

PERFORMANCE GRADE BITUMEN AASHTO M 320-23



| Performance Grade: | PG 64 | | PG 70 | | | | PG 76 | | | | PG 82 | | |
|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | 16 | 22 | 10 | 16 | 22 | 28 | 10 | 16 | 22 | 28 | 10 | 16 | 22 |
| LTPPBind calculated max pavement design temp, °C | <64 | | <70 | | | | <76 | | | | <82 | | |
| Min pavement design temperature, °C ^a | > -16 | > -22 | > -10 | > -16 | > -22 | > -28 | > -10 | > -16 | > -22 | > -28 | > -10 | > -16 | > -22 |
| Original Binder | | | | | | | | | | | | | |
| Flash point temp, T 48, min °C | 230 | | | | | | | | | | | | |
| Viscosity, T 316: ^b max 3 Pa·s, test temp, °C | 135 | | | | | | | | | | | | |
| Dynamic shear, T 315: G*/sinδ, min 1.00 kPa test temp @ 10 rad/s, °C | 64 | | 70 | | | | 76 | | | | 82 | | |
| Rolling Thin-Film Oven Residue (T 240) | | | | | | | | | | | | | |
| Mass change, ^c max, percent | 1.00 | | | | | | | | | | | | |
| Dynamic shear, T 315: G*/sinδ, min 2.20 kPa test temp @ 10 rad/s, °C | 64 | | 70 | | | | 76 | | | | 82 | | |
| Pressurized Aging Vessel Residue (R 28) | | | | | | | | | | | | | |
| PAV conditioning temperature, °C ^d | 100 | | 100 | | | | 100 | | | | 100 | | |
| Dynamic shear, T 315: G* sinδ, ^e max 6000 kPa δ, ^e min 42° test temp @ 10 rad/s, °C | 28 | 25 | 34 | 31 | 28 | 25 | 37 | 34 | 31 | 28 | 40 | 37 | 34 |
| Creep stiffness, T 313: ^f S, max 300 MPa m-value, min 0.3 test temp @ 60 s, °C | -6 | -12 | 0 | -6 | -12 | -18 | 0 | -6 | -12 | -18 | -6 | -12 | -18 |
| Direct tension, T 314: ^f Failure strain, min 1.0% test temp @ 1.0 mm/min, °C | -6 | -12 | 0 | -6 | -12 | -18 | 0 | -6 | -12 | -18 | -6 | -12 | -18 |

- Pavement temperatures are estimated from air temperatures using an algorithm contained in the LTPPBind program, or may be provided by the specifying agency.
- This requirement may be waived at the discretion of the specifying agency if the supplier warrants that the asphalt binder can be adequately pumped and mixed at temperatures that meet all applicable safety standards.
- The mass change shall be less than 1.00 percent for either a positive (mass gain) or a negative (mass loss) change.
- For climates with an LTPPBind high pavement temperature of 76°C or above, the PAV conditioning temperature shall be 110°C.
- If the intermediate temperature stiffness, $G^* \sin \delta$, is below 5000 kPa, the phase angle minimum limit is not required. If the intermediate temperature stiffness, $G^* \sin \delta$, is between 5000 and 6000 kPa, the intermediate phase angle minimum limit is required.
- If the creep stiffness is below 300 MPa, the direct tension test is not required. If the creep stiffness is between 300 and 600 MPa, the direct tension failure strain requirement can be used in lieu of the creep stiffness requirement. The m-value requirement must be satisfied in both cases.



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