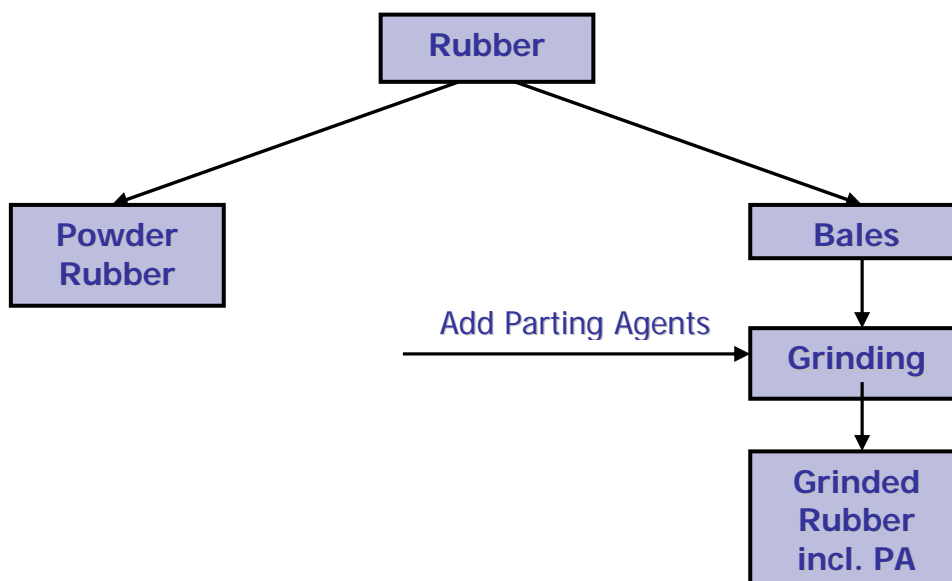
Most kinds of rubber are delivered in form of bales. For continuous dosing the loose material is required. To obtain the particles up to 8 mm average size it is necessary to grind or granulate rubber bales. Because of very high stickiness of rubber it is necessary to separate single particles of crushed material using a suitable type of parting agent. The amount of the parting agents depends on type of rubber and it equals 1–5 %.

This article describes the influence of type and dosage of parting agents on properties of rubber mixture.

Keywords: rubber, rubber mixture, dosage

1. INTRODUCTION

In continuous processing of rubber mixture it is necessary to have rubber and other components in flowing form. However rubber is mostly delivered in bales which have to be grinded to the form suitable for continuous conveying and dosing. However, to prevent sticking of single particles it is necessary to use parting agents (separators). The amount of used parting agent depends on the type of rubber, its stickiness and required size of particles and it varies between 1 to 5% by weight of rubber.



The aim of this study is evaluation of influence of the dosing parting agent (type and quantity) on quality of rubber mixture.

2. EXPERIMENTAL

There were tested two compounds – A (based on the NR) and B (based on the EPDM, CII and reclaimed rubber).

Four types of parting agents (PA) were used: chalk, china clay, zinc stearate, Aerosil 2000.

Separators were dosed in quantity as follow: 0% - standard and 1, 2, 3, 4, 5% by weight of rubber/tested compounds. By mixture preparation two stage mixing has been used (laboratory mixer and laboratory calender).

A large spectrum of properties was tested: Rheometer tests (ML, MH, S^{cc}@ MH, ts1, ts2, t50, t90, t95, t99, tan δ @ t90, tan δ @ t99), Mooney viscosity (ML (1+4) @ 100), Tensile tests (Break stress, Break strain, Peak stress, Peak strain, Modulus @ 100%, Modulus @ 300%), Tear strength (TStrgth, Tforce), Density, DMA (E', E'', /E*'/, tan δ), Hardness (Shore A), Scuff resistance (Schob, Lüpke), Resilience.

3. RESULTS

Some of results are given in the graphs bellow.

