



उत्पाद मैनुअल

तप्त - निम्नजी ज़िंक-एल्युमिनियम-मैग्नीशियम मिश्रधातु  
लेपित इस्पात पत्तियाँ, प्लेटें एवं चादरें - विशिष्टि

IS 18513:2023 के अनुसार

PRODUCT MANUAL  
FOR  
Hot-Dip Zinc-Aluminium-Magnesium Alloy  
Coated Steel Sheets, Plates and Strips — Specification  
ACCORDING TO IS 18513:2023

विभिन्न उत्पादों के लिए भारतीय मानक ब्यूरो) अनुरूपता मूल्यांकन (विनियम, 2018 की योजना -I के तहत प्रमाणन के संचालन में एकरूपता और पारदर्शिता के लिए इस उत्पाद मैनुअल का उपयोग सभी क्षेत्रीय / शाखा कार्यालयों और लाइसेंसधारियों द्वारा संदर्भ सामग्री के रूप में किया जाएगा। दस्तावेज़ का उपयोग बीआईएस प्रमाणन प्राप्त करने के इच्छुक संभावित आवेदकों द्वारा भी किया जा सकता है।

*This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure uniformity of practice and transparency in operation of certification under Scheme-I of Bureau of Indian Standards (Conformity Assessment) Regulations, 2018 for various products. The document may also be used by prospective applicants desirous of obtaining BIS certification.*

|    |                                          |   |                                                                                               |
|----|------------------------------------------|---|-----------------------------------------------------------------------------------------------|
| 1. | मानक संख्या<br>IS No.                    | : | IS 18513:2023                                                                                 |
|    | शीर्षक<br>Title                          | : | Hot-Dip Zinc-Aluminium-Magnesium Alloy Coated Steel Sheets, Plates and Strips — Specification |
|    | संशोधनों की संख्या<br>No. of amendments  | : | NIL                                                                                           |
| 2. | नमूना दिशानिर्देश<br>Sampling Guidelines |   |                                                                                               |

|    |                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| a) | <b>कच्चा माल</b><br><b>Raw material</b>                                                                                                                                                                                                                                                                                      | : The ingots of zinc and zinc alloys, aluminium and magnesium used for the molten bath for dipping shall conform to any of the grades specified in IS 13229/IS 209, IS 2590, IS 6694 respectively. In case of Zn-Mg-Al alloyed ingot, its properties and chemical composition can be as per mutual agreement between the purchaser and the manufacturer.<br><br>Conformity of ingots may be established through supplier test certificate/test report from BIS recognized lab/empanelled lab or any other NABL accredited lab or in house testing/combination thereof. No testing is required if ISI marked<br><br>Note: This section indicates the requirements for raw material (if specified in the IS) for which compliance is to be established during Grant of Licence/Change in Scope of Licence/Factory Surveillance |
| b) | <b>समूहीकरण दिशानिर्देश</b><br><b>Grouping Guidelines</b>                                                                                                                                                                                                                                                                    | : Please refer Annex-A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| c) | <b>नमूने का परिमाण</b><br><b>Sample Quantity</b>                                                                                                                                                                                                                                                                             | : For mechanical test: 1 metre in length<br>For chemical test : 5 pieces of 5cm X 5cm<br><br>Note: Dimensions, mass and visual examination of the full coil/sheet/plate/strip shall be done during factory testing.<br><br>Note: This section indicates the quantity of the sample of the product and/or the raw material (if applicable), required to be sent to the laboratory for testing, for the purpose of Grant of Licence/Change in Scope of Licence/ Factory Surveillance (in case of market surveillance, effort may be made to procure the required quantity of product sample, as far as possible since raw material sample may not be available in market)                                                                                                                                                      |
| 3. | <b>परीक्षण उपकरणों की सूची</b><br><b>List of Test Equipment</b>                                                                                                                                                                                                                                                              | : Please refer to Annex-B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 4. | <b>निरीक्षण और परीक्षण की स्कीम</b><br><b>Scheme of Inspection and Testing</b>                                                                                                                                                                                                                                               | : Please refer to Annex-C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 5. | <b>एक दिन में संभावित परीक्षण</b><br><b>Possible tests in a day</b>                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|    | All tests<br><br>Note: This section is for the guidance of BIS Certification Officers/Technical Auditors of BIS Authorized Outside Surveillance Agencies (OSAs) during factory inspection to provide ready reference regarding the tests which can be witnessed during the inspection in the factory by the officer/auditor. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

