भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG, NEW DELHI 110002

कार्यसूची

हमारा संदर्भ : सीईडी 41/ए-2.25 **26 नवंबर 2024**

विषय : वॉटरप्रूफिंग और डैम्प-प्रूफिंग विषय समिति, सीईडी 41 की पचीसवीं बैठक की कार्यसूची

सीईडी 41 के सभी सदस्य

प्रिय महोदय/महोदया,

हमारे सम संख्यक पत्र दिनांक **12 नवंबर 2024** के संदर्भ में वॉटरप्रूफिंग और डैम्प-प्रूफिंग विषय समिति, सीईडी 41 की पचीसवीं बैठक की कार्यसूची की एक प्रति आपको भेज रहें हैं । बैठक निम्नानुसार आयोजित होगी:

समिति	दिन	तिथि	समय	स्थान
वॉटरप्रूफिंग और डैम्प-प्रूफिंग विषय समिति, सीईडी 41	सोमवार	02 दिसंबर 2024	11:00 बजे	**मीमांसा (श्वेत कक्ष), (ऑनलाइन+ऑफलाइन)** भारतीय मानक ब्यूरो, मानक भवन, 9, बहादुर शाह जफर मार्ग नई दिल्ली 110 002

Webex लिंक का विवरण नीचे दिया गया है:

मीटिंग लिंक : https://bismanak.webex.com/bismanak/j.php?MTID=m04051777336e0ea9fc71c2b0907299c6
बैठक संख्या : 2512 039 5576
पासवर्ड : manojced41

कृपया ध्यान दें कि बीआईएस द्वारा उठाए गए नए सुधार उपाय के अनुसार, अनुभागीय समिति की बैठक में भाग लेना सभी सदस्यों के लिए अनिवार्य है, दो बैठकों में अनुपस्थित रहने पर अनुभागीय समिति में नामांकन वापस लिया जा सकता है।

हम आशा करते हैं कि आप इस महत्वपूर्ण बैठक में भाग लेंगे । इस बैठक में भाग लेने की पुष्टि कृपया ईमेल से भेज दें ।-

धन्यवाद । भवदीय,

(डॉ मनोज कुमार रजक)
सदस्य सचिव सीईडी 41
ई मेलः-manoj@bis.gov.in
फ़ोन न.: 011-23238253

संगलन : उपरिलिखित

भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG, NEW DELHI 110002

AGENDA

Our Ref: CED 41/A-2.25 **26 November 2024**

Subject: Agenda of Twenty-fifth Meeting of the Waterproofing and Damp-proofing Sectional Committee, CED 41

ALL MEMBERS OF CED 41

Dear Sir/Madam,

In continuation to our Meeting Notice of even number Dated **12 November 2024**, please find enclosed herewith a copy of the Agenda of the Twenty-fifth Meeting of the Waterproofing and Damp-proofing Sectional Committee, CED 41. The schedule of the meeting is as given below:

Technical Committee	Day	Date	Time	Venue
Waterproofing and Damp-proofing Sectional Committee, CED 41	Monday	02 December 2024	11:00 h	**Mimaansa (White Room), (Online + Offline)** Bureau of Indian Standards, Manak Bhavan, 9, Bahadur Shah Zafar Marg New Delhi 110 002

The detail of **Webex** link is as given below:

URL : https://bismanak.webex.com/bismanak/j.php?MTID=m04051777336e0ea9fc71c2b0907299c6
Meeting ID: 2512 039 5576
Password: manojced41

NOTE: - Please note that as per new reform measure taken by the BIS, participation in the sectional committee meeting is mandatory for all the members, absent in two meeting may liable to withdrawal the nomination of the committee in the sectional committee.

You are kindly requested to make it convenient to participate in the meeting and a line in confirmation through E-mail would be highly appreciated.

Thanking you,

Yours faithfully,

(Dr Manoj Kumar Rajak)
Member Secretary, CED 41
E-mail: manoj@bis.gov.in
Phone No. 011-23238253

Encl: As above

BUREAU OF INDIAN STANDARDS

AGENDA

Waterproofing and Damp-proofing Sectional Committee, CED 41 : **Twenty-fifth Meeting**

Monday, 02 December 2024 : **11:00 h**

Venue: Mimaansa (White Room), (Online + Offline), Bureau of Indian Standards, Manak Bhavan, 9, Bahadur Shah Zafar Marg, New Delhi 110 002

CHAIRPERSON : Dr Sukhdeo R. Karade
VICE CHAIRPERSON : Shri Supradip Das
MEMBER SECRETARY : Dr Manoj Kumar Rajak

ITEM 0 OPENING REMARKS OF CHAIRPERSON

ITEM 1 CONFIRMATION OF MINUTES OF THE LAST MEETING

The Minutes of the last meeting of Waterproofing and Damp-proofing Sectional Committee, CED 41 held on 22 July 2024 at Chennai were circulated vide BIS letter No. CED 41/A-2.24 dated 29 July 2024.

The Committee may confirm the minutes as circulated.

ITEM 2 COMPOSITION

The present composition of the Sectional Committee is given at **Annex 1**.

The Committee may note.

ITEM 3 PROGRAMME OF WORK

The present position of Programme of Work is given at **Annex 2**.

ITEM 4 DRAFT STANDARDS/AMENDMENTS FOR APPROVAL FOR FINALIZATION

4.1 Revision of IS 12027 (Part 1) : 1987 Water Repellents – Specification: Part 1 Silicone Based (first revision)

In the last meeting committee decided to circulate the draft in wide circulation. The draft circulated for wide circulation with Doc. No. CED 41(26421)WC vide BIS Letter No. CED41/T-17 Dated 27 August 2024. The comment received on this draft is given in **Annex 3.**

The committee may consider and advice.

4.2 IS 12027 (Part 2) : 1987 Water Repellents – Specification: Part 2 Silane Based

In the last meeting committee decided to circulate the draft in wide circulation. The draft circulated for wide circulation with Doc. No. CED 41(26422)WC vide BIS Letter No. CED41/T-52 Dated 27 August 2024. The comment received on this draft is given in **Annex 4**.

The committee may consider and advice.

4.3 Revision of IS 12054 : 1987 Application of Water Repellents – Code of Practice (*first revision*)

In the last meeting committee decided to circulate the draft in wide circulation. The draft circulated for wide circulation with Doc. No. CED 41(26419)WC vide BIS Letter No. CED41/T-18 Dated 28 August 2024. No. comment received on this draft.

The committee may consider and advice.

ITEM 5 ISSUES CARRIED OVER FROM PREVIOUS MEETING

5.1 New Indian Standard on Code of Practice for Preformed Membrane

In the last meeting Committee decided to formulate to new Indian Standard on code of practice for preformed membrane. The Committee composition a working group for preparation of draft. The composition of the working group is as given below:

1. Shri Ajaya Kumar Harit, Aayka Waterproofers Private Limited, Gurugram (WG Coordinator)
2. Shri P.N Ohja, National Council for Cement and Building Materials, Faridabad
3. Mr. Satish R Vachhani, Advanced Concrete & Construction Consultant, Faridabad
4. Shri Dinesh K Ujjainia, Central Public Works Department, New Delhi
5. Shri Sucharit Sarkar, Sika India Private Limited, Mumbai
6. Shri Mehul Parik, Nina Percept Systems Pvt Ltd, Mumbai
7. Shri Gautam Vora, Polygomma Industries Private Limited, Mumbai
8. Er Vijay B Kulkarni, Fosroc Chemicals India Private Limited, Bengaluru

The report is awaited.

The committee may consider and advice.

