BUREAU OF INDIAN STANDARDS

AGENDA

Concrete Reinforcement Sectional Committee, CED 54	**:**	**Twenty Seventh Meeting**
Date – 16 December 2024	**:**	**Time – 1030 hrs**

In Hybrid Mode from Mimaansa (White room), Manak Bhawan, Bureau of Indian Standards, 9, Bahadur Shah Zafar Marg, New Delhi 110 002

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CHAIRPERSON	**:**	**Shri Shailendra Sharma**
MEMBER SECRETARY	**:**	**Shri Nishikant Singh**

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Item 0 OPENING REMARKS AND WELCOME BY THE CHAIRMAN

Item 1 CONFIRMATION OF THE MINUTES OF THE LAST MEETING

The minutes of the 26th meeting of the Concrete Reinforcement Sectional Committee, CED 54 held on 20 September 2024 were circulated vide BIS DG letter No. CED 54/A-2.26 dated 11 October 2024. No comments have been received on the minutes.

The Committee may **NOTE** and **CONFIRM** the minutes.

Item 2 COMPOSITION OF THE SECTIONAL COMMITTEE

2.1 The composition of the Sectional Committee is enclosed at **Annex 1.**

The Committee may **NOTE** and **REVIEW** the composition.

2.2 Request for Co-option

2.2.1 A request has been received from Centre for Composite Materials (CCM), Anna University, Chennai for Co-option in the Working Group 05 for Formulation of Standards for FRP bars. The letter for Co-option request is attached at **Annex 2**.

The Committee may **NOTE** and **ADVISE.**

Item 3 PROGRAMME OF WORK

3.1 The present Programme of Work for CED 54 is enclosed at **Annex 3.**

The Committee may **NOTE**.

Item 4 ISSUES ARRISING IN PREVIOUS MEETING

4.1 IS 1785 (Part 1):1983 Specification for Plain Hard-Drawn Steel Wire for Prestressed Concrete: Part 1 Cold-Drawn Stress Relieved Wire (Second Revision)

4.1.1 IS 1785 (Part 2):1983 Specification for Plain Hard-Drawn Steel Wire for Prestressed Concrete: Part 2 As-Drawn Wire (First Revision)

In the last TC meeting, the Committee noted that no significant progress has been made in these drafts, and thus requested the Working Group CED 54/WG 3 for Revision of IS 1785 (Part 1 and Part 2), to expedite the drafts.

The Committee may **NOTE** and **REVIEW**.

4.2 IS 1786:2008 High Strength Deformed Bars and Wires for Concrete Reinforcement – Specification (Fourth Revision)

The Committee may review the progress for the draft for revision of the standard from the Working Group for Revision of IS 1786, CED 54/WG 2.

The Committee may **NOTE** and **REVIEW**.

4.3 IS 2090:1983 'Specification for High Tensile Steel Bars Used in Prestressed Concrete (First Revision)

The Committee may review the progress for the draft for revision of the standard from M/s Dextra india Private Ltd.

The Committee may **NOTE** and **REVIEW**.

4.4 IS 12594:1988 Hot-dip Zinc Coating on Structural Steel Bars for Concrete Reinforcement — Specification

The Committee may review the progress for the draft for revision of the standard from the Working Group for Revision of IS 12594, CED 54/WG 6.

The Committee may **NOTE** and **REVIEW**.

4.5 IS 13620:1993 Fusion Bonded Epoxy Coated Reinforcing Bars — Specification

The Committee may review the progress for the draft for revision of IS 13620 from the Working Group for Review of IS 13620, CED 54/WG 1.

The Committee may **NOTE** and **REVIEW**.

4.6 IS 16651:2017 High Strength Deformed Stainless Steel Bars and Wires for Concrete Reinforcement — Specification

In the 26th Meeting, Sh Rohit Kumar informed that the samples of 36 mm and 40 mm were made available and same would be sent for testing and based on the test results, draft amendment would be prepared.

The Committee may **NOTE** and **REVIEW**.

