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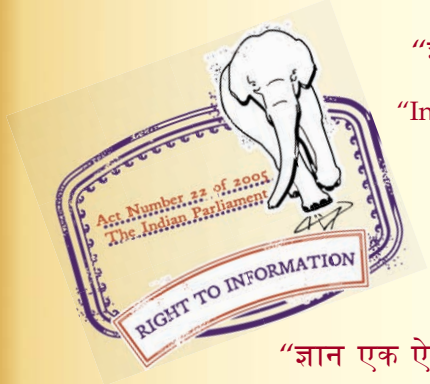

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SPECIFICATION FOR ASPHALT PAVER FINISHER

(Second Reprint MAY 1996)

UDC 625.85.089

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

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(Reaffirmed 1991)

Indian Standard

SPECIFICATION FOR ASPHALT PAVER FINISHER

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Indian Standard

SPECIFICATION FOR ASPHALT PAVER FINISHER

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 19 November 1965, after the draft finalized by the Construction Plant and Machinery Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 Rapid industrialization has created a demand for improved road surfaces. This has necessitated improvements in the techniques of construction of asphalt roads and machinery is playing an ever increasing role in the production and laying in position of high quality asphaltic mixtures. Asphalt paver finishers are commonly used for laying either hot or cold asphaltic base and surfacing mixtures. This standard covering the essential features of asphalt paver finishers has been prepared with the object of providing guidance to the manufacturers and users in obtaining asphalt paving finishers capable of giving satisfactory service.

0.3 In the formulation of this standard due weightage has been given to international co-ordination among the standards and practices prevailing in different countries in addition to relating it to the practices in the field in this country.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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1. SCOPE

1.1 This standard lays down the requirements regarding materials, construction, capacity and performance of asphalt paver finishers.

2. MATERIALS

2.1 Materials used in the construction of asphalt paver finisher and the power unit shall comply with the requirements of relevant Indian Standards.

*Rules for rounding off numerical values (*revised*).

3. CAPACITY

3.1 Paver finishers shall be of the following three basic sizes:

a) Narrow gauge,
b) Light duty, and
c) Heavy duty.

3.2 The narrow gauge paver finisher shall be designed and built to lay a mat of material up to 2·4 m wide and from 12·5 mm to 100 mm thick and shall be provided with a complete set of blanking or other attachments so that the width of the mat may be varied between the maximum width and a minimum working width of 1·4 m in increments of not more than 75 mm.

3.3 The light duty paver finisher shall be designed and built to lay a mat of material up to 3·3 m wide and from 12·5 mm to 100 mm thick and shall be provided with a complete set of blanking or other attachments so that the width of the mat may be varied between the maximum width and a minimum working width of 2·2 m in increments of not more than 75 mm.

3.4 The heavy duty paver finisher shall be designed and built to lay a mat of material up to 4·0 m wide and from 12·5 mm to 200 mm thick and shall be provided with a complete set of blanking or other attachments so that the width of the mat may be varied between the maximum width and a minimum working width of 2·5 m in increments of not more than 75 mm.

4. POWER UNIT

4.1 The paver finisher shall be powered by a petrol or diesel engine equipped with appropriate appurtenances such as an efficient air cleaner, a renewable oil filter, an electric generator for lighting, an auto starter, etc.

4.2 The rating of the engine for continuous duty, by its manufacturer, shall be not less than 25 kilowatts for the narrow gauge and light duty paver finishers and not less than 37 kilowatts for the heavy duty paver finishers.

4.3 The engine shall drive the paver finisher through a suitable clutch and an enclosed variable speed transmission running in oil.

5. MOUNTING

5.1 The paver finisher may be mounted on crawlers or on pneumatic tyres.

5.2 If the paver finisher is mounted on crawlers, they shall be independently operated to furnish full steering control. Crawlers shall be provided with a spring tension track tightener, and all rollers, sprockets, and idlers shall be designed with an adequate means for lubrication. The shoe width of each crawler assembly shall not be less than 75 mm for the narrow gauge paver finisher, 200 mm for the light duty paver finisher and 250 mm for the heavy duty paver finisher. The bearing pressure of the crawler assembly

when the paver finisher is empty shall not be greater than 1 000 g/cm². The bearing pressure of the crawler assembly under loaded condition shall not be greater than 1 200 g/cm² for narrow gauge paver finisher, 1 250 g/cm² for light duty paver finisher and 1 700 g/cm² for heavy duty paver finisher.

5.3 If the paver finisher is mounted on pneumatic tyres, the front wheels shall be fitted with automotive type steering and the main drive wheels shall be controlled through a differential drive. Power operated, independent brakes shall be provided for each side. The recommended tyre pressures shall be clearly indicated on the machine.

