

# BHARAT COAT-INNOVATIVE COATING TECHNOLOGY



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# Proposed Coating System

BASE COAT : BCOAT SOL- 2 Coats

TOP COAT : BCOAT Clear/Silver - 1 Coat

## Coating Performance

- ▶ 12-15 micron coating thickness ( 2Base Coat +1 Top Coat)
- ▶ 1000 hr SST after Torquing
- ▶ 10 Yr. of Coating Life
- ▶ COF Values 0.10-0.18
- ▶ Anti Galling, UV resistance, Fuel resistance etc
- ▶ Excellent Conductivity
- ▶ No risk of Hydrogen Embrittlement
- ▶ Chromium VI free

## 1. BHARAT COAT- Solvent series Base Coat ( 2 Coat)

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-Nano Zinc flake, Anti corrosive, Chrome VI free Technology

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-Thickness - 7-10 Microns

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-Application via Dip Spin or Spray Application

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-Solid Contents- 54% +

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-Low curing time and temperature - 25mins/ 180° C

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-UV Resistant, Fuel & Chemical Resistant

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-Excellent Cathodic protection

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-1000+ hr SST after Torquing

# BHARAT COAT Clear/Silver- Water Base Series Top Coat (1 Coat)

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Water Reducible Transparent Topcoat

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Excellent coverage and sealant capability

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Advance use of PTFE polymers for effective COF and Corrosion resistance (5-10% PTFE)

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Excellent Conductivity

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UV, Humidity & Chemical resistant

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Controlled COF Values - (0.8- 0.23 range possible)

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Low curing Temperature and Time: 160-180° C / 25 Min.

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Excellent Adhesion over Solvent/Water Base Coats

# BHARAT COAT Comparison with HDG

No	Description	HDG	Zn Al Flake
1	Processing Temperature	>400-450° C	200 & 350° C
2	Heat Resistance	>200°C	>200° C
3	Application Areas	Structures, Hardware	Hardware's
4	Uniformity of Layer film	+ -10-20μ	+ -2-3μ
5	Hardness of coated film	High	Lower
6	Anti Freezing	-100°C	OK Up to -60°C
7	Pretreatment	With Acids	Dry
8	Special Steels	Limitations	Good
9	Thickness for Fasteners	40-80μ	5-15μ
10	Compatibility for Nuts	No	Yes
11	Cathodic Protection	Yes	Yes
12	Re-Coat-ability	Yes	Yes
13	Life of Film on Fasteners	800-1200 hours	1500-2000 hours

# BHARAT COAT Comparison with SS 304/SS 303

No	Description	BHARAT COAT	SS 303 /SS 304/ SS 316
1	Anti Galling properties	Yes	No
2	Anti Seizing properties	Yes	No
3	Contact with Aluminium Structures	No Problem	Causes Adhesion & galvanic corrosion
4	Galvanic Corrosion Resistance	Yes	No
5	Hardness of Bolt	10.9 - High	Low
6	Resistance to gasoline fluids	Good	Average
7	COF	Controlled	Uncontrolled
8	Colors	Various Topcoat Available	No Colors
9	Hardness of Surface	Average	Good
10	Anti Freezing	Yes	Yes
11	Cost Impact- Pricing	Economical	Expensive

# BHARAT COAT comparison with Delta/Magni

Sr.No	Parameters	BHARAT COAT	Magni / Delta
1	Product Name	BHARAT COAT	Magni 565/ KL Series
2	Colour	Silver - Bright or Matt	Silver Dull/ Grey Matt
3	Coverage	25m <sup>2</sup> /Kg /10μ	18-20m <sup>2</sup> /Kg/10μ
3	Solids	50-55 %	Approx 50%
5	Flash point	30° C	30° C
6	COF Value	0.15-0.17μtot	0.15-0.17μtot
9	Addition of thinner as per %	1-2% by weight	Approx 5%
10	Application method	Dip/Spin, Dip, Spray	Dip Spin/ Spray
11	Coating thickness (2 Coat)	10-12μ	8-12μ
12	SST (ASTM B117)	2000 Hrs	1000 hrs
13	Single Pack System	Yes	NA
14	Shelf life	1 Year	1 Year (Importing to India from US takes 60 days via sea so that time period is already lost in transit )
15	Jellification of Paint	No	Yes