5.2 New Indian Standard on the Classification of Waterproofing Products

In the last meeting Committee decided to formulate to new Indian Standard on the classification of Waterproofing Products. The Committee composition a working group for preparation of draft. The composition of the working group is as given below:

1. Shri Sudish M. S., Sudish's Institute of Waterproofing and Insulation, Bangalore (WG Coordinator)
2. Shri Vivek Naik, Indian Concrete Institute, Chennai
3. Dr P. C. Thapliyal, CSIR-Central Building Research Institute, Roorkee
4. Shri Mehul Parik, Nina Percept Systems Pvt Ltd, Mumbai

5. Shri Dinesh K Ujjainia, Central Public Works Department, New Delhi
6. Shri Ajaya Kumar, Harit, Aayka Waterproofers Private Limited, Gurugram
7. Shri Rajeev Gupta, Cement Manufacturers Association, New Delhi
8. Shri Arham Shafiq, IWL India Limited, Mumbai
9. Shri Vamdev G. B, Fosroc Chemicals India Private Limited, Bengaluru

The report submitted by the WG is enclosed as **Annex-5**.

The committee may consider and advice.

5.3 Identification of New Subjects under CED 41

In the last meeting Committee decided to formulate a new Indian Standard on product, which, is already in use and still no Indian Standard is available. The Committee composition a working group for preparation of report. The composition of the working group is as given below:

1. Shri Supradip Das, Indian Concrete Institute, Chennai (WG Coordinator)
2. Shri P.N Ohja, National Council for Cement and Building Materials, Faridabad
3. Shri Vivek Naik, Indian Concrete Institute, Chennai
4. Shri Ashish Vashist, Sika India Private Limited, Mumbai
5. Shri Gautam Vora, Polygomma Industries Private Limited, Mumbai
6. Er Vijay B Kulkarni, Fosroc Chemicals India Private Limited, Bengaluru
7. Shri Dinesh K Ujjainia, Central Public Works Department, New Delhi
8. Dr R. Siva Chidambaram, CSIR-CBRI, Roorkee
9. Shri Rohit Varshney, Shalimar Tar Products Limited, New Delhi
10. Er Samir Surlaker, Assess Build Chem Private Limited, Navi Mumbai
11. Shri Mehul Parik, Nina Percept Systems Pvt Ltd, Mumbai

The report submitted by the WG is enclosed as **Annex-6**.

The committee may consider and advice.

5.4 Indian Standards related to APP/SBS

a) **IS 16526 : 2017 App Modified Bituminous Waterproofing & Damp-proofing Membrane with Glass Fibre Reinforcement − Specification**

b) **IS 16532 : 2017 App Modified Bituminous Waterproofing & Damp-proofing Membrane with Polyester Reinforcement- Specification**

c) **IS 16525 : 2017 SBS Modified Bituminous Waterproofing & Damp-proofing Membrane with Polyester Reinforcement – Specifications**

d) **IS 16540 : 2017 App Modified HMHDPE Bituminous Waterproofing & Damp-proofing Membrane – Specification**

In the last meetings, Committee requested Shri Supradip Das to study the comments and submit the report. In this regard a meeting was held on 22nd Nov 2023 and discussed all the comments.

The report submitted by Shri Supradip Das is enclosed as **Annex-7**.

The committee may consider and advice.

ITEM 6 ROLLING ANNUAL ACTION PLAN

6.1 Revision of Pre-2000 Indian Standards

In the last meeting, Committee decided to revise the all Pre-2000 Indian Standard. The revision work allocated as follows:

Sl No.	IS No.	Title	No. of Amds	Allocated to
1.	IS 1322 : 1993	Bitumen felts for water proofing and damp-proofing — Specification (*fourth revision*)	2	IWL
2.	IS 1346 : 1991	Code of practice for waterproofing of roofs with bitumen felts (*third revision*)	-	IWL
3.	IS 1580 : 1991	Bituminous compounds for waterproofing and caulking purposes — Specification (*second revision*)	-	TIKITAR
4.	IS 1609 : 1991	Damp-proofing treatment using bitumen felts — Code of practice (*third revision*)	-	IWL
5.	IS 3037 : 1986	Specification for bitumen mastic for use in water-proofing of roofs (*first revision*)	-	IWL / TIKITAR
6.	IS 3067 : 1988	Code of practice for general design details and preparatory work for damp-proofing and water-proofing of buildings (*first revision*)	-	STP
7.	IS 3384 : 1986	Specification for bitumen primer for use in waterproofing and damp-proofing (*first revision*)	-	STP
8.	IS 4365 : 1967	Code of practice for application of bitumen mastic for waterproofing of roofs	-	STP
9.	IS 4911 : 1986	Glossary of terms relating to bituminous waterproofing and damp-proofing of buildings (*first revision*)	1	STP
10.	IS 5871 : 1987	Specification for bitumen mastic for tanking and damp-proofing (*first revision*)	-	IWL
11.	IS 6494 : 1988	Code of practice for waterproofing of underground water reservoirs and swimming pools (*first revision*)	-	SIKA
12.	IS 7198 : 1974	Code of practice for damp - Proofing using bitumen mastic	-	STP/IWL
13.	IS 7290 : 1979	Recommendations for use of polyethylene film for waterproofing of roofs (*first revision*)	1	IWL
14.	IS 9918 : 1981	Code of practice for in-situ waterproofing and damp-proofing treatment with glass fibre-tissue reinforced bitumen	-	IWL
15.	IS 12027 : 1987	Specification for silicone - Based water repellents	1	Sika

Sl No.	IS No.	Title	No. of Amds	Allocated to
16.	IS 12054 : 1987	Code of practice for application of silicone-based water repellents	-	Sika
17.	IS 13435 (Part 2) : 1992	Acrylic based polymer waterproofing materials — Methods of test: Part 2 Determination of coarse particles	-	NCB
18.	IS 13435 (Part 3) : 1992	Acrylic based polymer waterproofing materials — Methods of test: Part 3 Determination of capillary water take-up	1	Assess Buildchem
19.	IS 13435 (Part 4) : 1992	Acrylic Based Polymer Waterproofing Materials - Methods of tests: Part 4 Determination of pH value	-	Sika/Pidilite
20.	IS 13826 (Part 1) : 1993	Bitumen based felts — Method of test Part 1 Breaking strength test	1	STP/IWL
21.	IS 13826 (Part 3) : 1993	Bitumen based felts — Methods of test: Part 3 Storage sticking test	-	STP/IWL
22.	IS 13826 (Part 4) : 1993	Bitumen based felts — Methods of test: Part 4 Pressure head test	1	STP/IWL
23.	IS 13826 (Part 5) : 1994	Bitumen based felts — Methods of test: Part 5 Heat resistance test	-	FOSROC/ IWL
24.	IS 13826 (Part 6) : 1993	Bitumen based felts — Methods of test: Part 6 Water absorption test	-	FOSROC/ IWL
25.	IS 13826 (Part 7) : 1993	Bitumen based felts — Methods of test Part 7 Determination of binder test	1	FOSROC/ IWL
26.	IS 14695 : 1999	Glass fibre base coal tar pitch outerwrap — Specification	-	STP

The committee may consider and advice.

6.2 New Standards to be formulated

In the last meeting, Committee had decided to formulate New Indian Standard on the following subject through ARP/R&D.

SI No.	Title
1	Test methods for bituminous membranes
2	Laying of waterproofing – code of practice

The draft still awaited.
The committee may consider and advice

ITEM 7 ANY OTHER BUSINESS

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Annex 1

COMPOSITION OF WATERPROOFING AND DAMP-PROOFING SECTIONAL COMMITTEE, CED 41

SCOPE: STANDARDIZATION IN THE FIELD OF WATERPROOFING AND DAMP- PROOFING MAINLY WITH REFERENCE TO GENERAL BUILDING CONSTRUCTION INCLUDING SPECIFICATION FOR MATERIALS, CODE OF PRACTICE AND METHODS OF TESTS.

