

Comparative Horsepower Tests:

The improved lubricating properties of lubricants including the **CerBond™** were further demonstrated by comparing the horsepower generated by an automobile engine operating without the **CerBond™** added to the lubricant versus the horsepower generated by the same automobile engine with the **CerBond™** added to the engine lubricant. In each case, the horsepower generated by a 1998 Jeep Grand Cherokee Laredo (“Jeep”) with a 4.0 liter, 6 cylinder engine was measured using a Dynajet Model 248C Dynamometer.

Five quarts of 10W30 petroleum-based motor oil were added to the Jeep. The horsepower of the Jeep was initially measured prior to addition of **CerBond™**. In the first test, the engine was accelerated from 0 to 5200 RPMs (Revolutions Per Minute). The absolute barometric pressure was recorded as 29.92 in. Hg (about 100 kPa) with a vapor pressure of 0.61 in. Hg (about 2 kPa). The intake air temperature was measured at 86° Fahrenheit (30° C) and the gear ratio was recorded as 49 RPM/MPH. A Society of Automotive Engineers (“SAE”) correction factor of 1.01 was used to convert the measured horsepower to a corrected horsepower.

A second test was performed on the same automobile by adding 2 ounces of **CerBond™** to the 5 quarts of engine-lubricating oil, resulting in a **CerBond™** concentration of 0.58%. The automobile was again accelerated from 0 to 5200 RPM with measurements again taken at increasing 250 RPM intervals. During the second test, the absolute barometric pressure was recorded as 20.92 in. Hg (about 100kPa) with a vapor pressure of 0.61 in. Hg (about 2 kPa). The intake air temperature was measured at 88.8 ° F (31.6° C), and the gear ratio was recorded as 48 RPM/MPH. An SAE correction factor of 1.01 was used to convert the measured horsepower to a corrected horsepower.

The measured and corrected horsepower of the Jeep at various engine speeds, operating with lubricant alone versus with **CerBond™** added to the lubricant, is detailed below in Table 1.

Table 1

Engine RPM	Measured Horsepower W/out CerBond™ treatment	Corrected Horsepower W/out CerBond™ treatment	Measured Horsepower With CerBond™ treatment	Corrected Horsepower With CerBond™ treatment
3250	109.0	109.7	136.8	138.2
3500	117.5	118.3	119.8	120.9
3750	124.5	125.3	124.6	125.9
4000	129.7	130.6	130.0	131.3
4250	133.9	134.8	138.3	139.6
4500	138.5	139.5	142.7	144.2
4750	139.0	139.9	139.9	141.2
5000	133.4	134.3	135.2	136.6
Avg.	125.4	126.3	133.4	134.7
Max.	139.0	139.9	142.7	144.2

In comparing the data in Table 1, it can be seen that the **corrected horsepower increased by an average of 8.4** horsepower when the **CerBond™** was added to the engine lubricant compared with the corresponding tests performed without the additive. In addition, the maximum horsepower achieved in the tests using the **CerBond™** exceeded the maximum horsepower in the tests without the additive by 4.3 horsepower. The test measurements of increased horsepower resulting from use of the **CerBond™** supports the conclusion that use of **CerBond™** provides better lubrication of the engine parts.