

FINALIZED DRAFT

AUTOMOTIVE INDUSTRY STANDARD

**Microdot Systems:
Product Specification**

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Status chart of the standard to be used by the purchaser for updating the record:

Sr. No.	Corrigenda	Amendment	Revision	Date	Remark	Misc.
General remarks:						

INTRODUCTION

The Government of India felt the need for a permanent agency to expedite the publication of standards and development of test facilities in parallel when the work on the preparation of the standards is going on, as the development of improved safety critical parts can be undertaken only after the publication of the standard and commissioning of test facilities. To this end, the erstwhile Ministry of Surface Transport (MoST) has constituted a permanent Automotive Industry Standards Committee (AISC) vide order No. RT-11028/11/97-MVL dated September 15, 1997. The standards prepared by AISC will be approved by the permanent CMVR Technical Standing Committee (CTSC). After approval, the Automotive Research Association of India, (ARAI), Pune, being the secretariat of the AIS Committee, will publish this standard.

Based on the discussions in the 51st Meeting of CMVR-TSC held on 11th December 2017 a working group under the convenorship of Director ICAT was formulated to take the subject forward. Subsequently the working group proposed a finalized document on the subject which was adopted in the 54th meeting of CMVR-TSC held on 8th September 2018 as AIS 155. It was agreed to adopt the standard as a guideline standard.

While formulating the standard reference has been drawn from the following documents:

- SANS 534-1:2017 Edition 4: Vehicle security-Whole-of-vehicle marking (Part 1: Microdot System)
- JIS D0205: Test method of weather ability for Automotive Parts
- BSIA “British Security Industry Association”: Asset marking products requirements and test methods
- ASTM D4060: Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser
- ISO 16750-5: Road vehicles -- Environmental conditions and testing for electrical and electronic equipment - Part 5: Chemical loads
- ISO 9001: Quality management systems

Composition of the Panel and Automotive Industry Standards Committee (AISC) responsible for preparation of this standard are given in Annex III and IV.

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MICRODOT SYSTEMS: PRODUCT SPECIFICATION

1	SCOPE
	<p>This standard specifies the guidelines for the characteristics and recommends positions of fitment of unique identification carriers, called microdots.</p> <p>The standard also recommends the minimum performance requirements of the adhesive used to affix the microdots to motor vehicle and their parts, components, assemblies, etc.</p>
2	REFERENCES
	<p>SANS 534-1:2017 - Edition 4 : Vehicle Security – Whole –of – vehicle marking IS 14272- Automotive Vehicles – Types – Terminology IS 9000: Part XI: Basic Environmental Testing Procedures for Electronic and Electrical items: Part XI Salt Mist Test ISO 16750-5: Road vehicles -- Environmental conditions and testing for electrical and electronic equipment - Part 5: Chemical loads ISO 9001: Quality management systems JIS D0205: Test method of weather ability for Automotive Parts ASTM D4060: Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser AIS 053: Automotive Vehicles Types – Terminology AIS 065: Statutory Plates and Inscriptions for Motor Vehicles, their Location and Method of attachment – Vehicle Identification Numbering System AIS 037: Procedure for Type Approval and Establishing Conformity of Production for Safety Critical Components</p>
3	DEFINITIONS: For the purpose of this standard, the following definitions shall apply:
	MARKING
3.1	Positions including recommended positions of marking to motor vehicle and their parts, components, assemblies, etc.
	MICRODOT
3.2	Micro-particle bearing and visual identifier. Recommended : Size: Min. 0.5mm
	MICRODOT IDENTIFIER
3.3	Microdot identifier should be a unique number also called PIN or VIN.