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| 6. | <b>लाइसेंस का दायरा /Scope of the Licence:</b>                                          |                                                                                                                                                                                                                                                |
|    | “Licence is granted to use Standard Mark as per IS 18513:2023 with the following scope: |                                                                                                                                                                                                                                                |
|    | Name of the product                                                                     | Hot-Dip Zinc-Aluminium-Magnesium Alloy Coated Steel Sheets, Plates and Strips                                                                                                                                                                  |
|    | Type and Designation of Substrate (Steel Grade)                                         | Classified as given in Table 1 for coated steels with cold rolled substrate and Table 2 for coated steels with hot-rolled substrate.<br>e.g.<br>IZMCCR0, IZMC300S .... (Cold Rolled Substrate)<br>IZMHHR1, IZMHHR2 .....(Hot Rolled Substrate) |
|    | Coating Mass Designation                                                                | Classified as per Table3<br>e.g.<br>ZM060, ZM070, ZM080 .....                                                                                                                                                                                  |
|    | Surface Finish Designation                                                              | N/S                                                                                                                                                                                                                                            |
|    | Surface Treatment Designation                                                           | C/P/O/CO/S/U/other (to be specified)                                                                                                                                                                                                           |
|    | Surface Quality                                                                         | As Coated Surface (AC)/ Improved Surface (B)/ Best Quality Surface (I)                                                                                                                                                                         |
|    | Product Dimensions                                                                      | Steel sheet/Plate/Strip of<br>Thickness: from ...mm to....mm,<br>Width: From..... mm to.... mm,<br>Length: from ....m to .....m.                                                                                                               |

**BUREAU OF INDIAN STANDARDS  
MANAK BHAVAN,9, BAHADUR SHAH ZAFAR MARG,  
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## ANNEX-A

### GROUPING GUIDELINES

For the purpose of Grant of Licence/Change in Scope of Licence, the following grouping guidelines shall apply:

a) On the basis of Type and Designation of Substrate (Steel Grade), the following grouping shall apply

i) For "**Cold Rolled Substrate**"

| Group | Type                                  | Grades/Designations                                                                                                                                                                      | Sampling guidelines                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.    | Mild steel sheet                      |  <p>Increasing order of grade quality</p> <p>IZMCCR0, IZMCCR1, IZMCCR2, IZMCCR3, IZMCCR4, IZMCCR5</p>   | <p>One sample of any size may be drawn for testing to cover all the sizes for which manufacturing and testing facility available.</p> <p>However, If sample is tested for grade of higher drawability (r) &amp; stretch-ability (n), then the recommendation may include grades of lower drawability (r) &amp; stretch-ability (n) also.</p> <p>ii) For example, Sample of IZMCCR5 should be drawn to cover IZMCCR0 to IZMCCR5.</p> |
| 2.    | Structural Quality Steel              |  <p>Increasing order of grade quality</p> <p>IZMC300S, IZMC310S, IZMC330S, IZMC360S....IZMC570S</p>   | <p>One sample of any size may be drawn for testing to cover all the sizes for which manufacturing and testing facility available</p> <p>However, If sample is tested for grade of higher tensile strength then the recommendation may include lower Grades also.</p> <p>For example, Sample of IZMC570S should be drawn to cover IZMC300S to IZMC570S.</p>                                                                          |
| 3.    | Bake-hardening type steel sheets      |  <p>Increasing order of grade quality</p> <p>IZMC270B, IZMC290B, IZMC320B, IZMC340B... IZMC440B</p>   | <p>One sample of any size may be drawn for testing to cover all the sizes for which manufacturing and testing facility available</p> <p>However, If sample is tested for grade of higher tensile strength then the recommendation may include lower Grades also.</p> <p>For example, Sample of IZMC440B should be drawn to cover IZMC270B to IZMC440B.</p>                                                                          |
| 4.    | Interstitial free-high strength steel |  <p>Increasing order of grade quality</p> <p>IZMC300P, IZMC330P, IZMC340P, IZMC360P, ....IZMC440P</p> | <p>One sample of any size may be drawn for testing to cover all the sizes for which manufacturing and testing facility available</p> <p>However, If sample is tested for grade of higher tensile strength then the recommendation may include lower Grades also.</p> <p>For example, Sample of IZMC440P should be drawn to cover IZMC300P to IZMC440P.</p>                                                                          |

