CIMA

construction industry
cold planer/milling machine handbook

with standardized terms and definitions

Developed by the Bituminous and Aggregate Equipment Bureau (BAEB) and Compaction and Paving Machinery Technical Committee (CPMTC) of the Construction Industry Manufacturers Association (CIMA)

111 East Wisconsin Avenue, Milwaukee, Wisconsin 53202

and in cooperation with the Committee for European Construction Equipment (CEOE)
Acknowledgement

The CIMA Construction Industry Cold Planer/Milling Machine Handbook (With Standardized Terms and Definitions) was developed by CIMA’s Bituminous and Aggregate Equipment Bureau (BAEB) and Compaction and Paving Machinery Technical Committee (CPMTC) and in cooperation with the Committee for European Construction Equipment (CECE). Contributions to this Handbook made by: Caterpillar Inc., Cedarapids Inc., CMI Corporation, Construction Industry Manufacturers Association (CIMA), GOMACO Corporation, Ingersoll-Rand Company, Komatsu Dresser Company, Roadtec Inc., and Wirtgen.

A Word About CIMA...

CIMA-the Construction Industry Manufacturers Association-was founded in 1911, and for more than 75 years has served as the U.S.-based international trade group representing manufacturers of construction machines, equipment and components used worldwide in the general construction, housing, roadbuilding, materials-handling, energy and forestry fields. Membership also includes construction industry publications as well as providers of financial and other services to the construction industry.

CIMA acts as a forum for its member companies to discuss and act upon issues of industry-wide concern, including export and trade activity, statistical marketing data, parts and service information, advertising and communications, technical and standards issues, product safety and product liability, training, government regulations and legislation, and the special concerns of the smaller and medium-sized manufacturer.

CIMA is also the sponsor and producer of the CONEXPO® International Construction Equipment Exposition. Held once every six years, the show is one of the world’s largest trade exhibitions and is considered a showcase of the latest in construction equipment design and technology.

CIMA
111 East Wisconsin Ave.
Milwaukee, WI 53202
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purpose

1. To reaffirm, promote and establish uniform recognized and accepted terminology for the guidance of manufacturers, distributors, buyers and users in comparing, specifying and presenting data relative to cold planers/milling machines;

2. To serve as a basis for common language and understanding between manufacturers, distributors, buyers and users in determining the basic types, features, operating characteristics and applications of cold planers/milling machines;

3. To provide means for the identification of common types of cold planers/milling machines;

4. To increase the knowledge of individuals involved with cold planing/milling, and to enhance their ability to communicate and carry out their responsibilities efficiently and effectively;

5. To provide useful text and reference material for code-writing agencies, regulatory agencies, engineers, marketing personnel, contractors, equipment operators, schools, students and others interested in, or involved with, the field of cold planing/milling.
INTRODUCTION

ACKNOWLEDGEMENT

This Handbook was developed by the Bituminous and Aggregate Equipment Bureau’s Cold Planer Committee, with the support of the Compaction and Paving Machinery Technical Committee - product oriented groups of the Construction Industry Manufacturers Association (CIMA). It represents the cooperative efforts and contributions of technical and marketing experts from companies which manufacture a broad range of equipment, including cold planers/milling machines, for the bituminous and aggregate processing industry.

In addition, the Committee for European Construction Equipment (CECE), Section I (Road Equipment) members, participated in the development of this document.

A WORD ABOUT CIMA

CIMA is the 75-plus-year-old U.S.-based international trade group representing manufacturers of construction machines, equipment and components used worldwide in the general construction, housing, roadbuilding, materials-handling, energy and forestry fields. Membership also includes construction industry publications and providers of financial and other services to the construction industry.

A WORD ABOUT CECE

The Committee for European Construction Equipment (CECE) was founded in 1959 by the National Associations representing manufacturers of construction equipment in Europe. At present, the CECE comprises the National Associations in the following countries: Belgium, Finland, France, Italy, Netherlands, Spain, Sweden, United Kingdom, and Germany.

SCOPE

This Handbook is intended to provide and promote standardized terminology pertaining to cold planers/milling machines and their operations, standardized parameters for designating the specifications, characteristics, and other information of general interest to those associated with, or interested in their operation.

This Handbook is not intended to establish machine requirements nor to promote the acceptance or use of any specific type of cold planer/milling machine. It is likewise not intended to be an exhaustive treatise on the subject.

Excluded from coverage in this Handbook are safety related matters which are addressed in manufacturers’ manuals. These are also addressed in CIMA’s “Cold Planer (Milling Machine) Safety Manual”.

