

DETERMINATION OF BINDER CONTENT FOR ASPHALT MIX

STANDARD

- IRC: SP 11 –1988 (Appendix - 5), ASTM D 2172.

OBJECTIVE

- To determine the binder content in the asphalt mix by cold solvent extraction

APPARTUS

- Centrifuge
- Balance of capacity 500 gram and sensitivity 0.01grams.
- Thermostatically controlled oven with capacity up to 250⁰C.
- Beaker for collecting extracted material.

PROCEDURE

- Take exactly 500 grams of representative sample and place in the bowl of extraction apparatus (W₁).
- Add benzene to the sample until it is completely submerged.
- Dry and weigh the filter paper and place it over the bowl of the extraction apparatus containing the sample (F₁) .
- Clamp the cover of the bowl tightly.
- Place a beaker under the drainpipe to collect the extract
- Sufficient time (not more than an hour) is allowed for the solvent to disintegrate the sample before running the centrifuge.



Bitumen Extractor.

- Run the centrifuge slowly and then gradually increase the speed to a maximum of 3600 rpm
- Maintain the same speed till the solvent ceases to flow from the drainpipe.
- Run the centrifuge until the bitumen and benzene are drained out completely.
- Stop the machine, remove the cover and add 200ml of benzene to the material in the extraction bowl and the extraction is done in the same process as described above.
- Repeat the same process not less than three times till the extraction is clear and not darker than a light straw colour.
- Collect the material from the bowl of the extraction machine along with the filter paper and dry it to constant weight in the oven at a temperature of 105⁰C to 110⁰C and cool to room temperature.
- Weigh the material (W₂) and the filter paper (F₂) separately to an accuracy of 0.01grams.

CALCULATIONS

- Percentage of binder in the total mix = $\frac{W_1 - (W_2 + W_3)}{W_1} \times 100$

W₁ = Weight of sample taken

W₂ = Weight of sample after extraction

W₃ = Increased weight of filter paper (F₂ - F₁)

REPORT

- The result obtained shall be reported as the percentage of binder content in the mix to the nearest second decimal.

FORM D29

Punjab State Road Sector Project
PWD B&R Branch, Govt. of Punjab
 Punjab Roads & Bridges Development Board

CONTENT & GRADATION OF THE MIX
 (I.R.C. : SP :11)

| |
|---------------|
| LOCATION : |
| TYPE OF MIX : |

| |
|--------------------|
| DATE OF TESTING : |
| DATE OF SAMPLING : |
| SAMPLED BY : |

| Type of Material tested | (A) Wt. Before Extraction Gms. | (B) Wt. Before Extraction Gms. | (C) Diff. Grams (A-B) | (D) Total ash in Mix (Frol L) | (E) Bitumen in Mix Gms (C-D-F) | % Bitumen in Mix E/Ax x 100 |
|-------------------------|--------------------------------|--------------------------------|-----------------------|-------------------------------|--------------------------------|-----------------------------|
| | | | | | | |

| PER PAPER (OVEN DRIED) | | | | | ASH CORRECTION | |
|---------------------------|---------------------------|--------------------|----------------------------|----------------------|--------------------------|--|
| Wt. After Extraction Gms. | Wt. After Extraction Gms. | (F) Wt. Diff. Gms. | Wt. of crucible & Ash Gms. | Wt. of crucible Gms. | (G) Wt. of Ash per 100cc | (L) wt. of Ash on Total solution - G/100xTot. Sol. |
| | | | | | | |

Measure total Bitumen solution in c.c. record Total solution herec.c.

Take 100 c.c. from total solution for correction

| WEIGHT AFTER WASHED (GMS.) | | | | | | | | |
|------------------------------------|--|--|--|--|--|--|--|--|
| WASH GRADATION EXTRACTED AGGREGATE | | | | | | | | |
| Sieve Size | | | | | | | | |
| Wt. Retained | | | | | | | | |
| % Retained | | | | | | | | |
| Cum% Retained | | | | | | | | |
| % passing | | | | | | | | |
| Limits | | | | | | | | |

Approved/Not Approved:

 Client's Representative

 Contractor's Representative

 Consultant's Representative