3.3.1	<p>PREDETERMINED IDENTIFICATION NUMBER (PIN)</p> <p>Unique identification number on the microdot, refer clause 4.1.2.</p>
3.3.2	<p>VEHICLE IDENTIFICATION NUMBER (VIN)</p> <p>The vehicle identification number is a unique combination of characters assigned to each vehicle by the manufacturer, refer clause 4.1.2.</p>
3.4	<p>MICRODOT SUPPLIER</p> <p>For the purpose of this standard supplier can be manufacturer/importer or distributor.</p>
3.5	<p>TEST AGENCY</p> <p>Test agency is an organization specified in rule 126 of CMVR,1989.</p>
4	<p>REQUIREMENTS FOR MICRODOTS</p>
4.1	<p>TEXT CONTENT OF MICRODOTS</p>
4.1.1	<p>TEXT SIZE AND STRUCTURE</p>
4.1.1.1	<p>All the text on every microdot shall be legible with equipment that magnifies the text at least 60 times.</p>
4.1.1.2	<p>Characters on the microdot shall be consecutive and not separated by spaces. The microdot identifier shall appear at least once on every microdot. If the text on the microdot is repeated, every occurrence shall be separated by an asterisk (*) from the next occurrence.</p>
4.1.1.3	<p>The microdot identifier shall be included in the text uniquely brought onto the dot during its manufacture.</p>
4.1.2	<p>TEXT ON THE MICRODOT: MICRODOT IDENTIFIER</p>
4.1.2.1	<p>WHEN THE MICRODOT IDENTIFIER IS A VIN</p> <p>In the case where the microdot identifier is a VIN, the microdot text shall contain the VIN.</p>
4.1.2.2	<p>WHEN THE MICRODOT IDENTIFIER IS A PIN</p> <p>The microdot text shall contain:</p> <ul style="list-style-type: none"> • A minimum of 10 alpha-numeric characters, of which the letters shall be Roman capitals excluding I, O and Q (except in the case of the two-character country code) and numerals shall be Arabic 0 to 9. • Recommended Coding: <ul style="list-style-type: none"> - OEM code (3(three) Characters) followed by - Category of Vehicle code (1(one) Characters)

	<ul style="list-style-type: none">- Microdot supplier Code (1(one) Characters) followed by- Test Agency code aligned with AIS-065 requirements for standardization- Purposes (1(one) Characters) followed by- E.g. C-ICAT, A-ARAI, G-GARC, T-CMTTI, P-IIP, R-CIRT followed by- Unique number – sr. no. (XXXX)
4.2	AUTHENCITY The microdot supplier may add covert features to the microdot. The features may be proprietary. Covert features are to be provided and recorded during testing.
4.3	ADHESIVE AND COATING MATERIAL The adhesive and coating material shall readily coat the microdots and cause them to adhere to motor vehicle and their parts, components, assemblies, etc. in such a manner that ensures compliance with the accelerated ageing and with stand the removal tests in Cl. No. 8 of this standard.
4.3.1	The adhesive and coating material shall allow for the selective removal of a small number of individual microdots (but not the en-mass removal of microdots).
4.3.2	The adhesive and coating material shall allow for easy detection by incorporating a trace element that enables its presence to be detected using an ultraviolet light source with a wave length in the range of 365 nm and 400nm (inclusive).
4.3.3	The adhesive and coating material shall not affect the integrity of the base material onto which the microdots are applied.
4.4	CONTAINER The container in which microdots are supplied shall bear information regarding the microdots on the container including the microdot identifier in legible alpha-numeric characters. The container shall be tamperproof, and shall signify that it might have been used or that its integrity has been compromised if certain seals are broken. A specific process shall be applied to ensure that, after use, it will be impossible to remove or apply any of the remaining microdots. It shall not be possible to reverse this process. Once the container has been used it shall not be possible for the container to be re-used. Used/unused container shall be manage/controlled and destroy in controlled conditions.
4.5	NOTIFICATION LABEL/MARKING A label/marking may be affixed on the motor vehicle and their parts, components, assemblies, etc. by the microdot supplier in a position where it may easily be read (for vehicle it shall not obstruct the view of the driver). The purpose of the label/marking is to alert that microdots have been affixed to the vehicle. The notification label/marking may be supplied separately from the container and shall not bear the microdot identifier referred to in 4.1.