|    |                                              |                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                         |
|----|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                                              |                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                         |
| 5. | C-Mn steel<br>(solid solution strengthening) | <p>Increasing order of grade quality</p>  <p>IZMC340W, IZMC370W, IZMC390W, ZMC440W....IZMC590W</p>           | <p>One sample of any size may be drawn for testing to cover all the sizes for which manufacturing and testing facility available</p> <p>However, If sample is tested for grade of higher tensile strength then the recommendation may include lower Grades also.<br/>For example, Sample of IZMC590W should be drawn to cover IZMC340W to IZMC590W.</p>                                                 |
| 6. | High strength low alloy                      | <p>Increasing order of grade quality</p>  <p>IZMC310LA, IZMC320LA, IZMC340LA, IZMC370LA, ... ..IZMC620LA</p> | <p>One sample of any size may be drawn for testing to cover all the sizes for which manufacturing and testing facility available</p> <p>However, If sample of grade of higher tensile strength is tested then the recommendation may include grades of lower minimum tensile strength also.<br/>For example, Sample of IZMC620LA should be drawn to cover IZMC310LA, to IZMC620LA</p>                   |
| 7. | Dual phase steel                             | <p>Increasing order of grade quality</p>  <p>IZMC450Y, IZMC490Y, IZMC540Y, IZMC590Y, .. IZMC1180Y</p>      | <p>One sample of any size may be drawn for testing to cover all the sizes for which manufacturing and testing facility available</p> <p>However, If sample of grade of higher tensile strength is tested then the recommendation may include grades of lower tensile strength also.<br/>For example, sample of any of the grades IZMC1180Y should be drawn to cover IZMC450Y to IZMC1180Y.</p>          |
|    |                                              | IZMC980YH                                                                                                                                                                                     | <p>One sample of any size may be drawn for testing to cover all the sizes for which manufacturing and testing facility available</p>                                                                                                                                                                                                                                                                    |
| 8. | TRIP steel                                   | <p>Increasing order of grade quality</p>  <p>IZMC590T, IZMC690T, IZMC780T</p>                              | <p>One sample of any size may be drawn for testing to cover all the sizes for which manufacturing and testing facility available</p> <p>However, If sample of grade of higher tensile strength is tested then the recommendation may include grades of lower minimum tensile strength also.<br/>For example, sample of any size of the grade IZMC780T should be drawn to cover IZMC590T to IZMC780T</p> |
| 9. | Complex phase steel                          | <p>Increasing order of grade quality</p>  <p>IZMC600N, IZMC780N,</p>                                       | <p>One sample of any size may be drawn for testing to cover all the sizes for which manufacturing and testing facility available</p>                                                                                                                                                                                                                                                                    |

|  |  |          |                                                                                                                                                                                                                                                                    |
|--|--|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |  | IZMC980N | <p>However, If sample of grade of higher tensile strength is tested then the recommendation may include grades of lower minimum tensile strength also.</p> <p>For example, sample of any of the grades IZMC980N should be drawn to cover IZMC600N to IZMC980N.</p> |
|--|--|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

ii) For "**Hot Rolled Substrate**"

