

PROGRAMME DE COOPÉRATION TRANSFRONTALIÈRE
GRENSOverschrijDEND SAMENWERKINGSPROGRAMMA

Interreg

France-Wallonie-Vlaanderen



UNION EUROPÉENNE
EUROPESE UNIE

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GoToS3

Elasto-Plast

The influence of particulate fillers on the mechanical properties of SEBS

16/03/21



Cofinanciering



AVEC LE SOUTIEN DU FONDS EUROPÉEN DE DÉVELOPPEMENT RÉGIONAL
MET STEUN VAN HET EUROPEES FONDS VOOR REGIONALE ONTWIKKELING

GoToS3

Catalyseur
d'innovation
Katalysator
van innovatie



**Projectlei
der**



**Chef de
file
Partners**

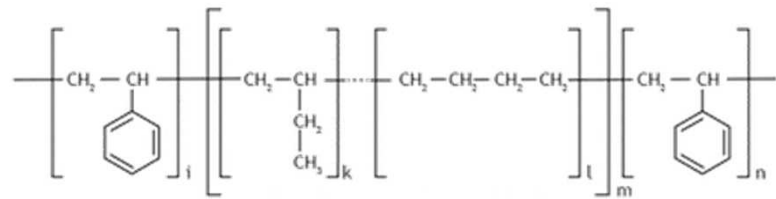
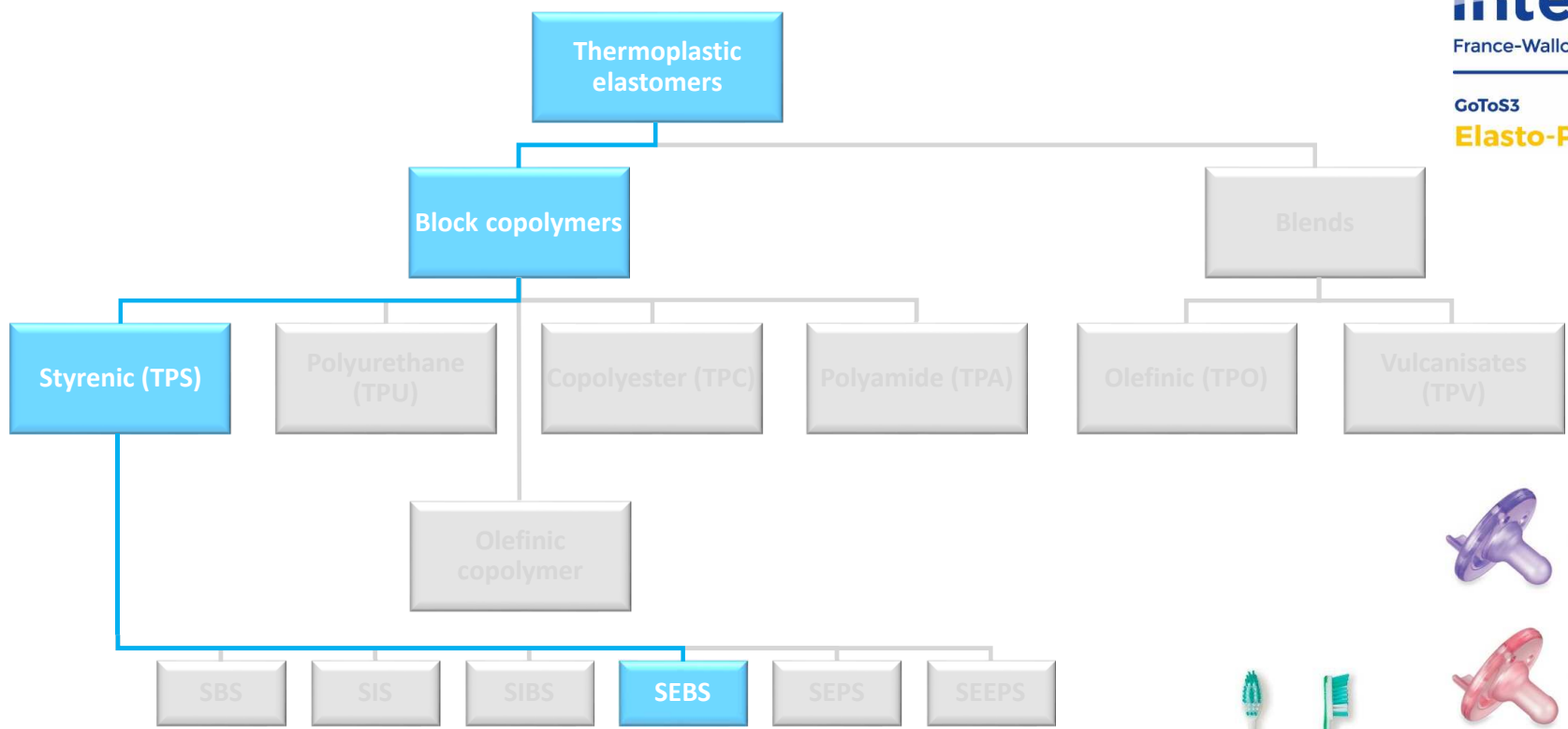
Partenaires



