cracking, crazing or chalking of the pipe surface they shall be put to one side for joint inspection by the Engineer and pipe manufacturer. Should the joint inspection determine that any of the products have been damaged they shall be removed from site and replaced.

# 21.2 Part 2 Products

## 21.2.1 Pipe Material Requirements

### *21.2.1.1 Polyethylene Pipe Material Requirements*

All polyethylene (PE) used to produce pipes and fittings in accordance with this specification shall be material that meets the requirements for black PE100 material given in ISO4427 - Part 1 and Table 21-2 below



| **Characteristics** | **Standard** | **Required Value** |
|---|---|---|
| Compound density | ISO 1183-2 | ≥ 950 kg/m$^3$ |
| Carbon black content | ISO 6964 | 2 to 2.5% by mass |
| Carbon black dispersion | ISO 18553 | ≤ 3 |
| Oxidation induction time (OIT) | ISO 11357-6 | ≥ 20 minutes at 200$^o$C |
| Water content | ISO 15512 | ≤ 300 mg/kg |
| Volatile content | EN 12099 | ≤ 350 mg/kg |
| Melt mass-flow rate (MFR) | ISO 1133 Condition T | 0.2 to 1.4 g/10 minutes |
| Tensile strength for butt-fusion | ISO 13953 | Ductile failure |
| Slow crack growth (110mm SDR11 pipe) | ISO 13479 | ≥ 500 hours |
| Slow crack growth (110mm SDR11 pipe) – HSCR PE100 | ISO 13479 | ≥ 8,760 hours |
| Elongation at break | ISO 6259 | ≥ 350 % |
| Hydrostatic strength at 80$^o$C | ISO 1167 | ≥ 165 hours at 5.4 MPa |
| Hydrostatic strength at 80$^o$C | ISO 1167 | ≥ 1000 hours at 5.0 MPa |
| Hydrostatic strength at 20$^o$C | ISO 1167 | ≥ 100 hours at 12.4 MPa |
| Longitudinal reversion | ISO 2505 | ≤ 3 % at 110 ± 2 $^o$C |

**Table 21-2: PE Material Properties**