



Asphalt

Testing Equipment



Instrumentation & Technologies



Carbon Residue

For determining the amount of carbon residue after evaporation, pyrolysis of oil, and to provide some indication of relative coke forming propensity.

Ref. Standards ASTM D 189, IP 13, also suitable for ASTM D 2416.

Carbon Residue, Conradson

AIM 501

The equipment consist of the following replaceable parts :

- AIM 50101** Porcelain Crucible
- AIM 50102** Skidmore Pattern Iron Crucible, with cover
- AIM 50103** Sheet Iron Crucible with cover
- AIM 50104** Circular Insulator Block
- AIM 50105** Sheet Iron Hood
- AIM 50106** 4 Pillar frame Tripod complete with a wire support having an opening of correct size to support sheet iron crucible at the same level as insulator block.
- AIM 50107** Glass Balls (2 Nos.)



AIM 501

Ordering Information :

AIM 501 Carbon Residue, Conradson

Cloud and Pour Point

Cloud Point :

Ref. Standards - IS:1448 (Part 10), ASTM D 2500 IP 219, ISO 3015
Low temperature properties of oils are evaluated by cloud point tests.

Pour Point :

Ref. Standards IS:1448 (Part 10), IP15, BS:4452, ISO 3016

Cloud and Pour Point Apparatus

AIM 503

The equipment consist of the following replaceable parts :

- AIM 50301** Bath with cover fitted with a Drain Cock.
- AIM 50302** Jacket to receive Test Jar.
- AIM 50303** Graduated Jar fitted with Cork.
- AIM 50304** Insulating Gasket.
- AIM 50305** Insulating Disc.

Suitable for operation on 220V, 50Hz, Single Phase, AC Supply.



AIM 503

Ordering Information :

AIM 503 Cloud and Pour Point Apparatus

Optional Accessories :

- AIM 50310** Thermometer IP 1C, Range :-38° C to +50° C.
- AIM 50311** Thermometer IP 2C, Range :-80° C to +20° C.

Note:

- *NPL Calibration, if required, will be arranged directly by the customer. Aimil can help the customers to get the equipment calibrated by NPL on behalf of customers, at extra cost, in time frame as required by NPL (which will normally be 14-16 weeks).
- Thermometer standard without calibration certificate.
- Third party calibration for thermometer can be provided at extra cost.



Asphalt Testing Equipment

Flash Point

Flash Point-Cleveland :

Ref. Standards - IS:1448 (Part 69), ASTM D 92, IP 36, BS:4689, ISO 2592

For determining the flash and fire points of petroleum products, except for fuel oil and those products which have open cup flash point below 79° C (175° F).

*Flash Point (Open) and Fire Point Cleveland

AIM 505

The equipment consists of the following replaceable parts :

AIM 50401 Cleveland Flash Cup Brass, with an Insulated Handle.

AIM 50405 Energy Regulator, To regulate the rate of rise in temperature.

Suitable for operation on 220V, 50Hz, Single Phase, AC Supply.



AIM 505

Ordering Information :

AIM 505 Flash Point (Open) and Fire Point Cleveland, Electrical Heating without NPL Certificate

Optional Accessories :

AIM 50410 Thermometer IP 28 C, Range : -6°C to +110°C

Note:

- Thermometer standard without calibration certificate.
- Third party calibration for thermometer can be provided at extra cost.

*Abel Flash Point Apparatus

AIM 507

Flash Point - Abel :

Ref. Standards IS:1448 - Part 20, IS:101, IP 170, IP 33, BS:3900

Suitable for operation on 220V, single phase, 50Hz, AC Supply.

For determining closed cup flash point of petroleum products, their mixtures, other liquid and paints, having flash points between 19°C and 49°C. Each instrument is supplied complete with an oil cup, cover fitted with water bath and stand, but without thermometer.

The equipment consists of the following replaceable parts :

AIM 50601 Abel Oil Cup with lid, shutter and gas test jet brass.

AIM 50603 Energy Regulator, suitable for operation 220V, Single Phase, 50Hz, AC supply.



AIM 507

Ordering Information :

AIM 507 Abel Flash Point Apparatus without NPL Certificate

Optional Accessories :

AIM 50610 Abel oil cup thermometer IP 74, Range : -35°C to +70°C

AIM 50611 Abel water bath thermometer IP 75, Range : -30°C to +80°C

Note:

- *NPL Calibration, if required, will be arranged directly by the customer. Aimil can help the customers to get the equipment calibrated by NPL on behalf of customers, at extra cost, in time frame as required by NPL (which will normally be 14-16 weeks).
- Thermometer standard without calibration certificate.
- Third party calibration for thermometer can be provided at extra cost.



Flash Point - Pensky Martens:

Ref. Standards - IS:1209, IS:1448 (Part 21), ASTM D 93, BS:2839, ISO 2719, DIN 51758, AFNOR M/07-019, IP34

For determining the flash point of fuel oils and lubricating oil, bitumen other than cutback bitumen and suspension of solids in liquids, having a flash point above 49°C.

The oil cup is made of brass, fitted with a thermally insulated lifting handle. The cup lid, with insulated handle, is fitted with two opposite wedge cams, which engage under pillars secured to the cup flange. This feature facilitates easy removal of the lid by rotating the handle a few degrees to disengage the cams

The shutter opening mechanism is designed for smooth operation and is operated by a spring handle with a knurled knob. A exposure device is mounted over the lid. The manually operated stirrer has a flexible shaft. The cup assembly is positioned in a cast iron air bath, fitted with a chrome plated brass top. The air bath is mounted on an upright.

*Flash Point (Closed) Pensky-Martens Apparatus

AIM 509

Electrical heating with electric heater and AIM 50405 energy regulator.

Suitable for operation on 220V, 50Hz, Single Phase, AC Supply.



AIM 509

Ordering Information :

AIM 509 Flash Point (Closed) Pensky-Martens Apparatus (without NPL Certificate)

*Flash Point (Open) and Fire Point Pensky-Martens Apparatus

AIM 511

Electrical heating with electric heater and AIM 50405 energy regulator.

Suitable for operation on 220V, 50Hz, Single Phase, AC supply.

Ordering Information :

AIM 511 Flash Point (Open) and Fire Point Pensky-Martens Apparatus (without NPL Certificate)

Optional Accessories :

AIM 50810 Thermometer IP 15C Range: 5°C to +110°C

AIM 50811 Thermometer IP 16C Range: 90°C to +370°C

Replacement Parts :

AIM 50801 Pensky-Martens Oil Cup

AIM 50802 Pensky-Martens Lid shutter with Gas Test Jet

Note:

- *NPL Calibration, if required, will be arranged directly by the customer. Aimil can help the customers to get the equipment calibrated by NPL on behalf of customers, at extra cost, in time frame as required by NPL (which will normally be 14-16 weeks).
- Thermometer standard without calibration certificate.
- Third party calibration for thermometer can be provided at extra cost.



Asphalt Testing Equipment

Penetration

Ref. Standards - IS:1448 (Part 60), IS:1203, ASTM D 5, IP 49, ASTM D1321, ASTM D 2884, ASTM D1403, IP 310, BS:1377, BS:2000-(Part49), BS:4691, BS:4698, ASTM D937, ISO 2137, IP 50, IP 179, ASTM D217, AASHTO T49, ENDD ENV 1991-2

Aimil Penetrometers are used for testing a wide variety of materials such as grease, petroleum, bitumen, tar, asphalt, wax polish, food stuffs, rubber, cement, pharmaceutical creams and soils.

In this test, a chosen force is applied over a given area for a known period of time and the depth of penetration or the depression made in the sample is measured in tenths of a millimetre which is expressed as a penetration number. An accurately aluminium casting base has been designed to facilitate penetration tests to be made over a wide surface area of sample. Adjustable feet are provided in the base for levelling.

Universal Penetrometer

AIM 512-1

The unit is compact with in-built timer to control duration of penetration preset in factory to 5 seconds. The instrument is provided with levelling screws.

Each penetrometer is supplied with a plunger weighing 47.5 g for testing bituminous product, and one each of 50g and 100 g weights.

Ordering Information :

AIM 512-1 Universal Penetrometer without Cone & Kit for Bitumen and Soil

AIM 512-2 Universal Penetrometer with Cone & Kit for Bitumen and Soil



AIM 512-1

Note: For Soil test, Penetration test cone (AIM 04201) & Penetration test cup (AIM 04202) are essential extra.

Penetration Cone

AIM 515

Ref. Standards IS:1448 (Part 60), ASTM D 937, IP 179, BS:4698, ASTM D217, IP 50, ISO 2137.

For empirical estimation of the consistency of lubricating grease and petroleum. Made of brass with a hardened steel tip. The stem of the cone is interchangeable with all types of Aimil Penetrometers manufactured to close tolerances, providing a unified cone and ensuring that there is no shoulder between the tip and the body.

Weight : $102.5 \pm 0.05\text{g}$



AIM 515

Note:

*NPL Calibration, if required, will be arranged directly by the customer. Aimil can help the customers to get the equipment calibrated by NPL on behalf of customers, at extra cost, in time frame as required by NPL (which will normally be 14-16 weeks).

Bitumen Penetration Kit

AIM 518

Ref. IS 1203, ASTM D-5, EN - 1426, 13179-2

The equipment consist of the following replaceable parts :

AIM 51801 Penetration Needle

AIM 51802 Transfer Dish made of copper.

AIM 51803 Aluminium Sample Containers, Set of two.



AIM 518



Ordering Information :

AIM 515	Penetration Cone
AIM 518	Bitumen Penetration Kit
AIM 04201	Penetration Test Cone with adjustable weight spacer for Soil
AIM 04202	Penetration Test Cup

Redwood Viscometer

Ref. Standard - IP 70

These instruments are for determining the viscosity of all oils, expressed in Redwood seconds at the temperatures of test as called for by IP 70. Both types of viscometers, Redwood No. 1 and Redwood No. 2 electrical heating models are available. The viscometer consists of a heavily silver plated brass oil cup with a precision stainless steel jet assembled in a chromium plated bath fitted with a heating tube or heating element and drain cock. The bath and cup assembly is mounted on a stand with levelling feet. Each unit is supplied complete with silver plated ball valve, spirit level with cover, thermometer clip and receiver of capacity 50ml.

