

Innovative laboratory equipment.

Preliminary testing to determine the mix quality.



More control.

Improved quality.





THE LABORATORY FOAMED BITUMEN PLANT PERFORMS A SERIES OF PRECISE MEASUREMENTS TO DETERMINE THE OPTIMUM FOAMED BITUMEN PROPERTIES.

THE DIFFERENT PARAMETERS CAN BE VARIED QUITE EASILY DURING THE PROCESS.

THE MOST SUITABLE COMPOSITION OF THE RECYCLING MIX IS DETERMINED QUICKLY IN COMBINATION WITH THE LABORATORY MIXER.

THE MIX CAN THEN BE USED TO MANUFACTURE TEST SPECIMENS USING THE LABORATORY COMPACTOR.

THE HIGH-QUALITY MACHINES ARE PERFECTLY TAILORED FOR USE IN COLD RECYCLING AND COMPLY WITH THE HIGH QUALITY STANDARDS SET BY TESTING LABORATORIES.

Outstanding features of WLB 10 S, WLM 30 and WLV 1

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05



WIRTGEN WLM 30
laboratory mixer

51

EFFICIENT MANUFACTURE OF TEST SPECIMENS

- > **Extremely simple, tried-and-tested process**
Compactor including vibrating hammer for the manufacture of test specimens.
- > **Defined impact energy**
Powerful vibrating hammer with heavy-duty tamping foot.
- > **Optimum compaction**
Effortless monitoring of the path-controlled and time-controlled compaction process.
- > **Standardized process**
Tried-and-tested method in the industry.

WIRTGEN WLV 1
laboratory compactor

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PERFECT MIXES

- > **High mixing intensity**
Powerful twin-shaft compulsory mixer with mixing blades manufactured from highly wear-resistant material for optimum, real-life mixing results.
- > **Variable speed settings**
Continuously adjustable mixing speed and separately adjustable mixing time.
- > **Broader range of applications**
The laboratory mixer can be used independently to produce a wide range of different mix compositions.
- > **Perfectly matched machinery**
Laboratory mixer and foamed bitumen plant can be connected quite easily to allow direct discharge of the bitumen foam into the mixer.

3 |

PRODUCING FOAMED BITUMEN OF HIGH QUALITY

- > **High-quality bitumen injection nozzle**
Special, high-precision bitumen injection nozzle with expansion chamber to ensure optimum bitumen foaming behaviour.
- > **Fully heated bitumen system**
All components transporting bitumen are heated to ensure reliable sample production.
- > **Highest metering accuracy**
Calibrated bitumen flow and precise process water settings to determine the optimum foamed bitumen quality.