**Geassocieerde
partners**

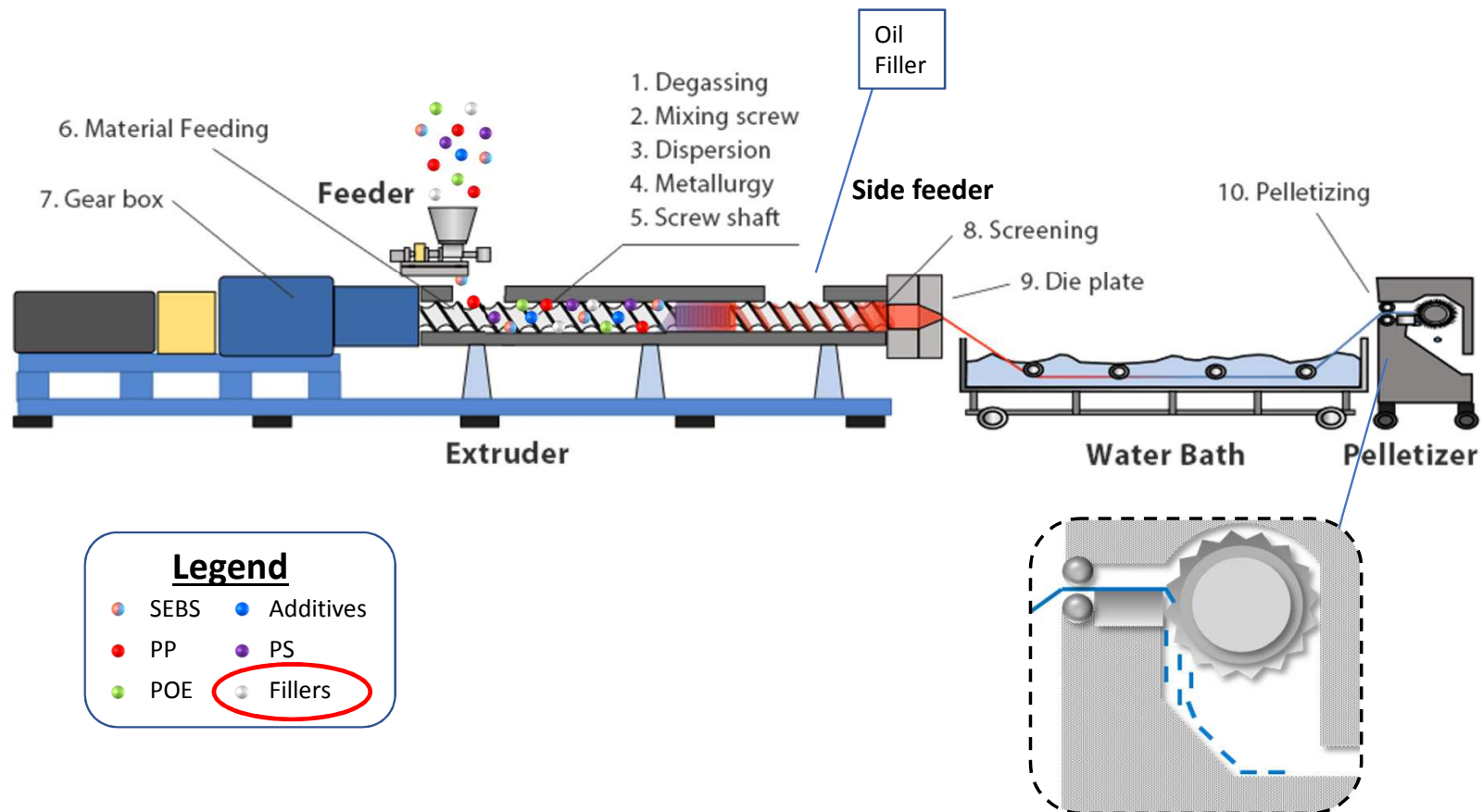
**Partenaires
associés**






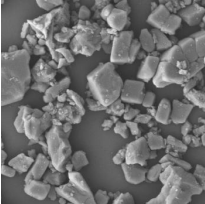
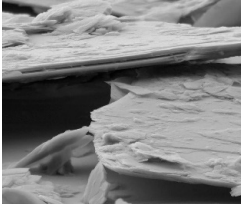
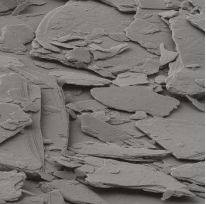






Compounding



Fillers

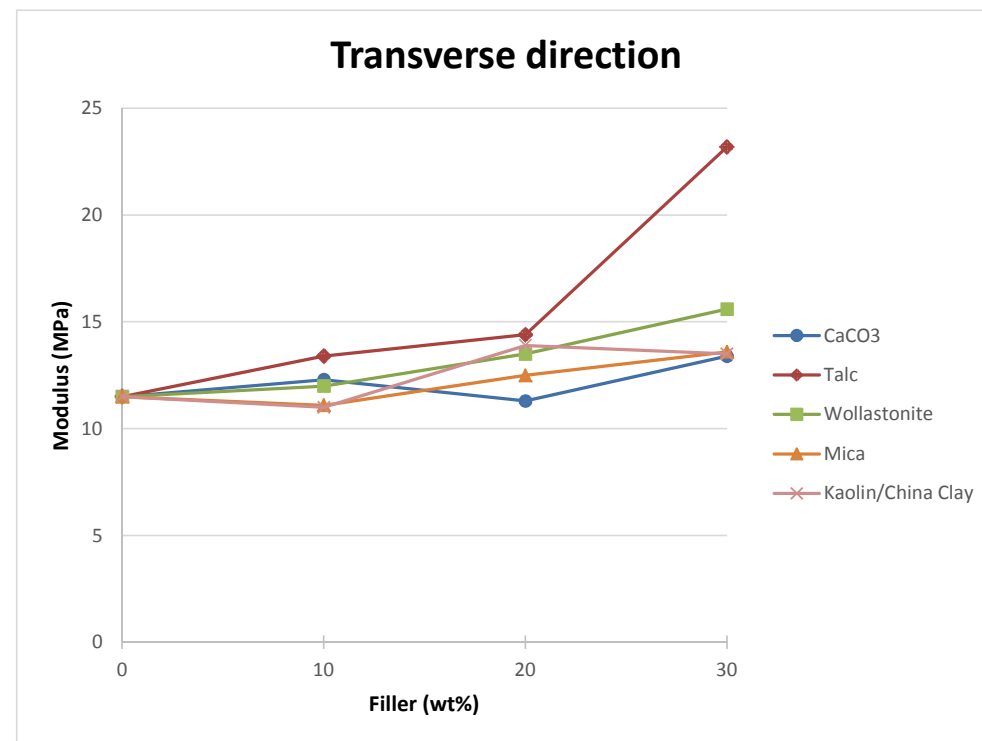
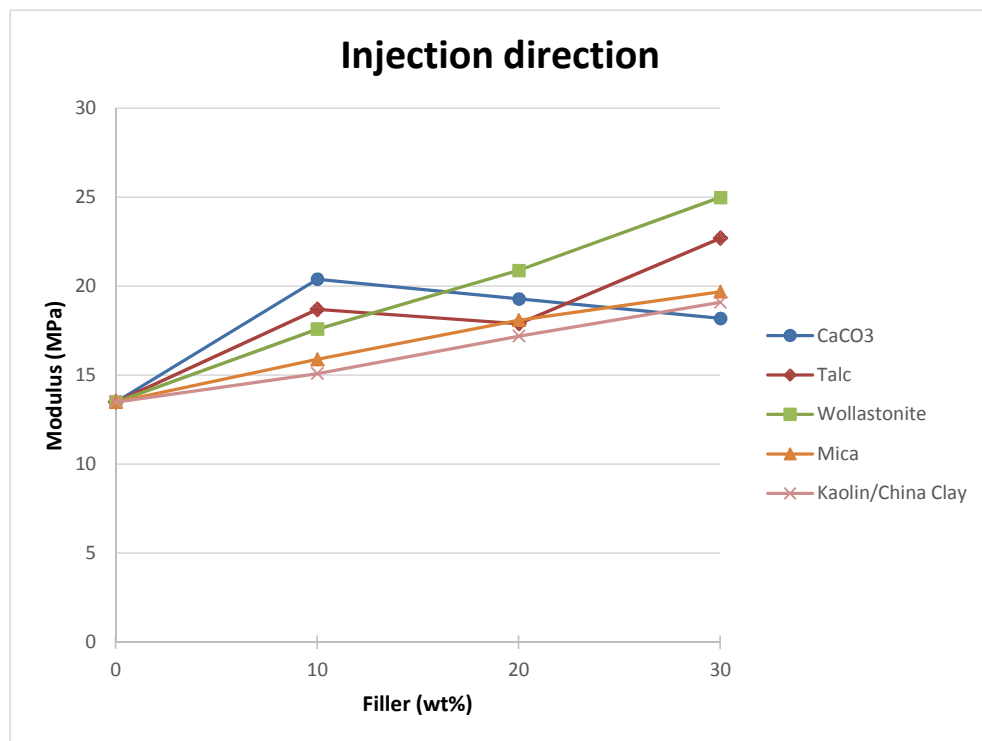
	Isotropic	Platy			Acicular
					
