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PRODUCT GUIDE

What's inside the machine?

HUMISEAL

- CENTRAL LOCKING
- POWER SUNROOF CONTROL
- CLIMATE CONTROLS
- FUEL LEVEL SENSING
- KEYLESS ENTRY
- AIRBAG CONTROL MODULES
- PARKING SENSORS
- STEERING SYSTEMS
- POWER SEAT CONTROL
- ENTERTAINMENT SYSTEM
- TYRE PRESSURE MONITOR

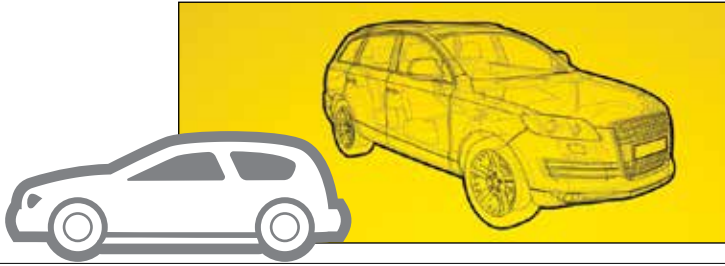
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 ADKEYLESSENTRYQUISNOSTYUMRXELCIRATS
 POWERSEATCONTROLBOREETDOLOSEMAANA EALTQUA
 TETURADIPISCEVELITSEDQUIANOGNUMQLAMVIUNMOD
 YELISQUPOWERSUNROOFCONTROLMNUIADOLOREITOMETC
 CIUNTNEQUEPOGRCONFORMALCOATINGSATIONELOLCPTATE
 JCTAENTERTAINMENTSYSTEMMIPSRMVOLUPTCDYSBOECLKQPF
 ARCHITECTOBIATAEVITAEDIWDIEBCYFIKSPKCKHEKV TENIAXU
 AERIA MEAQUKIPSAQUAEABILLOENVENTOREVIRINATASETQUA
 SEDUTYREPRESSUREMONITORNTSISTENATUSNRRSRSM TVOLU
 ICIAIRBAGCONTROLMODULESUF EJROCSITVGLUITA IEMACC
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 UNDEOM UPGATC



Automotive

HumiSeal®

Automotive Electronics



HumiSeal® is the only supplier specialized in conformal coating manufacture.

With a rich history of innovation for more than 50 years, our product offerings and technical support is second to none.

Automotive electronic assemblies continue to become an increasingly sophisticated and important aspect of both the functionality and reliability of modern automobiles.

These assemblies continue to be placed in ever more demanding end-use environments, where the risk of degradation in performance, due to extraneous factors such as humidity, salt-spray, noxious gases and other sources of corrosion continues to increase rapidly.

The costs of failure (both direct fiscal from recalls and longer-term to brand equity) and the competitive need to provide longer warranties and greater levels of reliability, drive the need to increase the Mean Time Between Failures (MTBF) to the maximum possible duration.

Increasingly, conformal coating is becoming one of the most important methodologies requested by Original Equipment Manufacturers (OEMs) and used by Tier 1 – Tier 3 automotive electronics suppliers to prevent corrosion and degradation of assemblies in use.

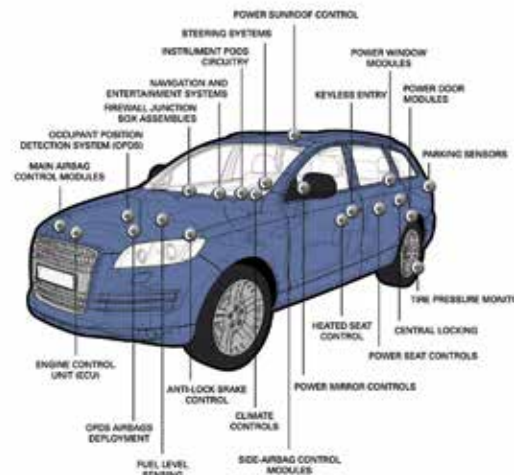
HumiSeal is a leading supplier of conformal coatings to the automotive industry for in-cabin electronics, under-hood electronics and exterior electronic applications, supplying every major OEM and multiple Tier 1 – Tier 3 suppliers.



Today, electronics manage critical automotive controls guiding power train, safety, comfort, entertainment, and navigation systems. Many mechanical components, such as hydraulic power steering and hydraulic power brakes, are being replaced with innovative electronics.