WIRTGEN WLB 10 S laboratory foamed bitumen plant



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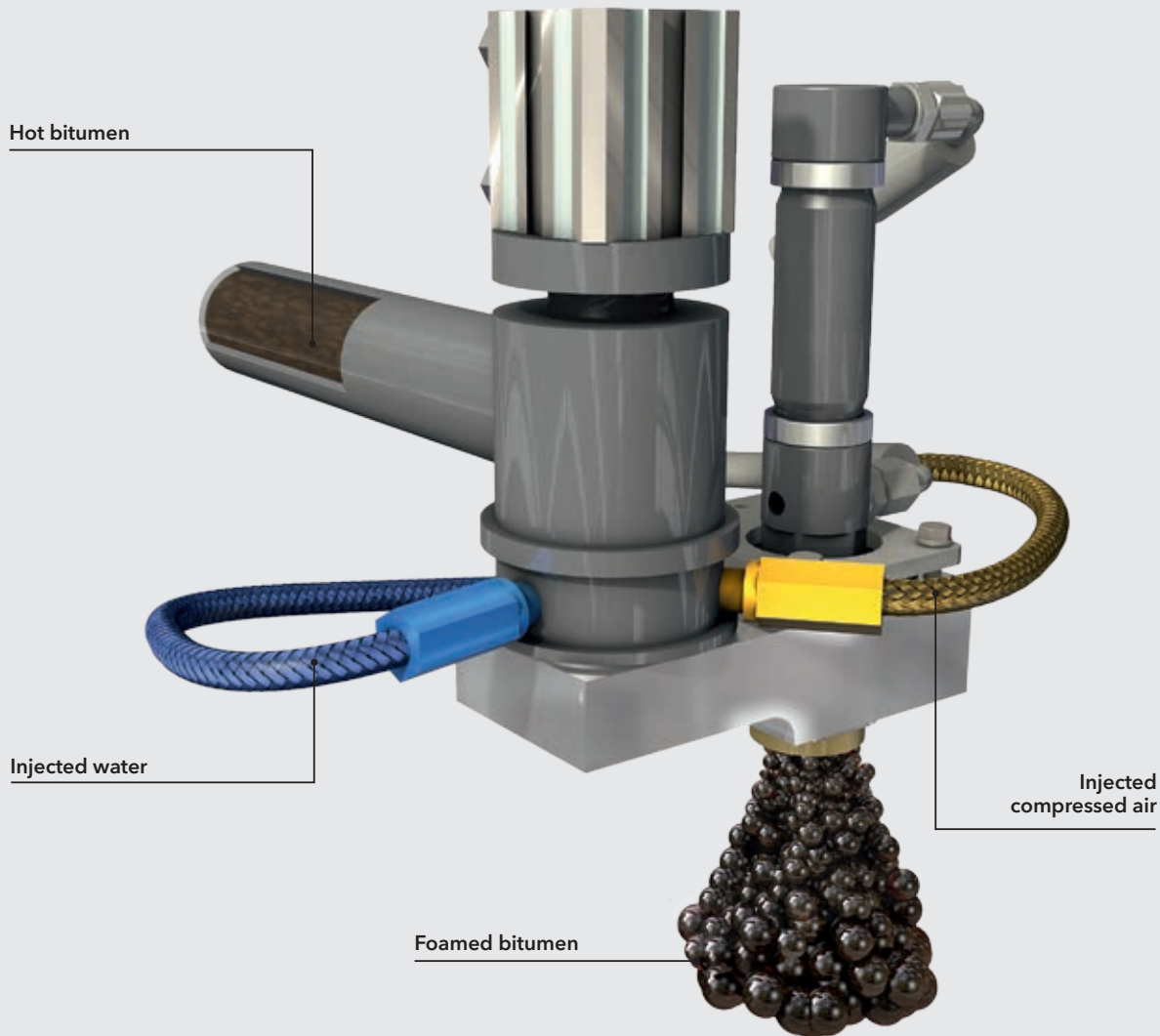
MOBILE DESIGN

- > **Mobile concept**
The foamed bitumen plant and laboratory mixer are mounted on wheels to allow easy repositioning.
- > **Compact machine dimensions**
Compact machines to allow flexible handling in the laboratory.
- > **Integrated air compressor**
Optional air compressor to allow operation without an external compressed air supply.

2 |

SIMPLE, INTUITIVE OPERATING CONCEPT

- > **Ergonomic design**
Ergonomically designed controls for intuitive operation.
- > **Clarity**
Clearly and logically structured control panels for straightforward, intuitive operation.
- > **Simple variation of parameters WLB 10 S**
Quick and highly precise variation of parameters to produce the best foamed bitumen quality within a short period of time.



The foamed bitumen injected via the nozzle at the expansion chamber is suitable for direct mixing with the mineral aggregate mixture.

What is foamed bitumen?

FOAMED BITUMEN FOR HIGH-QUALITY BASE LAYERS

Foamed bitumen is produced from standard grade bitumen used in asphalt road construction. When heated and foamed, bitumen permits the economical production of high-quality base layers. Foamed bitumen is produced by injecting small quantities of water and compressed air into hot bitumen. The water evaporates, causing the bitumen to foam abruptly and expand to around 15 to 20 times its original volume. The quality of foamed bitumen is primarily described in

terms of its expansion ratio and half-life. The larger its expansion and the higher its half-life, the better suited to processing the foamed bitumen will be.