Suitable for operation on 220 V, 50 Hz, Single Phase, AC supply.

Models available are:

*Redwood No. 1 Viscometer

AIM 526

Electrical Heating, complete with dimmerstat. Used for all oils having viscosity not more than 2,000 sec at the test temperature. Complete with AIM-52601 Redwood No.1 Viscometer cup without NPL Certificate.

*Redwood No. 2 Viscometer

AIM 528

Electrical Heating, complete with dimmerstat. Used for those oils, the viscosity of which exceeds 2,000 sec. Complete with AIM-52801 Redwood No.2 Viscometer cup without NPL Certificate.



AIM 528

Ordering Information :

AIM 526	Redwood No. 1 Viscometer
AIM 528	Redwood No. 2 Viscometer

Optional Accessories :

AIM 52610	Thermometer IP 8C, Range : 0° C to 45° C
AIM 52611	Thermometer IP 9C, Range : 40° C to 85° C
AIM 52612	Thermometer IP 10C, Range : 76° C to 122° C

Note: Third party calibration for thermometers can be provided at an extra cost

Replacement Parts :

AIM 52601	Redwood No. 1 Viscometer cup
AIM 52801	Redwood No. 2 Viscometer cup
AIM 52602	Receiving flask.



Asphalt Testing Equipment

Saybolt Viscometer

AIM 529-2

Ref. Standards - ASTM D88, D 244, AASHTO T 72

For the empirical measurement of Saybolt Viscosity of petroleum products at specified temperatures between 70°F and 210°F. This is also used for determining the Saybolt Furol viscosity of bituminous materials at temperatures of 250, 275, 300, 350, 400 and 450°F. It comprises two Cylindrical Oil Cups, Universal Tip, Furol Tip, Immersion heater fitted in a bath, Digital temperature controller and Stirrer. Apparatus is supplied complete with insulated handle and thermometer support, receiving flask, withdrawal tube, filter funnel, thermometer support for cup and circular spirit level.

Suitable for operation on 220 V, 50 Hz, Single Phase, AC Supply.



AIM 529-2

Ordering Information :

AIM 529-2 Saybolt Viscometer with two cups - Digital

Optional Accessories :

AIM 52910	ASTM Thermometer Type 17F, Range : 66° F to 80° F
AIM 52911	ASTM Thermometer Type 18F, Range : 94° F to 108° F
AIM 52912	ASTM Thermometer Type 19F, Range : 120° F to 134° F
AIM 52913	ASTM Thermometer Type 20F, Range : 134° F to 148° F
AIM 52914	ASTM Thermometer Type 21F, Range : 174° F to 188° F
AIM 52915	ASTM Thermometer Type 22F, Range : 204° F to 218° F
AIM 52916	ASTM Thermometer Type 77F, Range : 245° F to 265° F
AIM 52917	ASTM Thermometer Type 78F, Range : 295° F to 315° F
AIM 52918	ASTM Thermometer Type 79F, Range : 345° F to 365° F
AIM 52919	ASTM Thermometer Type 80F, Range : 395° F to 415° F
AIM 52920	ASTM Thermometer Type 81F, Range : 445° F to 465° F
AIM 52925	Silicon Oil, 10 lit

Replacement Parts :

AIM 52901	Brass Oil Tube
AIM 52902	Receiving Flask 60 ml
AIM 52903	Universal and Furol Tip (set of 2)
AIM 52904	Filter Funnel
AIM 52905	Thermometer Support
AIM 52906	Heating Coil

Note:

- Thermometer standard without calibration certificate.
- Third party calibration for thermometer can be provided at extra cost.

Standard Tar Viscometer

AIM 531 & 533

Ref. Standards - IS:1206 (Part I), IP 72, STPTC. RT 2, RT 3, BS:2000, (Part 72)

For determining the viscosity of Bitumen, Road Tar & Cut Back Bitumen. The viscometer consists of a chrome plated copper bath, with a drain valve and a central tube to receive the test cup and to position the stirrer, and is mounted on a stand with levelling feet. Stirrer has a curved shield and is provided with an insulated handle, thermometer socket and swivel support for the valve.

Supplied complete with cup and ball valve as per the model required.

AIM 531 Standard Tar Viscometer, 10 mm cup and ball valve Electrical Heating with Immersion Heating Elements and Dimmerstat for controlling the temperature. Complete with 10 mm Cup and Valve.

AIM 533 Standard Tar Viscometer, 4 mm cup and ball valve Electrical Heating with Immersion Heating Elements and Dimmerstat for controlling the temperature. Complete with 4 mm Cup and Valve.

Suitable for operation on 220V, 50 Hz, single phase, AC supply.



AIM 531



Ordering Information :

AIM 531 Standard Tar Viscometer, 10mm cup and ball valve

AIM 533 Standard Tar Viscometer, 4mm cup and ball valve

Optional Accessories :

AIM 52610 Thermometer IP 8C Range : 0° C to 45° C.

AIM 52611 Thermometer IP 9C Range : 40° to 85° C.

AIM 52612 Thermometer IP 10C Range : 76° to 122° C.

Replacement Parts :

AIM 53101 Cup 10 mm

AIM 53102 Ball Valve 10 mm

AIM 53301 Cup 4 mm

AIM 53302 Ball Valve 4 mm

Note:

- Thermometer standard without calibration certificate.
- Third party calibration for thermometer can be provided at extra cost.

Cannon Manning/ Fenske Viscometer

AIM 532-3

Ref. Standard: IS1206 (II) & IS 1206 (III)

Cannon Manning Viscometers are designed for the determination of the absolute viscosity of bitumen & cut – backs by a vacuum capillary method at specified temperatures.

Cannon Fenske Viscometers are designed for the determination of the Kinematic viscosity by a vacuum capillary method

The double layer constant temperature bath has a provision for illuminating the system, a temperature controller, an inbuilt stop watch, a heater and a stirrer for maintaining a uniform temperature in the bath.

Various types of Glass capillary Viscometers are used to measure the viscosities because no single capillary Viscometer is ideally suited for all viscosity determinations.

The temperature controller and vacuum pump sensor are provided with calibration certificate.

Suitable for operation on 220 V, 50 Hz, Single Phase, AC Supply.

Major Components:

- Viscometer bath with a provision for 4 tests
- Digital vacuum system upto 650mm Hg
- Thermometer of IP-5C of a range from – 2 to 300°C as per specification
- Thermometer IP – 64C of a range from – 20 to 102°C (0.2° resolution)
- Viscometer tubes (to be selected by the customer)



AIM 532-3

Ordering Information :

AIM 532-3 Cannon Manning cum Cannon Fenske Viscometer bath with Vacuum Pump (without Tubes)

Optional Accessories :

AIM-532-FO-150 CFO, Reverse Flow Type Viscometer Tube, size 150

AIM-532-FO-300 CFO, Reverse Flow Type Viscometer size 300

AIM-532-FO-350 CFO, Reverse Flow Type Viscometer size 350

AIM-532-FO-400 CFO, Reverse Flow Type Viscometer, size 400

AIM-532-M-10 Cannon Manning Vacuum Viscometer Tube, Size 10, Manufacturer Certificate

AIM-532-M-11 Cannon Manning Vacuum Tube, Size 11, with Manufacture Certificate

AIM-532-M-12 Cannon Manning Vacuum Viscometer Tube, Size 12, with Manufacture Certificate

AIM-532-M-13 Cannon Manning Vacuum Viscometer Tube, Size 13, with Manufacture Certificate

Note: Viscometer Tubes of other sizes also available on request at extra cost.



Aimil Rotational Viscometer

AIM 534-2

Ref. D4402

The Aimil Rotational Viscometer is specially designed for conducting high-temperature testing of asphalt binders, in compliance with ASTM D4402 and BIS 73 standards. It serves the purpose of determining the absolute viscosity of Newtonian liquids and the apparent viscosity of non-Newtonian liquids.

It is widely used for determining the viscosities of oil, asphalt & solvent etc.

Key Features:

- **Precise Temperature Control:** This standalone unit ensures precise temperature control, maintaining a constant and accurate testing temperature. This is essential for achieving accurate viscosity measurements of asphalt samples
- **User-Friendly Interface:** An easy-to-use, standalone instrument for viscosity measurement
- **Level Indicators:** Surface level indicators are present on both the temperature control unit and the main unit to ensure equipment remains level
- **Versatile Spindle Options:** Various spindle options are available, capable of withstanding the demanding conditions of asphalt testing
- **Built-In Micro Printer:** The instrument is equipped with a built-in micro-printer for convenient result printing.
- **Automatic Range Calculation:** The viscometer offers automatic Full-Scale Range (FSR) calculation for 100% viscosity measurement and maximum viscosity with specific spindle and speed combinations
- **Windows-Based Software:** Includes Windows-based software for creating viscosity vs. temperature curves, with test data conveniently stored in Excel format
- **High-Visibility LCD:** The LCD display features a white backlight for enhanced visibility and clarity



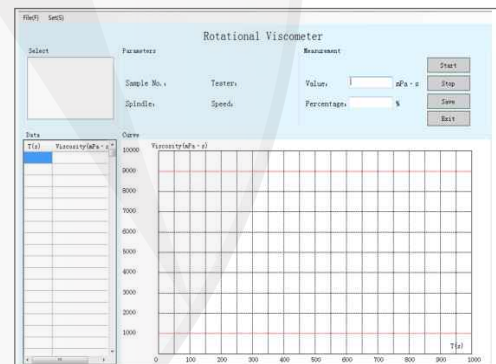
AIM 534-2

Technical Specifications:

- Rotation Speed: 5, 10, 20, & 50 r/min
- Viscosity Measurement Range: 100 mPa·s to 2×10^5 mPa·s (expandable to 4×10^5 mPa·s with No.30 spindles)
- Spindles: No. 21, 27, 28, & 29 (No.30 spindle optional)
- Measurement Error: $\pm 1\%$ (F·S), $\pm 3\%$ (F·S) for No.30 spindle
- Temperature Controlling Range: Ambient to 200°C
- Temperature Controlling Accuracy: $\pm 0.1^\circ\text{C}$
- Cubage of Sample Cylinder: 20ml
- Serial Interface: RS232
- Working Environment: Ambient temperature: 15°C to 35°C , $\leq 85\%$
- Operating Voltage: AC (220V $\pm 10\%$)V, 50Hz, Single Phase
- Total Power Consumption: 200W

Components Included:

- Head of Viscometer
- Auxiliary Controlling Case (Containing a temperature controller and a micro-printer)
- Heater
- Spindle
- Pen Drive for PC software setup



Ordering Information :

AIM 534-2 Aimil Rotational Viscometer



Engler Viscometer

AIM 535

Ref. Standard -ASTM D 1665, IP 212, BS:434

For determining the viscosity of bitumen road emulsions and fuel oils. The viscometer consists of a plated oil cup, fitted with a stainless steel jet, fitted in a highly polished and plated brass bath, which is mounted on a stand with levelling feet. The oil cup has a double walled lid with thermometer socket. A thermometer clip is fitted to the water bath. Supplied with plug valve to fit jet.

