CALCINED NEUBURG SILICEOUS EARTH (CNSE)
DRY ADDITION OF SILFIT Z 91
INTO NR LATEX, E.G., FOR DIPPED PRODUCTS

INTRODUCTION

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 sufficiently low viscosity
- storage stability, especially sedimentation
- high effort for slurry preparation, grinding and storage

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.

OBJECTIVE

Exploiting the unique property profile of Silfit Z 91 for the new route of direct dry addition into the NR-latex without obstacles.

FORMULATIONS

	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**
Characteristics					
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 [phr]	0 phr	8.8 phr	8.8 phr	18.5 phr	55.6 phr
Total solids	**60%**	**62%**	**60%**	**60%**	**61%**

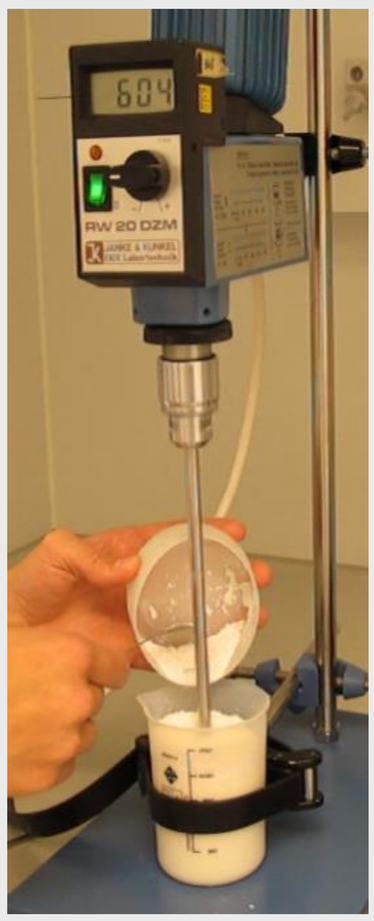
MIXING

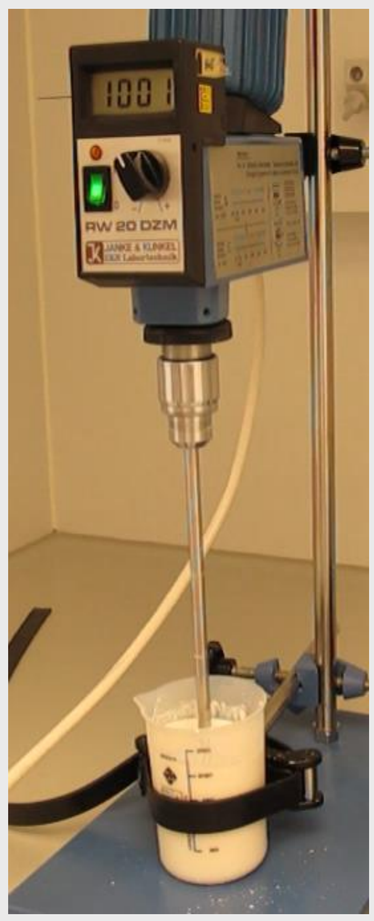
Equipment	• Beaker volume: 250 ml • Beaker height: 9.5 cm • Beaker diameter: 7 cm • Stirrer: three blade propeller type, diameter 4 cm
Batch size	Total quantity 150 to 172.5 g
Mixing sequence	• Adjust stirrer speed to 600 rpm • Premixing of latex and water for 1 min • Adding Silfit Z 91 stepwise within 5 to 7 min • Adjust stirrer speed to 1000 rpm • Homogenization/mixing for 10 min • Total time 15 to 18 min

CNSE: Silfit Z 91

- high brightness
- high color neutrality
- low particle size
- very low sieve residues
- excellent dispersion properties
- good transparency

Color L*		95
Color a*		-0.1
Color b*		1
Particle size d_{50}	[µm]	2.0
Particle size d_{97}	[µm]	10
Oil absorption	[g/100g]	55
Sieve residue >40 µm	[mg/kg]	10
Specific surface area BET	[m²/g]	7.0
Density	[g/cm³]	2.6