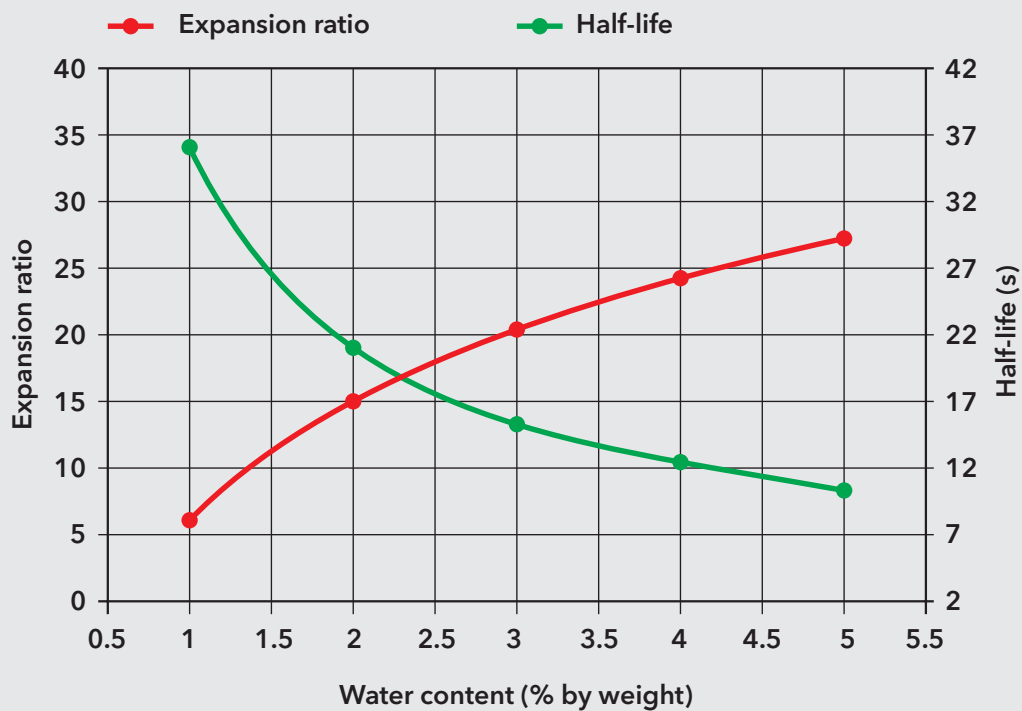
Compared to other binders, foamed bitumen offers the advantage of reduced transport and material costs. Bitumen used for the production of foamed bitumen is readily available in all parts of the world.



1 + 2 | Foaming takes place in expansion chambers where water and air are injected into hot bitumen (160°C to 180°C) at a pressure of approx. 5 bar.

3 | Development of half-life and expansion ratio to determine the water content.

3 |





11

1 | *The compact plant ensures ergonomically optimized handling and ease of operation.*

WLB 10 S determines the optimum bitumen foam

SIMULATING THE COLD RECYCLING PROCESS IN THE LABORATORY

Foamed bitumen is used to an ever-increasing extent as an economical binder in cold recycling. Preliminary testing with the mobile WLB 10 S laboratory plant enables the foamed bitumen quality to be precisely defined in the laboratory prior to the start of construction. Exceptional ease of operation enables parameters such as water amount, pressure and temperature to be varied quickly and different types of foamed bitumen to be produced within a short time. Based on the results

achieved, the WLM 30 laboratory mixer can then be used to determine the composition of the recycling mix.

The plant offers ease of operation and maintenance, as well as a compact, mobile design. It can also be used to test the suitability of mixes with added cement or lime in combination with foamed bitumen.



2 | The clearly and logically structured control panel permits easy setting and monitoring of important parameters.



3 | Electric control: the plant offers maximum accuracy as it enables calibration of the bitumen flow.

4 | Precise process water settings enable determination of the ideal foamed bitumen quality.



Powerful twin-shaft compulsory mixer on a laboratory scale

MIXES EVERY BIT AS HOMOGENEOUS AS ON THE CONSTRUCTION SITE

The powerful mixer with heavy-duty mixing blades produces a wide variety of cold mixes.

Direct injection of the foamed bitumen into the mixing chamber of the WLM 30 laboratory mixer enables mixes to be processed under real-life conditions and test specimens to

be manufactured. In addition, the twin-shaft compulsory mixer is perfectly matched to the laboratory plant in terms of design and performance.

The high mixing intensity corresponds to that of continuous mixers used on the construction site. The WLM 30 has a filling capacity of approx. 30 kg and offers variable settings for speed and mixing time. The mixing chamber is simply pivoted downwards about 180° and the cover opened to allow discharge of the mix. And what's more: when used separately, the WLM 30 is suitable for the production of a wide variety of mix compositions.



WLV 1 laboratory compactor for specimen manufacture

THE IDEAL CHOICE FOR BITUMEN-STABILIZED MATERIAL

The WLV 1 is used for the manufacture of test specimens from bitumen-stabilized material. It is equipped with a powerful vibrating hammer and heavy-duty tamping foot. The efficient path-controlled and time-controlled compaction process is documented via a colour screen. Intuitive operation enables easy adjustment of the specimen height, number of layers and maximum time of compaction.