5	<p>TESTING</p> <p>The microdot supplier shall ensure that adhesive and coating material pass the entire test procedure specified in Cl. No. 8 of this standard. Test report from test agency as notified under CMVR rule no. 126 shall be obtained and held. ANNEX I refers to the list of tests applicable. ANNEX II refers to the checklist: technical specifications to be submitted at the time of testing</p>
6	<p>QUALITY MANAGEMENT SYSTEMS</p> <p>Every microdot supplier shall implement and maintain a quality management system for all aspects of its operations regarding the microdot system as described in this standard. The microdot supplier shall obtain and maintain certification that such quality management system complies with a recognized standard such as ISO 9001 or an equivalent. Such certification shall at least include the following aspects:</p> <ul style="list-style-type: none">• Document control;• Record control;• Internal audit;• Corrective action;• Preventive action; and• Control of non-conforming product.
7	<p>RECOMMENDED POSITIONS OF FITMENT OF MICRODOTS</p>
7.1	<p>In the case of a vehicle, excluding special vehicles and vehicles of categories M2, M3, N2, N3, T and L, at least 10,000 microdots shall be applied. Seventy percent (70 %) of the microdots in the container shall be applied and fitted to at least five positions: Recommended Positions:</p> <ol style="list-style-type: none">a) The information plate; if not attached, the position of the chassis number or the VIN;b) The inside bonnet reinforcing;c) The inside boot reinforcing (where applicable);d) Inside front and rear bumpers;e) The front and rear suspension components;f) The underside of the engine head, engine base, bell housing, gearbox and drive shafts (where applicable);g) The rear axle and differential (where applicable);h) Parts of the floor pan and structural and reinforcing members;i) Inside openings in body structural members; andj) Part of the underside of the body.k) behind roof panel wherever applicablel) all tyre rimm) front and rear light cluster paneln) behind dash board assembly

7.2	<p>In the case of a category T trailer, at least 5,000 microdots shall be applied. microdots in the container shall be applied and fitted to at least five positions: Recommended Positions:</p> <ul style="list-style-type: none">a) The information plate; if not attached, the position of the chassis number or the VIN;b) The chassis or frame;c) axles;d) Suspension components;e) Inside openings in body structural members; andf) Part of the underside of the body.g) behind roof panel wherever applicableh) all tyre rimi) front and rear light cluster panelj) behind dash board assembly
7.3	<p>In the case of a category L vehicle, at least 2,000 microdots shall be applied. Microdots in the container shall be applied and fitted to at least five positions. Recommended Positions:</p> <ul style="list-style-type: none">a) information plate; if not attached, the position of the chassis number or the VIN;b) The chassis or frame;c) Drive components (for example drive shaft, rear swing-arm);d) Suspension components;e) instrumentation panel;f) engine control unit; andg) engine head, engine baseh) behind roof panel wherever applicablei) all tyre rimj) front and rear light cluster panel
7.4	<p>In the case of a category M2, M3, N2 or N3 vehicle, at least 10,000 microdots shall be fitted. Ninety percent (90 %) of the microdots in the container shall be applied and fitted to at least five positions: Recommended Positions:</p> <ul style="list-style-type: none">a) The information plate; if not attached, the position of the chassis number or the VIN;b) Inside front bumpers;c) The front and rear suspension components including axle and differential/s;d) The underside of the engine head, engine base, bell housing, gearbox and drive shafts;e) Parts of the cab (if fitted) under body, floor pan, chassis members and cross members and structural reinforcement;f) Inside openings in body structural members; andg) Engine components:<ul style="list-style-type: none">1) Engine block and cylinder head;2) Fuel pump;3) Alternator and air conditioner compressor (if fitted);4) Starter motor; and5) Side members of radiator and intercooler (if fitted).

	<ul style="list-style-type: none"> i) behind roof panel wherever applicable j) all tyre rim k) front and rear light cluster panel l) behind dash board assembly
7.5	<p>In the case of a special vehicle, at least 10,000 microdots shall be fitted. seventy percent (70 %) of the microdots in the container shall be applied and fitted to at least five positions: Recommended Positions:</p> <ul style="list-style-type: none"> a) The information plate; if not attached, the position of the chassis number or the VIN; b) The front and rear suspension components; c) The underside of the engine, bell housing, gearbox and drive shafts (where applicable); d) The rear axle and differential (where applicable); e) Parts of the floor pan and structural and reinforcing members; f) Inside openings in body structural members; and g) Part of the underside of the body.
7.6	<p>Optional positions of fitment: In addition to the positions given in Cl. No. 7.1 to 7.5 of this standard, microdots may be affixed to following areas:</p> <ul style="list-style-type: none"> a) The insides of the doors (including rear hatches, where applicable); b) Inside the boot and engine bay including openings in the boot and engine bay areas that lead into structural areas of the body; c) The rear of the instrument panel; d) The undersides of front seats; e) The undersides of and behind rear seats; f) Inside door pillars and behind door pillar trims; g) Under floor coverings; h) Behind the roof lining;
7.7	<p>In case of parts, components and assemblies, OEM shall suitably ensure location. The location shall be declared by the OEM and captured in the test reports.</p>
7.8	<p>Prohibited areas of fitment Microdots shall not be fitted in positions that</p> <ul style="list-style-type: none"> a) Negatively affect the warranty of the vehicle (for example electrical components), or b) Negatively affect the safety of the vehicle (glass or friction areas).
8	ACCELERATED AGEING AND REMOVAL TESTS
8.1	<p>GENERAL</p> <p>The intention of the tests in this clause is to ensure that the fitted microdots being tested comply with the specifications and will remain on the vehicle in a readable condition for at least 15 years after fitment. Under normal operating conditions, it is intended that at least 50% of the microdots applied as prescribed in the instruction manual of the Microdot supplier will be present and will be readable for up to 15 years.</p>