Mineral type	CaCO ₃	Talc	Mica	Kaolin China Clay	Wollastonite
Aspect ratio	1	10	20 - 40	20	12 15 14
Particle size (D ₅₀)	1 μm	5 μm	*	1,3 μm	4 μm 12 μm 53 μm
Density	0,7 g/cm ³	0,3 g/cm ³	2,85 g/cm ³	2,63 g/cm ³	2,85 g/cm ³
					

* Specific Surface Area Mica: 21 m²/g

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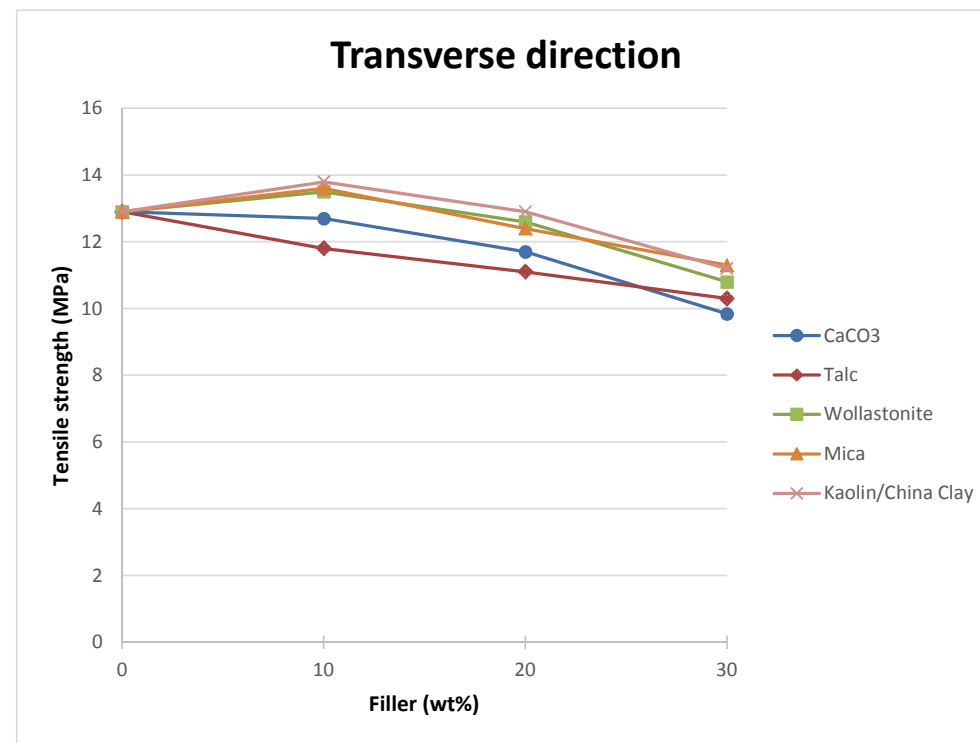
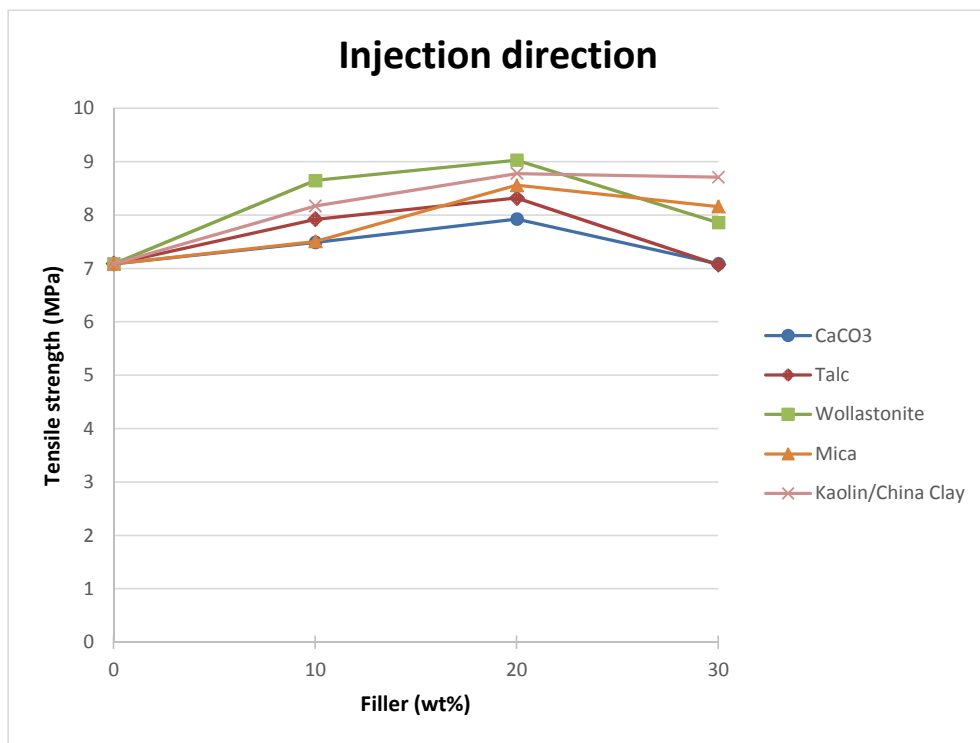
Stijn Corneillie - Centexbel