| Group | Type                                                  | Grades/Designations                                                                                                 | Sampling guidelines                                                                                                                                                                                                                                                                                                                                                                          |
|-------|-------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.    | Commercial quality steel                              | IZMHHR1                                                                                                             | One sample of any size may be drawn for testing to cover all the sizes for which manufacturing and testing facility available                                                                                                                                                                                                                                                                |
| 2.    | Drawing Quality Steel                                 | <p>Increasing order of grade quality →</p> <p>IZMHHR2, IZMHHR3, IZMHHR4</p>                                         | <p>One sample of any size may be drawn for testing to cover all the sizes for which manufacturing and testing facility available</p> <p>However, If sample of grade of higher minimum elongation is tested then the recommendation may include grades of lower minimum elongation also.</p> <p>For example, Sample of IZMHHR4 should be drawn to cover IZMHHR2 to IZMHHR4</p>                |
| 3.    | Structural Quality Steel                              | <p>Increasing order of grade quality →</p> <p>IZMH290S, IZMH330S, IZMH360S,...<br/>...IZMH570S</p>                  | <p>One sample of any size may be drawn for testing to cover all the sizes for which manufacturing and testing facility available</p> <p>However, If sample of grade of higher minimum tensile strength is tested then the recommendation may include grades of lower minimum tensile strength also.</p> <p>For example, Sample of IZMH570S should be drawn to cover IZMH290S to IZMH570S</p> |
| 4.    | High strength low alloy (high yield ratio type steel) | <p>Increasing order of grade quality →</p> <p>IZMH320LA, IZMH360LA, IZMH390LA, IZMH410LA, ....<br/>...IZMH750LA</p> | <p>One sample of any size may be drawn for testing to cover all the sizes for which manufacturing and testing facility available</p> <p>However, If sample of grade of higher tensile strength is tested then the recommendation may include grades of lower minimum tensile strength also.</p> <p>For example, Sample of IZMH750LA should be drawn to cover IZMH320LA to IZMH750LA</p>      |
| 5.    | High strength structural steel                        | <p>→</p> <p>Increasing order of grade quality</p> <p>IZMH440R, IZMH490R, IZMH540R, IZMH590R, IZMH780R</p>           | <p>One sample of any size may be drawn for testing to cover all the sizes for which manufacturing and testing facility available</p> <p>However, If sample of grade of higher tensile strength is tested then the recommendation may include grades of lower minimum tensile strength also.</p> <p>For example, sample of any of the grades IZMH780R should be drawn to cover</p>            |

|    |                                            |           |                                                                                                                               |
|----|--------------------------------------------|-----------|-------------------------------------------------------------------------------------------------------------------------------|
|    |                                            |           | IZMH440R to IZMH780R                                                                                                          |
| 6. | High hole expansion ratio type steel sheet | IZMH440FB | One sample of any size may be drawn for testing to cover all the sizes for which manufacturing and testing facility available |

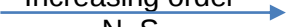
b) On the basis of Coating Mass Designation, the following grouping shall apply:

| Group | Coating Mass Designation                                                                                                                                      | Sampling guidelines                                                                                                                                                     |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.    | Increasing order of coating mass<br><br>ZM060, ZM070, ZM080, ZM090.... ZM650 | If sample of higher minimum coating mass is tested, then lower coating mass may also be covered<br>For Example, Sample of ZM650 should be drawn to cover ZM060 to ZM650 |

c) On Surface Treatment and Oiling Requirement, the following grouping shall apply

| Group | Surface Treatment Designation                                                                                                                                                     | Sampling guidelines                                                                                                                |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| 1.    | C (Mill Passivation)<br>P (Mill phosphating)<br>O (Oiling)<br>CO (Mill passivation and oiling)<br>S (Thin organic film (or sealing))<br>U (Un-treated)<br>Other (to be specified) | Sample of any surface treatment may be drawn to cover any/all of the designations for which manufacturing facilities are available |

d) On the basis of Surface Finish, the following grouping shall apply

| Group | Surface Finish                                                                                                  | Sampling guidelines                                                                                                                                                                                      |
|-------|-----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.    | Increasing order<br><br>N, S | If sample higher surface finish is tested, then lower surface finish may also be covered<br>For Example, Sample of surface finish (S) should be drawn to cover surface finish (N) and surface finish (S) |

e) On the basis of Surface Quality, the following grouping shall apply

| Group | Surface Quality                                                           | Sampling guidelines                                                                                                                                                                                                                              |
|-------|---------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.    | As Coated Surface (AC)<br>Improved Surface (B)<br>Best Quality Surface(I) | If sample higher quality surface is tested, then lower surface quality may also be covered<br>For Example, Sample of Best quality surface (I) should be drawn to cover As coated surface (AC), Improved Surface (B) and Best quality surface (I) |

f) Samples of plate or sheet or strip of any size i.e. any thickness and dimensions (width, length) may be tested.

g) Scope of licence shall be restricted based on the manufacturing and testing facilities available.

