HOFMANN

ROAD MARKING SYSTEMS

HOFMANN. Benchmark for Quality | Innovation | Product Variety | Services | Consulting

2024/25

Index

”

Research and development are the lifeblood of our company and have a significant impact on road markings around the world. We offer state-of-the-art technology and the comprehensive expertise that you need for your project.

Jan Hofmann, Managing Director

About us

Since 1952 HOFMANN have been supplying roadmarking equipment and gained international recognition as a qualified partner in all aspects of roadmarking technology.

The range of products encompasses everything the heart desires for roadmarking: From small, hand-controlled machines and self-propelled, ride-on machines to roadmarking trucks in various sizes, drying and line remover machines, and also melting machineries of thermoplastic materials.

Various application systems are available for paints, sprayable and extrudable 2-component cold plastics, as well as for sprayable and extrudable thermoplastic materials.Depending on the type of marking material, they are also available for low-pressure (atomising air method/Airspray) or Airless high-pressure marking.

Benefits are experienced in:

- MultiDotLine®-/ MultiDotLine®Plus Extruder for defined agglomerate-, profiled and plain markings
- Spotflex®-system for defined agglomerate, profiled and structure markings
- Metering pumps designed to operate path-dependently (CONEX®), thus maintaining the set volume of material per metre line length irrespective of any changes in travel speed (AMAKOS®)
- HofConnect®, a platform to establish a connection via web or smartphone app to a mobile construction machine. The retrieval of telemetry, status data of the machine are possible (management of machines in the cloud)

Further details about our company are available at "Wikipedia - HOFMANN GmbH"

Application Techniques


Cold Paints


2-component cold plastics


Sprayable 2-componentcold plastics


Thermoplastics


Sprayable Thermoplastics

Trademarks

- AMAKOS®
- CONEX®
- Spotflex®
- MultiDotLine®
- HofConnect®

are registered trademarks of company HOFMANN GmbH

- ViziSpot®
- LongDot®
- ThermLite®

are registered trademarks of company
Geveko Markings Denmark A/S

- Graco®

is a registered trademark of company Graco Inc.

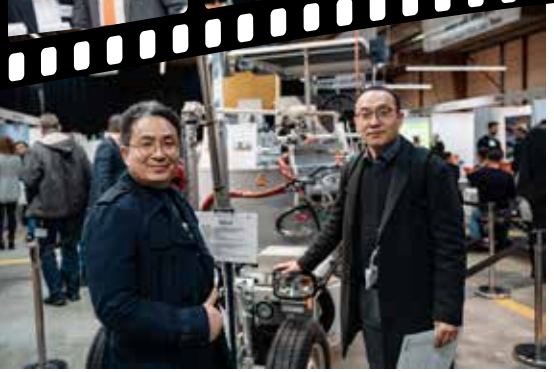
This leaflet serves to deliver a general idea of our range of products. For further and detailed information please refer to our special leaflets and technical HOFMANN information, partly available on our website for downloading.

All dimensions and characteristics may vary depending on equipment of machine; stated volume data are gross values.

Subject to technical / equipment changes and errors!

Deliveries exclusively subject to our terms of sale and delivery.

15. edition • October 2023




HOFMANN

HOFMANN Expo
Where the world meets

Since 2001, HOFMANN has been providing a platform for dialogue between marking companies, material manufacturers, authorities, ministries, research, and education through its annual Technology Day.

This event is organized each year by HOFMANN and is considered the largest of its kind worldwide, bringing together the 'Who is Who' in the field of road marking technology.

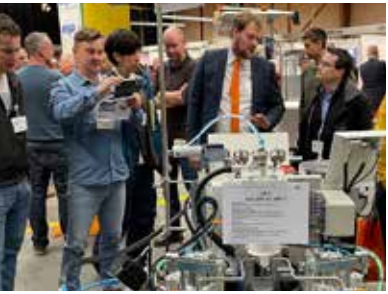
HOFMANN's goal is to impress its esteemed audience with exciting technical presentations. To enable all international experts to take advantage of the interesting offerings, the presentations are simultaneously translated into German, English, Spanish, French, and Russian.

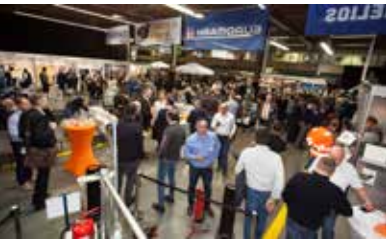
Five continents amidst discussions concerning technology and progress, technical lectures about road marking developments, the latest machine technology, sophisticated technologies, highly-developed operating controls and more are what make the annual TechnologyDay in Rellingen such a well-known event.

Exhibitors are welcome to showcase their offerings at booths, allowing the audience to visually and tangibly experience their products.