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machine examples

The following are examples of some of the cold planer/milling machine configurations available. This is not intended to be inclusive of all model configurations.
mach ne examp le

WITH OR WITHOUT CONVEYOR
machine specifications

Operating Weight (pounds, kilograms)
Shipping Weight (pounds, kilograms)
Overall Width (inches, millimeters)
Overall Height (inches, millimeters)
Overall Length (inches, millimeters)
Cutter Drum Width (inches, millimeters) (minimum, maximum)
Cutter Drum Diameter (with working tools) (inches, millimeters)
Wheel/Track Base (inches, millimeters)
Type of Engine (gasoline, diesel, etc.)
Intermittent Power (at installed full load governed speed) (horsepower, kilowatts @ RPM)
Operating Speed (feet per minute, meters per minute)
Travel Speed (miles per hour, kilometers per hour)
Fuel Capacity (gallons, liters)
Water Spray System Capacity (gallons, liters)
Discharge Conveyor (if applicable, type)
Grade and Slope Control (if applicable, manual/automatic)
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<tr>
<td>ADDITIVE KIT</td>
<td>Usually refers to a system which allows controlled dispersement of a liquid additive.</td>
</tr>
<tr>
<td>ASPHALT CUTTINGS</td>
<td>An expression referring to material produced by cold planing/milling operations.</td>
</tr>
<tr>
<td>ASPHALT PAVEMENT RECLAIMING</td>
<td>To bring into a condition for renovation or other use by recovering existing asphaltic pavement.</td>
</tr>
<tr>
<td>ASPHALT PAVEMENT REMOVAL</td>
<td>Removal of all of an existing asphalt mat.</td>
</tr>
<tr>
<td>AVERAGING SKI (OR LEVELING SKI)</td>
<td>An integral part of the automation system utilized to average a planing pass to a consistent profile.</td>
</tr>
<tr>
<td>BUTT CUT</td>
<td>Usually a sloping cut made in existing pavement by a cold planer/milling machine. These cuts can be made parallel or perpendicular to a roadway. (Also known as Conform, Taper, or Header Cut. Header Cut is the preferred term.)</td>
</tr>
<tr>
<td>COLD PLANING/MILLING</td>
<td>The process in which a rotating drum, equipped with special working tools, cuts the pavement to a predetermined depth and reduces it in size in the process.</td>
</tr>
<tr>
<td>COLD PLANER/MILLING MACHINE</td>
<td>A self-propelled construction machine (either rubber-tired or crawler mounted) specifically designed to cut a pavement to a predetermined depth, grade or slope, and which reduces the pavement material in size in the process, using a rotating drum equipped with special cutting tools.</td>
</tr>
<tr>
<td>CONCRETE PAVEMENT RECLAIMING</td>
<td>To bring into a condition for renovation or other use by recovering existing concrete pavement.</td>
</tr>
<tr>
<td>CONFORM CUT</td>
<td>Usually a sloping cut made in existing pavement by a cold planer/milling machine. These cuts can be made parallel or perpendicular to a roadway. (Also known as Butt, Taper, or Header Cut. Header Cut is the preferred term.)</td>
</tr>
<tr>
<td>CONVEYOR SWING ANGLE</td>
<td>Measurement in degrees conveyor will swing left and/or right of the machine center line.</td>
</tr>
<tr>
<td>CURB REVEAL</td>
<td>The result of a cutting pass alongside a curb which lowers the surface of the existing pavement in relation to the curb.</td>
</tr>
<tr>
<td>CUTTER DRUM</td>
<td>A rotating cylinder to which working tools are attached and which performs the planing/milling action.</td>
</tr>
<tr>
<td>CUTTER DRUM DRIVE</td>
<td>The system through which power is transmitted to the cutter drum.</td>
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# Glossary of Terms

<table>
<thead>
<tr>
<th>Term</th>
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<tr>
<td>Depth of Cut</td>
<td>The measurement of a cut from the pavement surface to the bottom of the cut.</td>
</tr>
<tr>
<td>Discharge Conveyor</td>
<td>The conveyor which transports and deposits material away from the machine.</td>
</tr>
<tr>
<td>Down-Cutting/Up-Cutting</td>
<td>The direction of cutter drum rotation in relation to the direction of travel and the pavement surface.</td>
</tr>
<tr>
<td>Flighting</td>
<td>The assembly attached to the cutter drum shell to which the working tool(s)/holders are attached.</td>
</tr>
<tr>
<td>Grade and Slope Control</td>
<td>The automation system which controls a machine for longitudinal grade and transverse slope to a consistent profile during a planing/milling pass.</td>
</tr>
<tr>
<td>Grade Sensor</td>
<td>The portion of the automation system which controls grade.</td>
</tr>
<tr>
<td>Header Cut</td>
<td>Usually a sloping cut made in existing pavement by a planing/milling machine. These cuts can be made parallel or perpendicular to a roadway. (Also referred to as Conform, Taper or Butt Cut.)</td>
</tr>
<tr>
<td>In-Place Recycling/In Situ Reprocessing</td>
<td>In-place recycling is a road reconstruction technique that reprocesses the existing pavement structure including, in some cases, the underlying untreated base material.</td>
</tr>
<tr>
<td>Lacing</td>
<td>The location of the working tools on the cutter drum.</td>
</tr>
<tr>
<td>Matching Shoe (or Grade Shoe)</td>
<td>An integral part of the automation system utilized to match a planing/milling pass to an existing profile.</td>
</tr>
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</table>
# Glossary of Terms