h) During operation of licence, samples of each variety covered in the scope of licence, shall be tested in rotation, to the extent possible

## ANNEX – B

### LIST OF TEST EQUIPMENTS

*(INDICATIVE LIST, FOR GUIDANCE ONLY)*

| Sl. No. | Tests Used In With Clause Reference                         | Test Equipment/Chemical                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------|-------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1       | Surface Finish, Cl. 5.4                                     | Surface roughness tester                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 2       | Chemical Composition, Cl. 7                                 | Equipment and reagents for wet analysis as per method specified in the relevant parts of IS 228 or appropriate spectrometer for instrumental analysis (ICP-OES, Spark emission spectrometer etc.)                                                                                                                                                                                                                                                                                    |
| 3       | Tensile Test, Cl. 10.1                                      | Universal testing machine with extensometer as per IS 1608 (Part 1)                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 4       | Plastic Strain Ratio, Cl. 10.2                              | Universal testing machine with extensometer (for semi-automatic and automatic method) and device for the measurement of length and width after plastic straining and unloading of specified accuracy as per IS 11999                                                                                                                                                                                                                                                                 |
| 5       | Tensile Strain Hardening Component ( $n$ - value), Cl. 10.3 | Universal testing machine with extensometer and arrangement for measurement of Thickness and width as per IS 15756                                                                                                                                                                                                                                                                                                                                                                   |
| 6       | Bake Hardening Index, Cl. 10.4                              | Universal testing machine with extensometer and furnace capable of maintaining 170 °C temperature                                                                                                                                                                                                                                                                                                                                                                                    |
| 7       | Bend Test, Cl. 10.5 (if required by purchaser)              | Testing machines or presses equipped with the following devices as per IS 1599:<br>a) bending device with two supports and a former as shown in Figure 1 of IS 1599;<br>b) bending device with a V-block and a former as shown in Figure 2 of IS 1599;<br>c) bending device with a clamp as shown in Figure 3 of IS 1599                                                                                                                                                             |
| 8       | Hardness test, Cl. 10.6 (if required by purchaser)          | Rockwell Hardness Tester or Vickers Hardness Tester                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 9       | Coating Mass, Cl. 8.1                                       | <p><u>X-ray fluorescence technique method (IS 12860)</u></p> <p>XRF apparatus consisting of an X-Ray source, and radiation detector in conjunction with electronic pulse amplitude discriminator and pulse counting (scaler) circuitry</p> <p><u>Weight loss (gravimetric) method on a single surface (IS 6745)</u></p> <p>Weighing balance of LC 0.01gm &amp; Chemicals Alcohol , Solvent naptha /trichloroethylene, antimony trioxide/ antimony trichloride, HCl ( Sp Gr 1.16)</p> |

|    |                                          |                                                                                |
|----|------------------------------------------|--------------------------------------------------------------------------------|
| 10 | Coating Adherence, Cl. 8.3               | Steel Mandrels, UTM attachments/clamps/vice/Magnifying glass                   |
| 11 | Dimensions, shape and tolerances, Cl. 11 | Measuring Tape, Vernier Calipers<br>Filler gauge, flat bench, Micrometer, Cord |

## ANNEX C

### SCHEME OF INSPECTION AND TESTING

#### 1. QUALITY ASSURANCE PLAN

1.1 It is expected that manufacturers (licensees/applicants) will implement a Quality Assurance Plan i.e. a plan of regular testing and in-process controls, designed to ensure that the product bearing the Standard Mark conforms to all requirements of the Indian Standard.

1.2 The manufacturers shall define a Quality Assurance Plan defining the control unit (i.e. lot/batch etc.) and the levels of control (i.e. the frequency and number of samples for conducting the different tests as per the Indian Standard) and submit the same to BIS Branch Office for information. The manufacturer shall comply with the same and maintain test records in accordance with para 2.4.

#### 1.3 RECOMMENDED LEVELS OF CONTROL/CONTROL UNIT:

1.3.1 For the guidance of manufacturers, the recommended definition of control unit is: Entire quantity of ZAM coated Steel sheet, Plate and Strip of the same cast/heat, same Type and Designation of Substrate (Steel Grade), same Coating Mass Designation, same Surface Treatment designation, same Surface Quality, and same Surface Finish Designation manufactured under similar conditions in a day.