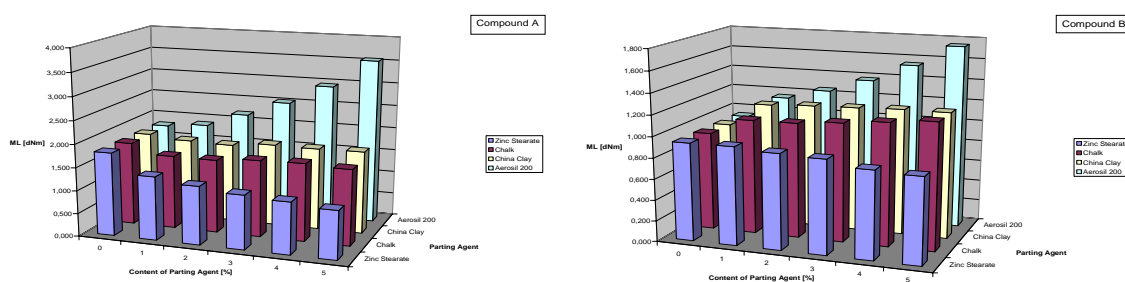


Figure 1. Influence of amount and type of PA on ML

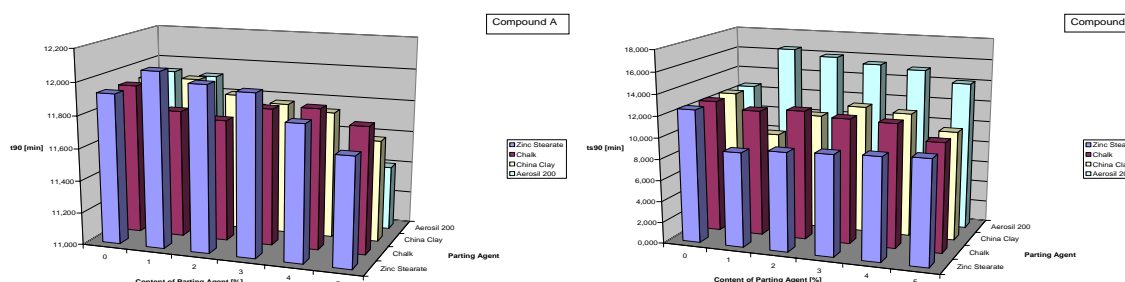


Figure 2. Influence of amount and type of PA on t90

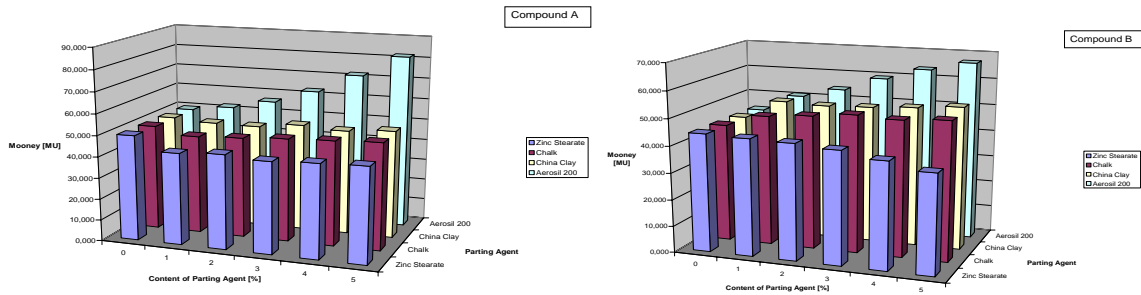


Figure 3. Influence of amount and type of PA on Mooney viscosity

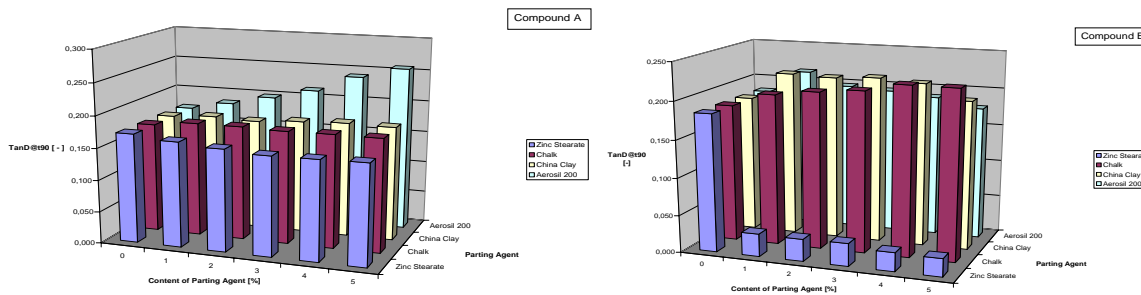


Figure 4. Influence of amount and type of PA on TanD@t90

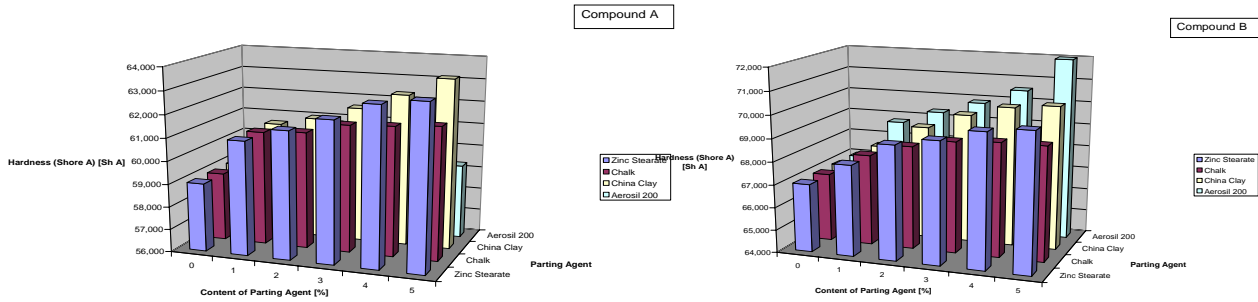


Figure 5. Influence of amount and type of PA on Hardness

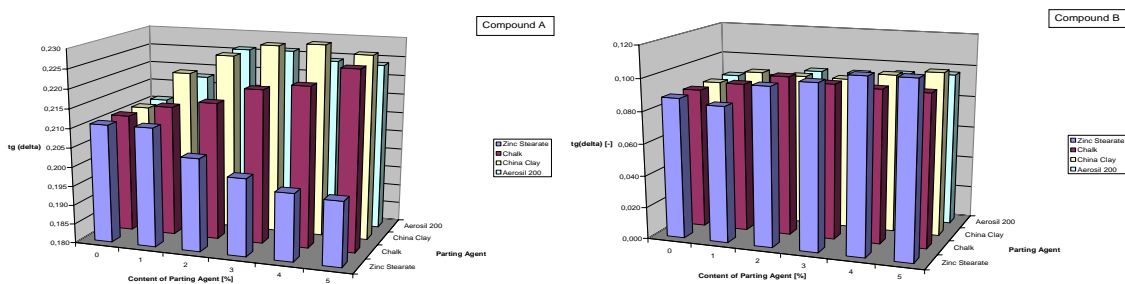


Figure 6. Influence of amount and type of PA on $tg\delta$

4. CONCLUSION

Chalk and China clay have only low influence on the properties of compounds. Zinc stearate has positive influence on the processing properties. Most of compound properties are influenced using Aerosil 2000, which causes very strong reinforcing effect. In choice of suitable type of parting agent it is necessary to take into account both influence on properties of compounds and separating effect and the price of the parting agent as well.

5. ACKNOWLEDGEMENT

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6. REFERENCES

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