Influence of particle shape on Modulus



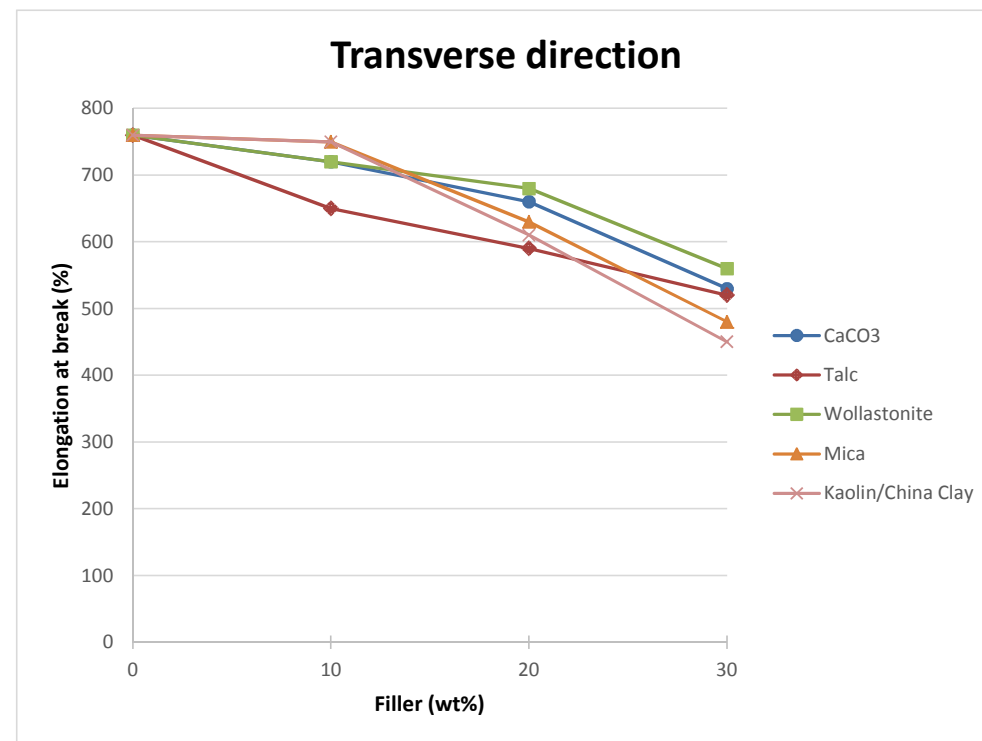
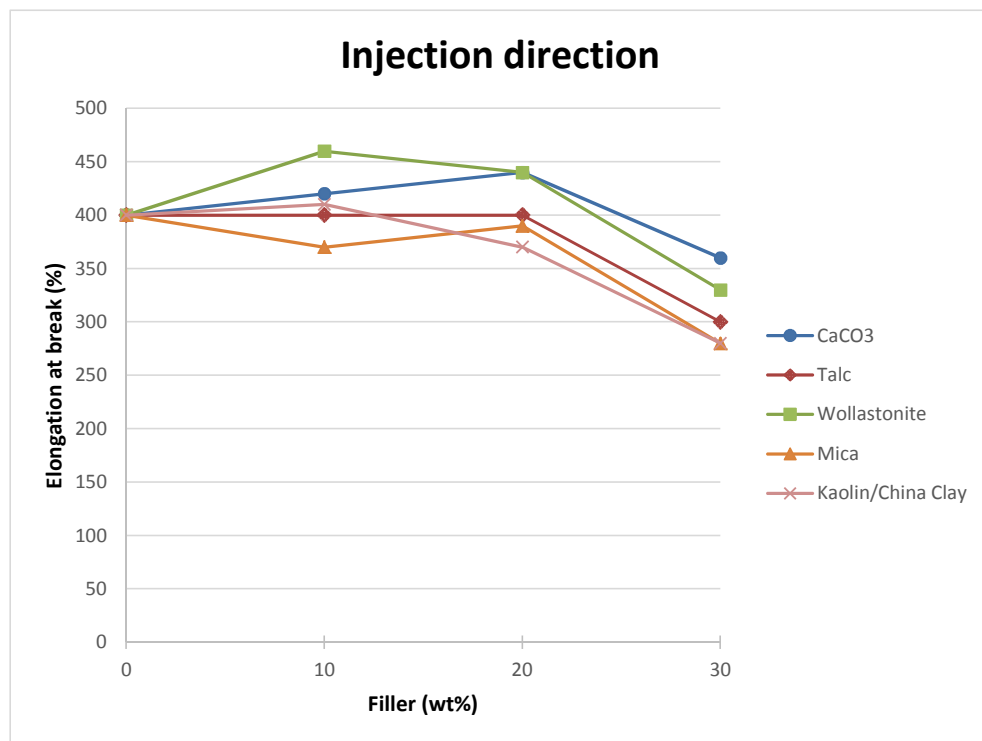
Injection molded samples: 150x150x2, cut and tested according to ISO527-2 (type 5A)