No. of Meetings	Date	Place
Twenty-second	22 Jun 2023	New Delhi
Twenty-third	01 Dec 2023	New Delhi
Twenty-fourth	22 July 2024	Chennai

SI No.	NAME OF THE ORGANIZATION	REPRESENTED BY	STA-TUS	MEETINGS			ATTEN-DANCE
				22nd	23rd	24th	
1	In Personal Capacity, Roorkee	Dr Sukhdeo R. Karade (***Chairperson***)	T	P	P	P	3/3
2	Advanced Concrete & Construction Consultant, Faridabad	Shri Satish R Vachhani	T	–	C	P	1/1
3	Aayka Waterproofers Private Limited, Gurugram	Shri Ajaya Kumar Harit	T	–	C	P	1/1
4	Assess Build Chem Private Limited, Navi Mumbai	Er Samir Surlaker Er Sunny Sulaker (*Alternate*)	M	P	P	P	3/3
5	Builders Association of India, Mumbai	Shri M. Karthikeyan Shri Sudip Kumar Dutta (*Alternate*)	T	P	P	A	2/3
6	CSIR-Central Building Research Institute, Roorkee	Dr P. C. Thapaliyal Dr R. Shiva Chidambaram (*Alternate* I) Shri Mohammad Reyazur Rahman (*Alternate* II)	T	P	P	P	3/3
7	Cement Manufacturers Association, New Delhi	Shri Rajeeb Kumar Shri Anjan Kumar Dey (*Alternate*) Shri Shubho Chakravarty (*YP*)	T	–	C	P	1/1
8	Central Public Works Department, New Delhi	Shri Prem Mohan Shri Dinesh K Ujjainia (*Alternate*)	U	P	P	P	3/3
9	Engineers India Limited, New Delhi	Shri Rajesh Gujral Ms Jyotsna Shridhar (*Alternate*) Shri Anish Mahala (*YP*)	T	P	P	A	2/3
10	Fosroc Chemicals India Private Limited, Bengaluru	Er Vijay B Kulkarni Shri Vamdev G. B (*Alternate*)	M	P	P	P	3/3
11	IWL India Limited, Mumbai	Shri Satya Mitra Bagga	M	P	P	P	3/3

SI No.	NAME OF THE ORGANIZATION	REPRESENTED BY	STA-TUS	MEETINGS			ATTEN-DANCE
				22nd	23rd	24th	
		Shri Ajay Behl (*Alternate* I) Shri Arham Shafiq Rahman (*Alternate* II)					
12	Indian Concrete Institute, Chennai	Shri Supradip Das Shri Vivek Naik (*Alternate*)	T	P	P	P	3/3
13	Kasturi Projects Private Limited, Thane	Shri Rajendra K. Pai	T	P	P	P	3/3
14	Master Builders Solutions India Private Limited, Navi Mumbai	Shri Zaheer Abbas	U	C	P	P	2/2
15	National Council for Cement and Building Materials, Faridabad	Shri P.N Ohja Shri Sanjay Mundra (*Alternate*)	T	P	P	P	3/3
16	Nina Percept Systems Pvt Ltd, Mumbai	Shri Mehul Parik	M	P	P	P	3/3
17	PIDILITE Industries Limited, Mumbai	Shri Imran Uddin	M	P	P	P	3/3
18	Polygomma Industries Private Limited, Mumbai	Shri Gautam Vora Shri Vinit Vora (*Alternate*)	M	P	P	P	3/3
19	Shalimar Tar Products Limited, New Delhi	Shri Rohit Varshney Shri Apurba Mallik (*Alternate*) Shri Arnab Kumar Bhattacharya (*YP*)	M	P	P	P	3/3
20	Sika India Private Limited, Mumbai	Shri Jaswanth Sobhana Shri Ashish Vashist (*Alternate*) Shri Sucharit Sarkar (*YP*)	M	P	P	P	3/3
21	Sudish's Institute of Waterproofing and Insulation, Bangalore	Shri Sudish M. S. Shri Aatif Ahmed (*Alternate*)	T	–	C	P	1/1

P – Present, A – Absent, C – Co-opt, YP – Young Professional

Annex 2

PROGRAMME OF WORK

CED 41
SCOPE WATERPROOFING AND DAMP-PROOFING
STANDARDIZATION IN THE FIELD OF WATERPROOFING AND DAMP-PROOFING MAINLY WITH REFERENCE TO GENERAL BUILDING CONSTRUCTION INCLUDING SPECIFICATION FOR MATERIALS, CODE OF PRACTICE AND METHODS OF TESTS

SI No.	IS No.	Title	Reaffirm M-Y	No. of Amds
1	IS 1322 : 1993	Bitumen felts for water proofing and damp-proofing — Specification (*fourth revision*)	Dec, 2022	2
2	IS 1346 : 1991	Code of practice for waterproofing of roofs with bitumen felts (*third revision*)	Mar, 2020	-
3	IS 1580 : 1991	Bituminous compounds for waterproofing and caulking purposes — Specification (*second revision*)	Mar, 2020	-
4	IS 1609 : 1991	Damp-proofing treatment using bitumen felts — Code of practice (*third revision*)	Mar, 2020	-
5	IS 3036 : 2022	Laying lime concrete for a waterproofed roof finish – Code of practice (*third revision*)		-
6	IS 3037 : 1986	Specification for bitumen mastic for use in water-proofing of roofs (*first revision*)	Mar, 2020	-
7	IS 3067 : 1988	Code of practice for general design details and preparatory work for damp-proofing and water-proofing of buildings (*first revision*)	Mar, 2020	-
8	IS 3384 : 1986	Specification for bitumen primer for use in waterproofing and damp-proofing (*first revision*)	Mar, 2020	-
9	IS 4365 : 1967	Code of practice for application of bitumen mastic for waterproofing of roofs	Mar, 2020	-
10	IS 4911 : 1986	Glossary of terms relating to bituminous waterproofing and damp-proofing of buildings (*first revision*)	Mar, 2020	1
11	IS 5871 : 1987	Specification for bitumen mastic for tanking and damp-proofing (*first revision*)	Mar, 2020	-
12	IS 6494 : 1988	Code of practice for waterproofing of underground water reservoirs and swimming pools (*first revision*)	Mar, 2020	-
13	IS 7193 : 2013	Glass fibre base bitumen felts – Specification (*second revision*)	May, 2023	-
14	IS 7198 : 1974	Code of practice for damp-proofing using bitumen mastic	Mar, 2020	-

SI No.	IS No.	Title	Reaffirm M-Y	No. of Amds
15	IS 7290 : 1979	Recommendations for use of polyethylene film for waterproofing of roofs (*first revision*)	Mar, 2020	1
16	IS 9918 : 1981	Code of practice for *in-situ* waterproofing and damp-proofing treatment with glass fibre - tissue reinforced bitumen	Apr, 2020	-
17	IS 12027 : 1987	Specification for silicone – Based water repellents	Dec, 2022	1
18	IS 12054 : 1987	Code of practice for application of silicone - Based water repellents	Apr, 2020	-
19	IS 13182 : 2020	Waterproofing and damp-proofing of wet areas in buildings – Recommendations (*first revision*)	-	-
20	IS 13435 (Part 1) : 2021	Acrylic based polymer waterproofing material — Method of tests: Part 1 Determination of solid content (*first revision*)		-
21	IS 13435 (Part 2) : 1992	Acrylic based polymer waterproofing materials — Methods of test: Part 2 Determination of coarse particles	Dec, 2022	-
22	IS 13435 (Part 3) : 1992	Acrylic based polymer waterproofing materials — Methods of test: Part 3 Determination of capillary water take-up	Dec, 2022	1
23	IS 13435 (Part 4) : 1992	Acrylic based polymer waterproofing materials — Methods of tests: Part 4 Determination of pH value	Dec, 2022	-
24	IS 13826 (Part 1) : 1993	Bitumen based felts — Method of test: Part 1 Breaking strength test	Dec, 2022	1
25	IS 13826 (Part 2) : 2022	Bitumen based felts — Methods of test: Part 2 Pliability test (*first revision*)		-
26	IS 13826 (Part 3) : 1993	Bitumen based felts — Methods of test: Part 3 Storage sticking test	Dec, 2022	-
27	IS 13826 (Part 4) : 1993	Bitumen based felts — Methods of test: Part 4 Pressure head test	Dec, 2022	1
28	IS 13826 (Part 5) : 1994	Bitumen based felts — Methods of test: Part 5 Heat resistance test	Dec, 2022	-
29	IS 13826 (Part 6) : 1993	Bitumen based felts — Methods of test: Part 6 Water absorption test	Dec, 2022	-
30	IS 13826 (Part 7) : 1993	Bitumen based felts — Methods of test: Part 7 Determination of binder test	Dec, 2022	1
31	IS 14695 : 1999	Glass fibre base coal tar pitch outerwrap — Specification	Jan, 2024	-
32	IS 16471 : 2017	Protection of below ground structures against water from the ground — Guidelines	Mar, 2022	-

