



TEST ON ESMAC PR PRECOATED AGGREGATE FOR ROAD REPAIRING

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Malode

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Abstract :- The Study was conducted to evaluate the performance of ESMAC PR Precoated Aggregate for road repair which is currently approved under IS (Indian Standard). The purpose of this study was to determine the results of the tests of various studies we performed.

These tests were placed to evaluate the material's performance and standardized evaluation form and performance model. The tests that we have performed in this study are Binder Content (%), Stripping Value (%), Volatile content (%), Water Absorption, Specific Gravity, Marshall stability test, Retained Stability Test, Soundness test .

Keywords:- ESMAC PR Precoated Aggregate ,Marshall stability Test , Bitumen content.

1. INTRODUCTION:-

Product which we are going to examine is ESMACPR Precoated Aggregate

Product Details :- Product Specification

Usage/ Application	Repairing Potholes
Locality type	Industrial area, Commercial area, Residential area
Coverage area	20mm per 25 kg
Packing size	50kg
Package type	Bag
Minimum order quantity	1000 Kg

Product Description :-

Keeping the diverse requirements of customers in mind, we are instrumental in providing Cold Mix ESMAC PR.

Other Details :-

Cold Mix Esmac PR is a premixed compound for instant repair of surface defects of roads under all weather conditions.

- All season repair of potholes including monsoons
- Repairs of expansion joints in bridges, subways, tunnels etc.
- Repairs of potholes in concrete pavements

2. METHODOLOGY :-

There are 8 Test we performed which are :

1. Binder Content (%)

Asphalt binder content is calculated as the difference between the initial mass of the HMA and the mass of the residual aggregate, correction factor, and moisture content. The asphalt binder content is expressed as percent of moisture-free mix mass.

2. Stripping Value (%)

The stripping value of aggregates is determined as the ratio of the uncovered area observed visually to the total area of aggregates, expressed as a percentage.

3. Volatile Content(%):-

Volatile content is material that can be easily transformed into a vapor. Volatile content undergoes this transformation so readily because it has a high vapor pressure. The rapid evaporation that volatile content can undergo is used advantageously in many applications.

4. Water Absorption:-

Water absorption gives an idea on the internal structure of aggregate. Aggregates having more absorption are more porous in nature and are generally considered unsuitable, unless found to be acceptable based on strength, impact and hardness tests.

5. Specific Gravity :-

Specific Gravity is the ratio of the weight of a given volume of aggregate to the weight of an equal volume of water. Water, at a temperature of 73.4°F (23°C) has a specific gravity of 1. Specific Gravity is important for several reasons. Some deleterious particles are lighter than the good aggregates.

6. Marshall Stability Test :-

The basic Marshall test consists essentially of crushing a cylinder of bituminous material between two semi-circular test heads and recording the maximum load achieved (i.e. the stability) and the deflection at which the maximum load occurs (i.e. the flow).

7. Retained Stability Test :-

It is conducted on the Marshall samples to measure the resistance of mix towards the moisture. The stability is determined after placing the samples in water bath at 60°C for half an hour and 24 hours.

8. Soundness test :-

The soundness test determines an aggregate's resistance to disintegration by weathering and, in particular, freeze-thaw cycles. Aggregates that are durable (resistant to weathering) are less likely to degrade in the field and cause premature HMA pavement distress and potentially, failure.

3. RESULT:-

Test that we have performed here are the results of the Binder content, Stripping Value, Volatile Content.

Test Name	Result
1. Binder Content (%)	6.30
2. Stripping Value (%)	96.00
3. Volatile Content (%)	1.63

4. Water Absorption Test (%) :-

Water Absorption For aggregate is 1.21

5. Specific Gravity :-

Specific Gravity For Aggregate is 2.91

6. Marshall Stability Test :-

Sr.No.	ID Mark	Compacted Density (g/cc)	Stability (kg)	Average Stability (kg)	Flow (mm)	Average Flow (mm)
1	ESMAC PR Precoated Aggregate for road repairing (Cold Mix)	2.33	985	995.00	3.70	3.73
2		2.34	1015		3.75	
3		2.34	985		3.75	

Sr.No.	ID Mark	Compacted Density (g/cc)	Stability (kg)	Average Stability (kg)	Flow (mm)	Average Flow (mm)
1	ESMAC PR Precoated Aggregate for road repairing (Cold Mix)	2.83	836	816	3.30	3.37
2		2.34	806		3.40	
3		2.34	806		3.40	

8. Soundness Test :-

Soundness Test % Loss in Wt after (5) cycles (By MgSO₄ method)

4. CONCLUSION :-

Test Name	Binder Content	Stripping test	Marshall stability test	Specific Gravity	Water absorption (%)
Cold Mix UPM	3.5% to 5%	95-100%	9.6 kN and flow 4.5m	1.04	0.96
ESMAC PR Precoated Aggregate	6.30%	96.00%	9.6 kN and flow 3.73	2.91	1.21

We already have a test reports on Cold-Mix UPM in one of our reference paper and now we completed a tests on ESMAC PR precoated Aggregate. So we compared the results and concluded that ESMAC PRprecoated aggregate is every way superior.