Engler Viscometer Electrical Heating with Immersion Heater, Dimmerstat for temperature control.

Suitable for operation on 220 V, 50 Hz, single phase, AC supply.

Ordering Information :

AIM 535 Engler Viscometer Electrical Heating

Optional Accessories :

AIM 52610 Thermometer IP 8C, Range : 0° C to 45° C

Marsh Cone (Funnel) Viscometer

AIM 536-1

Ref Standard: D6910/6910M/09

The Marsh Funnel Viscometer is a simple device used for routine quick measurements of fluid viscosity. It is an excellent indicator of changes in drilling fluid properties. The Marsh Funnel Viscometer is conical in shape - 152 mm in diameter at the top and 305 mm long with a capacity of 1500 cm³. A 12- mesh screen covers half of the top and is designed to remove any foreign matter and drilled cuttings from the fluid. The fluid runs through a fixed orifice at the end of the funnel, which is 50mm long by 4.7 mm diameter in size.

Optional Accessories:

AIM -53601 Plastic Measuring Cup, 1000 ml

AIM- 53602 Thermometer 0-50°C

AIM- 53603 Stopwatch



AIM 536-1

Ordering Information :

AIM 536-1 Marsh Cone Viscometer with stand

Flow Cup

AIM 539

Ref. Standard - IS: 3944

Simple flow cup of the efflux type is used for approximate measurements of apparent viscosity for control of consistency during manufacture and use of paints, lacquers and viscous products. Flow cups with protective skirt are made from gun metal with stainless steel orifice and are equivalent to Type B cups. Each cup is supplied complete with a stand having levelling screws.

Ordering Information :

***AIM 539** Flow Cup No.4



AIM 539

Note: *NPL Calibration, if required, will be arranged directly by the customer. Aimil can help the customers to get the equipment calibrated by NPL on behalf of customers, at extra cost, in time frame as required by NPL (which will normally be 14-16 weeks).



Asphalt Testing Equipment

Paving Mix Tests, Marshall Stability and Compaction

Paving Mix Tests, Marshall Stability and Compaction

Ref. Standards - IS: 17127 (2019), ASTM D1559, D6926-04, D6927-06, BS:598-197, EN-12697-34

Most frequently used test by highway departments, contractors, engineers, testing laboratories and governmental agencies is the stability test using Marshall Apparatus. The test is intended for the measurement of the resistance to plastic flow of cylindrical specimens of bituminous paving mixture loaded on the lateral surface. For use with hot mixture containing asphalt or tar and aggregate upto 25.4 mm maximum size.

Suitable for operation on 220V, 50 Hz, single phase, AC supply.

Salient Features :

- Single Speed, Bench top load frame
- Max. loading capacity, 50 kN
- Geared Screw jack and Motor Drive,
- Precise speed
- Limit Switch Protection for both upward and downward travel

User friendly and easy to use controls A thermal overload type Power Switch at the rear of the machine provides electrical protection. Platen movement is controlled from the front panel, by up-down rotary switch. Emergency switch is provided to stop the machine manually, if required. A Ball seated screw fitting located on the crosshead accepts load cells and load transducers upto and including 50kN. The equipment is a table top loading frame, with adjustable crosshead mounted on columns attached to sturdy base. The forces applied are generated by a screw jack via a reduction unit with worm gears housed in the base casting. Motive Power is from an electric motor via a multi-vee drive belt and provides a platen speed of 50.8mm / min.

The worm reduction unit is a grease packed on assembly and should not normally require lubrication.

Specifications :

Maximum Vertical Clearance	470mm
Minimum Vertical Clearance	250mm
Horizontal Clearance	265mm
Platen Diameter	133mm
Platen Travel	30mm
Platen Speed	50.8mm/min
Rated Power	375W
Dimension (l x w x h)	550×400×870mm
Weight	60kg

Analogue Marshall Apparatus

AIM 550-1

The equipment consist of the following replaceable parts :

AIM 552	Marshall Load Frame Cap 50kN speed-50.8mm/min	1 No.
AIM 55001	Breaking Head Stability Mould	1 No.
AIM 55002-100	Compaction Mould 101.6mm ID, Steel, with Base Plate and Collar	3 Set.
AIM 55005	Compaction Pedestal, Manual	1 No.
AIM 55006	Compaction Hammer 4.5 kg x 457mm drop	2 Nos.
AIM 55018-1	Sample Eject for 4" dia Sample	1 No.
AIM 072	Dial Gauge 25mm travel, 0.01mm least count	1 No.
AIM 271	Proving Ring capacity 25 kN.	1 No.



AIM 550-1



Digital Marshall Apparatus

AIM 550-2

Similar to AIM 550-1 but supplied with digital indicator, load cell 50kN & LVDT 25mm in place of Proving Ring & Dial Gauge



AIM 55031

AIM 550-2

Analog Modified Marshall Apparatus, 50 kN

AIM 550-4

Ref. Standard ASTM D5581:2007

The Load Frame construction of the equipment is same as per AIM-552 and its mould size is 152.4mm dia. It is supplied with a Rammer of 10.21kg, Breaking Head, and sample eject for 6" dia sample, as per the standard.



AIM 550-4

The equipment consist of the following replaceable parts :

AIM 552	Marshall load frame 50kN, Speed 50.8mm/min	1No.
AIM 55001-152	Breaking Head Stability Mould	1No.
AIM 55002-152	Marshall Mould 152.4mm ID with base plate and collar	3Set
AIM 55005-152	Compaction Pedestal for 152.4 mm dia sample	1 No.
AIM 55006-152	Compaction Hammer 10.21 kg x 457 mm drop	2 No.
AIM 55018-152	Sample Ejector for 152.4 mm dia Sample	1 No.
AIM 072	Dial Gauge 25 mm travel, 0.01mm least count	1 No.
AIM 274	Proving Ring capacity 50 kN	1 No.



Asphalt Testing Equipment

Digital Modified Marshall Apparatus, 100 kN

AIM 550-6

The equipment consist of the following replaceable parts :

AIM 552-100	Marshall Load Frame Cap 100kN speed-50.8mm/min	1 No.
AIM 55001	Breaking Head Stability Mould	1 No.
AIM 55002-100	Compaction Mould 101.6mm ID, Steel, with Base Plate and Collar	3 Set.
AIM 55005	Compaction Pedestal, Manual	1 No.
AIM 55006	Compaction Hammer 4.5 kg x 457mm drop	2 Nos.
AIM 55018-1	Sample Eject for 101.6mm dia Sample	1 No.
AIM 55001-152	Breaking Head Stability Mould	1No.
AIM 55002-152	Marshall Mould 152.4mm ID with base plate and collar	3 Set
AIM 55005-152	Compaction Pedestal for 152.4 mm dia sample	1 No.
AIM 55006-152	Compaction Hammer 10.21 kg x 457 mm drop	2 No.
AIM 55018-152	Sample Ejector for 152.4 mm dia Sample	1 No.
AIM 5502001	Digital Indicator	1 No.
AIM 5502002-1	Load Cell 100kN	1 No.
AIM 5502003-50	Displacement Sensor (LVDT) 50mm	1 No.



AIM 550-6

Ordering Information:

AIM 550-1	Analog Marshall Apparatus, 50kN for 4" dia sample
AIM 550-2	Digital Marshall Apparatus, 50kN for 4" dia sample
AIM 550-3	Digital Modified Marshall Apparatus, 50kN for 6" dia sample
AIM 550-4	Analog Modified Marshall Apparatus, 50kN for 6" dia sample
AIM 550-5	Analog Modified Marshall Apparatus, 100kN for 4" & 6" dia sample
AIM 550-6	Digital Modified Marshall Apparatus, 100kN for 4" & 6" dia sample
AIM 550-7	Automatic Modified Marshall Apparatus, 100kN for 4" & 6" dia sample with Software & Computer
AIM 550-8	Automatic Modified Marshall Apparatus, 100kN for 4" & 6" dia sample with Software & without Computer
AIM 55041	Software for Marshall stability test

Ordering Information:

AIM 55031-1	Indirect Tensile Test Attachment for Marshall Test Apparatus for 4" Dia Sample
AIM 55031-2	Indirect Tensile Test Attachment for Marshall Test Apparatus for 6" Dia Sample
AIM 55031-S1	Indirect Tensile Test Attachment for Marshall Test Apparatus for 4" & 6" Dia Sample

AIM 55031-1, AIM 55031-2 & AIM 55031-S1





Marshall Apparatus - Touch Based, 50kN

AIM 550-2-T

The Electromechanical Marshall Test Apparatus is an advanced testing machine designed for laboratories requiring fully automatic displacement-controlled tests. It simplifies the Marshall Stability test process with its 100kN compression capacity and 50.8mm/min test speed supported by closed-loop displacement control. This apparatus, controlled by a servo motor system, features intuitive and user-friendly controls.