1.3.2 For the guidance of manufacturers in preparing the Quality Assurance Plan, recommended levels of control are given in **Table 1**.

1.3.3 The manufacturer shall ensure inspection and testing as per the Quality Assurance Plan submitted by them on the whole production of the factory which is covered by this plan. Alternatively, the manufacturer has the option of adherence to the quality plan as per levels of control recommended in column 3 of Table 1.

1.4 However, all manufacturers shall ensure compliance of their products to all the requirements of the Indian Standard.

**2. ENSURING COMPLIANCE THROUGH TESTING-** It is expected that manufacturers (licensees/applicants) will establish a suitably equipped and staffed in house laboratory (In house testing facility) for testing at least those parameters of the Indian Standard which require routine testing for ensuring quality of the product. This includes in-process controls as may be defined and put in place by the manufacturer and testing parameters/requirements which can only be performed in the factory.

2.1 For the guidance of manufacturers, Table 1 giving the recommended levels of control is given below. Column 2 of Table 1 indicates routine tests where test equipment is required in house as "R" or other tests which can be subcontracted as "S". Subcontracting is permitted to BIS recognized/empanelled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025.

**2.2 For MSME manufacturers, the requirement of maintaining a laboratory/in-house testing facility for routine tests (indicated as "R" in Column 2 of Table 1) is also optional.**

2.2.1 MSME manufacturers may utilize common cluster based facilities as per guidelines for the utilization of cluster based test facilities by MSMEs or the provisions of Sharing of testing facilities or get testing done from BIS recognized/empaneled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025.

**2.3 Large Scale manufacturers shall maintain an in-house laboratory equipped at least with test facilities for routine tests (indicated as “R” in Column 2 of Table 1),** where different tests given in the specification shall be carried out in accordance with the method given in the specification. They shall also implement a calibration plan for the in-house test equipment.

2.3.1 Alternatively, in lieu of an in-house laboratory, large scale manufacturers can also utilize the provisions of Sharing of testing facilities as per the Guidelines for Grant of Licence available on BIS website [www.bis.gov.in](http://www.bis.gov.in). (Under Conformity Assessment>Product Certification Process). Even for subcontracted tests, provisions for sharing of testing facilities can be utilized.

**2.4 TEST RECORDS-** The manufacturers maintaining an in-house laboratory or utilizing common cluster based facilities or shared test facilities shall maintain test records for the tests carried out to establish conformity. For the tests being subcontracted to BIS recognized/empanelled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025, test reports issued by the laboratories shall be available for inspection by BIS.

**3. PACKING AND MARKING** - The Standard Mark as given in the Schedule of the licence shall be incorporated legibly and indelibly on each package and/or on the label attached to the coils and/or on the test certificate (see 4), provided always that the material so marked conforms to each requirement of the specification.

3.1 Packing and Marking shall be done as per the Indian Standard.

3.2 **Additional Marking requirements:** The material shall also be marked with the following additional requirement on each package and/or on the label attached to the coils and/or on the test certificate (see 4):

a) “For BIS certification details please visit [www.bis.gov.in](http://www.bis.gov.in)”

**4. TEST CERTIFICATE** – For each consignment of BIS Certified material conforming to IS 18513:2023 there shall be a test certificate which shall contain the Standard Mark, the Control Unit/Heat number and the corresponding test results (as given in Annexure-I enclosed)

**5. REJECTION** - All the production which conforms to the Indian Standard and covered under the scope of this licence shall be marked with the Standard Mark. Disposal of non-conforming product shall be done in such a way so as to ensure that there is no violation of provisions of BIS Act, 2016. Any rejected material which is potentially re-salable be sheared or cut or deformed in such a manner that it cannot be used for any other purpose except re-melting. A separate record shall be maintained giving information on quantity and cast number/coil number/control unit number, as applicable, relating to all such rejections/defective/sub-standard material of the production not conforming to the requirements of the Specification and the method of its disposal. Such material shall in no case be stored together with that conforming to the Specification. The Standard Mark (if already applied) on rejected material should be defaced.