SI No.	IS No.	Title	Reaffirm M-Y	No. of Amds
33	IS 16525 : 2017	Styrene butadiene styrene (SBS) modified bituminous waterproofing and damp-proofing membrane with polyester reinforcement — Specification	Jun, 2022	-
34	IS 16526 : 2017	Atactic polypropylene (APP) modified bituminous waterproofing and damp-proofing membrane with glass fibre reinforcement — Specification	Jun, 2022	-
35	IS 16532 : 2017	APP modified bituminous waterproofing and damp-proofing membrane with polyester reinforcement — Specification	Jun, 2022	-
36	IS 16540 : 2017	Atactic polypropylene (APP) modified high molecular high density polyethylene (HMHDPE) bituminous waterproofing and damp-proofing membrane — Specification	Jun, 2022	-

DRAFTS STANDARDS IN WC STAGE		
1	DOC.CED 41 (26419) Revision of IS 12054 : 1987	Application of water repellents — Code of practice (*first revision*)
2	DOC.CED 41 (26421) Revision of: IS 12027:1987	Water repellents — Specification: Part 1 Silicone based (*first revision*)
3	DOC.CED 41 (26422)	Water repellents — Specification: Part 2 Silane based

Annex 3

Doc. No. CED 41 (26421)
Title: Water Repellents – Specification:
Part 1 Silicone Based of IS 12027 (Part 1) (*First Revision*)

Sl No.	Clause/Para/Table / Figure No. Commented	Comments/Modified Wordings	Justification of the Proposed Change	Name of The Commentator
1	Clause **1**, **SCOPE**	Need to modify draft suitably as per given comments.	"flexible, hydrophobic layer on the surface that repels water while allowing moisture vapor to escape." There no test procedure indicated to validate that repellent if "Flexible". Also if the repellent is flexible on the surface then there should be measurable coating thickness which is not mentioned in the draft. Also there is no test procedure indicated to validate that applied repellent allows moisture vapor to escape. Kindly incorporate above short comings suitably.	Vinit Vora
2	**SCOPE**	This standard specifies the requirements, testing methods, and guidelines for the use of silicone based water repellents intended for the use on masonry, stone, tiles, wood, and other surface to impart water repellency through creating a flexible, hydrophobic layer on the surface that repels water while allowing moisture vapor to escape.	**1.1** This standard prescribes the requirement for silicone-based water repellents both water based and solvent based. **1.2** These water repellents can be applied to masonry generally free from cracks exceeding 0.10 mm in width, to confer water repellency without appreciable change of colour or appearance other than that imparted by fugitive dye. NOTE - The general life expectancy for water based water repellents are 3 to 4years	Shri Supradip Das, ICI

Sl No.	Clause/Para/Table / Figure No. Commented	Comments/Modified Wordings	Justification of the Proposed Change	Name of The Commentator
			and 5 to 9 years for solvent based, subject to the climatic conditions.	
3	Terminology **3.1**	**3.1** Aqueous Siliconate Solution – An aqueous solution of an alkali metal salt of silicone, the non volatile content which consist mainly of silicone.	**2.3 Aqueous Siliconate Solution** – Aqueous solutions of potassium methyl siliconate can be used to make mineral construction materials water-repellent. The solution reacts with carbon dioxide in the air to create a water-repellent surface barrier. However, it can leave a white deposit on colored surfaces. (Can be delated)	Shri Supradip Das, ICI
4	**4** Classification	Silicone based water repellents broadly classified into two categories. a) Type A (Water Mix), and b) Type B (Solvent Mix).	**3.0** Silicone based water repellents may be broadly classified into two categories. A) Water-based and B) Solvent-based.	Shri Supradip Das, ICI
5	**4**. Classification **4.1** Type A (Water Mix)	**4.1** Type A (Water Mix) Type A water repellents are generally used for residential and indoor applications where ease of use, safety, and low environmental impact are priorities. They work well on concrete, masonry, and wood surfaces in less demanding environments. These repellents are diluted with water, which makes them less toxic and easier to clean up compared to solvent-based products. Type A water repellent is based on silicone that is susceptible to hydrolysis. Hydrolysis occurs only after application to the substrate, which breaks the emulsion. Alcohol is released and the emulsion is converted into a	**3.1 Type A - Water Based** This type of water repellent is based on silicone that is susceptible to hydrolysis. Hydrolysis occurs only after application to the substrate, which breaks the emulsion. Alcohol is released and the emulsion is converted into a silicon resin water repellent. This type of water repellent is diluted with water just before use, in a proportion prescribed by the manufacturer. Water-based water repellents are useful in imparting water repellency to absorbent mineral surfaces, such as bricks, sand-lime bricks, plasters, porous stones, concrete and cast stone masonry of a predominantly calcareous nature, etc.	Shri Supradip Das, ICI

Sl No.	Clause/Para/Table / Figure No. Commented	Comments/Modified Wordings	Justification of the Proposed Change	Name of The Commentator
		silicon resin water repellent. Type A water repellent is diluted with water just before use, in a proportion prescribed by the manufacturer. Type A water repellents are useful in imparting water repellency to absorbent mineral surfaces, such as bricks, sand-lime bricks, plasters, porous stones, concrete and cast stone masonry etc.		
6	**4** Classification **4.2** Type B (Solvent Mix)	**4.2** Type B (Solvent Mix) Type B water repellents are generally used for industrial, high-traffic, and exterior applications where maximum durability and deep penetration are required. They are effective for concrete, masonry, stone, and roofing materials exposed to severe conditions. These repellents are mixed with organic solvents, which allow them to penetrate more deeply and form a more durable water-repellent layer. They often have a stronger odor and require more careful handling. Type B water repellents are based on silicone and are supplied pre diluted in organic solvents. They can be dissolved as per the manufacturer instruction. Generally the dilution to achieve reduction in 85 percent water absorption in 24 h. The diluted or as supplied the product can be applied on a surface till full saturation, these are suitable for application on all kinds of concrete, dense stones, natural and artificial stones, etc.	**3.2 Type B - Solvent Based** This type of water repellents are based on silicone and are supplied pre diluted in organic solvents. They can be dissolved in solvent or water as recommended by the manufacturer. The dilution to achieve reduction in 85% water absorption in 24 hrs is typically specified by the manufacturer. The Diluted or as supplied the product can be applied on a surface till full saturation, these are suitable for application on all kinds of concrete, dense stones, natural and artificial stones, etc.	Shri Supradip Das, ICI

Sl No.	Clause/Para/Table / Figure No. Commented	Comments/Modified Wordings	Justification of the Proposed Change	Name of The Commentator
7	**6** PERFORMANCE REQUIREMENTS **6.4** Solid Content	Total solid content in water repellent shall not be less than 4 percent for Type A and 6 percent for Type B, when tested as per IS 13435 (Part 1).	**5.5 Solid content** - To be tested as per Appendix F Should not be less than 4% for water based Should not be less than 6% for solvent based	Shri Supradip Das, ICI
8	New clause		**6 APPLICATION** **6.1** All solvent based water repellents are applied to a substrate, which is clean and dry. Wet surfaces hinder the development of repellency on the surface. After application, the surface develops full water repellency in about 72 h. Within this period if the surface is made wet by any means whether by sprinkling water or by rains effect of the treatment gets compromised. Hence, these treatment are best done on external surfaces during summers. **6.2** For water based, the water repellent has to be applied on a surface saturated dry surface. After applying the coating, it may be left undisturbed for a minimum period of two hours.	Shri Supradip Das, ICI
9	New Clause (**7**. Sampling)		**7 SAMPLING** **7.1** After thorough shaking of the containers, approximately equal samples totalling not less than 600 g in weight, shall be taken at random from not less than 1 in 20 of the original and previously unopened containers. The samples shall be thoroughly mixed together and then divided into triplicate samples, each weighing not less than 200 g. These latter samples shall be placed in clean, dry,	Shri Supradip Das, ICI