Sr No	Parameters	BHARAT COAT	MAGNI/DELTA
17	Topcoat required	No ( 2 Base Coat of BHARAT COAT can provide SST of over 1500-2000 Hours)	Yes (2 Base Coat + 1 Organic Topcoat) (SST Life <100 hrs)
18	Topcoat Compatibility	Excellent	Fair
19	Fluid resistance	Yes	Yes
20	Topcoat Available	Yes ( Various Colors like Silver , Black , Green, Yellow etc)	Yes (Silver/Black)
21	Availability in India	Yes - Ready Stocks Available throughout India	Limited ( Imported Prouduct)
22	Pricing	Economical	Expensive
23	Pricing Stability	Stable throughoout the year	Unstable
24	Hydrogen embrittlement	No	No
25	EEE, Reach / RoHS	Yes	Yes
26	Sacrificial behaviour	Yes	NA
27	Technical Support	Readily available with our facility available in Ahmedabad, India	Unstable

# BHARAT COAT Torque Performance after 5 times torquing & SST @ > 15 K Factor

Test Component No.	Set Applied Torque(Nm)	Measured Applied Torque T(Nm)	Thread Torque Tt(Nm)	Bearing Surface Friction Tb(Nm)	K factor	$\mu_{th}$	$\mu_{tot}$	$\mu_b$
1 ( IDENTIFIED AT TESTED SAMPLE )	48	47.900	21.2	26.7	0.205	0.129	0.155	0.176
	48	47.900	19.3	28.6	0.232	0.133	0.178	0.213
	48	48.100	21.3	26.8	0.223	0.144	0.171	0.192
	48	47.800	20.5	27.3	0.230	0.143	0.176	0.202
	48	47.800	22.1	25.7	0.217	0.147	0.165	0.179
2 ( IDENTIFIED AT TESTED SAMPLE )	48	48.000	23.2	24.8	0.210	0.149	0.159	0.167
	48	48.000	21.5	26.5	0.219	0.142	0.167	0.186
	48	48.000	20.0	28.0	0.219	0.129	0.166	0.196
	48	47.900	18.6	29.3	0.222	0.120	0.169	0.209
	48	48.000	17.6	30.4	0.223	0.111	0.170	0.218
3 ( IDENTIFIED AT TESTED SAMPLE )	48	47.800	25.6	22.3	0.178	0.137	0.132	0.128
	48	47.900	25.5	22.4	0.178	0.136	0.132	0.128
	48	47.900	25.2	23.0	0.177	0.132	0.131	0.130
	48	48.200	24.7	23.3	0.176	0.128	0.130	0.131
	48	48.000	25.6	22.3	0.178	0.137	0.132	0.128

No Red rust after 1000Hrs SST



# Sacrificial Behaviour of Nano Zinc in BHARAT COAT : Deep Cut and SST (pic 4 X 10X)



Before SST



After 1000 Hours SST, No red rust spots, Tests Stopped

# BHARAT COAT Coating Specifications for C1-C5 corrosion

## Category

Coating Required	C1	C2	C3	C4	C5
BHARAT COAT (2 Coats)	✓	✓	✓	✓	✓
BHARAT COAT Clear/Silver	✗	✗	✓	✓	✓

**Note:** 1. BHARAT COAT Basecoat- 2 Coats required for efficient corrosion protection and coverage.

2. We recommend to use Organic topcoat in all corrosion category as a precautionary step to avoid abrasion & damage to coating during storage and transportation

# Summary

- Meets requirement of ISO-10683/ASTM-F1136/ASTM-D2833 and BS-13858
- Good Corrosion protection in C4 & C5 climate
- Meets Requirement of SS8547
- SST >2000+ Hrs without red rust as per ASTM 117
- Cathodic protection + 1000 SST hours
- COF values 0.15tot (0.08-0.30tot as per ISO 16047 with or without additional topcoats, K factor control between 0.12-0.18 available)
- Multiple Tightening & Loosening : 5 times and SST-1000+ Hours without red spots
- Meets ELV/ROHS/REACH/GADSL guidelines, MDS available
- Efficient alternate to Hot Dip Galvanizing and Electroplating
- Economical Pricing when compared to Gemoet/Magni/Dorken Coated Fasteners