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<tr>
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<tr>
<td><strong>MOLDBOARD</strong></td>
<td>A scraper that rides on or near the planed/milled surface and confines material.</td>
</tr>
<tr>
<td><strong>NULL</strong></td>
<td>Zero set on an automatic sensing mechanism.</td>
</tr>
<tr>
<td><strong>OPERATING SPEED RANGE</strong></td>
<td>The speed range of the machine while cold planing/milling.</td>
</tr>
<tr>
<td><strong>OPERATING WEIGHT</strong></td>
<td>The gross machine weight with full mechanical operating systems, plus a tank of fuel; plus a half tank of water, if so equipped; plus a 175 pound (80 kg.) operator.</td>
</tr>
<tr>
<td><strong>PASS</strong></td>
<td>A one-way working trip or passage of the machine. A round trip in the same path is two passes.</td>
</tr>
<tr>
<td><strong>PAVEMENT PROFILING</strong></td>
<td>A technique of cold planing/milling a pavement to prepare or modify the riding surface.</td>
</tr>
<tr>
<td><strong>PAVEMENT TEXTURIZING</strong></td>
<td>A technique of cold planing/milling a pavement to improve skid resistance.</td>
</tr>
<tr>
<td><strong>PICK, CUTTER, BIT, TOOTH, CUTTING TOOL</strong></td>
<td>The pavement engaging tool held by a working tool holder attached to the cutter drum which performs the action of pavement planing/milling. (Working tool is the preferred term).</td>
</tr>
<tr>
<td><strong>PRIMARY CONVEYOR</strong></td>
<td>The conveyor which transports materials to the discharge conveyor.</td>
</tr>
<tr>
<td><strong>RAM</strong></td>
<td>Reclaimed Aggregate Material.</td>
</tr>
<tr>
<td><strong>RAP</strong></td>
<td>Reclaimed Asphaltic Pavement.</td>
</tr>
<tr>
<td><strong>REMOVABLE FLIGHTING</strong></td>
<td>Flighting that is attached to the cutter drum other than by welding.</td>
</tr>
<tr>
<td><strong>SHIPPING WEIGHT</strong></td>
<td>The gross machine weight with full mechanical operating systems.</td>
</tr>
<tr>
<td><strong>SIDE CUTTERS</strong></td>
<td>A portion of the working tools on the cutter drum that cuts the perpendicular joint.</td>
</tr>
<tr>
<td><strong>SINGLE PIECE CONVEYOR</strong></td>
<td>A one-piece conveyor which transports and deposits material away from the machine.</td>
</tr>
<tr>
<td><strong>SLOPE SENSOR</strong></td>
<td>The portion of the automation system which controls cross slope.</td>
</tr>
<tr>
<td><strong>TAPER CUT</strong></td>
<td>Usually a sloping cut made in existing pavement by a cold planer/milling machine. These cuts can be made parallel or perpendicular to a roadway. (Also known as Conform, Butt, or Header Cut. Header Cut is the preferred term).</td>
</tr>
<tr>
<td><strong>TOOTH ROTATION</strong></td>
<td>The free rotation of the working tool in the working tool holder.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
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</tr>
<tr>
<td>TRAVEL SPEED RANGE</td>
<td>The speed range available for roading the machine.</td>
</tr>
<tr>
<td>UP-CUTTING</td>
<td>The direction of cutter drum rotation in relation to the direction of travel and the pavement surface. (See Down-Cutting for diagram).</td>
</tr>
<tr>
<td>WORKING TOOL</td>
<td>The pavement engaging tool held by a working tool holder attached to the cutter drum which performs the action of pavement planing/milling. (Also known as pick, cutter, bit, tooth, cutting tool).</td>
</tr>
<tr>
<td>WORKING TOOL HOLDER</td>
<td>The device that retains and supports the working tool.</td>
</tr>
</tbody>
</table>