

# The Goodyear Tire & Rubber Company

Akron, Ohio 44316 - 0001

September 27th, 1987

Mr. Dick Znidarsic  
Technical Director  
Chardon Rubber

Subject: Low Temperature Testing of Chardon Rubber Compounds

Dear Dick;

Per your correspondence to me dated 9/2/87, low temperature tests were run on three compounds submitted by you. Compound BX58J-26801 was your compound V-2139 and reported to be a PVC compound containing no NBR rubber. Compound BX58J-26802 was your compound V-6003 and reported to be the same compound with 50 parts of CHEMIGUM P83 NBR rubber added. BX58J-26803 was a third compound tested and was your compound V-6003X-1. You reported this compound to be the same as V-6003 except 30 parts of DOP (out of a total of 110 parts) had been replaced with DOA.

The Gehman low temperature test run showed little difference among the three compounds. The addition of CHEMIGUM P83 showed a slight trend towards a stiffer compound; however the plasticizer change in the third compound tested showed an improvement in resistance to stiffening at low temperatures. The brittleness test showed no difference between the PVC compound and the PVC/P83 compound. The plasticizer change in the third compound again showed an improvement in this low temperature property.

Dick, as reported to you in previous correspondence we believe the compression/deflection test to come closest to reproducing the type of results you reported from Nissan. Results in this series of testing did not reproduce the test results obtained previously and reported to you in correspondence dated 10/2/87. Compression/deflection test data from this series shows the addition of CHEMIGUM P83 results in lower loads to compress it the same amount as the non-bearing nitrile compound. The third compound, containing the plasticizer change, shows an even greater improvement in lowering compression/deflection properties. This improvement becomes more significant as the temperature is lowered to -35 deg. C.

# LOW TEMP TESTING FOR CHARDON

BX58J 26801 26802 26803

## GEHMAN LOW TEMP. TORSION (DEG. C)

|        |      |      |      |
|--------|------|------|------|
| T( 2)  | -14. | -11. | -19. |
| T( 5)  | -25. | -23. | -29. |
| T( 10) | -30. | -28. | -33. |
| T(100) | -44. | -40. | -45. |

BRITTLE TEMP. (C) -46.5 -46.5 -51.3

## COMPRESSION DEFLECTION FIRST CYCLE TESTED @ RT

|           |      |      |      |
|-----------|------|------|------|
| PSI @ 10% | 60.  | 50.  | 59.  |
| PSI @ 20% | 160. | 133. | 142. |
| PSI @ 30% | 320. | 245. | 263. |
| PSI @ 40% | 600. | 442. | 443. |

## COMPRESSION DEFLECTION THIRD CYCLE TESTED @ RT

|           |      |      |      |
|-----------|------|------|------|
| PSI @ 10% | 56.  | 47.  | 55.  |
| PSI @ 20% | 145. | 115. | 130. |
| PSI @ 30% | 300. | 228. | 261. |
| PSI @ 40% | 658. | 487. | 485. |

## COMPRESSION DEFLECTION TESTED @ -25C THIRD CURVE

|            |       |       |       |
|------------|-------|-------|-------|
| PSI @ 10%  | 250.  | 180.  | 150.  |
| PSI @ 20%  | 800.  | 550.  | 450.  |
| PSI @ 30%  | 1950. | 1300. | 1110. |
| PSI @ 40%  | 3300. | 2500. | 2200. |
| INCHES SET | .039  | .032  | .025  |

## COMPRESSION DEFLECTION TESTED @ -25C INITIAL CURVE

|            |       |       |       |
|------------|-------|-------|-------|
| PSI @ 10%  | 170.  | 150.  | 190.  |
| PSI @ 20%  | 650.  | 500.  | 530.  |
| PSI @ 30%  | 1400. | 1030. | 1090. |
| PSI @ 40%  | 2275. | 1825. | 1700. |
| HARDNESS A | 86.   | 84.   | 84.   |

## COMPRESSION DEFLECTION TESTED @ -35C FINAL CURVE

|           |       |       |       |
|-----------|-------|-------|-------|
| PSI @ 10% | 850.  | 860.  | 450.  |
| PSI @ 20% | 2200. | 2100. | 1200. |
| PSI @ 30% | 4230. | 3800. | 2460. |
| PSI @ 40% | 6190. | 5600. | 4100. |

## COMPRESSION DEFLECTION TESTED @ -35C INITIAL CURVE

|            |       |       |       |
|------------|-------|-------|-------|
| PSI @ 10%  | 380.  | 375.  | 300.  |
| PSI @ 20%  | 1050. | 1040. | 775.  |
| PSI @ 30%  | 2000. | 1850. | 1470. |
| PSI @ 40%  | 3420. | 3015. | 2580. |
| HARDNESS A | 90.   | 87.   | 85    |

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