Designed with user convenience and durability in mind, the apparatus is built with a table-top loading frame featuring an adjustable crosshead mounted on columns attached to a sturdy base. The forces applied are generated by a screw jack via a PID control servo motor, ensuring precise platen movement and a platen speed of 50.8mm/min. Its 7-inch touchscreen color display allows for real-time graphing and data viewing, while the touch-sensitive keyboard simplifies data entry. With compatibility for 4" and 6" diameter samples, integrated safety features, and low maintenance requirements, this apparatus offers reliable and efficient testing capabilities for laboratory environments.

Features

- User-Friendly Interface: 7-inch touchscreen color display and touch-sensitive keyboard.
- Sample Size Compatibility: Supports 4" and 6" diameter samples.
- Adjustable Crosshead: Accommodates different sample positions.
- Auto Protection: Prevents sensor limit breaches.
- Low Maintenance: Reduces maintenance needs.
- Environmentally Friendly and Quiet Operation: Minimal environmental footprint and quiet operation.
- Inbuilt Data Acquisition: Captures and stores test data.
- Single Speed, Bench-top Load Frame: Simplifies setup and operation.
- Geared Screw Jack and Motor Drive: Provides reliable operation.
- Precise Speed Control: Ensures accurate test results.
- Limit Switch Protection: Safeguards against over-travel.
- Thermal Overload Power Switch: Provides electrical protection.
- Emergency Switch: Allows for manual machine stoppage.

Specifications

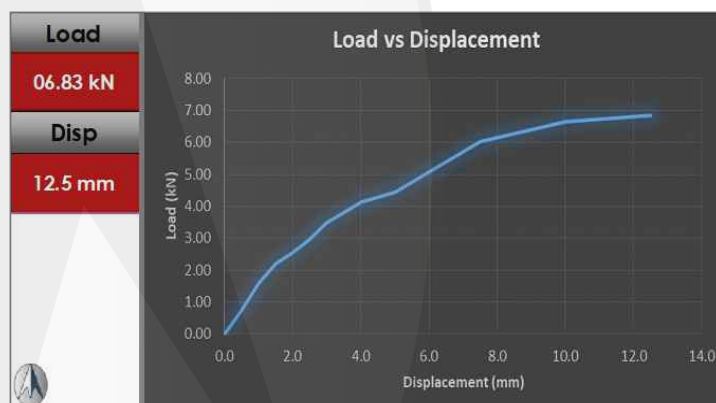
- Frame Capacity: 100 kN
- Load Cell: 50 kN
- Displacement Sensor: 25 mm
- Max. RAM Travel: 100 mm
- Platen Speed Range: 50.8 mm/min
- Fast Forward & Reverse Speed: 15 mm/min
- Horizontal Clearance: 364 mm
- Vertical Clearance: 910 mm
- Supply Voltage: 220-240 V AC, 50 Hz
- Power Consumption: 500 W
- Approximate Dimensions (L x W x H): 490 x 500 x 1420 mm
- Weight: Approximately 120 kg

The equipment consist of the following replaceable parts :

AIM 552-T	Marshall Load Frame Cap 50kN speed-50.8mm/min	1 No.
AIM 55001	Breaking Head Stability Mould	1 No.
AIM 55002-100	Compaction Mould 101.6mm ID, Steel, with Base Plate and Collar	3 Set.
AIM 55005	Compaction Pedestal, Manual	1 No.
AIM 55006	Compaction Hammer 4.5 kg x 457mm drop	2 Nos.
AIM 55018-1	Sample Eject for 4" dia Sample	1 No.
AIM 5502002	Load Cell capacity 50 kN.	1 No.
AIM 5502003	Displacement Sensor (LVDT) 25 mm travel, 0.01mm least count	1 No.



AIM 550-2-T & AIM 550-4-T





Asphalt Testing Equipment

Modified Marshall Apparatus - Touch Based, 50kN

AIM 550-4-T

The Load Frame construction of the equipment is the same as per AIM-550-T and its mould size is 152.4mm dia. It is supplied with a Rammer of 10.21kg, Breaking Head, and sample eject for 6" dia sample, as per the standard.

The equipment consist of the following replaceable parts :

AIM 552-T	Marshall load frame 50kN, Speed 50.8mm/min	1No.
AIM 55001-152	Breaking Head Stability Mould	1No.
AIM 55002-152	Marshall Mould 152.4mm ID with base plate and collar	3 Set
AIM 55005-152	Compaction Pedestal for 152.4 mm dia sample	1 No.
AIM 55006-152	Compaction Hammer 10.21 kg x 457 mm drop	2 No.
AIM 55018-152	Sample Ejector for 152.4 mm dia Sample	1 No.
AIM 5502002	Load Cell capacity 50 kN	1 No.
AIM 5502003	Displacement Sensor (LVDT) 25 mm travel, 0.01mm least count	1 No.

Modified Marshall Apparatus – Touch Based, 100kN Capacity

AIM 550-6-T

The Load Frame construction of the equipment is the same as per AIM-550-T. It is supplied with a 100kN load cell and 50mm Displacement sensor. It also supplied with both the specimen accessories for 4" & 6" diameter samples.

The equipment consist of the following replaceable parts :

AIM 552-100	Marshall Load Frame Cap 100kN speed-50.8mm/min	1 No.
AIM 55001	Breaking Head Stability Mould	1 No.
AIM 55002-100	Compaction Mould 101.6mm ID, Steel, with Base Plate and Collar	3 Set.
AIM 55005	Compaction Pedestal, Manual	1 No.
AIM 55006	Compaction Hammer 4.5 kg x 457mm drop	2 Nos.
AIM 55018-1	Sample Eject for 101.6mm dia Sample	1 No.
AIM 55001-152	Breaking Head Stability Mould	1No.
AIM 55002-152	Marshall Mould 152.4mm ID with base plate and collar	3 Set
AIM 55005-152	Compaction Pedestal for 152.4 mm dia sample	1 No.
AIM 55006-152	Compaction Hammer 10.21 kg x 457 mm drop	2 No.
AIM 55018-152	Sample Ejector for 152.4 mm dia Sample	1 No.
AIM 5502001	Digital Indicator	1 No.
AIM 5502002-1	Load Cell 100kN	1 No.
AIM 5502003-50	Displacement Sensor (LVDT) 50mm	1 No.



AIM 550-6-T

Ordering Information:

AIM-550-2-T	Touch Screen Marshall Apparatus, 50kN Single speed, for 4" dia sample"
AIM-550-4-T	Touch Screen Modified Marshall Apparatus, 50kN Single speed, for 6" dia sample"
AIM-550-6-T	Touch Screen Modified Marshall Apparatus, 100kN Single Speed, for 4" & 6" dia sample



Core Drilling

Pavement Core Drilling Machine

AIM 551-1

Ref. EN 12504-1

The Pavement Core drilling machine, petrol engine powered road building drill has been designed specifically for the purpose of drilling test cores from or holes in roads, airport runways, bridges.

The Machine comprises of two vertical support columns which carry the drill head/engine assembly accurately with the help of screwed spindle.

The 6HP petrol engine with pulley mechanism works with minimum vibrations. The double precision bit advances with screwed spindle which provides a constant, accurate drill pressure, minimum core chipping & long bit life.

The complete assembly is supplied on a rigid metal base with leveling facility and is suitable for vertically down coring applications only.

Bit diameter	: 150mm
Maximum depth of core	: 400mm
Drill Speed	: 1100rpm
Drive	: 4.3 Petrol Engine
Guide Shafts	: 40mm dia
Screwed Spindle	: 20mm dia
Water Tap	: 12mm



AIM 551-1

Ordering Information :

AIM 551-1 Pavement Core Drilling Machine

Optional Accessories :

AIM-55101-1A	Diamond Core Bit 50mm dia x 200mm long
AIM-55103-1A	Diamond Core Bits, 50mm dia x 400 long
AIM-55105-1A	Diamond Core Bit, 75mm dia x 200 long
AIM-55107-1A	Diamond Core Bit, 75mm dia x 400 long
AIM-55108-1A	Diamond Core Bit, 100mm dia x 400 long
AIM-55109-1A	Diamond Core Bit, 100mm dia x 200 long
AIM-55114-1A	Diamond Core Bit, 150mm dia x 200 long
AIM-55115-1A	Diamond Core Bit, 150mm dia x 400 long

Note 1: Standard Diamond core bit is suitable for taking out core from Plain Concrete, Asphalt Surface/ Block.

Note 2: Hilti Make core bit is supplied for taking out core from Reinforced Concrete Surface/ Block.

Note 3: Continuous supply of water is essential for smooth functioning of the machine.



Asphalt Testing Equipment

Compaction

Automatic Compactor for Bituminous Mixes

AIM 553-1

Ref. EN 12697-10-30

- Rugged construction to withstand hard work.
- Fully automatic and easy to operate.
- Uniform compaction.
- Automatic Blow Counter.

The Automatic compactor eliminates the laborious process of manual compaction and allows achievement of even degree of compaction. The drive mechanism lifts the weight of 4.5 kg and drops it through a height of 457 mm.

The rammer foot is removable, which facilitates preheating. A compaction pedestal with specimen holder is fixed to the base. An automatic blow counter enables the number of blows to be preset before each test and automatically stops the machine on completion.

Suitable for operation on 230 V, 50 Hz, Single Phase, AC supply.

Bitumen Compactor for Modified Marshall Moulds

AIM 553-2

Ref. Standard ASTM – D5581:1996, D 6926-04

The equipment is used for compactor of cylindrical 6" dia with specimen of bitumen mixes. The design is similar to AIM 553-1 except

- Weight of rammer - 10.2 Kg
- Provision for accommodating - 6" mould specimen

Suitable for operation on 440 V, 50 Hz, Three Phase, AC supply.

AIM 553-4

Automatic Compactor for Bituminous mixes for 4" & 6" dia Samples

The design is similar to 553-1 & 553-2 except

- Weight of rammer - 4.5 & 10.2 Kg - One no. each
- Provision for accommodating - 4" & 6" mould specimen



AIM 553-1

Ordering Information :

AIM 553-1	Automatic Compactor for Bituminous Mixes for 4" dia Samples
AIM 553-2	Automatic Compactor for Bituminous mixes for 6" dia Samples
AIM 553-4	Automatic Compactor for Bituminous mixes for 4" & 6" dia Samples (New Model)

Softening Point :

Ref. Standards - IS:1205, ASTM D 36, E 28, IP 198, IP 58, STPTC PT 3, AASHTO T53, BS:2000, EN 1427

For determining the temperature at which a sample of bituminous material loaded by a 9.5 mm dia steel ball, drops a specified distance when heated under specified conditions.