Influence of particle shape on Tensile strength



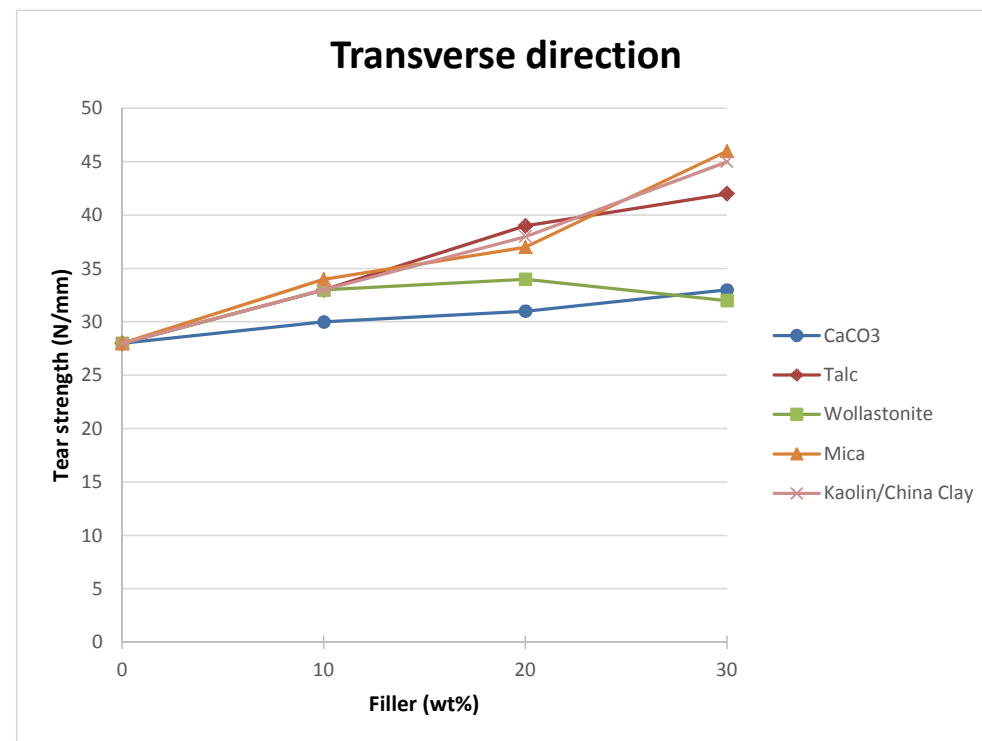
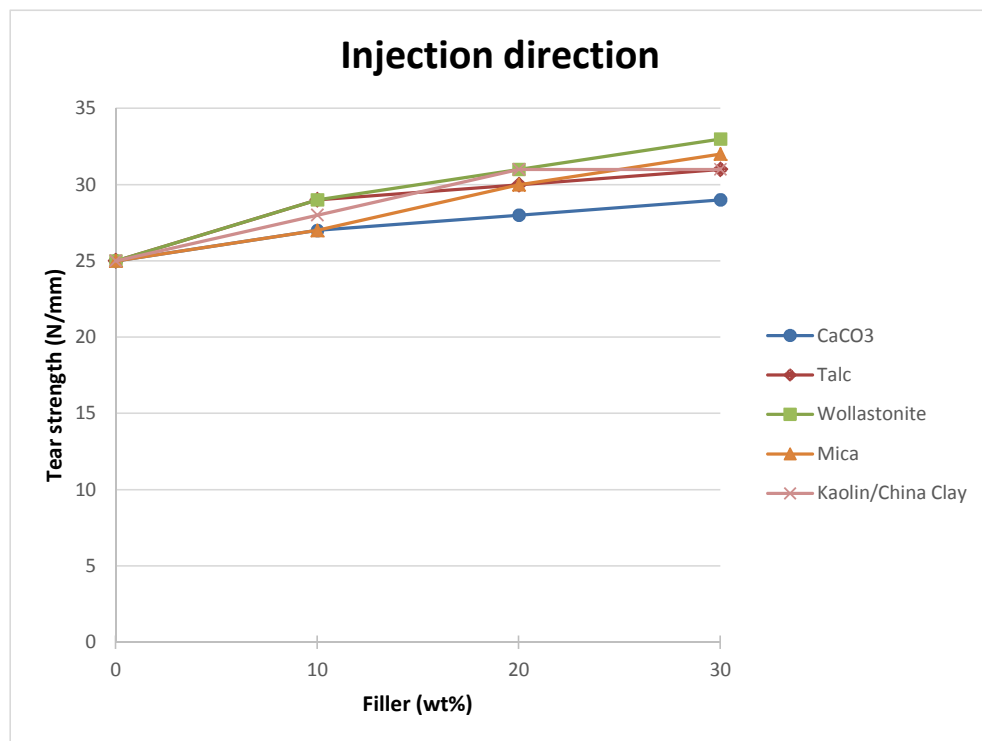
Injection molded samples: 150x150x2, cut and tested according to ISO527-2 (type 5A)

Influence of particle shape on Elongation at break



Injection molded samples: 150x150x2, cut and tested according to ISO527-2 (type 5A)