Compacting multiple layers of equal thickness in a series of specimens achieves consistent compaction results. A standard procedure for the manufacture of test specimens using the WLV 1 has already proven its worth in the industry.

1+2 | Clearly structured operating concept and simple variation of parameters.





1+2 | Specimens of different height are manufactured depending on the testing method.

Efficient manufacture of test specimens

RELIABLE COMPACTION PROCESS

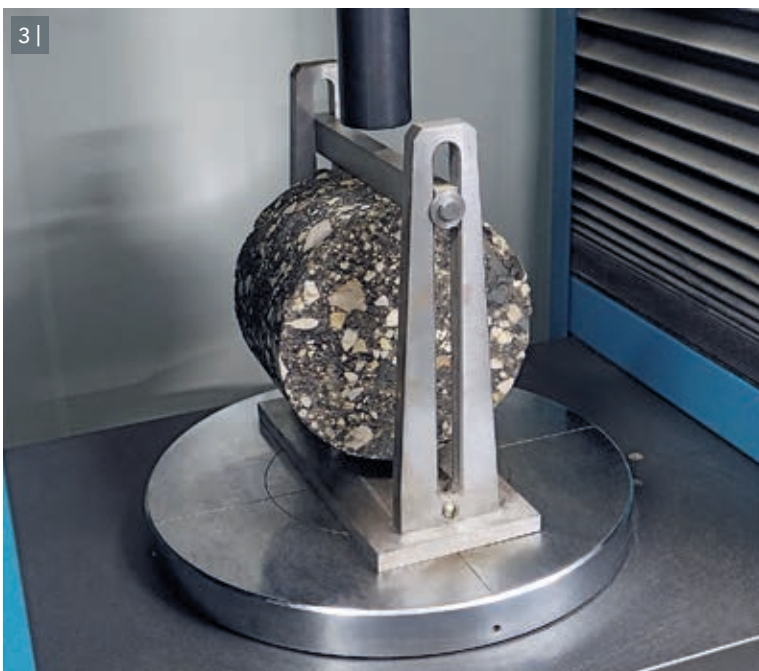
The WLV 1 laboratory compactor offers an ideal solution for the manufacture of specimens from bitumen-stabilized material (BSM).

The core element of the WLV 1 laboratory compactor, a height-adjustable vibrating

hammer, is mounted at a vertical column. The vibrating hammer uses a heavy-duty tamping foot to transfer a precisely defined amount of impact energy on the material filled into a cylindrical mould in multiple layers. In the process, a surface roughener is used to ensure a firm bond with the next, upper layer.

Following completion of each compaction process, the vibrating hammer returns to its initial position automatically. This feature substantially increases productivity in the manufacture of test specimens.

3 | Quality check by performing the indirect tensile strength test.





PERFECT SPECIMENS FOR DIFFERENT TESTING METHODS

Once the specified final height of the specimen has been achieved, the specimen can simply be removed from the mould by means of a quick-release fastener and then prepared for the testing method to be applied.

Specimens of 152 mm in diameter and 95 mm in height can be produced to determine the indirect tensile strength (ITS).

Large specimens of 152 mm in diameter and 300 mm in height are produced for use in triaxial testing.


4+5 | Even large specimens can be manufactured quite easily.

6+7 | WIRTGEN also supplies triaxial testing equipment.




Technical specification


WLB 10 S LABORATORY FOAMED BITUMEN PLANT

	Dimensions (L x W x H)	1,450 x 685 x 1,345 mm
	Bitumen pump	electrically heated gear pump
	Bitumen temperature	140-200 °C
	Water content	0-5 % of bitumen
	Air pressure	0-10 bar
	Electrical system	suitable for different mains power systems
	Own weight	270 kg

WLM 30 LABORATORY MIXER

	Dimensions (L x W x H)	1,085 x 770 x 960 mm
	Mixing capacity	30 kg
	Mixer type	twin-shaft compulsory mixer
	Mixer speed	0-144 rpm
	Drive	electric motor
	Electrical system	suitable for different mains power systems
	Own weight	220 kg

WLV 1 LABORATORY COMPACTOR

	Dimensions (L x W x H)	720 x 600 x 1,950 mm
	Impact energy, max.	23 J
	Cylindrical mould, small (Ø x H)	152 x 150 mm
	Cylindrical mould, large (Ø x H)	152 x 320 mm
	Electrical system	1.8 kW suitable for different mains power systems
	Own weight	170 kg





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