With the widest range of high performance conformal coatings, from every major type of protective chemistry, including acrylic, urethane and silicone, you can be certain that HumiSeal® has a high-performance solution for your specific application. With recent changes in OEM requirements related to new car outgassing and ISO14001 compliance requirements amongst their subcontractors, HumiSeal has a wide range of environmentally compliant, low-outgassing, solvent-free materials, in addition to a wide range of traditional solvent-borne chemistries. Whatever your requirements, HumiSeal has the solution.

SELECTION HumiSeal offers the industry's widest range of high performance coatings, drawn from the widest range of chemistries and they can be applied by any of the common application methodologies. This will enable you to select the product that best meets your project needs, production throughput, floor space, and capital equipment requirements. Whether you are upgrading an existing product, transferring a production process from another facility, or are working on a new product introduction



Application	Specified Coating/s
Airbag control modules	1B31, 1B66
Anti-lock brake control	1B31
Climate controls	1B31, 1B51LU, 1R32A-2, UV40-250
Engine control module (ECU)	1B31, 1B51, 1B51LU, 1R32A-2, 1B66
Firewall junction box assemblies	1C55
Heated seat control module	1B31
Keyless entry	1B66
Occupant position detection system	1B51LU, 1B66
Occupant position detection airbag control	1B51LU, 1B66
Power door control modules	1B66, 1R32A-2
Power mirror controls	1R32A-2
Power seat control	1B31
Power sliding door control	1B51
Power sunroof control	1B51, 1B31
Power window modules	1B51, 1B31, 1B66, 1R32A-2
Side airbag modules	1B31, 1B66
Speedometer modules	1A33, 1B66, UV40-250
Tyre pressure monitor	1B66

Whatever your requirements, HumiSeal has the solution.