Sl No.	Clause/Para/Table / Figure No. Commented	Comments/Modified Wordings	Justification of the Proposed Change	Name of The Commentator
			airtight containers of such size that they are nearly filled by the sample. Each container shall be sealed and marked with full details and the date of sampling. **7.2** For solvent based repellents, solvent resistant containers shall be used. **7.3** For water based repellents, glass, polyethylene, mild steel, stainless steel and other material resistant to caustic soda should be used.	
10	**7** PACKING AND MARKING **7.1**	**7.1** The package shall be securely closed and legibly and indelibly marked with the following information: a) The type of repellent – Type A or Type B; b) Name of the manufacturer; c) Weight of the material in the package; d) Recognized trade-mark, if any; e) Batch number or Date, month and year of manufacture; f) The appropriate flammability mark, if the flash-point is below 23 °C; g) g) Shelf-life and storage requirements;	**8.1.1** The package shall be securely closed and legibly and indelibly marked with the following information: a) The type of repellent - Type A or B b) Name of the manufacturer; c) Weight of the material in the package; d) Recognized trade-mark, if any; e) Date, month and year of manufacture; f) The appropriate flammability mark, if the flash-point is below 23°C; g) Shelf-life and storage requirements; h) Solids contents in percentage. i) i) PDS & MSDS to be provided	Shri Supradip Das, ICI

Annex 4

Doc. No. CED 41 (26422)
Title: Water Repellents – Specification:
Part 2 Silane Based of IS 12027 (Part 2)

Sl No.	Clause/Para/Table/ Figure No. Commented	Comments/Modified Wordings	Justification of the Proposed Change	Name of The Commentator
1	FORWARD Para 5	Proposed change is indicated in the comments.	The draft indicates that "The general life expectancy for Silane based water repellents are 10 years or more, subject to the climatic conditions." How to validate for 10 years of performance? Suitable accelerated ageing test method should be added in the draft standard.	Vinit Vora
2	FOREWARD 1st para last line	Water repellents are commonly used on various building materials, textiles, and other surfaces that need protection from moisture.	Water repellents are commonly used on various building materials, textiles, and other surfaces that need protection from water.	Shri Supradip Das, ICI
3		Water repellents can be categorized on the basis of their chemical composition and raw materials in five category silicone based water repellents, silane based water repellents, fluoropolymer based water repellents, acrylic based water repellents and wax based water repellents.	Water repellents can be categorized on the basis of their chemical composition and raw materials used in five categories: silicone based water repellents, silane based water repellents (including silane-siloxane combinations), fluoropolymer based water repellents, acrylic based water repellents and wax based water repellents.	Shri Supradip Das, ICI
4	FOREWARD 3rd para	Silane-based water repellents work by penetrating deeply into porous materials and chemically	Silane-based water repellents work by penetrating deeply into porous materials	Shri Supradip Das, ICI

Sl No.	Clause/Para/Table/ Figure No. Commented	Comments/Modified Wordings	Justification of the Proposed Change	Name of The Commentator
		bonding with the surface to form a hydrophobic barrier. This barrier effectively repels water while allowing moisture vapor to escape, thereby reducing water absorption and preventing damage without altering the material's appearance.	and chemically bonding with the silanol groups on the surface to make the material hydrophobic. The hydrophobic surface effectively repels water while allowing moisture vapor to escape, thereby reducing water absorption and preventing damage without altering the material's appearance significantly.	
5	FOREWARD 4th para 2nd line	Being Nano in nature they are able to penetrate in the micro cracks of the surfaces and stop the water ingress by simple saturation by roller brush.	Being molecular in nature they are able to penetrate in the micro cracks of the surfaces and stop the water ingress by simple saturation by roller brush or spray.	Shri Supradip Das, ICI
6	FOREWARD 4th para 3rd line	Silane based water repellents which is primarily Composed of silane and poly siloxanes compounds such as polydimethyl siloxane, dimethyl dichlrosilane, trichlorosilane, tetra methyl silane etc, penetrates deeply into the substrate and reacts with the material to form a hydrophobic barrier within the pores.	Silane based water repellents which are primarily composed of silanes or additionally poly siloxane compounds such as polydimethyl siloxane, dimethyl dichlrosilane, trichlorosilane, tetra methyl silane etc penetrates deeply into the substrate and react with the material to form a hydrophobic barrier within the pores.	Shri Supradip Das, ICI
7	FOREWARD 4th para 6th line	Thus Silane based water repellents maintain the aesthetics of the exposed brickwork and stone works enhancing their life.	Thus silane based water repellents maintain the aesthetics of the exposed brickwork, stonework, concrete, plaster and other masonry surfaces while enhancing their durability.	Shri Supradip Das, ICI

Sl No.	Clause/Para/Table/ Figure No. Commented	Comments/Modified Wordings	Justification of the Proposed Change	Name of The Commentator
8	FOREWARD 4th para 8th line	It also helps in protecting the exposed treated surfaces from becoming black because of growth of algae and mildew and drying with time	It also helps in protecting the exposed treated surfaces by allowing them to dry quickly and from becoming black because of growth of algae and mildew.	Shri Supradip Das, ICI
9	FOREWARD 5th para 2nd line	As a general guideline, silane based water repellents best suted for the porous surfaces such as concrete	As a general guideline, silane based water repellents are best suited for porous surfaces such as masonry or concrete.	Shri Supradip Das, ICI
10	FOREWARD 5th para 3rd line	However, other material may also utilized this if they have sufficient porosity such as porous stone or masonry and other porous surface.	However, other film forming materials such as polymers may also be utilized if the surface has sufficiently high porosity such as highly porous stone or masonry or other porous surfaces.	Shri Supradip Das, ICI
11	**SCOPE**	This standard specifies the requirements, testing methods, and guidelines for the use of silane based water repellents intended for the use on porous materials specially on concrete, to impart water repellence through penetrating deeply into porous materials and chemically bonding with the surface to form a hydrophobic barrier, while allowing moisture vapour to escape.	This standard specifies the requirements, testing methods, and guidelines for the use of silane based water repellents intended for the use on porous materials especially on concrete or masonry, to impart water repellence through penetrating deeply into porous materials and chemically bonding with the surface to form a hydrophobic barrier, while allowing moisture vapour to escape.	Shri Supradip Das, ICI
12	**SCOPE** Note	NOTE – Other material may also utilized this if they have sufficient porosity such as porous stone or masonry and other porous surface.	NOTE – Other materials such as polymers may also be utilized if the surfaces have	Shri Supradip Das, ICI

Sl No.	Clause/Para/Table/ Figure No. Commented	Comments/Modified Wordings	Justification of the Proposed Change	Name of The Commentator
			sufficient porosity such as porous stone or masonry or other highly porous surfaces.	
13	TERMINOLOGY **3.1**	**3.1** Silane Formulation – A silane solution in a voltaic solvent or an aqueous solution or emulsion, the non-volatile content of both consisting mainly of silanes.	**3.1Silane Formulation** – A silane or silane-siloxane solution in a volatile solvent or an aqueous solution or emulsion, the non-volatile content of both consisting mainly of silanes or both silanes and siloxanes.	Shri Supradip Das, ICI
14	TERMINOLOGY New clause **3.3**		**3.3 Siloxane** – A material that is a polysiloxane compound for example polydimethylsiloxane.	Shri Supradip Das, ICI
15	CLASSIFICATION a), b)	Silane based water repellents broadly classified into two categories. a) Type A (Water Mix), and b) Type B (Solvent Mix)	Silane based water repellents broadly classified into two categories. a) Type A **(**Water Dilutable), and b) Type B (Solvent Dilutable).	Shri Supradip Das, ICI
16	CLASSIFICATION **4.1** heading	**4.1 Type A** (Water Mix)	**4.1 Type A (Water Dilutable)**	Shri Supradip Das, ICI
17	CLASSIFICATION **4.1** , 1st line	Type A water repellents are generally used for residential and indoor applications where ease of use, environmental safety, and maintaining the surface's appearance are important.	Type A water repellents are generally used for all types of applications where ease of use, environmental safety, and maintaining the surface's appearance are important.	Shri Supradip Das, ICI
18	CLASSIFICATION **4.1**, 3rd line	Type A water repellent is based on silane that is susceptible to hydrolysis. Hydrolysis occurs only	Type A water repellent is based on silanes that are susceptible to hydrolysis or silane-siloxane emulsions that are pre-hydrolysed.	Shri Supradip Das, ICI

