

# How to introduce Silfit Z 91 into NR-latex e. g. for dipped products?



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EXPERIMENTAL

RESULTS

SUMMARY

Addition of **fillers as a slurry** to the NR-latex e. g. for dipped products is a possible strategy to extend the latex.

However there are some issues like

- High water content needed for achieving sufficient low viscosity
- Storage stability, especially sedimentation
- High effort for slurry preparation, grinding and storage





EXPERIMENTAL

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An innovative **new route** would be **the direct addition of the dry filler into the latex**. This strategy is very challenging for the filler properties.

The properties of the Calcined Neuburg Siliceous Earth Silfit Z 91 can be characterized by

- High brightness Very low sieve residues
- High color neutrality
- Low particle size

- Excellent dispersion properties
- Good transparency







EXPERIMENTAL

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Exploiting the unique property profile of

### Silfit Z 91

### for the new route of direct addition into the NR-latex

without obstacles.

VM-0/0614/06.2014





EXPERIMENTAL

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Calcined Neuburg Silice	Silfit Z 91	
Color L*		95
Color a*		-0.1
Color b*		1
Particle size d <sub>50</sub>	[µm]	2.0
Particle size d <sub>97</sub>	[µm]	10
Oil absorption	[g/100g]	55
Sieve residue >40 µm	[mg/kg]	10
Specific surface area BET	[m²/g]	7.0
Density	[g/cm <sup>3</sup> ]	2.6







EXPERIMENTAL

RESULTS

	Control straight NR- Latex	+ 5 % Silfit Z 91	+ 5 % Silfit Z 91 + water	+ 10 % Silfit Z 91 + water	+ 25 % Silfit Z 91 + water
NR-Latex, 60 % solids, full ammonia, Neotex FA	100	95	95	90	75
Silfit Z 91	-	5	5	10	25
Water, demineralised	-	0	3	6	15
Total	100	100	103	106	115





#### **EXPERIMENTAL**

RESULTS

	Control straight NR- Latex	+5 % Silfit Z 91	+5 % Silfit Z 91 + water	+10 % Silfit Z 91 + water	+25 % Silfit Z 91 + water
Silfit Z 91 content in latex batch	0%	5%	4,9%	9,4%	21,7%
Silfit Z 91 content in dry rubber	0%	8%	8%	16%	36%
Silfit Z 91 content in dry rubber	0 phr	8.8 phr	8.8 phr	18.5 phr	55.6 phr
Total solids	60%	62%	60%	60%	61%







INTRODUCTION EXPERIMENTAL RESULTS SUMMARY	Equipment	Beaker volume: 250 ml Beaker height: 9,5 cm Beaker diameter: 7 cm Stirrer: three blade propeller type, diameter 4 cm	٦
	Batch size Mixing sequence	<ul> <li>Total quantity 150 to 172,5 g</li> <li>Weighing of ingredients</li> <li>Adjust stirrer speed to 600 rpm</li> <li>Premixing of latex and water for 1 min</li> <li>Adding Silfit Z 91 stepwise within 5 to 7 min</li> <li>Adjust stirrer speed to 1000 rpm</li> <li>Homogenization/mixing for 10 min</li> <li>Total time 15 to 18 min</li> </ul>	
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#### **EXPERIMENTAL**

RESULTS

	+ 25 % Silfit Z 91	Weight for Mixing [g]
NR-Latex, 60 % solids, full ammonia, Neotex FA	75	112.5
Silfit Z 91	25	37.5
Water, demineralised	15	22.5
Total solids	115	172.5





#### EXPERIMENTAL

**RESULTS** 







**EXPERIMENTAL** 

**RESULTS** 





## Coagulation after 7 days / 14 days



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# **Sediment**









RESULTS

SUMMARY

0

+ 25 %

Silfit Z 91

+ water



# Appearance of Air Dried Films





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## Conclusion



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The extension of NR-latex by Silfit Z 91 up to 25 % via the new route of dry filler addition into the latex results in:

**Retained Features:** 

- ✓ solid content
- ✓ dispersion
- ✓ viscosity
- ✓ sedimentation
- ✓ translucence



## Conclusion



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### **Improved Features:**

- + tremendous reduction of effort due to no preparation of separate filler slurry
- + no grinding of filler
- + no problems with viscosity and sedimentation of filler in slurry
- + potential cost reduction
- + potential for improved (lower) permeability





## We supply material for good ideas!

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