6. PUSHING ROLLERS

6.1 The front end of the main frame of the light and heavy duty paver finishers shall be equipped with two rollers properly spaced to contact the rear wheels of the material feeding truck when feeding premixed material into the paver finisher and sufficient traction shall be provided by the crawlers or pneumatic tyres when working on a firm unyielding base to push up a 10 percent grade, a fully loaded truck weighing 6 800 kg in the case of the light duty paver finisher and 11 300 kg in the case of the heavy duty paver finisher.

7. RECEIVING HOPPER AND FEEDING CONVEYOR

7.1 The paver finisher shall be provided with a sheet steel hopper to receive material direct from trucks. The hopper for the narrow gauge and light duty paver finisher shall have a bar type conveyor. Machines with one feeder shall provide means for diverting the material to either side of the receiving area of the screw conveyor. The hopper for the heavy duty paver finisher shall have two bar type conveyors capable of operating independently of each other.

7.1.1 The floor of the hopper shall be constructed of abrasion resistant steel plate having a minimum thickness of 6 mm for the narrow gauge and the light duty paver finisher and 10 mm for the heavy duty paver finisher.

7.1.2 The minimum capacity of the hopper shall be as below:

Narrow gauge paver finisher	2 000 kg
Light duty " "	3 000 kg
Heavy duty " "	8 000 kg

7.1.3 The sides of the hopper of the heavy duty paver finisher shall consist of wings so arranged that each hopper wing can be individually raised or lowered by a hydraulic ram to a position within the paver's overall width for travel or to avoid accumulation of material in the corners of the hopper.

7.2 The conveyor shall move the premixed material to the spreading screws, the volume of material moved being controlled by means of adjustable gates.

8. SPREADING SCREWS

8.1 The paver finisher shall be provided with two spreading screws capable of evenly distributing the material delivered by the bar type conveyor over the whole or either half of the width of the area to be surfaced. One screw shall have a right-hand thread and the other a left-hand thread, each moving material from the centre to the sides. The screws shall be visible to the operator.

8.2 The screw conveyor shall be made of an abrasion resistant material or shall be hard surface welded on all wearing surfaces and shall have a minimum diameter of 250 mm for narrow gauge paver finisher, 275 mm for light duty paver finisher and 300 mm for heavy duty paver finisher.

9. COMPACTION

9.1 The paver finisher shall be equipped with a device for obtaining preliminary compaction of the mat laid. Compaction may be effected either by means of a tamping device ahead of the screed or by vibration applied to the screed.

9.2 Tamper — If compaction is obtained by means of a tamper, the tamper shall operate at the rate of not less than 1 000 strokes per minute. The wearing parts of the tamper shall be of manganese steel or equally wear-resisting alloy steel and shall be renewable and adjustable to the optimum projection below the screed. The tamping action shall not be preceded by any strike off action and the tamper shall leave the material in proper condition for smoothing and finishing by the screed.

9.2.1 The tamper may be operated mechanically, electrically or hydraulically.

9.3 Vibrating Screed — If compaction is obtained by means of a vibrating screed, the intensity of vibration shall be capable of being controlled through a range having a maximum value of at least 3 000 vibrations per minute so that the optimum intensity in relation to mat thickness, density, working speed and material specification may be employed.

10. SCREED

10.1 The paver finisher shall be equipped with a fully floating, heated screed. The screed shall slide over the compacted mat and smooth it out in preparation for rolling and shall be adjustable to give a crown to the compacted mat.

10.2 The screed shall be equipped with a satisfactory heating system which will enable the screed to be uniformly heated before and during the operation of the paver finisher.

10.3 The screed shall be constructed from abrasion resisting steel and the wearing parts shall be renewable.

10.4 The screed and the tamper, if employed, shall be so carried and drawn over the material that it will maintain a predetermined average thickness which will not be affected by sudden or minor changes in the level of the base on which the material is being applied.

10.5 Means shall be provided for raising the screed and the tamper if employed, by a power operated hydraulic hoist or similar device to a travelling position clear of the road surface. Locks or safety chains shall be provided for holding the screed in the raised position while the paver finisher is being moved from one working point to another.

11. OPERATING SPEEDS

11.1 Narrow gauge and light duty paver finishers shall have, not less than four operating speeds from approximately 2 to 13·5 m/min with a reverse speed of not less than 50 m/min.

11.2 Heavy duty paver finisher shall have, not less than seven operating speeds from approximately 2 to 23 m/min, with a reverse speed or speeds of not less than 75 m/min.

12. CONSTRUCTION

12.1 The drives from the engine to the crawlers or driving wheels, hopper conveyor, screw spreaders, etc, shall be of first quality design in accordance with best engineering practice. Gears and sprockets shall be machine cut and properly hardened. Clutches and brakes shall be of simple design, of ample capacity and shall be accessible for quick adjustment.