	Normal operating conditions include high pressure cleaning with hot or cold water, the use of common detergents for cleaning and exposure to salt mist or spray.
8.2	PREPARATION OF TEST SPECIMENS
8.2.1	They shall be prepared as per the clauses mentioned below and shall be done prior to the application of the microdot and adhesive system under test:
8.2.1.1	TYPE 1 — 1) of mild steel or aluminum or plastic or carbon fibre plate or any other material, depending on vehicle/parts/components/assemblies body material; 2) of thickness 1 mm to 2 mm; 3) square plates, of length and width 300 mm; 4) fully coated with a typical minimum rust-proof coating;
8.2.1.2	TYPE 2 — are type 1 plates, but the plates are fully coated to replicate a typical automotive cosmetic surface.
8.2.2	14 (fourteen) test specimens of each type shall be prepared to enable new test specimens to be used for each of the accelerated ageing treatments and subsequent removal test.
8.3	TESTING ENVIRONMENT A controlled atmosphere with a temperature of 23 °C ± 5 °C and a relative humidity of 50 % ± 5 %, unless otherwise specified.
8.4	APPLICATION OF MICRODOT SYSTEM
8.4.2	Apply the microdot system on one side of every specimen plate. Attempt to fully cover the selected side of the specimen plate. The fitment of the microdot system need not be carried out in the test environment as prescribed in 8.3. Once the microdots have been applied this side is known as the "prepared side". Once the fitment has been completed, use an appropriate ultraviolet light to measure and note the coverage. When the coverage is calculated, ensure that not less than 90% of the surface of the specimen plate is covered. Discard any specimen plate with less than 90% coverage and prepare a replacement specimen plate. Execute the entire test on an access controlled site. No equipment or other specimen plate may touch the prepared side of the specimen plate during the test, except for the removal of microdots as required for reading. Condition every specimen plate by storing it in the test environment for at least 24h with the prepared side fully exposed, before continuing with the accelerated ageing treatment.

8.5	ACCELERATED AGEING TREATMENTS
8.5.1	HIGH AIR TEMPERATURE Two of each type of test specimen (types 1 and 2) shall be placed into an air circulating oven preheated to 110°C ± 1°C and maintained at this oven temperature for a period of 168 hours.
8.5.2	HIGH HUMIDITY Two of each type of test specimen shall be placed in a humidity cabinet at 38°C ± 1°C with a relative humidity of 97% to 100% and maintained in this environment for 168hours.
8.5.3	LOW AIR TEMPERATURE Two of each type of test specimen shall be placed in a freezer at -30°C ± 2°C for 4h.
8.5.4	SALT MIST SPRAY Two of each type of test specimen shall be subjected for 7 days to the salt mist spray described in IS 9000: Part XI.
8.5.5	WEATHERABILITY TEST Two of each type of test specimen shall be subjected for Xenon arc lamp system weather ability test (JIS D 0205 Table1-2 to 2-2).
8.5.6	The treated side (for clause no. 8.5.1 to 8.5.5) shall be fully exposed during this period. The test specimens shall then be removed and allowed to return to the testing environment conditions.
8.5.7	COMBINED ENVIRONMENTAL AND VIBRATION For components normally mounted on the vehicle, two of each type of test specimen shall be subjected to 10Hz to 500Hz with maximum amplitude of ±5mm and maximum acceleration of 3g. For components intended for attachment to the engine, two of each type of test specimen shall be subjected to the frequency shall be variable from 20Hz to 300Hz with maximum amplitude of ±2 mm and maximum acceleration of 15g (0-peak). The frequency variation is 1 octave/min. The number of cycles is 10; the test shall be performed along each of the 3 axes. The vibrations are applied at low frequencies at maximum constant amplitude and at a maximum constant acceleration at high frequencies Temperature at 55°C and 98% relative humidity to be maintained during vibration.