Item 5 NEW WORK ITEM PROPOSALS (NWIP)

5.1 Development of Standard for Determination of Corrosion Initiation Time and Chloride Threshold Levels for Various Types of Reinforcing Bars

In the 25th meeting, the Committee had requested Prof Radhakrishna G Pillai, Dr. S. R. Karade and Shri P. N. Ojha to submit the proposals for the test for corrosion initiation time and chloride threshold levels for consideration of the committee. The proposal is yet to be received.

The Committee may **NOTE** and **REVIEW**.

5.2 Proposal for Formulation of an Indian Standard for Sacrificial Anode Cathodic Protection (SACP) of Reinforced Concrete Structures

In the 25th meeting, the Committee requested Prof Radhakrishna G Pillai to submit the new item/subject proposal on the subject along with the concept note. Same is still awaited.

The Committee may **NOTE** and **REVIEW**.

5.3 Proposed Draft for Textile Reinforcement for Use In Concrete

In the 26th meeting, the Committee considered the request made by Ms Smitha Gopinath, the Convenor of the Working Group (WG 8) for preparation of draft for Textile Reinforcement.

The Committee may **NOTE** and **REVIEW**.

5.4 Proposal for new standard on PSWC-Bars by Committee Member Sh Anil K Kar

In 26th Meeting, proposal for new standard on PSWC-Bars (plain surface and wave-type configuration) as received from member of CED 54, Sh Anil K Kar, was discussed in detail. Further data and details relevant to its practical application were sought. The data as provided by Sh Anil K Kar has been attached at **Annex 4.**

The Committee may **NOTE** and **ADVISE.**

5.5 Proposal for new standard on Electrogalvanied Steel for Concrete Reinforcement

A proposal from Sh Kapil Jat for formulation of standard covering the requirements of high strength deformed HSD steel bars for concrete reinforcement coated with zinc by electrolytic process. The details as submitted have been attached at **Annex 5.**

The Committee may **NOTE** and **ADVISE.**

Item 6 DRAFTS PENDING FOR WIDE CIRCULATION

6.1 IS 432 (Part 1):1982 Specification for Mild Steel and Medium Tensile Steel Bars and Hard-Drawn Steel Wire for Concrete Reinforcement: Part 1 Mild Steel and Medium Tensile Steel Bars (Third Revision)

6.2 IS 432 (Part 2):1982 Specification for Mild Steel and Medium Tensile Steel Bars and Hard-Drawn Steel Wire for Concrete Reinforcement: Part 2 Hard Drawn Steel Wire (Third Revision)

6.3 IS 1566:1982 Specification for Hard-Drawn Steel Wire Fabric for Concrete Reinforcement (Second Revision)

In the 26th Meeting of the Committee, it was decided that Working Group 7 would review the drafts and based on the recommendations of the Working Group, the draft would be sent for wide circulation. The response is still awaited.

The Committee may **NOTE** and **ADVISE.**

Item 7 ANY OTHER BUSINESS

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ANNEX 1

(*Item* 2.1)

COMPOSITION OF CONCRETE REINFORCEMENT SECTIONAL COMMITTEE, CED 54

SI No.	NAME OF THE ORGANIZATION	REPRESENTED BY	STA-TUS	MEETINGS			ATTEN-DANCE
				24th	25th	26th	
1	In Personal Capacity, New Delhi	Shri Shailendra Sharma	T			P	1/1
2	All India Steel Rerollers Association, New Delhi	Shri Vinod Vashisht Shri A K Bhargava (Alternate)	T		P	P	
3	Bharat Heavy Electricals Ltd, New Delhi	Shri Abhay Kumar Dr Abdullah Ahmed Laskar (Alternate)	U	P	P	P	3/3
4	Birla Institute of Technology and Science, Pilani	Prof Shamsher Bahadur Singh	T	P	P	P	3/3
5	Central Public Works Department, New Delhi	Shri Nagendra Prasad Shri A. K. Jalan (Alternate)	U	P	P	P	3/3
6	CSIR-Central Building Research Institute, Roorkee	Dr S. R. Karade Dr R. Siva Chidambaram (Alternate I) Shri D. M. Mecon (Alternate II)	T	P	P	P	3/3
7	CSIR-Central Electrochemical Research Institute, Karaikudi	Shri K. Saravanan Dr J. Daniel Ronald Joseph (Alternate I) Dr M. Ashok (Alternate II)	T	P	A	P	2/3
8	CSIR-Central Road Research Institute, New Delhi	Dr Rajeev Goel Shri S. S. Gaharwar (Alternate)	T	A	P	P	2/3
9	CSIR-Structural Engineering Research Centre, Chennai	Dr B. H. Bharath Kumar Dr Smitha Gopinath (Alternate-I) Dr M. Surendran (Alternate-II)	T	P	P	P	3/3