Sl No.	Clause/Para/Table/ Figure No. Commented	Comments/Modified Wordings	Justification of the Proposed Change	Name of The Commentator
		after application to the substrate, which breaks the emulsion.	They may come packaged in a carrier solvent or as an emulsion in water. In the case of silane based water repllent hydrolysis starts once diluted in water and continues to progress when applied substrate.	
19	CLASSIFICATION **4.1**, 5th line	Alcohol is released and the emulsion is converted into a silicon resin water repellent.	Alcohol is released and the solution / emulsion is converted into a siloxane resin water repellent.	Shri Supradip Das, ICI
20	CLASSIFICATION **4.1**, 6th line	Type A water repellent is diluted with water just before use, in a proportion prescribed by the manufacturer.	Type A water repellent is further diluted with water just before use, in a proportion prescribed by the manufacturer	Shri Supradip Das, ICI
21	CLASSIFICATION **4.2** heading	**4.2 Type B (Solvent Mix)**	**4.2 Type B (Solvent Dilutable)**	Shri Supradip Das, ICI
22	CLASSIFICATION **4.2**, 3rd line	Type B water repellents are based on silane and are supplied pre diluted in organic solvents	Type B water repellents are based on silanes and are supplied in 100 percent form or pre diluted in organic solvents.	Shri Supradip Das, ICI
23	CLASSIFICATION **4.2**, 5th line	Generally, the dilution to achieve reduction in 85 percent water absorption in 24 h.	Generally, the extent of dilution is limited to ensure reduction of 85 percent water uptake in 24 h.	Shri Supradip Das, ICI
24	CLASSIFICATION **4.2**, 6th line	The diluted or as supplied the product can be applied on a surface till full saturation	The diluted or as supplied product should be applied on the surface till full saturation	Shri Supradip Das, ICI

Sl No.	Clause/Para/Table/ Figure No. Commented	Comments/Modified Wordings	Justification of the Proposed Change	Name of The Commentator
			or as per the manufacturers recommendation.	
25	APPLICATION 2nd line	After applying the silane solution, it may be left undisturbed for a minimum period of 24 h or till fully dried.	After applying the water repellent solution, it may be left undisturbed for a minimum period of 24 h or till fully dried.	Shri Supradip Das, ICI
26	APPLICATION 4th line	The surface can be checked for repellency at that stage	The surface can be checked for repellency and water absorption using RILEM test at that stage.	Shri Supradip Das, ICI
27	PERFORMANCE REQUIREMENT **6.1** water repellency, 3rd line	The water repellency shall be such that no pool of water shall he completely absorbed within 10 min	The water repellency shall be such that no pool of water shall be completely absorbed within 10 min and there should not be an immediate visible water darkening of the surface.	Shri Supradip Das, ICI
28	PERFORMANCE REQUIREMENT **6.2** Absorption of Water, 1st line	Water absorption of test specimen prepared as per Annex A, with coating of silane based water repellent after 48 h immersion in water.	Water absorption of test specimen prepared as per Annex A, with coating of silane based water repellent after 24 h immersion in water.	Shri Supradip Das, ICI
29	PERFORMANCE REQUIREMENT **6.2** Absorption of Water, 2nd line	The difference of mass of coated cube, before and after immersion, it shall not be more than 0.5 percent.	The reduction in water absoption should be greater than 85 percent for a silane coated cube compared to a control cube.	Shri Supradip Das, ICI

Sl No.	Clause/Para/Table/ Figure No. Commented	Comments/Modified Wordings	Justification of the Proposed Change	Name of The Commentator
30	PERFORMANCE REQUIREMENT **6.3** Evaporation of Water, 2nd line	The evaporation ratio of water determined as per Annex C of IS 12027 (Part 1) shall not be less than 10 percent.	The evaporation ratio of water determined as per Annex C of IS 12027 (Part 1) shall not be less than 10 percent. (It is under preparation, we cannot comment on this).	Shri Supradip Das, ICI
31	PERFORMANCE REQUIREMENT **6.4** Ultraviolet (UV) Radiation, 2nd line	The sample shall not change the colour and the treated sample shall maintain at least 80 percent of its initial water repellency after exposure to UV light for 1 000 h when tested as per **6.1**.	The sample shall not change colour and the treated sample shall maintain at least 80 percent of its initial water absorption after exposure to UV light for 1 000 h when tested as per **6.2.**	Shri Supradip Das, ICI
32	**ANNEX A** PREPARATION OF TEST SPECIMEN **A-5**, 1st line	5 Dry the specimen of concrete cube to the constant mass at 50 ± 2°C so that they are free from moisture.	Dry the specimen of concrete cube at 110 ± 5 °C for 2 h or till it achieves a constant weight so that it is free from moisture	Shri Supradip Das, ICI
33	ANNEX A PREPARATION OF TEST SPECIMEN A-5, 2nd line	Apply water repellent as per the manufacturer's instruction on the dry surface by brush and spray. Allow the specimen to dry for as per manufacturer's instruction at room temperature.	Apply water repellent as per the manufacturer's instruction on the dry surface by brush or spray till saturation or manufacturers instruction on coverage.	Shri Supradip Das, ICI

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Annex-5

Classification of waterproofing system

substructure	**basment horizontals**	crystalline system	In depth penetrating Crystalline dry shake			
			crystalline admixture			
			In depth penetrating Crystalline Coating			
		preformed membrane system	bonded to pcc	APP modified bitumen based, torch applied water proofing sheet membranes		
				SBS modified self adhesive cold applied membranes with cross laminated HDPE film		
			loosely laid	Min. 2 mm thick Plain PVC (Polyvinyl Chloride) twin colored membrane with weldable overlaps		
				Min 1.2mm thick reinforced twin colored UV resistant TPO (Thermoplastic Polyolefin) Membrane		
				EPDM (Ethylene Propylene Diene Monomer), Plain as well as Internally reinforced		

			bonded to rcc	chemically bonded	Pre-applied fully bonded HDPE (high density poly ethylene) membrane that allows structural concrete to be directly placed onto it and bonds to the structural concrete cast over it - with either double sided adhesive selvedge overlaps or weldable overlaps .	
				mechanically bonded	Keyed Preformed PVC-T Lock mechanically bonded membrane with weldable overlaps that allows structural concrete in underground structures to be directly cast onto it and bonds to the concrete .	
					pp fleece co extruded with PVC membrane	
	basement verticals / retaining walls	precast	Tapes- TPE			
			glass fibre strip			
		diaphragm wall	crystalline system	In depth penetrating Crystalline Coating		
				Crystalline admixture		
		confined	crystalline system	In depth penetrating Crystalline Coating		
				crystalline admixture		

			preformed membrane system	loosely laid	Min. 2 mm thick Plain PVC (Polyvinyl Chloride) twin colored membrane with weldable overlaps	
					Min 1.2mm thick reinforced twin colored UV resistant TPO (Thermoplastic Polyolefin) Membrane	
					EPDM (Ethylene Propylene Diene Monomer), Plain as well as Internally reinforced	
				bonded to rcc	chemically bonded	Pre-applied fully bonded HDPE (high density poly ethylene) membrane that allows structural concrete to be directly placed onto it and bonds to the structural concrete cast over it - with either double sided adhesive selvedge overlaps or weldable overlaps .