5. REFERENCE :-

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Supervisor
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repair published by authors Brian D Prowell(reserch
scientist),Allan G Franklin (reserchassistance).
3. An Artical on Laboratory mix design of cold bitument
emulsion mixtures published by author Kiplagat Chelelgo, Zachary
C. Abiero Gariy, Stanley Muse Shitote

3. An Artical on Bituminous cold Mix Design for flexible pavement it is an International Journal of Engineering Research and technology published by <http://www.ijert.org>

4. An Artical in International Journal of Pavement Engineering, Artical is about Feild and laboratoryevaluation of winter season pavement patching pothole material published by authors Qiao Bong,Sheng Zhao, Bashon hong



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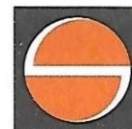
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Date: may 5,2022

To,

metropolis building
jakat naka,porwal road
pune 411014

*Kind Attn. : Mr.Abhishek wankhede**Sub: Regarding NABL accreditation of our Laboratory*

With reference to our discussion and above-mentioned subject, we hereby inform you that our Laboratory is accredited by NABL, the accreditation certificate No. is TC -7258, for Chemical, Mechanical and NDT disciplines with issue date 05.05.2022 and validity till 23.05.2023.

On the NABL- 400, Directory of NABL accredited testing laboratory, on page no500, sr. No. 3495, name of our laboratory is displayed on NABL portal.

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TEST REPORT

TEST REPORT NO. & DATE

1. Name & Address of Client

2. Project / Site

3. Client's Reference

4. Sample

i) Description

ii) Quantity

iii) Date of receipt

iv) Condition

5. Test method followed, if any

6. Date of Testing

CSRL-STRUCTWEL/Pun0024021/13044

25/04/2022

abhishek wankhede, jakat nakaa
porwal nakaa, Pune 411014

PMC/BMC/PCMC/ASCDCL

Maharashtra

Ltr Dtd 13/04/22

Aggregate.

01 Kg.

13/04/2022

Acceptable

1) IS : 2386 (Part 2), 2) IS : 2386 (Part-7) : 1963,

3) IS:2386 (Part-5) : 1963.

23/04/2022



TC - 7258

CHEMICAL TEST RESULTS

(Chemical, Building Material)

ID MARK :-

ESMAC PR Precoated Aggregate for road repairing (Cold Mix)

Type of Test	Type of Material	IS Requirements		
	Washed Aggregate			
	Results	IS : 383, Table No.2		
Deleterious materials %	--	Uncrushed Max 5%	Crushed Max 5%	Manufactured Max 5%
Organic Impurities	--	IS : 383, Table No.2 Note-4		
Alkali aggregate reactivity	--	IS : 2386:1963 (Part VII) Fig.6, IS : 383:2016 Clause 5-6 (1)		
Soundness Test % Loss in wt after (5) cycles (by Na ₂ SO ₄ Method)	6.70	For Fine Aggregate Max.10% for 5 Cycles, For Coarse Aggregate Max.12% for 5 Cycles as per I.S. 383 Clause 5.5		
Soundness Test % Loss in wt after (5) cycles (by MgSO ₄ Method)	--	For Fine Aggregate Max.15% for 5 Cycles, For Coarse Aggregate Max.18% for 5 Cycles as per I.S. 383 Clause 5.5		

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Swati Chirputkar (Quality Manager)
Authorised Signatory

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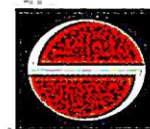
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CERTIFICATE NO. & DATE	CSRL-STRUCTWEL/Pun0024021/13171 25/04/2022
1. Name & Address of Customer	abhishek wankhede, jakat nakaa porwal road, pune 411014
2. Project / Site	PMC/BMC/PCMC/ASCDCL/AMC Maharashtra
3. Client's Reference	Ltr Dtd 13/04/2022
4. Sample	
i) Description	Cold mix Sample
ii) Quantity	1 No
iii) Date of receipt	13/04/2022
iv) Condition	Acceptable
5. Test method followed, if any	As per MORTH, ASTM-D-1559, ASTM-D-2174
6. Date of Testing	23/04/2022

TEST REPORT

ID Mark: ESMAC PR Precoated Aggregate for road repairing (Cold Mix)

Test Name	Result
1. Binder Content (%)	6.30
2. Stripping Value (%)	96.00
3. Volatile Content (%)	1.63

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Duryodhan G. Panadi / Tech. officer
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CERTIFICATE NO. & DATE