Influence of particle shape on Tear strength



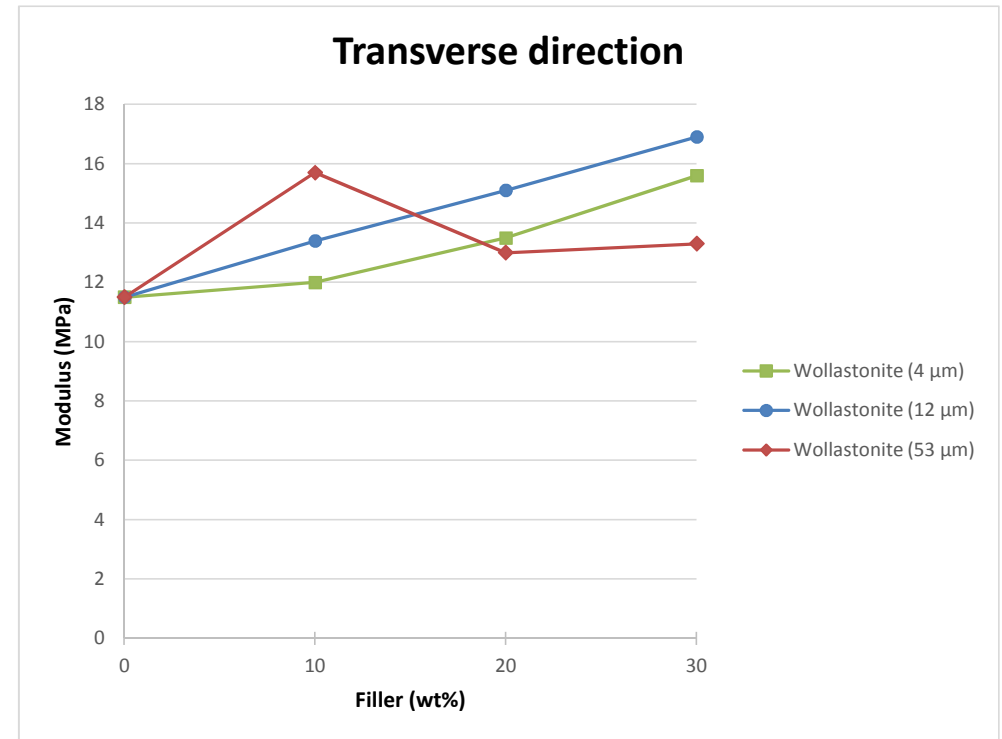
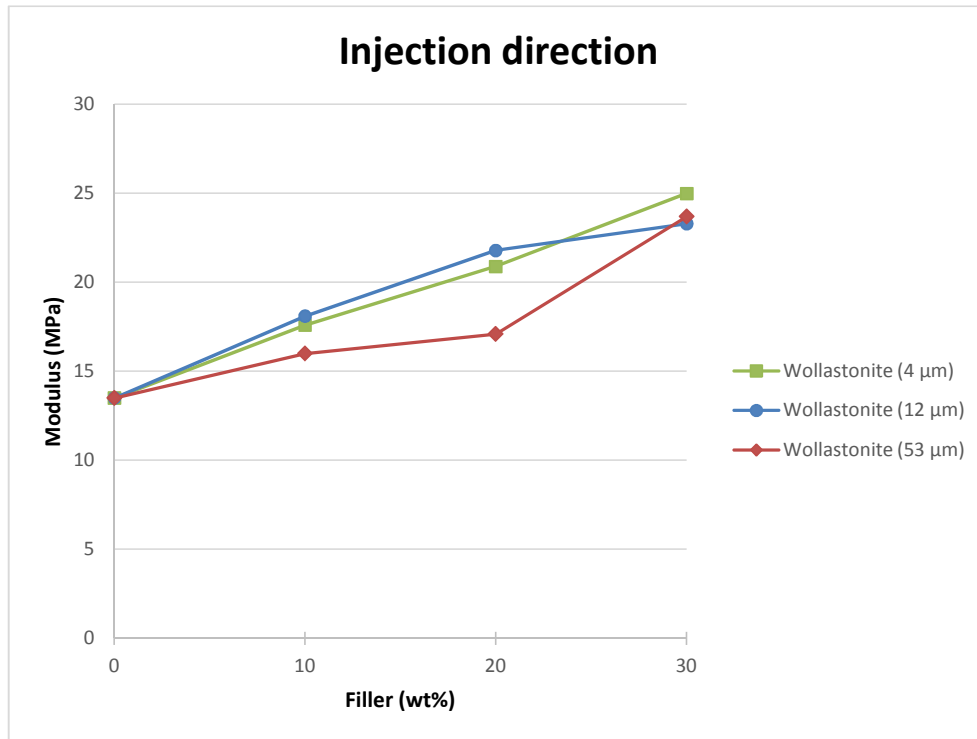
Injection molded samples: 150x150x2 mm, cut and tested according to ISO34 (methode B: Angle)

Influence of particle shape

Overview

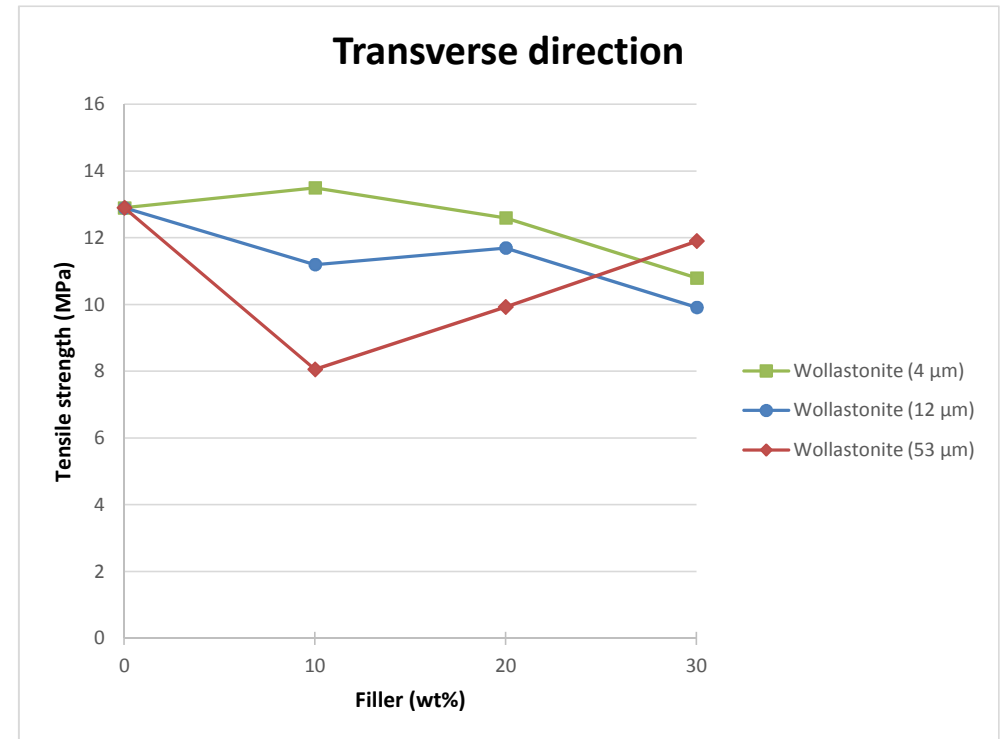
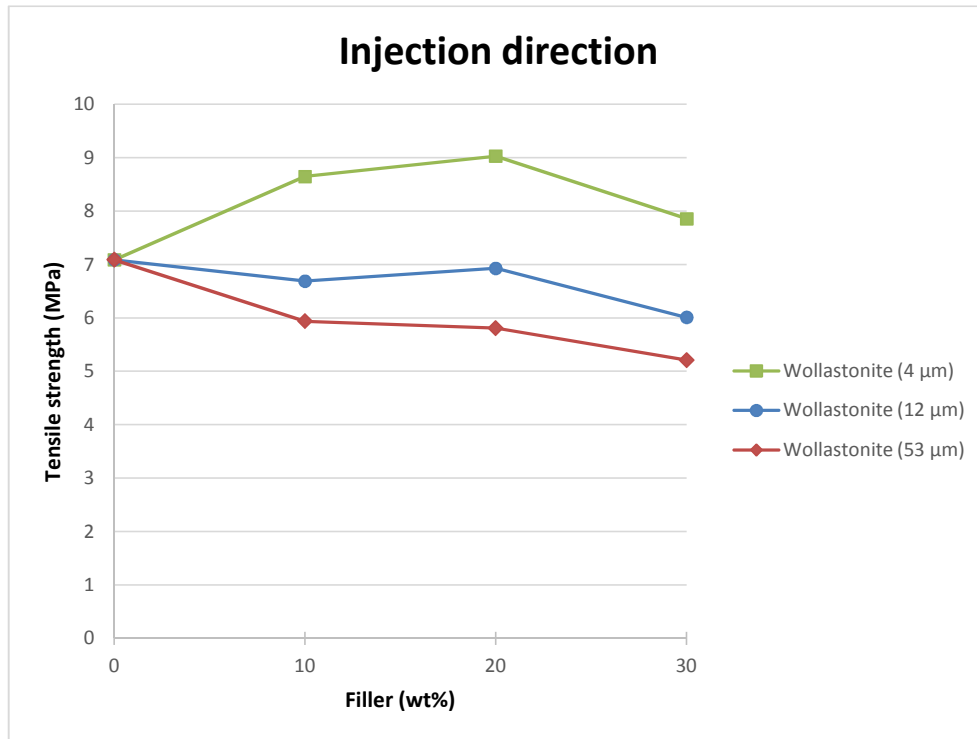
	Injection direction			Transverse direction		
	Isotropic 	Platy 	Acicular 	Isotropic 	Platy 	Acicular 
Modulus	↑	↑↑	↑↑↑	↑	↑	↑↑
Tensile strength	-	↑↑	↑	↓↓	↓	↓
Elongation at break	↓	↓↓↓	↓↓	↓↓	↓↓↓	↓
Tear strength	↑	↑↑	↑↑↑	↑	↑↑↑	↑