					mechanically bonded	Keyed Preformed PVC-T Lock mechanically bonded membrane with weldable overlaps that allows structural concrete in underground structures to be directly cast onto it and bonds to the concrete .
						pp fleece co extruded with PVC membrane
		unconfined	preformed membrane system	APP modified bitumen based, torch applied water proofing sheet membranes		
				SBS modified self adhesive cold applied membranes with cross laminated HDPE film		
				Wet-applied bituminous membranes made of special polymers and fully-bonded to the concrete substrate by a special modified cement-based adhesive		
			Liquid applied membranes	polyurethane	1k moisture curing pure polyurethane	
					Single component & Two component high solids content (> 80 %) Polyurethane liquid membrane	

					one-component, moisture-curing, bitumen-modified polyurethane elastomeric waterproofing membrane	
					Two Comp 100% solids Hybrid Polyurea Polyurethane ,or Pure Polyurea , Hot spray applied liquid membrane	
					Hybrid Polyurethane Acrylic Water based UV resistant elastomeric liquid membrane /coating applied with reinforcing fleece	
				PMMA based	Two component 100% solids cold spray applied or roller applied solvent free and isocyanate free PMMA resin based liquid membrane for bridge decks and roofs /podiums, applied with or without reinforcing fleece	

	tanks	external	Horizontal	Pre-applied fully bonded HDPE (high density poly ethylene) membrane that allows structural concrete to be directly placed onto it and bonds to the structural concrete cast over it - with either double sided adhesive selvedge overlaps or weldable overlaps .		
				Min. 2 mm thick Plain PVC (Polyvinyl Chloride) twin colored membrane with weldable overlaps		
			Vertical	SBS modified self adhesive cold applied membranes with cross laminated HDPE film		
				Pre-applied fully bonded HDPE (high density poly ethylene) membrane that allows structural concrete to be directly placed onto it and bonds to the structural concrete cast over it - with either double sided adhesive selvedge overlaps or weldable overlaps .		
		internal	potable	Cementitious system with protection and food grade epoxy lining		

				Two component solvent free cold applied PU based liquid waterproofing and chemical resistant protective membrane capable of application in potable water tanks as well as sewage treatment tanks		
			Chemical resistant	Cementitious system with protection and coal tar epoxy lining		
				Two component solvent free cold applied PU based liquid waterproofing and chemical resistant protective membrane capable of application in potable water tanks as well as sewage treatment tanks		
	Podium	cementitious coating	Two component polymer modified flexible and elastomeric cementitious coatings			
		crystalline system	In depth penetrating Crystalline Coating			
			Crystalline admixture			
		Liquid applied membranes	polyurethane	1k moisture curing pure polyurethane		
				Single component & Two component high solids content (> 80 %) Polyurethane liquid membrane		
				one-component, moisture-curing, bitumen-modified polyurethane elastomeric waterproofing membrane		

				Two Comp 100% solids Hybrid Polyurea Polyurethane ,or Pure Polyurea , Hot spray applied liquid membrane		
				Hybrid Polyurethane Acrylic Water based UV resistant elastomeric liquid membrane /coating applied with reinforcing fleece		
			PMMA based	Two component 100% solids cold spray applied or roller applied solvent free and isocyanate free PMMA resin based liquid membrane for bridge decks and roofs /podiums, applied with or without reinforcing fleece		
		preformed membrane system	bonded to rcc	APP modified bitumen based, torch applied water proofing sheet membranes		
				SBS modified self adhesive cold applied membranes with cross laminated HDPE film		
			loosely laid	Min. 2 mm thick Plain PVC (Polyvinyl Chloride) twin colored membrane with weldable overlaps		
				Min 1.2mm thick reinforced twin colored UV resistant TPO (Thermoplastic Polyolefin) Membrane		

				EPDM (Ethylene Propylene Diene Monomer), Plain as well as Internally reinforced		
				Min 0.9 mm thick Reinforced PVC-KEE (Polyvinyl Chloride and Ketone Ethylene Ester) UV resistant Membrane .		
	Podium - Landscape	Anti root polyurethane				
		Anti root bituminous membrane				
	Wet areas	Cementitious based	Acrylic Co-Polymer /Latex polymer modified cementitious Coatings			
			Two component polymer modified flexible and elastomeric cementitious coatings			
		crystalline system	In depth penetrating Crystalline Coating			
			crystalline admixture			
		polyurethane	1k moisture curing pure polyurethane			
			Single component & Two component high solids content (> 80 %) Polyurethane liquid membrane			
			one-component, moisture-curing, bitumen-modified polyurethane elastomeric waterproofing membrane			

			Two Comp 100% solids Hybrid Polyurea Polyurethane ,or Pure Polyurea , Hot spray applied liquid membrane			
			Hybrid Polyurethane Acrylic Water based UV resistant elastomeric liquid membrane /coating applied with reinforcing fleece			
		1 component acrylic/SBR based copolymer system				
	Roofs	cementitous coating	Two component polymer modified flexible and elastomeric cementitious coatings			
		bitumen based coating	High Build Flexible Bituminous cold and hot applied coatings			
		preformed membrane system	bonded to rcc	APP modified bitumen based, torch applied water proofing sheet membranes		
				SBS modified self adhesive cold applied membranes with cross laminated HDPE film		
			loosely laid	Min. 2 mm thick Plain PVC (Polyvinyl Chloride) twin colored membrane with weldable overlaps		
				Min 1.2mm thick reinforced twin colored UV resistant TPO (Thermoplastic Polyolefin) Membrane		

				EPDM (Ethylene Propylene Diene Monomer), Plain as well as Internally reinforced		
				Min 0.9 mm thick Reinforced PVC-KEE (Polyvinyl Chloride and Ketone Ethylene Ester) UV resistant Membrane .		
		Liquid applied membranes	polyurethane	1k moisture curing pure polyurethane		
				Single component & Two component high solids content (> 80 %) Polyurethane liquid membrane		
				one-component, moisture-curing, bitumen-modified polyurethane elastomeric waterproofing membrane		
				Two Comp 100% solids Hybrid Polyurea Polyurethane ,or Pure Polyurea , Hot spray applied liquid membrane		
				Hybrid Polyurethane Acrylic Water based UV resistant elastomeric liquid membrane /coating applied with reinforcing fleece		

			PMMA based	Two component 100% solids cold spray applied or roller applied solvent free and isocyanate free PMMA resin based liquid membrane for bridge decks and roofs /podiums, applied with or without reinforcing fleece		

Annex-6

List of Waterproofing Materials available in Indian Market by Shri Supradip Das, ICI

Sr. No.	Products
1.	**Liquid Integral Waterproofing Compound**
2.	**Crystalline Waterproofing**
a.	Admixture
b.	Coating
3.	**Liquid Membranes & Coating**
a.	High Build Flexible Bitumenous, acrylic Modified Cementitious Coating
b.	Acrylic Co-Polymer /Latex based Liquid Coating
c.	Emulsified Bituminous Coating
d.	Single / two component high solid content cold applied liquid elastomeric membrane (Acrylic / PU)
e.	Single component Polyurethane Membrane
f.	Polyurethane primer coating
g.	Two Comp 100% solid Poly-urea, spray gun applied
4.	**Pre Form Membrane**
	Thermoset Synthetic Membrane
a.	EPDM (Ethylene Propylene Diene Monomer), Plain as well as Internally reinforced
	Thermoplastic Synthetic Membrane
b.	PVC (Polyvinyl Chloride) Membrane
c.	TPO (Thermoplastic Polyolefin) Membrane
d.	HDPE (High Density Polyethylene) Self adhesive membrane
5.	**PU based grouting Material (low viscous)**

List of Waterproofing Materials available in Indian Market
By Mr. Sudish M. S.

