Nano-Composites versus Traditional Mineral Filled Thermoplastic

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Outline

• What are nano-composites?
• What makes them special?
• How do they compare to traditional composites?
• Are they cost competitive?
• Conclusion and future outlook
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Composite Density (g cm$^{-3}$) vs. Yield Stress (MPa) for various materials:

- Glass Fibre
- Mineral Fibre
- Mica
- Talc
- CaCO$_3$
- Wood Fibre
- Nanoclay

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• Increased modulus
• Increased tensile strength
• Increased heat resistance (HDT)
• Increased flame retardance
• Greater chemical resistance
• Minimal impact on toughness
Conclusion

- Nano-clay based composites offer no advantage in terms of mechanical performance, density or price.
- They do offer good barrier properties, useful for packaging.
- Good flame retardance is possible combined with good mechanical performance (halogen free).
- Nano-composites are not yet ready for wide use. This can be expected to change if the performance can be tuned and the price lowered.