` Test report – Wartsila 824 T8

A diesel powered icebreaker with a Wartsila 824 T8 main engine has been tested with nano protect services for several years.

Machine Working Hours before Use		54,432 hrs		
Duration of Examination		11,752 hrs		
Examination BEFORE use		Examination AFTER use		
Test Objectives	BEFORE	AFTER	RESULTS	
Analysis of Bearing Shells			After 300 hours there has been a cleaning of the friction surface. The deposits from combustion have been detached.	
Compression Pressure	25.3 kg/cm^3	32 kg/cm^3	After 2,000 hrs optimal results were achieved and continued to the end of the monitoring period at 11,752 hrs	**26.48% Improvement**
Friction	0.11 – 0.15		Friction coefficient decreased. After 6,105 hrs it achieved the optimal result and remained there	
Temperature	2 – 4.5 °C		Temperature decreased from average between 2 and 4.5 °C	
Vibration	15.9 mm/s	7.2 mm/s after 300 hrs 6 mm/s after 11,752 hrs	54.71% Improvement after 300 hrs 62.26% Improvement after 11,752 hrs	
Oil Consumption	320 litres	260 litre after 300 hrs 240 litre after 600 hrs 190 litre after 6,105 hrs	An oil change is expected after 3000 hrs. At the end of monitoring (11,752 hrs) and again at a later test (18,700 hrs) no oil change was required (determined by oil analysis). As a result 4 oil changes were saved in the study period.	**18.75% Improvement after 300 hrs** **25.00% Improvement after 600 hrs** **40.62% Improvement after 6,105 hrs**
Fuel Consumption	70.38 litres / 30 min at 450 KW	63.32 l after 6,105 hrs 61.62 l after 11,752 hrs	**10.30% Improvement** (7.06 l / 30 min) **12.45% Improvement** (8.76 l / 30 min)	