Sr. No.	Products	Method of application	Remarks
1.	**Liquid Integral Waterproofing & durability enhancing admixture** that reduces permeability by > 70% , with crack healing capability upto 0.4mm wide cracks and corrosion protection capability .		
2.	**Crystalline Waterproofing**		
a.	Integral Admixture conforming to ACI212.3R.16		
b.	In depth penetrating Crystalline dry shake and Coating	Brush / shake	
3.	**Liquid Membranes & Coating**		
a.	High Build Flexible Bituminous cold and hot applied coatings	Brush / roller / trowel	
b.	Acrylic Co-Polymer /Latex polymer modified cementitious Coatings	Brush / roller / trowel	
c.	Two component polymer modified flexible and elastomeric cementitious coatings	Brush / roller / trowel	
d.	Single component water based liquid elastomeric Acrylic based UV resistant coating , applied with or without reinforcing mesh	Brush / roller / spray	
e.	Single component & Two component high solids content (> 80 %) Polyurethane liquid membrane	Brush / roller / spray	
f.	Hybrid Polyurethane Acrylic Water based UV resistant elastomeric liquid membrane /coating applied with reinforcing fleece for roof retrofits.	Brush / roller / spray	
g.	Two Comp 100% solids Hybrid Polyurea Polyurethane ,or Pure Polyurea , Hot spray applied liquid membrane	Hot spray	
h	Two component 100% solids cold spray applied or roller applied solvent free and isocyanate free PMMA resin based liquid membrane for bridge decks and roofs /podiums, applied with or without reinforcing fleece	Roller / spray	
i	One or Two component Advanced Polymer water based cold Liquid applied membrane capable of application by spray and roller in permanent water immersion conditions		Is it 2k acrylic cementitious system (or) 1k acrylic/SBR based

			copolymer system?
j	Two component solvent free cold applied PU based liquid waterproofing and chemical resistant protective membrane capable of application in potable water tanks as well as sewage treatment tanks .	Brush / roller / spray	
k	Two component Hybrid Polyurea high solids content (> 80 %) cold spray and roller applied liquid membrane	spray / roller	
l	One component water borne liquid rubber cold applied elastomeric membrane for application in internal wet areas , water retaining structures and roofs capable of withstanding permanent water immersion conditions.	Roller / spray	
M	one-component, moisture-curing, bitumen-modified polyurethane elastomeric waterproofing membrane.	Roller / brush / spray	
4.	**Synthetic Pre-Formed Membranes**		
	Thermoset Synthetic Membrane		
a.	EPDM (Ethylene Propylene Diene Monomer), Plain as well as Internally reinforced.		
b.	Self healing fully bonded EPDM membrane with polymer gel core and geotextile fabric that allows and bonds to the structural concrete in Underground structures to be directly cast onto it .		
	Thermoplastic synthetic Membrane		
a.	Pre-applied fully bonded HDPE (high density poly ethylene) membrane that allows structural concrete to be directly placed onto it and bonds to the structural concrete cast over it - with either double sided adhesive selvedge overlaps or weldable overlaps.		https://www.sciencedirect.com/topics/materials-science/polyethylene
b.	Keyed Preformed PVC-T Lock mechanically bonded membrane with weldable overlaps that allows structural concrete in underground structures to be directly cast onto it and bonds to the concrete.		https://www.lincoln-plastics.com/what-is-thermoplastic-pvc/
c.	SBS modified self adhesive cold applied membranes with cross laminated HDPE film		https://www.soprema.co.uk/en/article/sopravoice/what-are-the-benefits-of-sbs-modified-bitumen-

			waterproofing-systems#:~:text=SBS%20is%20a%20thermo%20plastic,cold%20flexibility%20and%20elastic%20properties.
d.	Min. 2 mm thick Plain PVC (Polyvinyl Chloride) twin colored membrane with weldable overlaps for underground applications.		
e.	Min 0.9 mm thick Reinforced PVC-KEE (Polyvinyl Chloride and Ketone Ethylene Ester) UV resistant Membrane.		
f.	**Min 1.2mm thick reinforced twin colored UV resistant TPO (Thermoplastic Polyolefin) Membrane**		
g.	APP modified bitumen based, torch applied water proofing sheet membranes		
h.	Wet-applied bituminous membranes made of special polymers and fully-bonded to the concrete substrate by a special modified cement-based adhesive		

Annex-7

Working group of sectional committee on Waterproofing & Damp-proofing (CED 41) met on 22nd Nov'23 to discuss the issues raised by IWL & STP in the draft revision of existing codes on APP/SBS membranes. While the committee approved almost all the suggestion, only few observations required to be discussed & finalized. The following members were present & discussed the following in details.

Chairman : Dr. Sukhdeo R Karade , CSIR-SBRA
Vice Chairman : Dr. Supradip Das, ICI
Member Secretary : Dr. Manoj Rajak

Members present :

Physically
Vice Chairman : Dr. Supradip Das
Secretary : Dr. Manoj Rajak

Mr. Sumit Pal, IWL India Ltd.
Mr. Arham Shafiq Rehman, IWL

Virtually
Mr. N Vamsi Krishna, IWL
Mr. Ashok Aggarwal, IWL
Mr. Arup, STP

The following points were discussed & resolved in the meeting. The corrections may be made in the existing standards & release for wider circulation.

1. The temp of pliability Test

IWL feel that -15°C for SBS is too stringent and be modified to -5/-10°C as the existing SBS membrane may not be able to pass the test at -15°C. The committee extensively debated the issue as IS 13826 (Part 2), bituminous felt talks about -15°C for pliability test. In that case both the codes needs to be amended accordingly. It was pointed out that some of the manufacturers (Polygomma) want 15°C to be kept & there should not be any change. In view of the above. IWL & STP were asked to provide test data at the earliest. It was decided that BIS will get the samples collected from the market as well as from the manufacture for getting them tested at its laboratory. Based on the report, the data to be incorporated in the specification suitably.

The convenor pointed out that except one manufacturer, No one has gone for certification of any of the products till date. Since BIS has limited data in store, it becomes difficult to justify the demands of the members. It is suggested that more manufacturers should be enrolled as members to have wider representation.

(Since no data has been provided, the existing parameters will not be changed)
It was brought to the notice of the committee that SBS is also available in two variants that is self adhesive & torch on. In that case separate remarks to be added in the Forward of the spec.

2. Puncture Resistance Test

ASTM has prescribed both static & dynamic puncture resistance test as they are relevant to check the maximum puncture resisting capacity of the membrane at two different conditions. However convenor suggested that in Indian condition the membrane are usually protected after the installation & unlikely any occurrence of puncture or damage. Convenor recommended that BIS may keep both the tests as optional as the introduction of Dynamic test needs consent of the manufactures. Convenor suggested that puncturing load be maintained at 140kg/cm^2/min
(**To be incorporated in the all the specs**)

3. Tearing Strength

Recent communication from IWL dated 15th Nov'23 was also discussed. It is suggested that the minimum value to be kept at 550 N/5 cm instead of a range of 650 $\pm$ 20 percent N/5 cm given in the specification. According to the convenor, the values were taken from various specs, write ups, research papers & data available. However, this suggestion can be considered if the parties concerned provided some test data on the same.
(**No data received as such - there will be no change)**

4. Provision of 2mm thick membrane

STP & IWL both requested for a provision of 2mm thick membrane in the code. Convenor felt this will not only dilute the quality of the product but also help in encouraging local polymer felt manufacturers. The purpose of whole exercise will be defeated. (already taken up in the point No. 7). There is no scope to discuss further in coming meetings.

The specifications are made to facilitate the end user with knowledge & information & should not be based on limitation of manufacturers

Working committee also explore the possibility of separate code for practice for application and testing procedure. The same may be taken up for discussion in the 25th Meeting

It also conveyed that the time has now come to look into all other specs available for waterproofing & rolling action plan to be devised.

Working committee formed in the 22nd Meeting of CED 41, checked the suggestion made by IWL. Convenor felt that all the aspect has been discussed. Further amendment can be considered after receipt of lab test report, 3rd party test report & tests carried out at BIS Lab.

Since there is not much change in the present edition, the specs may be released for wider circulation.

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