8.5.8	<p>MELTING TEMPERATURE</p> <p>Two of each type of test specimen shall be placed in a furnace and tested for 10 minutes at minimum $100^{\circ}\text{C} \pm 10^{\circ}\text{C}$. Specimens shall be then examined under an ultraviolet light. The area still covered with the microdots as indicated by the response of the UV tracer in the adhesive/coating material shall be assessed visually. Then temperature should be increased by 100°C and raised till maximum temperature limit as specified in table below:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Test Specimen Material</th> <th>Test Temperature (Max.)</th> <th>Test Duration</th> </tr> </thead> <tbody> <tr> <td>Mild Steel</td> <td>$1300^{\circ}\text{C} \pm 10^{\circ}\text{C}$</td> <td>10 minutes</td> </tr> <tr> <td>Aluminum</td> <td>$600^{\circ}\text{C} \pm 10^{\circ}\text{C}$</td> <td>10 minutes</td> </tr> <tr> <td>Plastic/Carbon Fibre</td> <td>$300^{\circ}\text{C} \pm 10^{\circ}\text{C}$</td> <td>10 minutes</td> </tr> </tbody> </table> <p>Maximum temperature at which following conditions are not met shall be noted and recorded in test report:</p> <ul style="list-style-type: none"> a) The measured coverage is 75 % or more, b) The microdot identifier on at least 50% of microdots (microdots being on the specimen plate or microdots that were removed) can be read successfully, and c) The microdot identifier on at least one microdot removed from every specimen plate can be read successfully. <p>Failure of one specimen plate is deemed to be a complete failure of the assessed microdot system.</p>	Test Specimen Material	Test Temperature (Max.)	Test Duration	Mild Steel	$1300^{\circ}\text{C} \pm 10^{\circ}\text{C}$	10 minutes	Aluminum	$600^{\circ}\text{C} \pm 10^{\circ}\text{C}$	10 minutes	Plastic/Carbon Fibre	$300^{\circ}\text{C} \pm 10^{\circ}\text{C}$	10 minutes
Test Specimen Material	Test Temperature (Max.)	Test Duration											
Mild Steel	$1300^{\circ}\text{C} \pm 10^{\circ}\text{C}$	10 minutes											
Aluminum	$600^{\circ}\text{C} \pm 10^{\circ}\text{C}$	10 minutes											
Plastic/Carbon Fibre	$300^{\circ}\text{C} \pm 10^{\circ}\text{C}$	10 minutes											
8.6	ADHESION REMOVAL TESTS												
8.6.1	HIGH PRESSURE COLD WATER AND DETERGENT CLEANER TEST												
8.6.1.1	This test consists of cleaning of each type of the test specimens as mentioned in the ANNEX I of this standard using high pressure cold water cleaner with a detergent injection.												
8.6.1.1.1	<p>Cleaning: Place the specimen plates on a flat horizontal surface with the prepared sides facing upwards.</p> <p>Apply and maintain a pressure measured by a calibrated in-line pressure transducer at (11.5 ± 0.5) MPa using an outlet nozzle that creates a fan type spray, the spray being directed at an angle of 25° to clean the specimen plates. Place the outlet nozzle at (130 ± 5) mm from and perpendicular to the test specimen surfaces and move slowly back and forth across the entire specimen plate surfaces for a period of at least 5 minutes such that all areas get approximately the same exposure to the cleaning jet.</p>												
8.6.1.2	<p>The spray shall be a high-pressure cold water jet with detergent injection. The detergent shall be</p> <ul style="list-style-type: none"> a) A commercially available degreasing detergent for use in high-pressure cold-water cleaners, and b) Injected at the rate recommended by the detergent or high-pressure cold-water cleaner manufacturer. 												