Ring and Ball Apparatus

AIM 561-1 & AIM 561-2

The Ring and Ball Apparatus is a compact user friendly apparatus. It has magnetic stirrer with heating facility and digital display of temperature, the heating can be adjusted through knob in AIM 561-1 and can be controlled through the integral PID controlled in AIM 561-2.

Suitable for operation on 220 V, 50 Hz, Single Phase, AC supply.

The equipment consist of the following replaceable parts :

AIM 56101	Tapered Rings (Set of 2 Nos.)	1 Set
AIM 56102	Ball Centering Guide (2 Nos.)	2 Set
AIM 56103	Steel Balls of 9.5 mm dia	2 Nos.
AIM 56104	Ring holder	1 No.
AIM 56105	Electric Heater	1 No.



AIM 561-1



Automatic Ring and Ball Test Apparatus

AIM 561-3

Ref. Standards - IS:1205, ASTM D 36, E 28, IP 198, IP 58, STPTC PT 3, AASHTO T53, BS:2000, EN 1427, ASTM D36, NF T66-008, DIN 52011, UNE 7111, UNI 4161, CNR N.35

The Aimil Automatic Ring and Ball Test Apparatus is a sophisticated, digital microprocessor-based tester designed to automatically determine the softening point of asphalts, pitches, and bituminous binders recovered from bituminous mixes, whether by extraction or after aging processes such as RTFOT and PAV. This state-of-the-art equipment integrates advanced technology to provide accurate, reliable, and efficient test results, making it an ideal choice for industries including construction, road maintenance, and materials testing laboratories.

Key Features:

- Real-Time Display: Temperature (°C) vs. Time (sec) graph displayed throughout the test.
- High-Resolution Display: 7-inch touch-screen TFT LCD graphic display with 800x480 pixel resolution.
- Data Management: Unlimited memory storage with USB pendrive and internal Micro SD options.
- User Interface: Multilanguage selection and microprocessor-friendly menu for intuitive control.
- Top-Quality Components: Laser sensors, electronic magnetic stirrer, and ceramic-glass heating plate.
- Fully Automatic Operation: Ensuring precision and repeatability.
- Rapid Cooling System: Fan cooling system for quick sample cooling, increasing test throughput.
- Versatile Test Parameters: Test with boiled distilled water (30-80 °C) or glycerol (80-150 °C).
- Temperature Control: Electronic system maintaining a 5 °C/min gradient.
- Magnetic Stirrer: Electronic speed adjustment from 0 to 160 rpm.
- Detailed Results: Mean and difference between specimens, exportable in TXT format.
- Safety Features: Automatic cut-off at the end of the test cycle.

Specifications:

- Power Supply: 230V, 1-phase, 50-60Hz, 700W
- Dimensions: 435 x 330 x 510 mm
- Weight: Approximately 20 kg

Ordering Information :

AIM 561-1	Ring and Ball Apparatus
AIM 561-2	Ring and Ball Apparatus (Digital, Semi Automatic)
AIM 561-3	Automatic Ring and Ball Test Apparatus

Optional Accessories :

AIM 56110	Thermometer IP 60C, Range : -2° C to 80° C
AIM 56111	Thermometer IP 61C, Range : 30° C to 200° C



Binder Extraction

Ref. EN 12697-1, ASTM D 2172, AASHTO T-58, T-164

For determining bitumen percentage in Bituminous paving mixtures.

It has a removeable, precision machined, aluminium rotor bowl, mounted on a vertical shaft. A filter paper disc is pressed in-between the rotor bowl and cover plate by tightening a knurled nut. The bowl assembly is enclosed in a housing mounted on a cast body. In the electrical operating model, the rotor bowl is coupled to a motor. The solvent may be introduced during test through a cup on the housing cover.

Centrifuge Extractor, Capacity 1500g Electrically Operated

AIM 563-1

The new design of centrifuge extractor is compact with in-built dimmerstat for speed variation from 0 rpm to 3600 rpm.

Each unit is supplied complete with a set of 25 Filter Paper Discs.

Suitable for operation on 220 V, 50 Hz, Single Phase, AC supply.



AIM 563-1



Asphalt Testing Equipment

Ordering Information :

AIM 563-1 Centrifuge Extractor, Capacity 1500g Electrically Operated

Replacement Parts :

AIM 56301 Filter Paper Discs, Set of 25 numbers

Note: Solvent is not supplied as a part of the unit.

Ductility

Ref. Standards IS:1208, IS: 15462 (2019), ASTM D113, AASHTO T 51

Bituminous surfaces exposed to varying temperature conditions undergo a great deal of expansion and contraction. Therefore, an important characteristic of the binder is its ductility and the degree of ductility has an effect on the cracking of bituminous surfaces caused by traffic stress.

The ductility of bitumen is expressed as the distance in centimetres to which a standard briquette can be elongated before the thread thus formed breaks under specified conditions.

A molten bitumen sample is poured into a standard mould, allowed to cool to room temperature and then placed in a water bath so that the briquette can be brought to test temperature before mounting in the testing machine.

Ductility Testing Machine, Electrically Operated, Digital

AIM 565-1, AIM 565-DG & AIM 565-DG-C

Designed to test three specimens simultaneously. The machine consists of a carriage moving over a lead screw. An electric motor driven reduction gear unit ensures smooth constant speed and continuous operation. The entire assembly is mounted with water bath completely encased in metal bound hardwood. It is equipped with an electric pump circulator and heater. The temperature is controlled by digital temperature controller. Two rates of travel i.e. 5 cm/min and 1cm/min are provided. Suitable for operation on 220 V, 50 Hz, Single Phase, AC supply.

The equipment supplied with :

AIM 56501 Ductility Mould, with Base Plate -1set (set of 3 Nos.)

Ordering Information :

AIM 565-1 Ductility Testing Machine

AIM 565-DG Ductility Testing Machine with digital display

AIM 565-DG-C Ductility Testing Machine with digital display & cooling arrangement (temp. range 04°C to 50°C)

Optional:

AIM 56501-S1 Elastic recovery mould, IS:15462 (2019)



AIM 565-1



AIM 565-DG



AIM 565-DG-C



Benkelman Beam

AIM 566-3 & AIM 566-3-AN

- Light weight aluminium construction
- Ease of Transportation
- Unique Telescopic Design, simplifying field set up
- Compact, thereby reducing the amount of storage space needed

Benkelman Beam utilises the technique of using balanced beam in conjunction with a suitable vehicle to measuring road flexure. The improved Benkelman Beam is a convenient, accurate device for measuring the deflection of flexible pavements under moving wheel loads. Operating on a simple lever arm principle, the unit consists of a Reference Beam, Body, two part Probe Beam and Rear Zero adjust.



AIM 566-3

Ordering Information :

AIM 566-3 Benkelman Beam with Digital dial gauge 0.001x25mm Travel

AIM 566-3-AN Benkelman Beam with Analog dial gauge 0.01x25mm Travel

Optional Accessories :

AIM 072 Analog Dial Gauge, 25 mm travel and 0.01 mm least count

AIM 072-DG Digital Dial Gauge, 25 mm travel & 0.001 mm least count

Pavement Dynamic Cone Penetrometer

AIM 567

- A simple and robust instrument for rapid in-situ measurement of the structural properties of road pavements.
- Provides fast and efficient method of obtaining information.
- For continuous measurements up to a depth of 800 mm and 1,200 mm with the extension rod.
- Portable and can be accommodated in a carrying case.

The Pavement Dynamic Cone Penetrometer (DCP) is a very robust instrument, designed for rapid in-situ evaluation of strength of sub-grade and the bases for roads & runway pavements. Continuous measurements can be made down to a depth of 800 mm, or when an extension is fitted, to a depth of 1200 mm. Where pavement layers have different strengths, the boundaries can be identified and the thickness of the layers determined.

A typical test takes only a few minutes and the instrument therefore, provides a very efficient method of obtaining information which would normally require test-pits. Correlations have been established between measurements with DCP and California Bearing Ratio (CBR) so that the results can be interpreted and compared with CBR specifications for pavement design. Agreement is generally good over most of the range but differences are apparent at low values of CBR, especially for fine grained materials.

It incorporates a 8kg weight dropping through a height of 575 mm and a 60° cone having a diameter of 20mm. It is supplied complete with assembly tools and weighs 20kg approx.

The DCP needs three operators, one to hold the instrument, other to raise and drop the weight and a technician to record the results. The instrument is held vertically and the weight carefully raised to the handle limit and then allowed to fall onto the anvil.

The equipment consist of the following replaceable parts :

AIM 56701 Top and Bottom Rod

AIM 56702 Handle

AIM 56703 Hammer

AIM 56704 1 m Scale

AIM 56705 60° Cone

AIM 56706 Anvil



AIM 567

Ordering Information :

AIM 567 Pavement Dynamic Cone Penetrometer



Asphalt Testing Equipment

Surface Irregularity

Equipment described below are based on the principle of a travelling straight edge and is for measuring, marking and recording irregularities of roads and runways pavements of both concrete and bituminous material.