SI No.	NAME OF THE ORGANIZATION	REPRESENTED BY	STA-TUS	MEETINGS			ATTEN-DANCE
				24th	25th	26th	
10	Delhi Metro Rail Corporation, New Delhi	Shri Navneet Kumar Kothari Shri Sanjeev Kumar Garg (Alternate)	U	P	A	A	1/3
11	Dextra India Pvt Ltd, Mumbai	Shri Sunil Desai Shri Jitendra H. Pathak (Alternate)	M	P	A	A	1/3
12	Engineers India Limited, New Delhi	Shri Deepak Agrawal Shri Ankur Sharma (Alternate) Ms Divya Khullar (Alternate-YP)	U	P	P	P	3/3
13	Indian Association of Structural Engineers, New Delhi	Shri Hari Om Gupta Shri Manoj K. Mittal (Alternate)	T	P	A	A	1/3
14	Indian Institute of Technology Delhi, New Delhi	Dr Dipti Ranjan Sahoo Prof B. Bhattacharjee (Alternate)	T	P	P	A	2/3
15	Indian Institute of Technology Hyderabad, Hyderabad	Dr Suriya Prakash Dr Meenakshi Sharma (Alternate)	T	A	A	A	0/3
16	Indian Institute of Technology Roorkee, Roorkee	Prof Pramod Kumar Gupta Prof Akhil Upadhyay (Alternate)	T	P	A	P	2/3
17	Indian Institute of Technology Madras, Chennai	Dr Radhakrishna G. Pillai Dr Rupen Goswami (Alternate)	T	P	P	P	3/3
18	Indian Stainless Steel Development Association, New Delhi	Shri Rohit Kumar Shri Karan Kumar Pahuja (Alternate)	M	A	A	P	1/3
19	Institute of Steel Development and Growth (INSDAG), Kolkata	Shri Lakshmana Rao Pydi Shri Sajal Kumar Ghorai (Alternate)	T	P	P	P	3/3
20	International Zinc Association, New Delhi	Dr Rahul Sharma	M	P	P	A	2/3

SI No.	NAME OF THE ORGANIZATION	REPRESENTED BY	STA-TUS	MEETINGS			ATTEN-DANCE
				24th	25th	26th	
		Shri Kenneth De Souza					
21	IRCON Ltd, New Delhi	Shri Rohit Khanna Shri Nripendra Kumar Roy (Alternate)	U	P	P	P	3/3
22	Ministry of Road Transport & Highways, New Delhi	Dr S. K. Verma Dr Sanjay Wakchaure (Alternate)	U	P	A	P	2/3
23	Ministry of Steel (Govt of India), New Delhi	Shri Parmjeet Singh	U	P	A	A	1/3
24	M/s Usha Martin Limited, Ranchi	Shri Sandeep Jaiswal Shri Sudip Chakraborty (Alternate)	M		C	A	0/1
25	National Council for Cement and Building Materials, Ballabgarh	Shri P. N. Ojha Shri Amit Trivedi (Alternate-I) Shri Brijesh Singh (Alternate-II)	T	P	A	P	2/3
26	National Highways Authority of India, New Delhi	Shri R. K. Pandey Shri S. K. Mishra (Alternate)	U	P	A	A	1/3
27	National Institute of Secondary Steel Technology, Mandi Gobindgarh	Shri Rajib Kumar Paul Shri Sandeep Pal Singh (Alternate)	T	P	P	A	2/3
28	NBCC (India) Ltd, New Delhi	Shri Bibhash Kumar Shri Rahul Singh Raj (Alternate)	U	P	P	P	3/3
29	Nirma University, Ahemdabad	Dr Urmil V. Dave	T	P	P	P	3/3
30	NTPC Limited, Noida	Shri S. Khadanga Shri A. P. Srivastava (Alternate)	U	P	P	A	2/3
31	Nuclear Power Corporation India Limited, Mumbai	Shri Y. T. Praveenchandra Shri R. N. Sarangi (Alternate)	U	P	P	A	2/3
32	P.S.L. Limited, Mumbai	Shri R. Radhakrishnan Shri Ramnath Bhat (Alternate)	M	P	P	P	3/3

