



## CASE STUDY OF DURABILITY OF MILLERS OILS CFS 5W40 NT ENGINE OIL



### Purpose of the case study

The purpose of this case study is to analyse the durability of Millers Oils Nanodrive CFS 5w40 NT engine oil. Many racers routinely change oil after every event or two due to concerns over degradation (viscosity breakdown, loss of TBN/increase in oil acidity, depletion of additives etc.), but the greater protection offered by Millers Oils Nanodrive products means that drain intervals can generally be extended provided the engine is in good condition.

### Vehicle details

The vehicle being used to carry out this analysis is a Porsche 996 with a 3.6 litre engine making approx 300 HP at the rear wheels. The car is fully developed as a professional race car running in the Pirelli World Challenge series in the USA. The vehicle minimum weight for the series is 2800 lbs including driver. The sump capacity is approx 11 litres (there is a deep sump kit installed which increases capacity). The car routinely sees cornering forces exceeding 1.6g and runs on Pirelli slick tyres.

### Summary of results so far

An initial fill of CFS 5w40 NT was installed in the vehicle in March 2012 and, with minimal oil top-ups since then, analysis of used samples has confirmed that the oil is still fit for further racing after a total of 5 race weekends totalling around 17.5 hours and around 1600 race miles. In all approximately 4 litres of new oil has been added during or after the various events, 2 litres to replace the 5 samples that have been taken and only 2 litres that has been consumed during the 17.5 hours of racing.

The 5 race weekends attended so far were:

- March 23<sup>rd</sup>-25<sup>th</sup> – Saint Petersburg Grand Prix Weekend, FL – Pirelli World Challenge
- June 1<sup>st</sup>-2<sup>nd</sup> – Watkins Glens Int'l Raceway, Watkins Glen, NY – Porsche Club of America
- June 22<sup>nd</sup>-24<sup>th</sup> – Mosport Int'l Raceway, Bowmanville, Canada – Pirelli World Challenge
- August 2<sup>nd</sup>-5<sup>th</sup> – Mid Ohio Pro Sports Car Course, Lexington, OH – Pirelli World Challenge
- September 1<sup>st</sup>-3<sup>rd</sup> – Road America, Elkhart Lake, WI – Porsche Club of America

The graphs overleaf show the results of laboratory analysis of the original, unused product, alongside used samples taken after 3½ hours racing, 6 hours racing, 10 hours racing, 15 hours racing and 17.5 hours racing.

### Conclusion

The results presented in this case study confirm that Millers Oils Nanodrive CFS NT engine oils allow for drain intervals that are significantly longer than the drain intervals typically followed in racing today, while still providing optimum protection. We would recommend that sample testing is carried out periodically with new oil installations to establish normal baselines for the specific engine, but given that the engine is "healthy" we would expect similar results as shown in this study.

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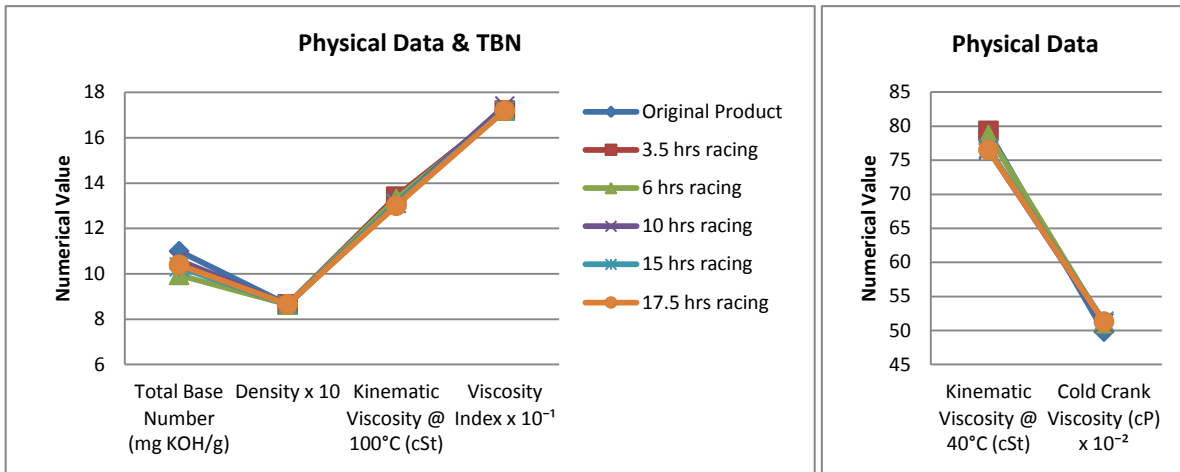


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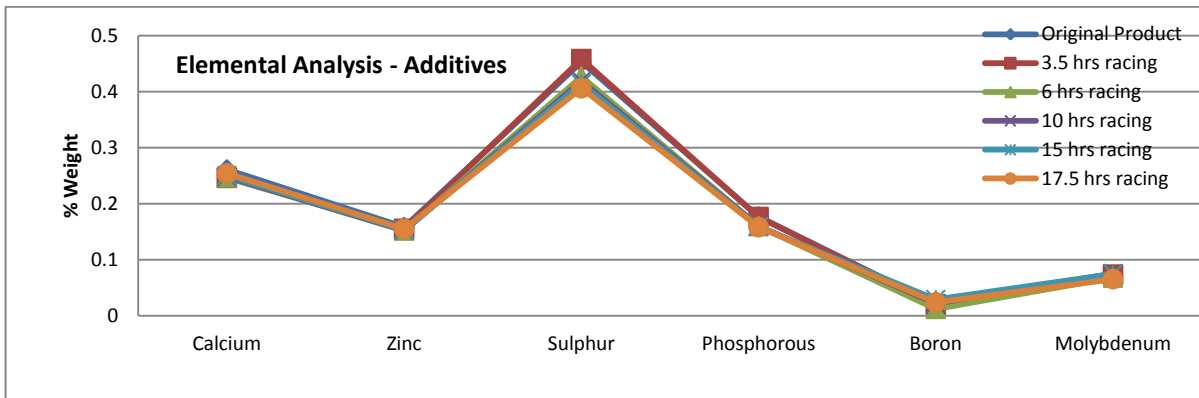
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The first graphs confirm that the physical characteristics, including the oil viscosity, TBN (ability to absorb acidic combustion products), and density, remain virtually unchanged even after 17.5 hours of racing.



The graph below shows that there has only been minimal depletion of the key additives needed to ensure the continued peak performance of the oil.



The following graph confirms that the low friction properties of the oil remain the same even after 5 race events.