8.6.1.3	Each test specimen shall be allowed to dry and then examined under an ultraviolet light. The area still covered with the microdot identification system as indicated by the response of the UV tracer in the adhesive and coating material shall be assessed visually.
8.6.1.4	<p>The test is deemed to have been passed if:</p> <ul style="list-style-type: none">a) The measured coverage is 75 % or more,b) The microdot identifier on at least 50% of microdots (microdots being on the specimen plate or microdots that were removed) can be read successfully, andc) The microdot identifier on at least one microdot removed from every specimen plate can be read successfully. <p>Failure of one specimen plate is deemed to be a complete failure of the assessed microdots.</p>
8.6.2	HIGH-PRESSURE HOT WATER CLEANER TEST
8.6.2.1	This test consists of cleaning of each type of the test specimens as mentioned in the ANNEX I of this standard using a high-pressure hot water cleaner (sometimes referred to a steam cleaner).
8.6.2.1.1	Refer clause 8.6.1.1.1 for Cleaning
8.6.2.2	The spray shall be a high-pressure hot water jet with an outlet temperature of $65\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$.
8.6.2.3	Each test specimen shall be allowed to dry and then examined under an ultraviolet light. The area still covered with the microdot identification system as indicated by the response of the UV tracer in the adhesive/coating material shall be assessed visually
8.6.2.4	<p>The test is deemed to have been passed if:</p> <ul style="list-style-type: none">a) The measured coverage is 75 % or more,b) The microdot identifier on at least 50% of microdots (microdots being on the specimen plate or microdots that were removed) can be read successfully, andc) The microdot identifier on at least one microdot removed from every specimen plate can be read successfully. <p>Failure of one specimen plate is deemed to be a complete failure of the assessed microdots.</p>
8.6.3	CHEMICAL TEST
8.6.3.1	This test consists of cleaning of each type of the test specimens as mentioned in the ANNEX I of this standard using chemicals defined in ISO 16750-5.
8.6.3.2	The test specimen shall be placed on a flat horizontal surface and the treated side subjected to application of chemicals defined in ISO 16750-5 for 1 hour at room temperature.

8.6.3.3	Each test specimen shall be allowed to dry and then examined under an ultraviolet light. The area still covered with the microdot identification system as indicated by the response of the UV tracer in the adhesive/coating material shall be assessed visually
8.6.3.4	<p>The test is deemed to have been passed if:</p> <ul style="list-style-type: none">a) The measured coverage is 75 % or more,b) The microdot identifier on at least 50% of microdots (microdots being on the specimen plate or microdots that were removed) can be read successfully, andc) The microdot identifier on at least one microdot removed from every specimen plate can be read successfully. <p>Failure of one specimen plate is deemed to be a complete failure of the assessed microdots.</p>
8.6.4	ABRASION TEST
8.6.4.1	This test consists of abrading of each type of the test specimens as mentioned in the ANNEX I of this standard using method defined in ASTM D4060.
8.6.4.2	The test specimen shall be subjected to test as per ASTM D4060.
8.6.4.3	Each test specimen shall be then examined under an ultraviolet light. The area still covered with the microdot identification system as indicated by the response of the UV tracer in the adhesive/coating material shall be assessed visually.
8.6.4.4	<p>The test is deemed to have been passed if:</p> <ul style="list-style-type: none">a) The measured coverage is 75 % or more,b) The microdot identifier on at least 50% of microdots (microdots being on the specimen plate or microdots that were removed) can be read successfully, andc) The microdot identifier on at least one microdot removed from every specimen plate can be read successfully. <p>Failure of one specimen plate is deemed to be a complete failure of the assessed microdots.</p>
9	CONFORMITY OF PRODUCTION
9.1	COP shall be carried out at least once a year or production volume exceeding 10,000 units (whichever is earlier) by any of the testing agencies notified under Rule 126 of CMVR.
9.2	The conformity of production shall comply with the parameters set out in the AIS-037.

ANNEX I

LISTS OF TESTS APPLICABLE

Sample Type	Sample No.	Test Name										
		High Air Temp.	High Humid.	Low Air Temp.	Salt Mist	Weatherability	Combined Environmental and Vibration	Melting Temperature	High Pressure Cold Water	High Pressure Hot Water	Chemical	Abrasion
Type 1	S1-1	X							X		X	
	S1-2	X								X		X
	S1-3		X						X		X	
	S1-4		X							X		X
	S1-5			X					X		X	
	S1-6			X						X		X
	S1-7				X				X		X	
	S1-8				X					X		X
	S1-9					X			X		X	
	S1-10					X				X		X
	S1-11						X		X		X	
	S1-12						X			X		X
	S1-13							X				
	S1-14							X				
Type 2	S2-1	X							X		X	
	S2-2	X								X		X
	S2-3		X						X		X	
	S2-4		X							X		X
	S2-5			X					X		X	
	S2-6			X						X		X
	S2-7				X				X		X	
	S2-8				X					X		X
	S2-9					X			X		X	
	S2-10					X				X		X
	S2-11						X		X		X	
	S2-12						X			X		X
	S2-13							X				
	S2-14							X				