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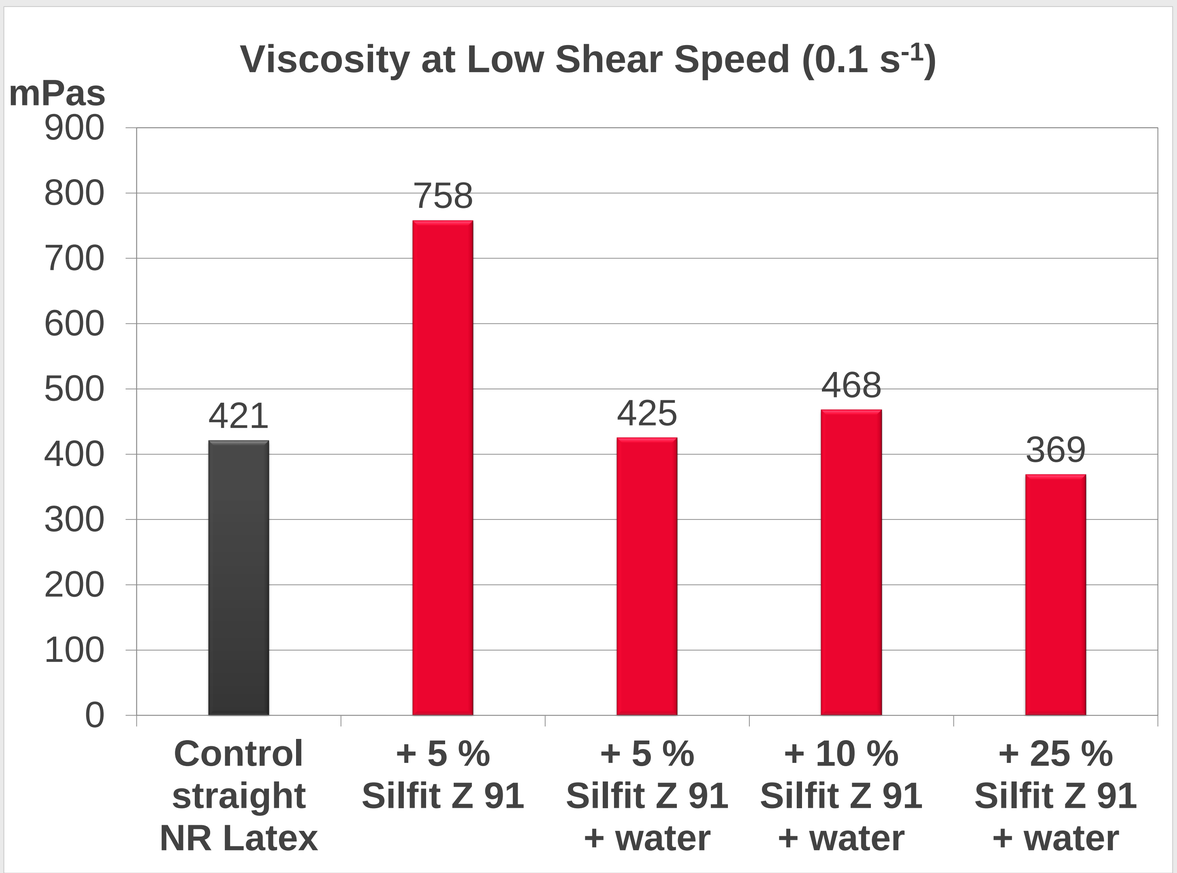
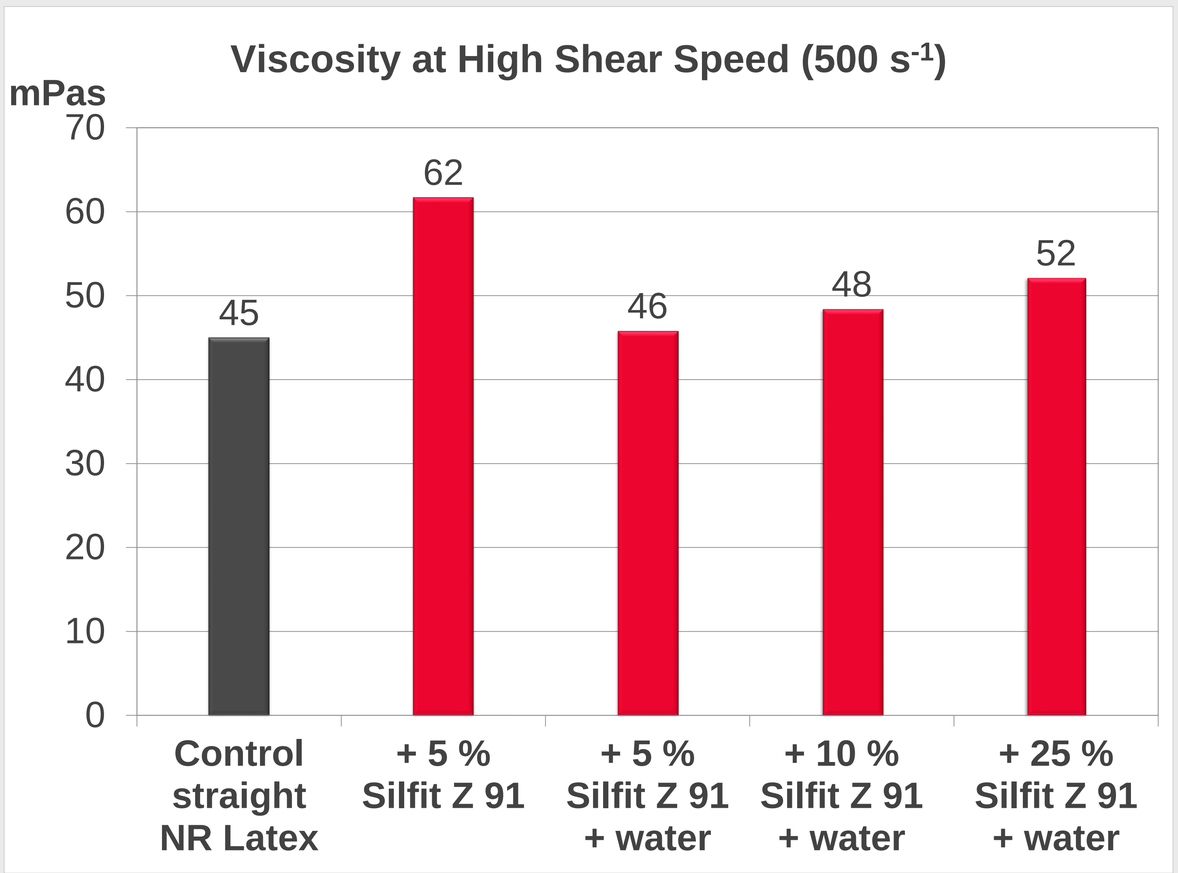
