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VANDERBILT

Technical Data

40% Wollastonite in Nylon

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40% Wollastonite in Nylon

PURPOSE

To compare the reinforcing effects of low aspect ratio, fine ground wollastonite in nylon: **VANSIL® W-50** wollastonite, **VANCOTE® W-50AS** treated wollastonite, **VANCOTE W-40AS**, treated wollastonite.

FILLER PROPERTIES

| | VANSIL W-50 | VANCOTE W-50AS | VANCOTE W-40AS |
|---|------------------------------------|------------------------------------|------------------------------------|
| Median particle size, μm | 2.8 | 2.8 | 5.6 |
| Average aspect ratio | <5:1 | <5:1 | <5:1 |
| BET surface area, m^2/g | 4 | 4 | 3 |
| Particle morphology | short needle and irregular/nodular | short needle and irregular/nodular | short needle and irregular/nodular |

COMPOUND

Preblend: 57.3% nylon (PA 211 Nylon 6 or PA 111 Nylon 6,6: Clariant), 42% filler, 0.7% antioxidant/stabilizers (0.3% Bruggolen® H3346, 0.3% Bruggolen P130, 0.1% Bruggolen P22: Brueggemann Chemical). Compounded in ZSE-40 Leistritz Extruder (250 rpm; 300°C); molded in Boy 50M injection molder; properties dry as molded.

DATA

| | Nylon 6 | | | Nylon 6,6 | | |
|------------------------------|------------|---------------|----------------|------------|---------------|---------------|
| | VANSIL W50 | VANCOTE W50AS | VANCOTE W-40AS | VANSIL W50 | VANCOTE W50AS | VANCOTE W40AS |
| Flexural Modulus, GPa | 4.32 | 4.23 | 4.33 | 5.58 | 5.38 | 5.02 |
| Flexural Strength, MPa | 140.8 | 137.4 | 138.0 | 153.0 | 163.9 | 157.8 |
| Izod Impact, J/m | 34.5 | 53.9 | 43.9 | 25.5 | 31.4 | 33.5 |
| Tensile Strength, Yield, MPa | 86.4 | 85.7 | 85 | 92.5 | 96.6 | 97.9 |
| Tensile Strength, Break, MPa | 83.6 | 78.9 | 80.2 | 90.4 | 96.6 | 97.9 |
| Yield Elongation, % | 3.4 | 3.4 | 3.4 | 2.2 | 3.2 | 3.9 |
| Break Elongation, % | 5.2 | 8.2 | 7.6 | 2.3 | 3.3 | 4.0 |
| Young's Modulus, MPa | 5.53 | 5.37 | 5.32 | 6.46 | 6.50 | 5.81 |

RESULTS

In Nylon 6:

- There was little difference in the stiffness (flexural modulus) imparted by the three wollastonite products.
- **VANCOTE W-50AS** aminosilane-treated wollastonite increased impact strength by 55% compared to untreated **VANSIL W-50** wollastonite.
- **VANCOTE W-40AS** aminosilane-treated wollastonite increased impact strength by 27% compared to **VANSIL W-50** wollastonite.
- **VANCOTE W-50AS** aminosilane-treated wollastonite provided the best overall balance of stiffness and impact strength.

In Nylon 6,6:

- Untreated **VANSIL W-50** wollastonite provided the greatest stiffness, by a small margin: 4% more than **VANCOTE W-50AS** aminosilane-treated wollastonite and 11% more than **VANCOTE W-40AS** aminosilane-treated wollastonite.
- **VANCOTE W-40AS** aminosilane-treated wollastonite provided the best impact strength: 7% more than **VANCOTE W-50AS** aminosilane-treated wollastonite and 31% more than untreated **VANSIL W-50** wollastonite.
- **VANCOTE W-50AS** aminosilane-treated wollastonite provided the best overall balance of stiffness and impact strength.

General Information

Read, understand and comply with MSDS warnings before using any of the above listed products.

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