**TABLE 1**  
**(ONLY FOR GUIDANCE PURPOSE)**

| (1)          |                                                                                 |                               |                                                                                      | (2)                                                                        | (3)                                                                                                                             |                  |                                                                                                                                                                                                                                             |
|--------------|---------------------------------------------------------------------------------|-------------------------------|--------------------------------------------------------------------------------------|----------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Details |                                                                                 |                               |                                                                                      | Test equipment requirement<br>R: required (or)S: Sub-contracting permitted | Levels of Control                                                                                                               |                  |                                                                                                                                                                                                                                             |
| Cl.          | Requirement                                                                     | Test Methods Clause Reference |                                                                                      |                                                                            | No. of Sample                                                                                                                   | Frequency        | Remarks                                                                                                                                                                                                                                     |
| 5.3          | Coating bath metal composition                                                  | 5.3                           | IS 18513                                                                             | R                                                                          | Manufacturer shall ensure adequate inspections and in process controls to ensure compliance to the requirements of the standard |                  |                                                                                                                                                                                                                                             |
| 5.4          | Surface Finish                                                                  |                               | IS 18432 (Part 2) : 2023 (superseding IS 15262 : 2002)                               | R                                                                          | Manufacturer shall ensure adequate inspections and in process controls to ensure compliance                                     |                  |                                                                                                                                                                                                                                             |
| 6.4          | ingots of zinc and zinc alloys, aluminium and magnesium/ Zn-Mg-Al alloyed ingot |                               | IS 13229/IS 209, IS 2590, IS 6694                                                    | S                                                                          | One                                                                                                                             | Each consignment | Conformity of ingots may be established through supplier test certificate/test report from BIS recognized lab/empanelled lab or any other NABL accredited lab or in house testing/combination thereof. No testing is required if ISI marked |
| 7            | Chemical Composition of base metal                                              |                               |                                                                                      |                                                                            |                                                                                                                                 |                  |                                                                                                                                                                                                                                             |
| 7.1          | Ladle Analysis                                                                  |                               | IS 228 or any other national/international standard for instrumental/chemical method | R                                                                          | One                                                                                                                             | Each cast        | Applicable for manufacturers having in-house steelmaking facilities (primary manufacturers)                                                                                                                                                 |
| 7.2          | Product Analysis                                                                |                               | IS 228 or any other national/international standard for instrumental/chemical method | R                                                                          | NIL                                                                                                                             | NIL              | Not applicable for manufacturers having in-house steelmaking facilities (primary manufacturers)                                                                                                                                             |
|              |                                                                                 |                               | IS 228 or any other national/international standard for instrumental/chemical method | R                                                                          | One                                                                                                                             | Each cast        | In case the steel sheets/strips obtained for production of galvanized/galvannealed steel sheets/strips are ISI marked and received                                                                                                          |

|      |                                              |         |                                      |    |                                                                                                                                         |                           |                                                          |
|------|----------------------------------------------|---------|--------------------------------------|----|-----------------------------------------------------------------------------------------------------------------------------------------|---------------------------|----------------------------------------------------------|
|      |                                              |         |                                      |    |                                                                                                                                         |                           | with test certificate, no further testing is required    |
| 8    | Coating                                      |         |                                      |    |                                                                                                                                         |                           |                                                          |
| 8.1  | Coating Mass                                 |         | IS 12860/IS 6745                     | R  | One                                                                                                                                     | Each control unit         |                                                          |
| 8.3  | Coating Adherence                            | 8.3     | IS 18513                             | R  | One                                                                                                                                     | Each control unit         |                                                          |
| 8.4  | Corrosion Resistance for Coating             | 8.4     | IS 18513                             | R* | As agreed between purchaser and supplier                                                                                                | *If required by purchaser | 8.4                                                      |
| 9    | Surface Treatment and Finish                 | 9       | IS 18513                             | R  | Manufacturer shall ensure adequate inspections and in process controls to ensure compliance                                             |                           |                                                          |
| 10   | Mechanical Properties                        |         |                                      |    |                                                                                                                                         |                           |                                                          |
| 10.1 | Tensile Test                                 |         | IS 1608 (Part 1)                     | R  | One                                                                                                                                     | Each control unit         |                                                          |
| 10.2 | Plastic Strain Ratio (r-bar/r-90)            |         | IS 11999                             | R  | One                                                                                                                                     | Each control unit         |                                                          |
| 10.3 | Tensile Strain Hardening Component (n-value) |         | IS 15756                             | R  | One                                                                                                                                     | Each control unit         |                                                          |
| 10.4 | Bake Hardening Index — (BH)                  | Annex C | IS 18513                             | R  | One                                                                                                                                     | Each control unit         |                                                          |
| 10.5 | Bend Test (optional)                         |         | IS 1599                              | R* | One*                                                                                                                                    | Each control unit*        | *If agreed to between the manufacturer and the purchaser |
| 10.6 | Hardness Test (optional)                     |         | IS 1586 (Part 1) or IS 1501 (Part 1) | R* | One*                                                                                                                                    | Each control unit*        | *If agreed to between the manufacturer and the purchaser |
| 11   | DIMENSIONS, SHAPE AND TOLERANCES             | 10      | IS 18513                             | R  | Manufacturer shall ensure adequate inspections and in process controls to ensure compliance to the tolerances specified in the standard |                           |                                                          |
| 14   | Surface appearance and surface quality       | 11      | IS 18513                             | R  | Manufacturer shall ensure adequate inspections and in process controls to ensure compliance to the requirements of the standard         |                           |                                                          |
| 14   | Cracks due to strain ageing                  | 14      | IS 18513                             | R  | Manufacturer shall ensure adequate inspections and in                                                                                   |                           |                                                          |