12.2 The heavy duty paver finisher shall be provided with a complete set of controls on each side of the machine so that alternative driving positions are available.

12.3 Workmanship — All parts, components, and assemblies of the paver finisher including castings, forgings, moulded parts, stampings, bearings, seals, machined surfaces, and welded parts shall be clean and free from sand, dirt, fins, pits, sprues, scale, flux, and other harmful extraneous material. All exposed edges shall be rounded or beveled.

13. METHOD OF TRANSPORTING

13.1 Narrow gauge and light duty crawler mounted paver finisher shall be equipped with two retracting pneumatic tyred wheels to permit converting the paver finisher to a two wheel trailer for quick movement from one location to another. A front mounted tow bar shall be provided for convenient attachment to a towing truck.

13.2 In the case of paver finishers mounted on pneumatic tyres which have travelling speeds of less than 16 km/h, means shall be provided for disengaging the drive from the engine to the road wheels so that the paver finisher

may be towed at a moderate speed. A front mounted tow bar shall be provided for convenient attachment to a towing truck.

14. PERFORMANCE

14.1 The paver finisher shall lay, compact, and finish a mat of asphaltic material of thicknesses and widths as specified in **3.2** to **3.4**. As a specific performance test, the paver shall be tested to lay at its maximum extended width, a mat of asphaltic concrete approximately 200 m long and 25 mm thick on a base having no depression greater than 10 mm when tested under a straight edge 3 m long placed parallel to the centre line of the carriage way. The material for the test mat shall be asphaltic concrete containing well graded aggregate with 100 percent passing a 10-mm IS Sieve (square) and a bitumen content such that the compacted sample shall contain approximately 3 percent of air voids. The mat shall be free from tearing and dragging and the surface shall be smooth both laterally and longitudinally. The resultant surface tested with a straight edge 3 m long placed parallel to the centre line of the carriage way shall have no depression greater than 5 mm on the surface.

15. MAINTENANCE ACCESSIBILITY

15.1 Ease of Maintenance — All major assemblies and installed attachments shall be accessible for maintenance, repair, and replacement without the removal of other major assemblies and installed attachments. Covers and plates which must be removed for component adjustment, replacement, and maintenance shall be equipped with quick-disconnect fasteners.

16. LUBRICATION

16.1 Means for lubrication shall be provided for all bearings, power transmitting gears, sprockets, chains and all other moving parts requiring lubrication. Plain bearings or their shafts shall have oil or grease grooves. All lubricating nipples shall be of similar type and shall be readily accessible. Where access for lubrication is difficult, bearings shall be such that lubrication is required as infrequently as possible or facilities for lubrication from a remote position shall be provided. A lubrication chart indicating the points to be lubricated shall be permanently affixed in a conspicuous place on the machine describing the type of lubricant, the internal of greasing and the amount to be used. Chains shall be enclosed and provided with oil bath or drip feed lubrication.

16.2 Automatic pressure release devices shall be provided where pressure lubricating equipment will damage grease seals or other parts.

17. SAFETY REQUIREMENTS

17.1 All exposed parts which are subject to high operating temperatures or which are energized electrically shall be insulated, fully enclosed, or guarded. All moving parts which are of such nature or so located as to be

a hazard to operating or maintenance personnel shall be fully enclosed or guarded. Protective devices shall not impair the operating functions.

17.2 Effective precautions shall be taken to minimize fire hazard.

18. FINISHING

18.1 All exposed parts of the paver finisher shall be cleaned, treated and painted with suitable anti-corrosive protective paint conforming to the relevant Indian Standards. Electrical equipment, power units and parts subjected to high temperature shall be painted with special paint suited for the purpose.

19. MAINTENANCE TOOLS AND ACCESSORIES

19.1 A strong tool box with lock and key and containing necessary tools and accessories for normal maintenance, adjustment and lubrication of the paver finisher together with instructions and inventory of tools and accessories shall be provided. Provisions shall be made for suitably affixing the tool box on the paver finisher.

20. MARKING

20.1 Instruction Plates — The paver finisher shall be equipped with instruction plates including warnings and cautions, suitably located, describing any special or important procedure to be followed in operating and servicing the machine.

20.2 Marking Plate — The paver finisher shall have an identification plate permanently affixed to it with the following particulars conspicuously marked on it:

a) Manufacturer's name or trade-mark,
b) Manufacturer's reference number,
c) Capacity (*see* **3**),
d) Type and rating of power unit, and
e) Year of manufacture.

20.2.1 The paver finisher may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act, and the Rules and Regulations made thereunder. Presence of this mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard, under a well-defined system of inspection, testing and quality control during production. This system, which is devised and supervised by ISI and operated by the producer, has the further safeguard that the products as actually marketed are continuously checked by ISI for conformity to the standard. Details of conditions, under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

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