1. Name & Address of Customer

2. Project / Site

3. Client's Reference

4. Sample

i) Description

ii) Quantity

iii) Date of receipt

iv) Condition

5. Test method followed, if any

6. Date of Testing

CSRL-STRUCTWEL/Pun0024021/13173

25/04/2022

abhishek wankhede, jakat nakaa
porwal road, pune 411014

PMC/BMC/PCMC/ASCDCL/AMC

Maharashtra

Ltr Dtd 13/04/2022

Cold mix Sample

1 No

13/04/2022

Acceptable

As per MORTH, ASTM-D-1559, ASTM D-2174

23/04/2022

TEST REPORT

MARSHALL STABILITY TEST

Sr.No.	ID Mark	Compacted Density (g/cc)	Stability (kg)	Average Stability (kg)	Flow (mm)	Average Flow (mm)
1	ESMAC PR Precoated Aggregate for road repairing (Cold Mix)	2.33	985	995.00	3.70	3.73
2		2.34	1015		3.75	
3		2.34	985		3.75	

Reference Standards :

1. MORTH Specification

2. ASTM-D-1559

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CERTIFICATE NO. & DATE

CSRL-STRUCTWEL/Pun0024021/13174
25/04/2022

1. Name & Address of Customer

abhishek wankhede, jakat nakaa
porwal road, pune 411014

2. Project / Site

PMC/BMC/PCMC/ASCDCL/AMC
Maharashtra

3. Client's Reference

Ltr Dtd 13/04/2022

4. Sample

i) Description

Cold mix Sample

ii) Quantity

1 No

iii) Date of receipt

13/04/2022

iv) Condition

Acceptable

5. Test method followed, if any

As per MORTH, ASTM-D-1559, ASTM D-2174

6. Date of Testing

23/04/2022

TEST REPORT

RETAINED STABILITY TEST

Sr.No.	ID Mark	Compacted Density (g/cc)	Stability (kg)	Average Stability (kg)	Flow (mm)	Average Flow (mm)
1	ESMAC PR Precoated Aggregate for road repairing (Cold Mix)	2.83	836	816	3.30	3.37
2		2.34	806		3.40	
3		2.34	806		3.40	

Reference Standards :

1. MORTH Specification

2. ASTM-D-1559

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TEST REPORT

TEST REPORT NO. & DATE

CSRL-STRUCTWEL/Pun0024021/13172

25/04/2022

1. Name & Address of Customer

abhishek wankhede, jakat naka
porwal road, pune 411014

2. Project / Site

PMC/BMC/PCMC/ASCDCL/AMC

3. Customer's Reference

Maharashtra

4. Sample

Ltr Dtd 13/04/2022

i) Description

Washed Aggregate

ii) Quantity

01 Bag

iii) Date of receipt

13/04/2022

iv) Condition

Acceptable

5. Test method followed, if any

IS : 2386 - 1963 Part - I, Part-III (RA 2016)

6. Date of Testing

23/04/2022

TEST RESULT

1. Sample

Washed Aggregate

2. ID. Mark

ESMAC PR Precoated Aggregate for road repairing (Cold Mix)

3. Specific gravity

2.91

4. Sieve Analysis

IS. SIEVE	% Passing by Weight			Avg. % Passing
	Sample 1	Sample 2	Sample 3	
13.2 mm	100	100	100	100.00
9.5 mm	100	100	100	100.00
4.75 mm	68	66	69	67.67
2.36 mm	10	10	10	10.00
1.18 mm	4	4	5	4.33
0.075 micron	1	1	1	1.00

5. Water Absorption

(%)

1.21

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CERTIFICATE NO. & DATE

CSRL-STRUCTWEL/Pun0024021/13175

1. Name & Address of Customer

27/04/2022

abhishek wankhede, jakat nakaa
porwal road, pune 411014

2. Project / Site

PMC/BMC/PCMC/ASCDCL/AMC

Maharashtra

3. Client's Reference

Ltr Dtd 13/04/2022

4. Sample

i) Description

Cold mix Sample

ii) Quantity

1 No

iii) Date of receipt

13/04/2022

iv) Condition

Acceptable

5. Test method followed, if any

As per MORTH, ASTM-D-1559, ASTM D-2174

6. Date of Testing

23/04/2022

TEST REPORT

RETAINED STABILITY TEST

Sr.No.	ID Mark	Marshal Stability in kN	Marshal Stability in KN (4 days soaked)	Retained Marshal Stability, %	Average Retained Stability
1	ESMAC PR Precoated Aggregate for road repairing (Cold Mix)	9.66	8.20	84.89	82.06
2		9.96	7.91	79.42	
3		9.66	7.91	81.88	

Reference Standards :

1. MORTH Specification

2. ASTM-D-1559

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