

1999 NOVA AWARD WINNER**AMIR - Asphalt Multi-Integrated Roller For Asphalt Pavement Compaction**

The Asphalt Multi-Integrated Roller (AMIR) is a new compactor designed to compact asphalt paving mixes in the field. Its design is based on a theory that explains the phenomenon of construction induced cracks in asphalt pavements. It applies its compaction energy to the asphalt mix in a way that differs from existing vibratory, pneumatic, or static steel rollers. It was observed that conventional compacting equipment, such as steel vibratory rollers, while capable of achieving a specific density, induced cracks during pavement construction. These cracks are often visually apparent and are due to a mismatch between the geometry and relative rigidity of the roller and the asphalt mix. This observation led to the design and construction of the new compactor. Its design replaces the cylindrical stiff shape of the roller with a moving flat, soft plate and results in a crack-free asphalt layer and a more uniform compaction along and across the mat. It achieves the same, if not better, density with fewer passes than needed by conventional rollers. The AMIR compactor was originated in Ottawa, Canada, and since 1987, a number of integrated field trials and laboratory experiments have been carried out. Comparative test results have been performed on asphalt specimens from conventional and AMIR compacted sections. These results show quite significant improvements in density, tensile strength, fatigue life and resistance to moisture damage. AMIR has been used in Australia, Canada, Egypt, and Sweden.

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