|    |                                                  |    |          |   |                                                                                                                                 |  |
|----|--------------------------------------------------|----|----------|---|---------------------------------------------------------------------------------------------------------------------------------|--|
|    |                                                  |    |          |   | process controls to ensure compliance to the requirements                                                                       |  |
| 15 | Surface treatment                                | 15 | IS 18513 | R | Manufacturer shall ensure adequate inspections and in process controls to ensure compliance to the requirements                 |  |
| 16 | COIL BREAKS, STRETCHER STRAINS AND BENDS (KINKS) | 16 |          | R | Manufacturer shall ensure adequate inspections and in process controls to ensure compliance to the requirements of the standard |  |
| 17 | WELDABILITY                                      | 17 |          | R | Manufacturer shall ensure adequate inspections and in process controls to ensure compliance to the requirements                 |  |
| 19 | MASS                                             | 19 |          | R | Manufacturer shall ensure adequate inspections and in process controls to ensure compliance to the requirements of the standard |  |

# ANNEXURE I

BIS  
STANDARD  
MARK

(Para 4 of the Scheme of Inspection and Testing)  
XYZ IRON AND STEEL COMPANY  
(Registered office Address and works address)

## TEST CERTIFICATE FOR Hot-Dip Zinc-Aluminium-Magnesium Alloy Coated Steel Sheets, Plates and Strips — Specification

TEST CERTIFICATE No.                      DATE  
TO M/s

We certified that the material described below fully conforms to IS 18513:2023

Chemical, Physical and Mechanical properties of the product, as tested in accordance with the Scheme of Testing and Inspection contained in the BIS Certification Marks Licence No. CM/L-                      are as indicated below against each order No.

(PLEASE REFER TO IS 18513:2023 FOR DETAILS OF SPECIFICATION REQUIREMENTS)

| Order No. & Date | Size | Control Unit | Grade | Quantity | Chemical Composition |    |   |   |    |    |    | Mechanical Properties |    |       |    |          |               |                  | Dimension Shape Mass | Coating Mass |
|------------------|------|--------------|-------|----------|----------------------|----|---|---|----|----|----|-----------------------|----|-------|----|----------|---------------|------------------|----------------------|--------------|
|                  |      |              |       |          | C                    | Mn | S | P | Cr | Mo | Ni | TS                    | YS | Elong | BH | Hardness | Plastic Ratio | Strain Hardening |                      |              |
|                  |      |              |       |          |                      |    |   |   |    |    |    |                       |    |       |    |          |               |                  |                      |              |

REMARKS  
WAGON NO.  
TRUCK NO.

FOR XYZ IRON AND STEEL COMPANY

“For BIS certification details please visit [www.bis.gov.in](http://www.bis.gov.in)”

(It is suggested that size A4 paper be used for this test certificate)