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		ACRYLICS				URETHANES		UV CURE			SYNTHETIC RUBBER & SILICONES								
		1R32A-2	1B31	1B73	1B73D	1A20	1A33	UV500	UV40	UV40-250	1B51	1B51 NSLU	1B58LU	1B59LU	1C49 LV	1C48	1C51 / 1C53	1C63	
QUALIFICATIONS	MIL-I-46058C	No	Yes	Yes	No	Yes	Yes	No	Yes	No	No	No	No	No	Yes	No	Yes	No	
	IPC CC-830B	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	No	Yes	Pending	Yes	No	
	UL746E	Yes	No	Yes	Pending	Yes	Yes	Yes	Yes	Yes	No	No	No	No	Yes	No	Yes	Yes	
	UL94	V0	No	V0	Pending	V0	V0	V0	V0	V0	V1	V1	No	No	V0	No	V0	V1	
LIQUID PROPERTIES	Available as an Aerosol	No	Yes	Yes	No	No	Yes	No	No	No	Yes	No	No	No	No	No	Yes	No	
	Solids Contents (%w/w)	29	35	29.5	29.5	50	44	98	95	95	22	22	20	21	90	100	98	100	
	Viscosity (MAX)/cPs	250	215	270	270	130	200	375	800	350	215	215	240	280	800	400	780	5000	
	Flash Point °C (°F)	7 (45)	-1 (30)	-1 (30)	-1 (30)	28 (83)	-1 (30)	> 99 (210)	80 (176)	70 (158)	4 (39)	4 (39)	-4 (23)	-4 (23)	48 (118)	150(302)	121 (250)	220 (392)	
	VOC (grammes/litre)	645	592	661	660	511	531	0	35	35	694	632	628	616	0	0	0	<50	
	Drying Time	Tack-free/mins	10	10	30	30	60	15	0.5	0.5	0.5	10	10	10	10	60	5	N/A	0.5, 60
		Dry	24 hrs	24 hrs	24 hrs	24 hrs	24 hrs	20 hrs	N/A	N/A	N/A	24 hrs	24 hrs	24 hrs	24 hrs	24 hrs	24 hrs	24 hrs	15 mins
		Optimum Properties	1 week	1 week	1 week	1 week	1 week	1 month	1 week	72 hrs	72 hrs	1 week	1 week	1 week	1 week	1 week	1 week	15 mins	1 week
	Shelf Life at RT		24	24	24	24	6	24	6	12	6	18	18	18	18	12	12	12	6
	Coverage m ² /litre (25 microns thickness)		13	14	12	12	20	18	40	40	40	8	8	8	8	40	40	40	40
	PHYSICAL PROPERTIES	Continuous Use Operating Range °C	-65 to 125	-65 to 125	-65 to 125	-65 to 125	-65 to 125	-65 to 125	-65 to 125	-65 to 125	-65 to 125	-65 to 125	-65 to 125	-65 to 135	-65 to 145	-65 to 200	-65 to 200	-65 to 200	-65 to 200
		Thermal Shock °C	-65 to 125	-65 to 125	-65 to 125	-65 to 125	-65 to 125	-65 to 125	-65 to 125	-65 to 125	-65 to 125	-65 to 125	-65 to 125	-65 to 135	-65 to 145	-65 to 200	-65 to 200	-65 to 200	-65 to 200
Glass Transition Temperature (Tg) °C		14	14	42	42	71	26	-43	45	26	14	14	-50	53	<-65	<-65	<-65	<-90	
CTE (x 10 ⁶ / °C)		Below Tg	170	170	138	138	193	119	137	85	112	313	195	217	163		0		
		Above Tg	340	340	-	-	532	225	311	197	283	-	330	446	600	323	145	296	0
Dielectric Constant (1MHz @ 25°C)			2.5	2.5	2.6	2.6	3.5	3.6	2.5	2.5	2.41	2.5	2.5	1.9	1.9	2.5	2.5	2.4	2.5
ELECTRICAL PROPERTIES	Dissipation Factor (1MHz @ 25°C)	0.01	0.01	0.01	0.01	0.03	0.03	0.1	0.01	0.01	0.07	0.07	0.006	0.004	0.01	0.01	0.01	0.01	
	Dielectric Withstand Voltage V (1 minute)	>1500	>1500	>1500	>1500	>1500	>1500	>1500	>1500	>1500	>1500	>1500	>1500	>1500	>1500	>1500	>1500	>1500	
	Insulation Resistance Per MIL-I-46058C (Ω)	8.0 x 10 ¹⁴	8.0 x 10 ¹⁴	5.5 x 10 ¹⁴	5.5 x 10 ¹⁴	3.0 x 10 ¹⁴	2.0 x 10 ¹⁴	4.5 x 10 ¹¹	8.0 x 10 ¹⁴	8.0 x 10 ¹⁴	2.0 x 10 ¹⁴	2.0 x 10 ¹⁴	5.0x10 ¹⁴	5.1x10 ¹⁴	5.0 x 10 ¹⁴	5.0 x 10 ¹³	5.0 x 10 ¹⁴	1.1 x 10 ¹²	
	Moisture Insulation Resistance Per MIL-I-46058C (Ω)	6.0 x 10 ¹⁰	6.0 x 10 ¹⁰	7.0 x 10 ¹⁰	7.0 x 10 ¹⁰	4.8 x 10 ¹⁰	1.6 x 10 ¹⁰	1.6 x 10 ¹⁰	4.7 x 10 ¹⁰	4.7 x 10 ¹⁰	1.0 x 10 ¹⁰	1.0 x 10 ¹⁰	7.5x10 ¹³	7.4x10 ¹³	1.0 x 10 ¹⁰	45.2 x 10 ¹⁰	1.0 x 10 ¹⁰	1.1 x 10 ¹⁰	
	Resistance to chemicals and solvents	Poor	Poor	Poor	Poor	Excellent	Very Good	Good	Excellent	Excellent	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	
	Recommended Thinner (Dip & Brush/Spray)	503, 505/521 (EU), 600	503, 521 (EU)	521(EU)/73	521(EU)/73	521 (EU)	503, 521, 521EU	N/A	N/A	N/A	535/521(EU)	903/905	903/905	903/905	N/A	N/A	N/A	N/A	
Recommended Stripper	1080, 1080EU	1080 (EU)	1080 (EU)	1080 (EU)	1072	1063	1072, Mech	1100*, Mech	1100*, Mech	1080 (EU)	1080 (EU)	1080 (EU)	1080 (EU)	1090, Mech	1090, Mech	1090, Mech	1090, Mech		

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What's inside the machine?

HUMISEAL[®], THE WORLD'S LEADING FORMULATOR OF
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