

# Effect of heat dissipaters in a NA disc brake pad –Wear performance and influence on $\mu$ sensitivity towards pressure and speed

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## 1. Abstract

Consistent level of friction in a disc brake pad during adverse conditions is difficult to achieve as the  $\mu$  (coefficient of friction) depends upon the formulation. Sensitivity of  $\mu$  towards different load, speed and temperature should be as minimum as possible. Also, thermal conductivity plays an imperative role in the performance of the composites. Hence, the effect of heat dissipaters (copper powder, brass powder and zinc powder) was studied with respect to tribological performance including its sensitivity of  $\mu$  towards load and speed. Three brake pads were developed using these three heat dissipaters as a single variant. All the developed pads were characterized for physical, chemical and mechanical properties as per industrial norms. For tribo-evaluation inertia brake-dynamometer testing which reflects the most realistic performance was selected. Complete schedule of JASO C406 was used to study the performance of the pads and JASO C427 was used to carry out the wear test. It was concluded that inclusion of more amount of heat dissipaters led to enhancement in friction and wear performance. From  $\mu$  sensitivity point of view, brake pad with medium level of heat dissipaters and thermal conductivity showed better performance. But the wear of mating part namely the rotor experienced highest wear. Worn surface analysis and wear mechanism are also discussed in detail.

Table 1 First fade and Recovery in Full scale Dynamometer

		Baseline	0.38	0.32	0.40
1 <sup>st</sup> Fade & Recovery	Fade	1 st	0.39	0.3	0.41
		Max	0.41	0.34	0.44
		Min	0.27	0.3	0.27
		Max Temp °C	280	284	310
		Fade rate	69.0 %	100.0 %	66.0 %
	High temp effect	0.2	0.26	0.22	
Low Temp. effect	0.47	0.44	0.43		
Recovery	Max	0.47	0.44	0.43	
	Min	0.32	0.32	0.28	
	Rate	84.0 %	101.0 %	70.0 %	

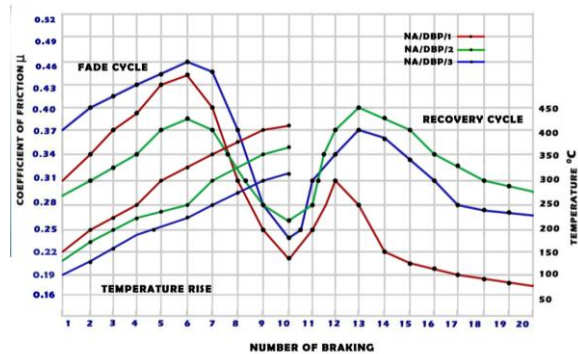


Fig.1 Fade and Recovery Graph using Full scale Dynamometer

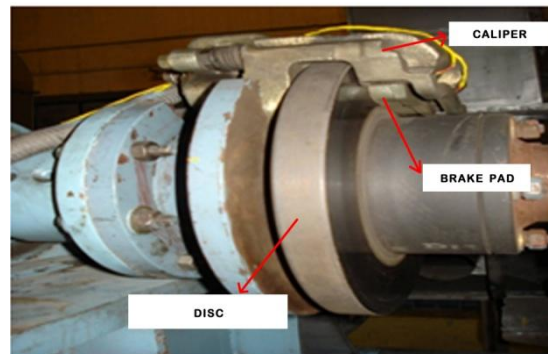


Fig 2 Full scale Dynamometer

## 2. References

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