Merlin

AIM 570

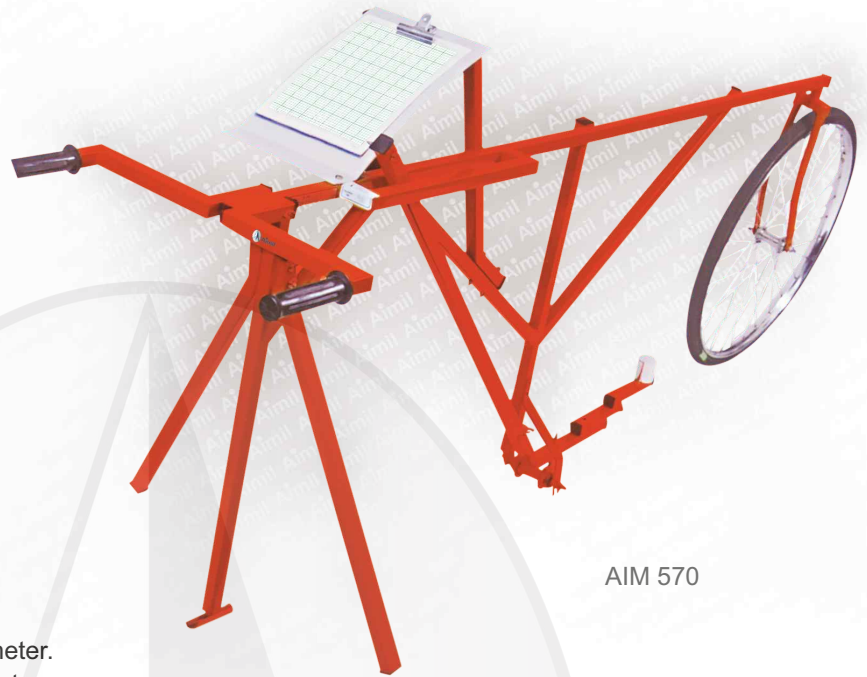
Features :

- Easy to use.
- Self calibrating.
- Robust.
- Easily maintained.
- No complex calculations.
- Measures displacement to less than a millimeter.

The unevenness of road surface is an important measure of road condition and a key factor in determining vehicle operating costs. A number of instruments have, therefore, been developed for measuring unevenness, which is usually called roughness and standard roughness scales have been established. However, many of the instruments are expensive and complicated to use or require regular calibration.

Modified Roughness Indicating machine is a simple machine to measure roughness, also called MERLIN - Machine for Evaluating Roughness using low-cost Instrumentation.

The device can be used either for direct measurement or for calibrating other instruments such as the Vehicle Mounted Bump Integrator. The equipment is easy to use, self - calibrating, robust, easily maintained and employs readily available components.



AIM 570

Ordering Information :

AIM 570 Modified Roughness Indicating Machine - Merlin

Bump Integrator

Ref. C.R.R.I Design

Roads are public utilities built for providing speedy, safe and comfortable ride to the road users. The safety and comfort of the users is adversely affected by poor riding quality of the roads. The riding quality, also termed as unevenness or roughness is an important parameter for evaluation of surface condition of roads. Roughness is the distortion in the road profile, which is of main concern to the road users. It is caused due to the inherent properties of materials and the construction techniques. This further deteriorates through permanent deformation of the layers in the pavement structures.

The roughness of the pavement forms an important input to any Pavement Management System (PMS) in deciding upon the maintenance strategies to be applied on road surface. The riding quality is generally measured by response type instruments, which are either towed or mounted on the vehicle itself.

Bump Integrator also known as Roughometer or Automatic Road Unevenness Recorder gives quantitative integrated evaluation of surface irregularities on an digital counter / LCD screen. It comprises of a single wheeled trailer, with a pneumatic tyre mounted on a chassis, on which an integrating device is fitted. The machine has a panel board fitted with two / four sets of digital counters for accounting the unevenness index value. The operating speed of the machine is 32 ± 0.5 km/hr. The machine is towed by a vehicle, usually a jeep.

The wheel runs on the pavement surface and the vertical reciprocating motion of the axle is converted into unidirectional rotary motion by an integration unit. The accumulation of this unidirectional motion is recorded by operating electronic sensors incorporated in the circuit, once for every 10mm of accumulated unevenness.

Wheel revolutions are also indicated on another digital counter through electronic sensors, actuated by the cam fixed on the wheel hub. The two sets of counter readings give the unevenness index value in cm/km.

Bump Integrator is supplied with a pair of transportation wheels at additional cost, which permit towing, speeds up to 60km/hr, without disturbing the accuracy of the unevenness-measuring wheel.



Bump Integrator machine as per CRR1 design it is supplied with the following specifications:

Overall Length	: 2400mm
Overall Width	: 700mm
Height	: 1100mm
Net Weight	: 350 kg (Approx.)
Tyre Size	: 6.00 x 16.4 Ply
Inflation Pressure	: 2.1 kg/sq. Cm (30 lbs./sq. inch)
Standard operation Speed	: 32 + 0.5 Km/Hour

Bump Integrator is supplied with three nos. towing wheels, Micro processor based indicator with suitable leads and necessary tools.

The Machine gives direct reading of the bumps in centimeters, with a least count of one centimeter and its wheel revolution counter gives direct reading of length in kilometer with a least count of one meter and a digital display to enable testing at night also.

A pair of transportation wheels (fitted with shockers) is also provided. It is supplied with an arrangement for towing.

Micro Processor Based Bump Integrator with Preset Facility

AIM 9903-1



AIM 9903-1

It has facility to set length level from 50 meters to 9999 meters.

The user has the option to choose from Direct /Preset mode. Through the Direct mode, the user can direct reading of road unevenness index at any point whereas through the Preset mode, the user can select the length as per his requirement, ranging from 50 meters to 9999 meters.

The machine has the facility to skip any obstruction on road (i.e. speed breakers, pot holes etc.) just by pressing the 'Pass button' to ensure that the reading obtained over a stretch of road is a true reflection of the surface irregularity.

The user can also evaluate the roughness index, in terms of lengths and bumps at preset lengths. The example cited

below indicates the cumulative bumps over preset lengths of 100 meters.

Length in meters	Bumps in centimeters
100	000016
100	000015
100	000017
100	000018
100	000018



Asphalt Testing Equipment

As per CRRI design with following new features:

- Accumulates vertical undulations after every one centimeter on LCD counter.
- Allows automatic changing & re-setting of the counter, after completion of every section.
- Displays data of the set distances on the panel board
- Operates on 12V & 220 volts.
- Stores 2000 segment data - memory is provided with a battery backup.
- The Data Output comprises of
 - Date & Time
 - Length in meter
 - Preset Length in meter
 - Section no.
 - Bumps in cm
 - Speed of vehicle
- Allows transfer of data through RS 232 port. Windows compatible
- Print out format:

DD/MM/YY	:	HH/MM/SS	Section No.
Preset Length	:	Bumps in CM	Length in Meters

Micro Processor Based Bump Integrator with Unevenness Index AIM 9905-1

Same as AIM 9903-1 but with additional USB Port, Internal Battery and facility to define the category of Road as per the defined bins of good, fair, poor & very poor and corrected Unevenness Index Value (centimeter/kilometer formula) Print out format.

DD/MM/YY	:	HH/MM/SS	Section No.
Preset Length	:	Bumps in CM	Length in Meters
Corrected UI	:	Speed of UI	Road Category

UI - Unevenness Index

CRRI Calibration is arranged on extra cost

Ordering Information :

AIM 9903-1	Micro Processor Based Bump Integrator with Pre Set Facility (with Transportation Wheel)
AIM 9905-1	Micro Processor Based Bump Integrator with Unevenness Index (with Transportation Wheel)
AIM 9905-2	Micro Processor Based Bump Integrator with Unevenness Index & GPS model LX130 (with Transportation Wheel)



Asphalt Mixing

AIM 575 & AIM 577-2

Ref. Standard EN 12697-35

Aimil provides three model of asphalt mixer.

This machine is used for laboratory mixing of bituminous materials to prepare the specimens to be used for various asphalt tests. Its is widely used in road construction laboratories, Testing laboratories, Research Institutions.

The machine mainly consists of a main frame, variable speed mixer, elevating system, heating pot, electrical control box. The variable speed mixer consists of electric motor, gear box and vertical curved blade. The elevating system consists of a motor, worm gear, up right column, guide bar and stopper block.

In vertical type of mixer the pot can move up and down and in the horizontal type of mixer the elevating system with agitator assembly moves up and down.



AIM 575



AIM 577-2

Technical Specification	Asphalt Mixer 5 ltr	Asphalt mixer 20 ltr. Vertical
Cat No.	AIM 575	AIM 577-2
Mixer Bowl Capacity	5 ltr	20 ltr.
Mixing Capacity	3-4 kg	12-14 kg
Temperature Range	Room temp. to 140 + 5° C	Room temp. to 200 + 5° C
Speed of Blade-Revolution	0-80 rpm	42-48 rpm
Speed of Blade-Rotation	0-180 rpm	70 -75 rpm
Heater Capacity	1.5 kW	3 kW
Testing Environment	10-40°C & < 80 % RH	10-40°C & < 80 % RH
Power Supply	220 V, 50 Hz, Single Phase AC Supply	415 V, 50 Hz, Three Phase AC Supply (Single phase also available as optional)

Ordering Information :

AIM 575	Asphalt Mixer, 5 ltr
AIM 577-2	Digital Asphalt Mixer Vertical, 20 ltr



Wheel Rut Shaper

AIM 578-1

Ref. Standard EN 12697 - 33

This apparatus is used to prepare the bitumen specimen for wheel rut testing used in research and road construction. It compacts asphalt slabs to a target density in a size of 300x300x50 mm.

The machine has a bearing car which has a mould for sample preparation loaded by rolling wheel vertically. The bearing car moves 300 mm in and out for homogenous compaction of specimen by rolling wheel. The rolling wheel is compacted thru pneumatic cylinder and has in built heater to heat up the specimen thru top cover of mould. The bearing car moves in and out on crank shaft, gear wheel with eccentric shaft mechanism.

Features:

- High reading accuracy and rugged design of digital display.
- Simple control to facilitate ease of operation.
- User can set the passes & temp.
- PID controller is provided for control the temp.
- Proximity sensor is provided for count the passes.
- Clear memory facility.
- Date & time facility.
- Calibration is protected through password.
- Machine will automatically stop when the defined passes is reached.
- Emergency switch is provided for emergency stop.