SI No.	NAME OF THE ORGANIZATION	REPRESENTED BY	STA-TUS	MEETINGS			ATTEN-DANCE
				24th	25th	26th	
33	Rashtriya Ispat Nigam Ltd, Visakhapatnam	Dr M. S. Prasad Shri Ch Appa Rao (Alternate)	M	P	P	P	3/3
34	Research Design and Standards Organization, Ministry of Railways, Lucknow	Shri Sandeep Singh Shri J. P. Meena (Alternate I) Shri M. K. Shukla (Alternate II)	T	P	P	P	3/3
35	Steel Authority of India Limited, R&D Centre for Iron & Steel, Ranchi	Dr V. Kumar Dr P. Saravanan (Alternate)	M	A	A	P	1/3
36	Sunflag Iron and Steel Co Ltd, New Delhi	Shri Ranjan Chhibba Shri K. K. Barriar (Alternate)	M	P	A	A	1/3
37	Tata Steel Ltd, Jamshedpur	Shri Biswajit Ghosh Dr Anup Kumar (Alternate)	M	P	P	P	3/3
38	Tata Steel Global Wires, Mumbai	Shri Shishir V. Desai Shri Suresh Mahajan (Alternate)	M	P	A	P	2/3
39	Weldmesh Manufacturer's Association, Mumbai	Shri Vijay Lachmandas Dodeja Shri Zakir Nissar Ahmed (Alternate I) Shri Bipin Kedia (Alternate II)	M	P	P	P	3/3
40	In Personal Capacity, Kolkata	Dr Anil K. Kar	T	P	P	P	3/3

Technologist (T)	18
Manufacturer (M)	11
Users (U)	11
Others (O)	00
Total	**40**

ANNEX 2

(*Item* 2.2.1)

CENTRE FOR COMPOSITE MATERIALS (CCM)
ANNA UNIVERSITY, CHENNAI – 600025

Dr. D. SANGEETHA
Professor & Director

Address: 2nd Floor, Thermal Science Block
Department of Mechanical Engg.
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To
The Director General,
Bureau of Indian Standards,
New Delhi

27.11.2024

Respected Sir,

Sub: FRP bars for concrete reinforcement – **Request to empanel Centre for Composite Materials (CCM), Anna University in BIS Committee** -Reg.

Our recently established Centre for Composite Materials (CCM), Anna University aims to serve the society at large through four key aspects by utilizing the expertise and resources of the associated faculties and infrastructures in the areas of composite materials research and applications.

- **Testing**, validation and Certification by Professional Engineers
- Providing solutions through **Consultancy** to the industries
- **Educating and Training** for the skilled employees of industries
- Providing **R&D supports** for existing/new products through innovative & sustainable approaches

CCM is collaborating with **Highways Research Station (HRS), Chennai** on developing FRP products for highway infrastructure and use of GFRP bars and geotextiles in road construction. CCM is also collaborating with **Ashok Leyland, Bosch** and several others composite industries through consultancy, testing, training and research.

