



CLAYS IN TECHNICAL RUBBER

Clays find use in a variety of applications, either because of specific technical properties and/or because of their very favourable cost/performance ratio.

Fine clays have semi-reinforcing properties and may be used as either the primary filler in rubber or in order to partially replace or extend more highly reinforcing carbon blacks. Less fine (filler) clays confer lower levels of reinforcement and may be more readily used at higher volume loadings. In addition, the processing properties of filler clays are often more advantageous, since they are easier to disperse efficiently. If light coloured articles are to be produced, then china clays such as **Speswhite™** & **Polwhite™ E** or **PoleStar™ 200R** calcined clay can be used in brightly coloured compounds.

WASHING MACHINE SEAL

| Formulation | phr |
|--------------------------|-------------|
| Vistalon 3666 | 175 |
| Zinc oxide | 5 |
| Stearic acid | 1 |
| Titanium dioxide | 20 |
| Speswhite™ clay | 100 |
| Polyvest 25 | 2 |
| Sunpar 2280 | 25 |
| Struktol WB212 | 3 |
| TMTD | 0,8 |
| Tetrone A | 0,8 |
| ZBDC | 2,0 |
| Sulphur | 2,0 |
| Properties | |
| Tensile Strength | 10,7 MPa |
| Modulus at 300% | 2,8 MPa |
| Elongation at break | 800% |
| Tear Strength | 20 N/mm |
| Hardness | 45° Shore A |
| Compression set at 70°C | 24,2% |
| Compression set at 100°C | 31,3% |

All clay fillers share some common features because of the plate-like shape of their particles, which results in some stiffening of the rubber compound. This gives much better extrusion and calendaring properties (exhibiting low die swell and good dimensional stability) than can be obtained from most other mineral fillers.

FLOORING COMPOUND

| Formulation | phr |
|-------------------------|---------|
| Vistalon 4608 | 60 |
| Vistalon 2504 | 40 |
| Zinc oxide | 5 |
| Stearic acid | 2 |
| Paraffin wax | 5 |
| Polwhite™ E clay | 200 |
| Sunpar 150 | 30 |
| Sulphur | 1,5 |
| ZDC | 0,5 |
| TMTD | 0,5 |
| MBT | 1,5 |
| Properties | |
| Tensile Strength | 5,8 MPa |
| Modulus at 300% | 3,7 MPa |
| Elongation at break | 440% |
| Hardness | 73 IRHD |
| Compression set at 70°C | 79,3% |

In injection mouldings platy china clays or talcs can cause anisotropy while synthetic silicas or aluminium silicates give a high viscosity causing difficulties in mold filling. Calcined clay gives, as a consequence of its shape and size, little anisotropy and low viscosity. Properties are also very good (but may be boosted by small amounts of synthetic silica) and a typical EPDM injection moulding for a spark plug cap is given overleaf.

SPARK PLUG CAP

| | phr |
|---------------------------|------|
| Vistalon 7606 | 100 |
| Polyethylene Wax | 3 |
| PoleStar™ 200R | 120 |
| Precipitated Silica | 30 |
| Plasticiser | 30 |
| Polyethylene glycol | 3 |
| ZMTI | 1 |
| Sulphur | 0.2 |
| Peroxide (40% on carrier) | 8 |
| Curing characteristics | |
| Minimum torque (lb/in) | 9.7 |
| Maximum torque (lb/in) | 73.4 |
| T ₂ (min) | 1.0 |
| T ₉₀ (min) | 7.7 |
| Mechanical Properties | |
| Tensile Strength (Mpa) | 10.1 |
| Elongation at Break (%) | 43.0 |
| Modulus at 100% | 3.0 |
| Hardness (Share A) | 64 |

The information contained herein was obtained as a result of work carried out on materials thought to be representative and accordingly is believed to be correct. Such information shall not, however constitute any representation, condition or warranty as to any fact contained herein, and accordingly IMERYS Minerals Ltd hereby disclaims all and any liability arising from the use of such information howsoever caused.

IMERYS PERFORMANCE & FILTRATION MINERALS

Par Moor Centre, Par Moor Road, Par, Cornwall, UK PL24 2SQ
 t: +44 (0)1726 818000 f: +44 (0)1726 811200
 e: perfmins@imerys.com
 www.imerys-perfmins.com

154 rue de l'Université, 75007 Paris - France
 t: +33 1 49 55 66 37 f: +33 1 49 55 66 57
 e: info.europe@worldminerals.com
 www.worldminerals.com