ANNEX II
CHECKLIST:
TECHNICAL SPECIFICATIONS TO BE SUBMITTED AT THE TIME OF TESTING

General information	
Name and address of Microdots Supplier with contact persons' name, designation, email, phone nos. etc.	
Importers Name and address of Microdots Supplier with contact persons' name, designation, email, phone nos. etc.	
Name(s) and address (es) of manufacturing plants	
Size of Microdot	
Shape of Microdot (Hexagon, Circular, etc.)	
Type of Applicator (Canister, Pen, etc.)	
Microdot and adhesive system type (Type 1 / Type 2)	
Covert / Proprietary Features	
Microdot Identifier mentioned on Microdot	
Vehicle Category	
Details of parts, components, assemblies, etc.	
Vehicle/Parts/Components/Assemblies Body Material	
ISO Certification/Quality Standard details (supporting documents to be submitted)	
Any Additional Information	

ANNEX III
COMPOSITION OF AISC PANEL *

Name	Organization
Mr. Dinesh Tyagi	Convener – Director, ICAT International Centre for Automotive Technology, Manesar
Members	Representing
Ms. Vijayanta Ahuja	International Centre for Automotive Technology, Manesar
Dr. Madhusudan Joshi	International Centre for Automotive Technology, Manesar
Ms. Aditi Sethi	International Centre for Automotive Technology, Manesar
Ms. Sita Kumari	International Centre for Automotive Technology, Manesar
Mr. V.G. Kulkarni	Mahindra Truck & Bus Division
Mr. Alok Jaithey	MSIL
Mr. Sumit Sharma	MSIL
Mr. V. P. Gautam	Ashok Leyland Ltd.
Mr. S. Ravishankar	Ashok Leyland Ltd.
Mr. Devinder Tangri	Mahindra & Mahindra
Mr. Jatin Mehta	Engineer Homologation
Ms. Sania S.Yusuf	ABE Pvt. Ltd.
Mr. Arpit	ABE Pvt. Ltd.
Mr. Mukesh	ELS
Mr. Mukesh Goel	Gopsons Papers Ltd.
Mr. Rajendra khile	Renault Nissan
Mr. Feroz Khan	Honda Cars R&D
Mr. Shaurabh Chatterjee	TATA Motors
Mr. Rahul Righwani	Isuzu Motor
Mr. Piyush Chowdhry	Hero Motocorp
Mr. T M Balaraman	Hero Motocorp
Mr. Vijeth Gatty	Toyota
Mr. A. V. Kumbhar	Bajaj Auto

* At the time of approval of this Automotive Industry Standard (AIS)

ANNEX IV
(See Introduction)
COMMITTEE COMPOSITION*
Automotive Industry Standards Committee

Chairperson	
Mrs. Rashmi Urdhwareshe	Director The Automotive Research Association of India, Pune
Members	Representing
Shri Priyank Bharti	Ministry of Road Transport and Highways (Dept. of Road Transport and Highways), New Delhi
Representative from	Ministry of Heavy Industries and Public Enterprises (Department of Heavy Industry), New Delhi
Shri S. M. Ahuja	Office of the Development Commissioner, MSME, Ministry of Micro, Small and Medium Enterprises, New Delhi
Shri Shrikant R. Marathe	Former Chairman, AISC
Shri R.R. Singh	Bureau of Indian Standards, New Delhi
Director	Central Institute of Road Transport, Pune
Director	Global Automotive Research Centre
Director	International Centre for Automotive Technology, Manesar
Director	Indian Institute of Petroleum, Dehra Dun
Director	Indian Rubber Manufacturers Research Association
Director	Vehicles Research and Development Establishment, Ahmednagar
Representatives from	Society of Indian Automobile Manufacturers
Shri T. R. Kesavan	Tractor Manufacturers Association, New Delhi
Shri Uday Harite	Automotive Components Manufacturers Association of India, New Delhi

Member Secretary
Shri Vikram Tandon
Dy. General Manager
The Automotive Research Association of India, Pune

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