Fibre-Reinforced Polymer (FRP) bars for concrete construction are researched in CCM. FRP bars with their non-corrosive property and high strength have great potential for use in concrete structures in coastal and harsh environment. CCM is developing facilities for the testing and certification of FRP bars as per the recently published codes - **IS 18255: 2023 and IS 18266: 2023**. As a further step, with the expertise and the testing facilities available at the Centre, CCM would like to be empaneled in the committees for the development of the standards for FRP bars in concrete construction.

By contributing to the development of standards for FRP bars, CCM honestly believes in strengthening **Industry-Academia-Government partnerships** fostering innovative solutions to the societal needs.

Kindly let us know the procedure for the empanelment of CCM into BIS committees and also the other ways in which CCM can collaborate with BIS and contribute to the development of the society.

Looking forward to working with you.

Best regards,

Director - CCM

ANNEX 3

(*Item* 3.1)

PROGRAMME OF WORK OF CONCRETE REINFORCEMENT SECTIONAL COMMITTEE, CED 54

CED 54 SCOPE	CONCRETE REINFORCEMENT STANDARDIZATION IN THE FIELD OF REINFORCEMENT FOR CONCRETE INCLUDING PRE-STRESSING STEEL
LIAISON	ISO/TC 17/SC 16 (P) STEEL FOR THE REINFORCEMENT AND PRESTRESSING OF CONCRETE

Sl No.	IS Number/ DOC Number	Title	Reaffirm Date	No. of Amd.	Aspect
STANDARDS PUBLISHED					
1	IS 432 (Part 1):1982	Specification for mild steel and medium tensile steel bars and hard-drawn steel wire for concrete reinforcement: Part 1 Mild steel and medium tensile steel bars (*third revision*)	May 2020	2	S
2	IS 432 (Part 2):1982	Specification for mild steel and medium tensile steel bars and hard-drawn steel wire for concrete reinforcement: Part 2 Hard-drawn steel wire (*third revision*)	May 2020	3	S
3	IS 1566:1982	Specification for hard-drawn steel wire fabric for concrete reinforcement (*second revision)*	May 2020	4	S
4	IS 1785 (Part 1):1983	Specification for plain hard-drawn steel wire for prestressed concrete: Part 1 Cold-drawn stress relieved wire (*second revision)*	Jan 2023	4	S
5	IS 1785 (Part 2):1983	Specification for plain hard-drawn steel wire for prestressed concrete: Part 2 As-drawn wire (*first revision*)	Jan 2023	4	S
6	IS 1786:2008	High strength deformed steel bars and wires for concrete reinforcement — Specification (*fourth revision*)	Jan 2023	4	S
7	IS 2090:1983	Specification for high tensile steel bars used in prestressed concrete (*first revision*)	May 2020	1	S

Sl No.	IS Number/ DOC Number	Title	Reaffirm Date	No. of Amd.	Aspect
8	IS 6003:2010	Indented wire for prestressed concrete — Specification	Mar 2021		S
9	IS 6006:2014	Uncoated stress relieved strand for prestressed concrete — Specification (*second revision)*	Mar 2024		S
10	IS 9417:2018	Welding of high strength steel bars for reinforced concrete construction — Recommendations (*second revision)*	June 2023		C
11	IS 10790 (Part 1):1984	Methods of sampling of steel for prestressed and reinforced concrete: Part 1 Prestressing steel	Mar 2021		M
12	IS 10790 (Part 2):1984	Methods of sampling of steel for prestressed and reinforced concrete: Part 2 Reinforcing steel	Mar 2021		M
13	IS 12594:1988	Hot-dip zinc coating on structural steel bars for concrete reinforcement – Specification	Mar 2021	1	S
14	IS 13620:1993	Fusion bonded epoxy coated reinforcing bars — Specification	May 2020	1	S
15	IS 14268:2022	Uncoated stress relieved low relaxation seven-wire (Ply) strand for prestressed concrete – Specification (*second revision)*			S
16	IS 16172:2023	Reinforcement couplers for mechanical splices of steel bars in concrete – Specification (*first revision*)			S
17	IS 16651:2017	High strength deformed stainless steel bars and wires for concrete reinforcement — Specification	July 2022		S
18	IS 16644:2018	Stress-relieved low relaxation steel wire for prestressed concrete — Specification	May 2023		S
19	IS 18255:2023	Fibre-reinforced polymer (FRP) bars for concrete reinforcement – Methods of tests			M
20	IS 18256:2023	Solid round glass fibre reinforced polymer (GFRP) bars for concrete reinforcement — Specification			S