Influence of particle size on Modulus



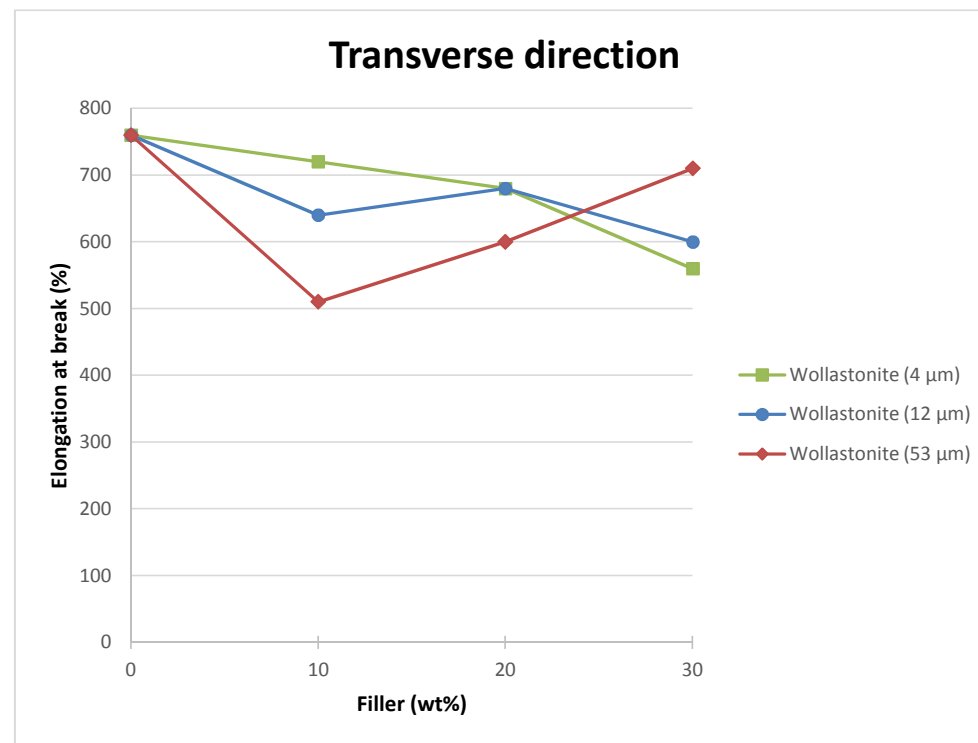
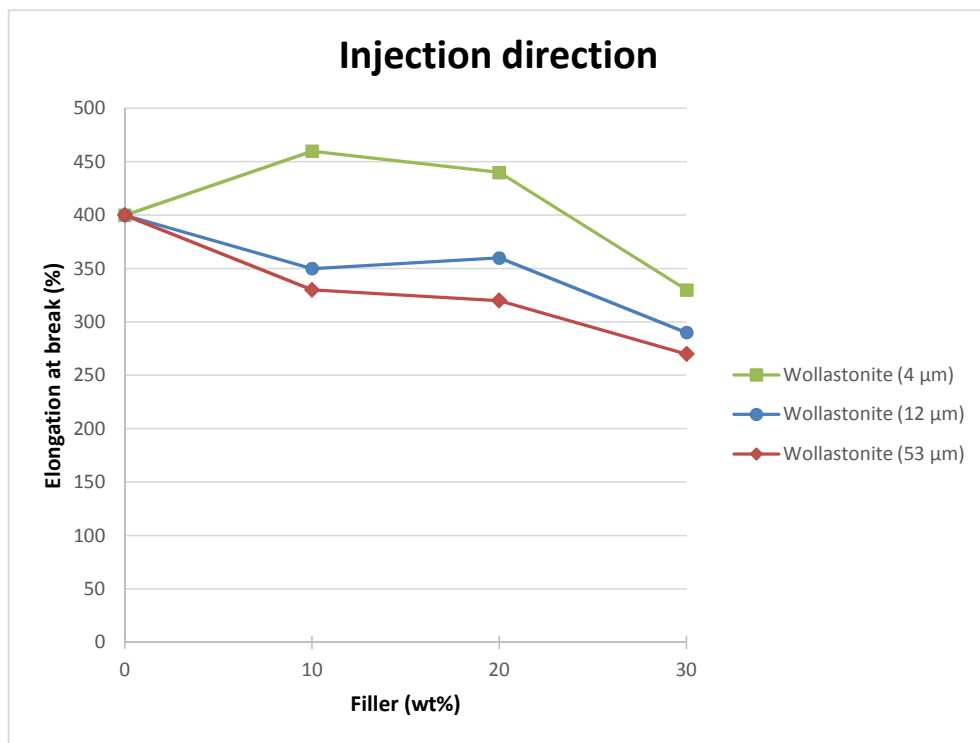
Injection molded samples: 150x150x2, cut and tested according to ISO527-2 (type 5A)