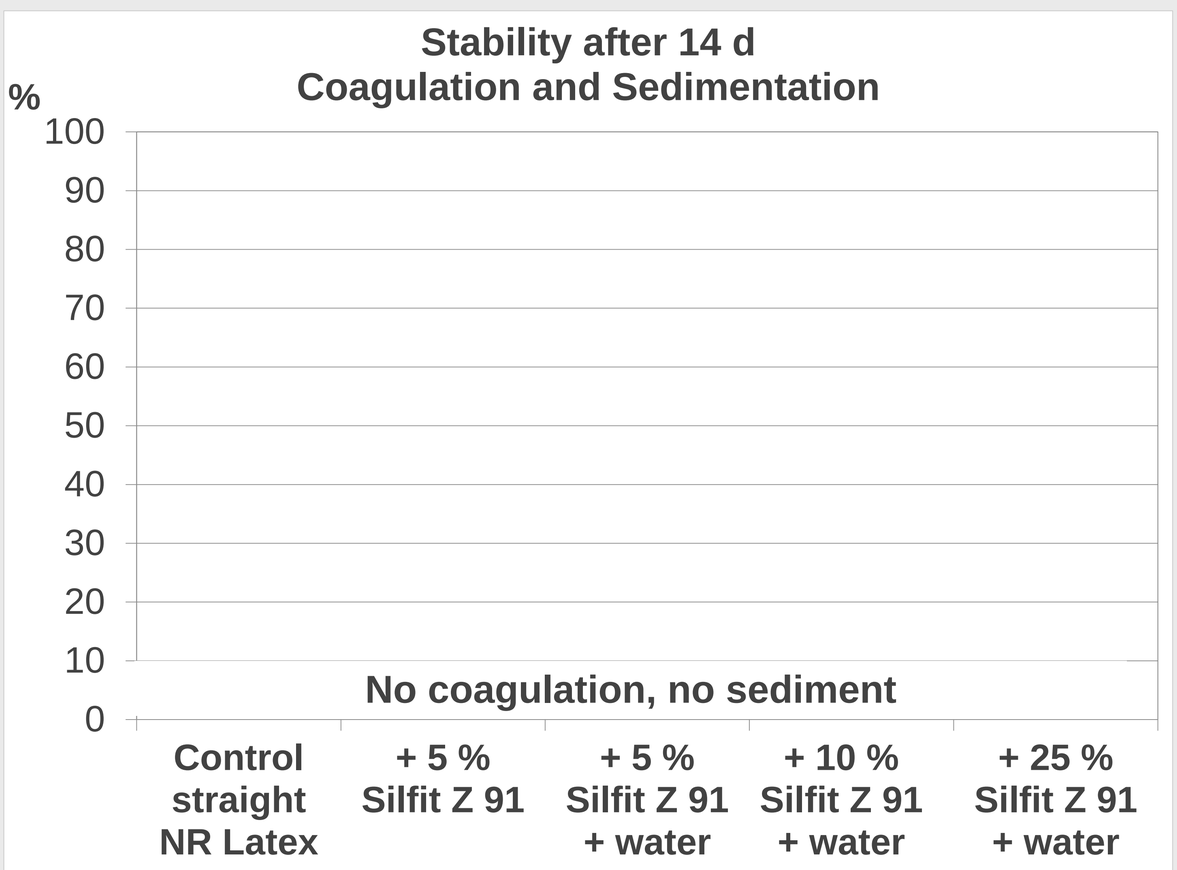
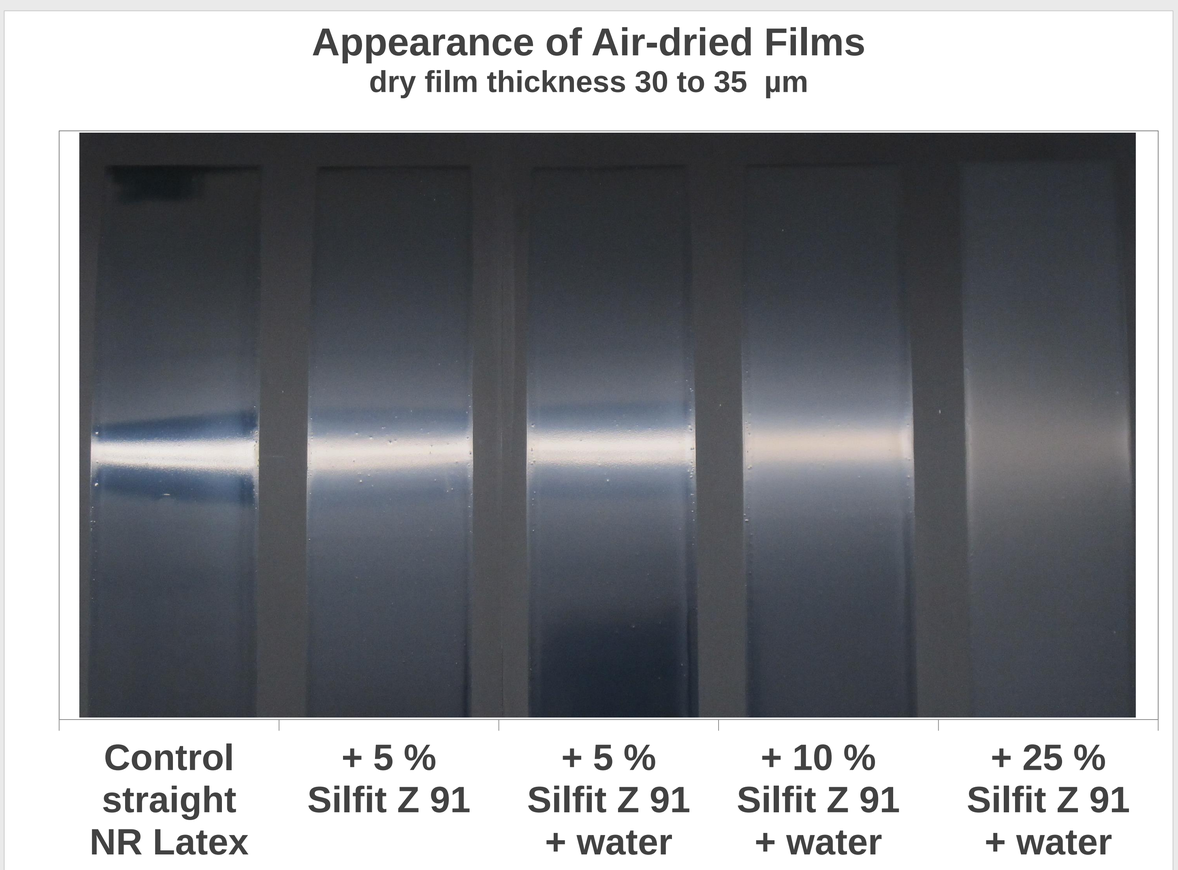
RESULTS









SUMMARY

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
- ✓ coagulation
- ✓ sedimentation
- ✓ translucence

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

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