DRAFTS UNDER PRINTING		
1	DOC: CED 54 (22059)	Continuous hot-dip galvanized steel bars for concrete reinforcement – Specification

*** INDICATES STANDARDS UNDER REVISION**

/ INDICATES ADOPTION OF ISO STANDARD

ANNEX 5
(Item 5.5)

Draft Standard

Electrogalvanized Steel for Concrete Reinforcement

FOREWORD

Electro-galvanizing is a process in which a layer of zinc is applied to steel in order to protect it against corrosion. The process of electroplating takes place by placing the steel into a cold/hot solution of zinc salts and exposing it to electric current. One of the major benefits of electro-galvanizing process is that it has a higher level of thickness control, which provides uniform consistent and accurate coating. The layer of zinc coating above the steel surface prevents it to come into contact with oxygen or moisture.

This standard specifies a range of electroplated coatings of zinc for the protection of steel against corrosion under various service conditions.

While developing this draft standard, assistance has been derived from ISO 2081:1986 Metallic coatings- Electroplating coatings of zinc on iron or steel

For the purpose of whether a particular requirement of this draft standard is complied with the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this draft standard.

1 SCOPE

1.1 This draft standard covers the requirements of high strength deformed [HSD] steel bars for concrete reinforcement coated with zinc by electrolytic process.

2 REFERENCES

The following standards contain provisions which through in this text, constitute provisions of this draft standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	*Title*
1786:2008	High strength deformed steel bars and wires for concrete reinforcement- Specification (*Fourth Revision*)
3531:1997	Glossary of terms relating to corrosion of metals (*Second Revision*)
3554:2017	Glossary of terms relating to electroplating (*First Revision*)

8910:2010 General technical delivery requirements for steel and steel products (*First Revision*)

3 TERMINOLOGY

For the purpose of this draft standard the definitions given in IS 3531, IS 3554 and the following definitions shall apply.

3.1 Size of Bar — Nominal diameter of HSD steel bars for concrete reinforcement without any coating on it. This is also termed as BMD (base metal diameter). This is the size that should be used while ordering the coated steel. In case of coated steel, it is measured after removing the coating.

3.2 Lot — A production of 25t of the electrogalvanized HSD steel bars of same size, quality, dimensions and coating thickness that have been electroplated during the single production shift.

3.3 Product — Electrogalvanized HSD steel bars for concrete reinforcement.

3.4 Minimum average thickness - The mean of the thickness measurements, of which a specified number is made within a reference area of a HSD steel bar.

4 DESIGNATIONS

4.1 Coating Class

Expressed as EG “XXX”, where ‘XXX’ is the coating thickness in µm.

4.2 Base Metal Grade

Reinforcing steel to be electrogalvanized shall comply with the grade of the steel mentioned in IS 1786.

4.3 Designation of electrogalvanized HSD steel bars

4.3.1 The designation is the combination of base metal grade [Fe XXX] and the coating class separated by ‘hyphen’.

Example — Electrogalvanized HSD steel bars having base metal of carbon steel grade Fe 550 plated with coating class of EG010, the designation of that electrogalvanized HSD steel bars and wires for concrete reinforcement will be: Fe 550-EG010.

5 SUPPLY OF MATERIAL

The general requirements relating to supply of electrogalvanized HSD steel bars shall conform to IS 8910.