Influence of particle size on Tensile strength



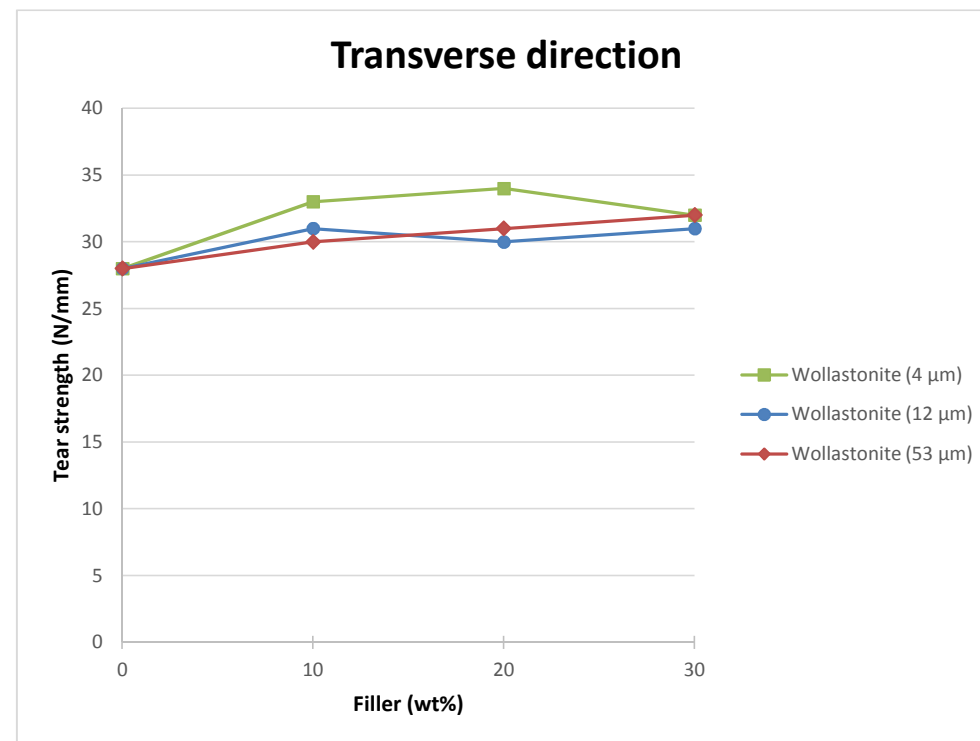
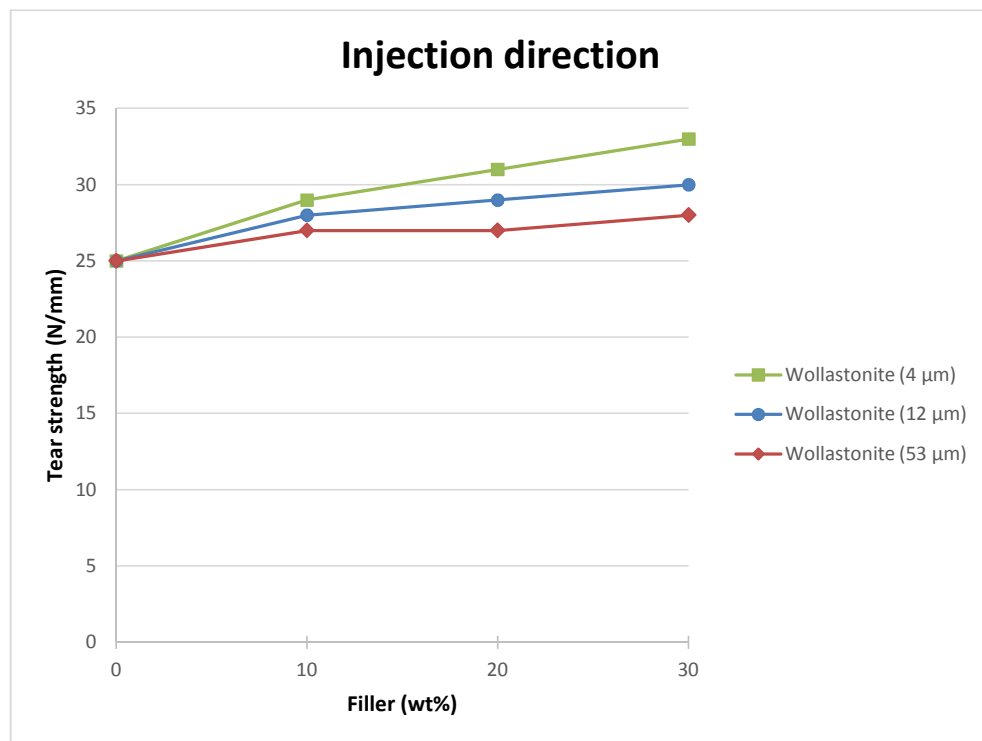
Injection molded samples: 150x150x2, cut and tested according to ISO527-2 (type 5A)

Influence of particle size on Elongation at break



Injection molded samples: 150x150x2, cut and tested according to ISO527-2 (type 5A)

Influence of particle size on Tear strength



Injection molded samples: 150x150x2 mm, cut and tested according to ISO34 (methode B: Angle)

Influence of particle size

Overview

	Injection direction			Transverse direction		
	Small	Medium	Large	Small	Medium	Large
Modulus	↑↑↑	↑↑	↑	↑↑	↑↑↑	↑
Tensile strength	↑	↓	↓↓	↓↓	↓↓↓	↓
Elongation at break	↓	↓↓	↓↓↓	↓↓↓	↓↓	↓
Tear strength	↑↑↑	↑↑	↑	↑	↑	↑

Conclusions

- **High-aspect-ratio fillers** are more effective at reinforcing, but predominantly in the injection direction
- **Talc** acts as a crystal nucleator, resulting in a higher modulus
- **Tear strength** is higher in transverse direction for platy fillers
- Choosing the **right filler loading** is crucial for optimal properties
- **Smaller particle sizes** result in improved properties

Thank you!



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