

## Product Description

ND Microspheres 593S is a powerful pre-applied adhesive film for locking and sealing. ND Microspheres 593S is factory applied to either internal or external threads. It remains inert on the fastener until assembly of the threads mixes the resin. The resin fills the voids of the threads and cures to lock and seal the assembly.

## Typical Applications

ND Microspheres 593S prevents loosening through vibration to provide locking and sealing of threaded assemblies including but not limited to: • Ring gear bolts • Head bolts • Intake manifold bolts • Transmission bolts

Chemical Type	Microencapsulated Epoxy
Color	Blue, Pink, Green, Yellow, Red

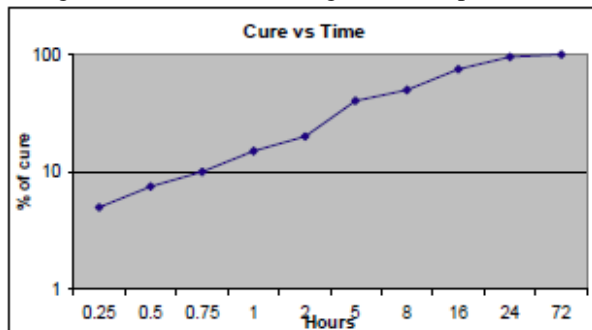
## Properties of Cured Material

Installation Torque	0.55 Nm
Breakaway Torque	30 Nm
Prevailing Off-Torque	22 Nm
Temperature Range	-65°F to 300°F (-54°C to 150°C)
Cure Time at 23°C	72 Hours
k-Value	Zinc Organic: 0.14 Zinc Plate: 0.19

Please note that installation, breakaway, and prevailing off-torque data are from test results conducted on an M-10 x 1.5 class 10.9 zinc organic finish bolts and M010 x 1.5 class 10 zinc nuts. Performance may vary depending on fastener finish.

## Cure speed

The graph shows the rate of cure of an M-10 nut and bolt plated with various finishes. The breakaway strength was determined using industrial procedures.



## Environmental and Fluid Resistance

	Temp	% Initial Strength
SW30 Synthetic Oil	150°C	88
Brake Fluid	150°C	94
50/50 Coolant	100°C	109
Transmission Fluid	150°C	104
Gasoline	23°C	100
Gasoline / Ethanol	23°C	108
15W40 Axel Lube	150°C	110
Cyclic Aging	-40°C to 50°C	261
High Temp Aging	150°C	84
Hot Strength*	150°C	57

Heat age testing was conducted on M-10 x 1.5 zinc organic finish bolts and a zinc plate nuts. Assembled fasteners were aged at 150°C for 168 hours and allowed to cool to room temperature before breakaway test. Immersion testing was conducted using M-10 x 1.5 Zinc organic finish bolts and zinc plate nuts. Assembled fasteners were submerged in each fluid for 168 hours at the temperature. Assemblies were allowed to cool to room temperature before breakaway test.

## Shelf Life & Storage

Fasteners coated with product are to be stored in a cool and dry location at temperatures between -10°C to 35°C. Optimal storage is 25±4°C.

## Special Note

The data contained on this data sheet is believed to be reliable. However, since actual conditions may vary, testing should be conducted by the user to determine suitability for their application.

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