6 MANUFACTURE

6.1 Unless otherwise agreed to between the manufacturer and the purchaser, the processes used in the electrogalvanizing are left to the discretion of the manufacturer.

6.2 It shall be the responsibility of the manufacturer to maintain the identity of the steel reinforcement throughout the electrogalvanizing process and to the point of shipment.

7 FINISH AND APPEARANCE

7.1 The electrogalvanized HSD steel bars shall not have any uncoated areas. The coating shall be free from clearly visible plating defects such as blisters, pits, roughness, cracks or unplated areas other than those arising from defects in the base metal and other imperfections that are detrimental to the final product's practical application. On bars, usually where a contact mark is inevitable, this contact mark is excluded for inspection of appearance. Superficial stains that result from rinsing or slight discolouration resulting from drying shall not be the cause for rejection.

8 Sampling Frequency

8.1 One sample of the electrogalvanized HSD steel bars selected from the inspection lot.

9 CORROSION RESISTANCE FOR COATING

9.1 On request of the purchaser, corrosion resistance of the product may be tested. The test conditions for the corrosion resistance test and evaluation criteria shall be in accordance with the agreement between the purchaser and the manufacturer or as per the established national or international standards.

10 COATING THICKNESS

10.1 The minimum average thickness of electrogalvanized coating shall be as given in Table 1.

Table 1 Minimum average thickness of electrogalvanized coating

Service condition or Service life	**Designation**	**Minimum Average Thickness** [in micro meter]
Increasing severity of service condition or of life required	Fe XXX-EG005	5
	Fe XXX-EG008	8
	Fe XXX-EG010	10
	Fe XXX-EG020	20

11 METHOD FOR DETERMINATION OF AVERAGE THICKNESS

11.1 The thickness of electrogalvanized coating shall be determined by stripping solution method.

11.2 Dissolve 20 % Sulphuric Acid in in 500 ml of cold concentrated RO water [relative humidity 0.36].

11.3 Procedure

Accurately determine the thickness and length of test bar. Degrease it with an organic solvent such as trichloroethylene, dry thoroughly and weigh to an accuracy of one part in 10,000. Then totally immerse it and turn it over so that the reagent has free access to all surfaces. After the effervescence has ceased, remove the loose coating and immerse in clean acetone to remove any trapped water. Then remove the sample, dry by the process previously used and reweigh.

11.4 Calculation

Zinc coating thickness in micrometer = $\frac{(m_1 - m_2) \times 10^6}{\pi \; l \; d \; D}$

where

m_1 = original mass in g of the sample

m_2 = final mass in g of the sample, and

l = length of the sample in mm

d = diameter of HSD bar in mm

Note – The above calculation assumes a density [**D**] of 7.1 g/m^3 for zinc.

12 RE-TESTING

12.1 When a part of the test results fails to comply with the requirement specified in **7.1** and **10.1**, a re-test (two more sets of test samples shall be taken for specific test requirements from the same lot) on the relevant items may be carried out to determine whether it is acceptable or not. If any of the re-test samples fail to meet the test requirements of this standard, the lot represented by the sample shall be deemed as not conforming to this standard.

13 TEST REPORT

13.1 If mutually agreed, the manufacturer shall furnish the test report and test certificate stating that the Electrogalvanized HSD steel bars conform to this standard.

14 PACKING

14.1 Electrogalvanized HSD steel bars shall be delivered in the form of bundles of straight bars and suitably packed to avoid any transit/handling/storage damage and as per the agreement between the purchaser and the manufacturer.

15 MARKING

15.1 The following shall be legibly and indelibly marked on the top of each bundle/package of Electrogalvanized HSD steel bars or shown on a tag attached to each bundle/package:

a) IS No. of this standard;

b) Manufacturer's name or trade-mark;

c) Material identification/coil number/batch number, etc;

d) Product dimensions;

e) Number of bars or mass;

f) Designation of electrogalvanized HSD steel bars; and,

g) Date of manufacture.

16 BIS CERTIFICATION MARKING

16.1 The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.