# NLGI Grease Specifications – GC-LB and HPM

## GC-LB Comparison

| Test Name | Units | Method | GC-LB (ASTM D4950) | High Performance Multiuse (HPM) | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | HPM Core | + Water Resistance (WR) | + Corrosion Resistance (CR) | + High Load (HL) | + Low Temp (LT) |
| Worked-60 Pen | dmm | D217 | 220 - 340 | 220 -340 | | | | |
| Bearing rust (DI) | rating | D1743 | Pass | Pass | | | | |
| Bearing rust (10% SSW) | rating | D5969 | | | | Pass | | |
| Emcor rust test (distilled water), max | rating | D6138 | | 0,1 | | | | |
| Emcor rust (100% SSW), max | rating | D6138 | | | | 1 , 2 | | |
| Emcor rust (0.5 N NaCl solution), max | rating | D6138 | | | | 2 , 3 | | |
| Four-Ball wear, max | mm | D2266 | 0.6 | 0.60 | | | 0.50 | |
| Four-Ball weld, min | kgf | D2596 | 200 | 250 | | | 400 | |
| Four-Ball LWI, min | kgf | D2596 | 30 | | | | | |
| SRV step load, (Proc. B at 80 °C), min | N | D5706 | | | | | 800 | |
| Fretting wear scar by SRV, max | mm | D7594 | | | | | 0.500 | |
| Fretting wear (wt loss), max* | mg | D4170 | 10 | | | | | |
| Fretting wear (wt loss), ave of 2 tests, max* | mg | D4170 | | | | | 5 | |
| Dropping point, min | °C (°F) | D2265 | 220 (428) | | | | | |
| High temp life, max | hrs | D3527 | 80 | | | | | |
| Oxid. stability, 100 hrs, 100 °C, max | ΔkPa (psi) | D942 | | 35 (5.1) | | | | |
| Copper corrosion, 24 hrs, 100 °C, max | rating | D4048 | | 1b | | | | |

*The GC-LB specification requires only 1 test (using D4170) to be run and it must meet the 10 mg spec limit. In HPM, due to the variability inherent in the test and the lower limit of 5 mg, requiring the test to be run in duplicate helps reduce the variability and ensures more accurate results. Therefore, the HPM spec requires that the D4170 test be run twice and the results averaged. The average of the two runs needs to meet the 5 mg limit.

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| CR Volume Change | Δ Vol % | D4289 | 0 to 40 | | | | | |
| CR Hardness Change | ΔHardness | D4289 | -15 to 0 | | | | | |
| NBR Volume Change | Δ Vol % | D4289 | -5 to 30 | | | | | |
| NBR Hardness Change | ΔHardness | D4289 | -15 to 2 | | | | | |
| NBR (ISO 13226), 168 hrs at 125 °C | ΔHardness | D4289 | | -15 to +2 | | | | |
| | Δ Vol % | D4289 | | -5 to +30 | | | | |
| Prolonged worked pen (Δ100k) | dmm | D217 | | +/- 30 | | | | |
| Water washout, % loss, max | wt% | D1264 | 15 | 10 | 5 | | | |
| Water spray off, max | wt% | D4049 | | | 40 | | | |
| Wet roll stability (pen change) | dmm | D8022 | | | +/- 15% | | | |
| High temp bleed (30 hr, 100 °C), max | wt% | D6184 | | 7 | | | | |
| Roll stability (2 hrs, RT) | dmm | D1831 | | +/-10% | | | | |
| Oil sep (24 hrs @ 25 °C), % loss, max | wt% | D1742 | 6 | 5 | | | | |
| Leakage, grams loss, max | g | D4290 | 10 | | | | | |

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| Low temp torque ball bearing, -20 °C | | D1478 | | | | | | |
| Starting torque, max | mNm(g·cm) | | | 1000(10,200) | | | | |
| Running torque, max | mNm(g·cm) | | | 100(1,020) | | | | |
| Low temp torque @ -40 °C, max | N-m | D4693 | 15.5 | | | | | |
| Low temp torque ball bearing, -30 °C | | D1478 | | | | | | |
| Starting torque, max | mNm (g·cm) | | | | | | | 1000(10,200) |
| Running torque, max | mNm (g·cm) | | | | | | | 100(1,020) |
| U. S. Steel mobility, -20 °C, min | g/min | LT-37 | | | | | | 10 |
| Low temp flow (Kesternich), -30 °C, max | mbar | DIN 51805-2 | | | | | | 1400 |

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