

Mechanical properties of a composite of carbon nanotube masterbatches and high impact polystyrene (HIPS) as a function of the content of carbon nanotubes. The carbon nanotube masterbatches are composed of 10 wt% carbon nanotubes and 90 wt% polystyrene (PS). The composite is prepared by mixing the carbon nanotube masterbatches and HIPS at a temperature of 210 °C with a twin screw extruder. Samples for the property measurement are injection-molded at a pressure of 60 bar, a velocity of 40 mm/s, and a temperature of 190-210 °C.

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|---------------------------------------|------|------|------|------|
| Content of CNTs (%wt) | 0 | 1.5 | 3.0 | 4.5 |
| Yielding strength in tension (MPa) | 22.9 | 27.2 | 30.1 | 33.5 |
| Fracture strength in tension (MPa) | 37.0 | 48.7 | 53.5 | 56.4 |
| Elongation in tension (%) | 50.0 | 38.5 | 33.2 | 25.3 |
| Young's modulus (MPa) | 1850 | 2288 | 2433 | 2531 |
| Impact strength* (KJ/m ²) | 11.3 | 9.6 | 7.0 | 4.3 |

* Izod Pendulum Impact Strength; Notched; Testing Standards: ASTM D256 or ISO 180.

Mechanical properties of a composite of carbon nanotube masterbatches and general purpose polystyrene (GPPS) as a function of the content of carbon nanotubes. The carbon nanotube masterbatches are composed of 10 wt% carbon nanotubes and 90 wt% polystyrene (PS). The composite is prepared by mixing the carbon nanotube masterbatches and GPPS at a temperature of 210 °C with a twin screw extruder. Samples for the property measurement are injection-molded at a pressure of 60 bar, a velocity of 40 mm/s, and a temperature of 190-210 °C.

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|---------------------------------------|------|------|------|
| Content of CNTs (%wt) | 0 | 1.5 | 3.0 |
| Yielding strength in tension (MPa) | 44.8 | 48.7 | 43.8 |
| Fracture strength in tension (MPa) | 86.2 | 97.1 | 90.0 |
| Elongation in tension (%) | 7.1 | 2.1 | 1.9 |
| Young's modulus (MPa) | 2620 | 2884 | 3030 |
| Impact strength* (KJ/m ²) | 3.4 | 0.8 | 0.3 |

* Izod Pendulum Impact Strength; Notched; Testing Standards: ASTM D256 or ISO 180.