Technical Specifications

Rolling wheel radius	: 500 mm
Rolling wheel width	: 300 mm
Temperature	: room temp to 200°C
Pressure	: up to 7 bar
Bearing car speed	: 6 rpm
Distance in & Out	: 300 mm
Passes range	: 0-999 passes
Mould Size	: 300x300x50 mm
Suitable for operation	: 415 V, 50 Hz, 3 phase, AC supply



AIM 578-1

Ordering Information :

AIM 578-1 Wheel Rut Shaper with compressor

Wheel Rut Tester

AIM 579-1



Ref. Standard EN 12697 - 22

The Wheel Rut Tester is designed to determine the resistance ability of bituminous combined materials to wheel tracking at high temperatures. The machine consists of two main parts: the testing machine and a constant temperature cabinet, which is controlled by a PID controller.



The device features a loaded wheel that bears on a sample held on a moving table, which reciprocates with simple harmonic motion. Equipped with a solid rubber tire, the wheel operates at variable speeds from 50 to 56 rpm. The sample table is fitted with a locking clamp for 230 ± 10 mm. The speed mechanism is servo motor and a PID control system.

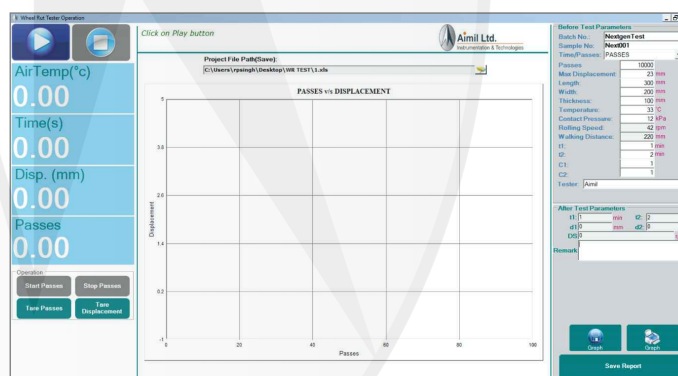
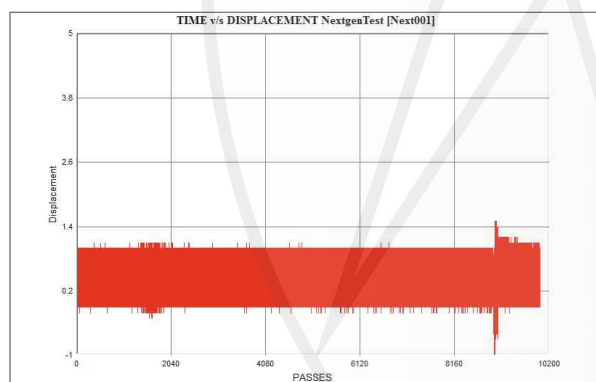
Pressure between the table and the specimen is maintained at 0.7 MPa through the leverage effect of a moving beam. Additionally, a temperature sensor is positioned near the specimen to monitor the cabinet temperature. The test is fully automated and controlled by a data acquisition and processing system featuring a large graphic display for real-time monitoring of cycles, rut depth, temperature, and time displacement graphs.

Salient Features :

- RS 232 ports for PC and printer connectivity
- Large graphic display for real-time monitoring
- Displays the number of cycles, rut depth, and temperature in real-time
- Tracks for a specified number of passes or to a specified rut depth
- Measures temperature inside the cabinet
- Automatically generates reports in Excel format
- User-defined settings for temperature, passes, and test duration
- Automatic graph scale changeover
- Displays and prints passes-displacement or time-displacement curves during tests
- Raw data of passes, temperature, time, and displacement viewable in Excel
- Internal cabinet light
- Blower to maintain cabinet temperature
- Automatic stop when defined passes or displacement is reached

Technical specifications

Test wheel speed	: 50 to 56 rpm
Moving distance of sample table	: 230 ± 10 mm
Rubber hardness of wheel	: 78 ± 2 at 60°C
Specimen Size	: $300 \times 300 \times 50$ mm
Displacement measuring range	: $0-50 \pm 0.1$ mm
Max pressure applied on specimen	: 0.7 ± 0.05 MPa
Temperature of cabinet	: Room temperature to $80 \pm 0.5^\circ\text{C}$
Heating power	: 3 kW
Suitable for operation	: 415 V, 50 Hz, 3-phase, AC supply



Minimum Recommended Computer Hardware

- 2 GHz Pentium Dual Core or better
- 4 GB RAM
- Using multiple testing machines may require additional memory and/or a faster processor
- 512 MB DirectX 10.0 capable video card or better
- 500 GB HD Drive
- RS232 Serial Port
 - 1 integrated serial port (not USB) where possible per testing machine
 - If RS232 serial port unavailable, then 1 USB serial port with RS232/USB adapter is required (per machine)
- USB Port
 - Additional ports required if using RS232/USB adapters to communicate with machines
 - Additional ports for required measuring devices, barcode scanners, etc.
- Mouse or pointing device and keyboard supported by Windows
- Monitor
 - 32-bit color
 - 1600 x 900 (Widescreen) or higher
- Windows compatible printer (for reporting capabilities)
- Windows compatible sound card and speakers (for audio playback)
- An active Internet connection (for team viewer use and help desk support)



Asphalt Testing Equipment

Software Requirements

- The Aimil Software's are designed for 32-bit & 64-bit operating systems running Windows 7, Windows 8 or Windows 10. It does Not support Windows XP and below.
- Internet Explorer 8 or higher.

Note: A 64-bit operating system is preferred for best Performance

Ordering Information :

AIM 579-1 Wheel Rut Tester

Note: The unit is supplied with Software. Computer can be supplied at extra cost.

Skid Resistance Tester

AIM 580

Ref. Standard: IS: 2386 (Part 4) BS 812-114

The apparatus is used to measure antiskid performance of high grade roads and airport pavement in-situ.

The apparatus consists of a spring loaded rubber slider mounted on a pendulum arm. The arm can be adjusted vertically from a rigid support column. The base has three adjustable feet so that the swing of the pendulum during the test moves through a truly circular path while operated directly on a road surface.

The same instrument can be used in the laboratory along with AIM 58002, base plate with vice.



AIM 580

Ordering Information :

AIM 580 Skid Resistance Tester

Optional Accessories :

AIM 58002 Base Plate with vice

Film Stripping Device

AIM 581

Film stripping device is used to measure the resistance of bituminous mixtures to stripping of asphalt from aggregate particles. It is generally used to evaluate mineral aggregates & to judge the adhesion of the bituminous materials.

The device consists of a disk on which 4 bottles are mounted. The disc rotates at a speed of approx. 100 rpm. The sample, usually the aggregate fraction which passes a 9.525 mm sieve but is retained on a 2.36mm sieve, is placed in the bottles & agitated for 15 minutes. The percentage of aggregate stripped can be visually estimated. The device is provided with a pre-set digital counter having memory retention facility.

Suitable for operation on 220 V, 50Hz, Single Phase, AC supply.



AIM 581

Ordering Information :

AIM 581 Film Stripping Device



Asphalt Mixer Theoretical Density Meter

AIM 582

Ref. Standard: ASTM D2041-03

This machine is used for determination of theoretical density of asphalt mixer by vacuum method for applications such as asphalt mixer design, road condition investigation, calculation of porosity and compactness in the road construction quality management.

The equipment has a main body fitted with digital vacuum indicator, two vacuum containers, vibratory table, control panel. A vacuum pump is also supplied.

The vibratory table operates on manual and automatic mode to release the entrapped air from the asphalt sample.

Suitable for operation on 220V, 50Hz, 1phase, AC supply.

Technical specifications

Vacuum range	: 0-680 mmHg
Vibration loading capacity	: 10kg
No of sample	: Two



AIM 582

Ordering Information :

AIM 582 Asphalt Mixer Theoretical Density Meter with Vacuum Pump

Bitumen PAV System

Pressure Aging Vessel (PAV) & Vacuum Degassing Oven (VDO)

AIM 585 & AIM 586

Ref Std: IS 15799, ASTM D6521, EN 14769

The Bitumen PAV System is a specialized testing solution designed to evaluate the long-term durability and performance of asphalt binders used in road construction. The system consists of:

- **Pressure Aging Vessel (PAV):** Simulates the oxidative aging process of asphalt binders under controlled high-pressure and temperature conditions, replicating in-service aging effects.
- **Vacuum Degassing Oven (VDO):** Removes entrapped air bubbles from aged asphalt binders to ensure accurate viscosity and rheological testing.

The system is widely used in pavement engineering, asphalt quality control, and research applications to ensure that asphalt materials can withstand long-term weathering and traffic loads. The combination of PAV and VDO ensures compliance with industry testing standards and enhances the reliability of asphalt performance predictions.





Asphalt Testing Equipment

Key Features

Pressure Aging Vessel (PAV)

- Touchscreen Controller – Displays real-time temperature and pressure
- Delay Start Preheating – Allows programmed heating initiation
- Error Time Calculation – Ensures precision by tracking temperature fluctuations
- Remote Operation Support – Connects via USB and computer control
- Long-Duration Aging Process – Operates up to 99 hours
- High Precision Control – $\pm 0.1^{\circ}\text{C}$ temperature accuracy
- Automatic Pressure Release – Prevents overshooting and enhances safety
- Robust Pressure Chamber – Designed to withstand up to 8x the rated working pressure
- Pave can run the aging process upto 99 hours
- High accuracy temperature controller
- USB communication port data exporting in pen drive

Vacuum Degassing Oven (VDO)

- Efficient Air Removal – Eliminates entrapped air post-aging
- Precision Temperature Control – Accuracy: $\pm 2^{\circ}\text{C}$
- User-Friendly Interface – Simplified touchscreen operation
- Advanced Vacuum System – Maintains absolute pressure at 15kPa
- Remote Monitoring – Supports touchscreen and computer control

- Safety Features – Equipped with an observation window and alarms

Technical Specifications

Pressure Aging Vessel

- Power Supply: 220V, 50Hz
- Rated Power: 1100W
- Working Volume: 10.7L
- Working Medium: Air
- Temperature Range: $80\sim 115^{\circ}\text{C}$
- Working Pressure: 2.1 MPa
- Design Pressure: 2.2 MPa
- Hydraulic Test Pressure: 2.75 MPa
- Open Pressure of Safety Valve: 2.5 MPa
- Bursting Pressure of Safety Disc: 2.6 MPa
- Pressure Controller Accuracy: $\pm 0.01\text{ MPa}$
- Temperature Controller Accuracy: $\pm 0.1^{\circ}\text{C}$
- Control Method: Touchscreen or Remote
- Dimensions: 850 x 550 x 550mm

Vacuum Degassing Oven

- Power Supply: 220V, 50Hz
- Rated Power: 900W
- Working Volume: 6.8L
- Working Medium: Air
- Temperature Range: $170^{\circ}\text{C} \pm 0.5^{\circ}\text{C}$
- Vacuum Pressure: Absolute 15kPa
- Temperature Accuracy: $\pm 2^{\circ}\text{C}$
- Control Method: Touchscreen or Remote
- Dimensions: 845 x 510 x 530mm

Ordering Information :

AIM 585	Pressure Aging Vessel (PAV)
AIM 586	Vacuum Degassing Oven (VDO)

Note: Air compressor is not a part of supply. Air compressor can be supplied on request at extra cost.

Asphalt Extraction Apparatus Automatic

AIM 588

The Asphalt Extraction Apparatus Automatic is used to perform reliable analysis on asphalt mixtures using noninflammable solvent as trichloroethylene and dichloromethane.

It works on high speed centrifugal separation, dissolvent recovery and purification technology for extracting the asphalt from bituminous mixtures.

The instrument has several safety features for its easy & trouble free operation such as Phase sequence alarm, overheating protection, high or low level protection, high voltage protection, timer etc. The centrifuge basket is made of aluminium alloy material supported by high performance thrust bearing for its long lasting performance. The dissolvent recovery and storage chamber is made of anti corrosion stainless steel. The extraction operation is completed in three steps i.e. Bitumen extraction, dissolvent recovery chamber cleaning and regenerated combined liquid dissolvent recovery.

Suitable for operation on 415V, 50Hz, 4.5kW, 3phase, AC supply.

Technical specifications

Specimen capacity	: 1000g to 1500g
Extraction accuracy	: 0.1%
Centrifugal Separator rotation speed	: 5500rpm, 11000rpm



AIM 588

Ordering Information :

AIM 588	Asphalt Extraction Apparatus Automatic
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Trichloroethylene Recycler

AIM 589

Ref: Standard ASTM D5616-04

The ever-increasing emphasis on safety, environmental pollution and automatic handling of toxic materials has seen a need for the development and use of asphalt extraction systems. Aimil offers instrument for asphalt extraction to recover the Trichloroethylene or dichloromethane from the bituminous mixtures.

This machine is used for recycling trichloroethylene (C_2HCl_3) used in asphalt extraction tests and the recovered solvent can be used 6-7 times and its found very cost effective as the price of trichloroethylene is very high.

The instrument comprises of two chambers for solution evaporator and condensation and control cabinet for temperature control & cooling water cycling. The main unit is made of stainless steel for rust free operation for longer time.

Suitable for operation on 220V, 50Hz, 1phase, AC supply.

Technical Specifications

Combined solution	: 1500 ml to 5500ml
Heating tube power	: 800W
Temp control range	: 86 to 100°C
Working Temp	: Amb to 40°C
Relative Humidity	: <85%



AIM 589

Ordering Information :

AIM 589 Trichloroethylene Recycler

Asphalt Content Tester

AIM 590

Ref. Standard ASTM D6307 & EN 12697 39

This machine is used to determine the asphalt content of hot mix asphalt (HMA), paving mixtures and pavement samples by removing the asphalt in an ignition furnace by means of sample heating not by means of solvents.

Suitable for operation on 415V, 50Hz, 20A, 3phase, AC supply.

Technical Specifications

Working Temperature	: 540±5°C
Combustion Temperature	: 750°C
Balance Capacity	: 10kg
Accuracy of Balance	: 0.1g
Balance Capacity (Usable)	: 2500 g
Recommended Weight of Sample	: 1500 g
Time for test results	: 30 to 45 min
End Point Sensitivity	: 0.01% for 3 consecutive minutes
Data Output	: Through SD Card
Chamber Size	: 300mm x 340mm x 400mm
Outer Size	: 590mmx755mmx1300mm
Power Rating	: 5 kW
Accessories	: Sample Bucket - 2 Sets, Safety cover for bucket 1 No., Lifting Handle - 1 No., Asbestos Gloves - 1 Pair, Safety Helmet - 1 No.



AIM 590

Ordering Information :

AIM 590 Asphalt Content Tester



Asphalt Testing Equipment

Mastic Asphalt Tester

AIM 592

Ref. Standard BS 5284 & IS 1195

This machine is used to determine the hardness of asphalt material the design features direct vertical loading with loading weight that rest on thrust bearings therefore load is applied to the specimen without transmitting shock to the loading column. At the end of the loading period the depth of penetration of the pin can be read from the dial gauge to an accuracy of 0.01mm. The thermostatically controlled heater unit has a built in impeller which circulates the water to maintain an even temperature throughout.

Technical Specifications

Water Bath	: 440mm x 350mm x 180mm
Mould Size	: 150 mm dia x 25 mm depth
Heating power	: 1 kW
Temperature range	: Room temp to 85 +/- 0.1°C
Accuracy of penetration	: 0.01 mm



AIM 592

Ordering Information :

AIM 592 Mastic Asphalt Tester

Rolling Thin Film Oven

AIM-9881

Ref. Standard IS 1579, ASTM -D2872, EN 12607-1 & T 240

Double-walled electrically heated convection oven for rolling thin film oven tests on asphalts. Incorporates all required features per ASTM specifications, including: door with double-pane viewing window; symmetrical top and bottom vents; air plenum; squirrel cage-type 2800 rpm fan; digital indicating thermostat to control oven temperature at 163°C $\pm$ 0.5°C; vertical circular carriage to mechanically rotate the samples at 15 $\pm$ 0.2rpm; air jets to blow heated air into each sample bottle at its lowest point of travel; and a calibrated flowmeter to control air flow at 4000mL/min. An over temperature cut-off circuit disconnects power to the unit in the event of control failure.



AIM 9881

Technical Specifications

RPM of the rotating disc	15/min
Operating temp	163°C
Sample bottle size	Length-140mm, outer diameter-62mm, ID- 30mm
Heater cap	3kw
Air flow	4 ltr./min
Temp. control accuracy	0.1°C
Size of the chamber	405mm X 440mm X 340mm
Motor Cap.	1/4hp Hitech make with gearbox
Window	Glass
Power supply	220V, 50Hz, 20A, Single phase, AC supply

Ordering Information :

AIM 9881 Rolling Thin Film Oven



Thin Film Oven / Loss on heating Oven

AIM-9840

Reference standard: IS 1212, IS 9382, ASTM D1754, EN 12953, EN13303, T 47 & T 179

Dual purpose oven for loss of heat test and thin film test for bitumen and asphaltic materials. Interior chamber of stainless steel and stored powder painter steel exterior. Double glazed window in door for viewing test chamber. Side mounted controls comprise digital control, independent overheat thermostat, main switch and indicator lamps. Two rotating platforms supplied to perform both the tests.

Features:

- The exterior is constructed from sheet steel finished in an easy clean powder-coated paint
- Interior chamber is made from Stainless Steel
- Toughened Glass view window to observe / Test the material without disturbing
- The system is controlled by a microprocessor digital controller and overheat thermostat
- Temperature is controlled and pre-set at $163^{\circ}\text{C} \pm 1^{\circ}\text{C}$
- Two rotating platforms of 13.5 inches diameter are supplied to perform both the tests. Side mounted controls comprise
- Digital control
- Reduction gear is fitted from outside rotated by a vertical shaft having 5-6 RPM
- Independent overheat thermostat
- Mains switch
- On/off switch for the turntable motor
- Indicator lamps



AIM 9840

Technical Specifications

Size of Chamber	400mm x 400mm x 400mm
Maintain the temperature	$163^{\circ}\text{C} \pm 1^{\circ}\text{C}$
Vent hole	18mm diameter
Rotation of vertical shaft	5-6 RPM
Suitable for operation	220V, 50Hz, Single phase, AC supply

Ordering Information :

AIM 9840 Thin Film Oven /Loss on heating Oven



Asphalt Testing Equipment

Mobile Laboratories

Laboratory on Wheel

- A mobile laboratory for performing on site facilities both for physical and chemical test for Soil, Cement, Concrete, Asphalt & other construction material.
- Rugged construction of vehicle for difficult terrain.
- Aesthetically designed interior with shelves and cupboards for housing Laboratory equipments
- Performance of tests, as and when required, with immediate results.
- Getting to destination quickly, fully-equipped for the job.
- Follow up and monitoring of several sites simultaneously
- The unit can fabricated on customer's vehicle like TATA 207/407 or SWARAJ MAZDA etc.
- Depending on area available, the quality and location of benches, desks cabinets, sink, hood etc can be decided
- Lab can be quipped with AC, generator etc. as required.

Suggested list of equipment and Lab Layout Plan are appended below. However, changes can be done as per customer's specific needs.

Recommended Equipments For Mobile Van

Soil Lab	Cement Lab	Concrete Lab	Highway Lab
Standard Penetration Test	Compression Testing Machine, Hand Operated, 1000 kN	Sand Pouring Cylinder Apparatus	Soil Compactor
Dynamic Cone Penetration Test	Sieves	Electronic Balance	Pavement Core Drilling Machine
Soil Sampler	Pan and Cover for 20cm dia sieves	Sieves	Centrifuge Extractor
Liquid & Plastic Limit	Slump Test Apparatus	Thickness/ Length Gauge	Sieves
Unconfined compression tester	Measuring Cylinder	Mould Cast Iron	Sieve Shakers
Proctor Compaction	Mould Cast Iron	Beam Mould	Balance
Sieves	Concrete Test Hammer	Slump Test Apparatus	Marshall Apparatus
Sieve shaker	Vicat Apparatus	Core Case	Benkelman Beam
Balance	Gauging Trowel	Air Entrainment Meter	Penetrometer
Nuclear Density/Moisture Gauge		Vibrating Table	Bitumen Penetration Kit
Sand Replacement		Measuring Cylinder	
Pressuremeter		Sample Tray	

Mobile Laboratory Layout Plan