Scan the QR code for registration and other highlights of the HOFMANN Expo:

HOFMANN Expo
This is where the Who's Who come together





HOFMANN Expo 2021
The expert forum for you

Lecture video

Christophe Nicodème
Impact of new mobility on the road infrastructure by 2030

Lecture video

Keith Dawson
Transforming Roadmarkings UK

Lecture video

Emiel De Bruin
The roadmarking squeeze in The Netherlands. A challenging environment with increasing sustainability demands under big margin pressure

HOFMANN Expo 2022
The expert forum for you

Lecture video

Harald Mosböck
Part 3: Road markings and automated vehicles - an update on initiatives around the world

Lecture video

Dr. Nils Katzorke
Automated Vehicle Development at the Mercedes-Benz Proving Ground in Immendingen: Road Marking Projects

Lecture video

Dr. Alexander Klein
Reduction of the CO2 balance taking into account the circular economy

GEVEKO MARKINGS

KANSAI HELIOS

swarco
Road Marking Systems

traffic-lines

VELUVINE

VSV

HOFMANN TechnologyDay 2022 / 2023
Our partners for you

Contact Sales & Marketing
marketing@HOFMANNmarking.de

Edda Krohn-Haker
Marketing Services
+49 4101 3027-53
ekh@HOFMANNmarking.de

Contact Im- und Export
export@HOFMANNmarking.de

Minela Yalcin
Im- & Export
+49 4101 3027-46
my@HOFMANNmarking.de

Contacts Sales Support
sales@HOFMANNmarking.de

Julia Taschner
Sales Support
+49 4101 3027-111
jt@HOFMANNmarking.de

Olaf Knoblich
Sales Support
+49 4101 3027-36
ok@HOFMANNmarking.de

Contacts Sales Support
sales@HOFMANNmarking.de

Sandra Brunzel
Sales Support
+49 4101 3027-31
sb@HOFMANNmarking.de

Contacts Sales Support - Technique
service@HOFMANNmarking.de

Andreas Hentzgen
Sales Support Technique
+49 4101 3027-179
he@HOFMANNmarking.de

Contacts Sales Support - Technique
service@HOFMANNmarking.de

Andreas Eggers
Sales Support Technique
+49 4101 3027-81
ae@HOFMANNmarking.de

Bernd Jahnke
Sales Support Technique
+49 4101 3027-74
bj@HOFMANNmarking.de

Airport Runway and Airfield Markings

Together with our customers we are developping customised airport marking machines matching local, climatic as well as technical requirements.

Only a small selection from our large range of individually developed airport marking machines is shown in this leaflet.

① H75-3000P in Rome/Italy with sprayable thermoplastic system and metering pump for operation with 90 cm wide line marker unit and including 4 sprayguns and 4 glass bead guns, 2 x 1500 l pressureless container.

② H33 in Manama/Bahrain with 1-component cold paint Airless system, 1 x 460 l and 2 x 220 l pressurised container with 90 cm wide line marker unit incl. 4 paint and glass bead guns each as well as 3 paint and glass bead guns for taxiways in black/yellow/black.

③ H26 on Airbus area / Hamburg, Germany equipped with 1-component cold paint Airless system as well as with 2-component sprayable cold plastic Airless system M98:2, 460 l pressurised container as well as 90 cm wide line marker unit incl. 3 paint guns.

④ H18 in Singapore equipped for 1-component cold paint Airless system incl. 120 cm wide line marker unit, with 5 paint- and glass bead guns, pressurised container 460 l.

⑤ H33 in Kiev/Ukraine with pressurised container system for cold paints, 2 x 385 l pressurised container incl. 90 cm wide line marker unit with 4 paint- and glass bead guns each as well as 2 paint- and glass bead guns each for taxiways in red and white.

⑥ H26 in Bucharest/Romania with pressurised container system for cold paints, 1 x 460 l and 1 x 225 l pressurised container incl. 90 cm wide line marker unit with 3 paint- and glass bead guns each as well as 2 paint- and glass bead guns each for taxiways.

⑦ H33 in Hamburg/Germany equipped with 1-component cold paint Airless system and 5 Airless pumps, 1 x 460 l and 2 x 220 l as well as 2 x 110 l pressurised containers and with 90 cm wide line marker unit with 4 paint guns as well as further 12 paint guns for differnet colours: white, red, blue, yellow and black, for taxiways and safety lines.

Technical Data

Motor and equipment according to customers' request and application system.

Techniques/Container volumes

Roadmarking machines can be equipped with all available application systems depending on the marking job they have to fulfil.

Roadmarking Trucks

We gladly develop customised roadmarking trucks matching national, climatic and technical requirements.

The following shows some samples from our large range of individually developped roadmarking trucks:

① H60-2500EX
with preheater (2 x 1100 l) as well as feed tank (300 l) for thermoplastics, MultiDotLine® Universal Extruder 50 cm on both sides for Rip'N'Dot as well as plain markings.

② H75-3400P
with unpressurised containers (2 x 1700 l) for sprayable thermoplastics with screw pump, marker unit on both sides.

③ H37-5000P
Multi purpose marking truck with exchangeable pressureless containers (4 x 1250 l) for 1-component cold paints with pump and for 2-component sprayable cold plastics for Airless spraying method with path-dependent metering pump AMAKOS®.

④ H36-1300P
with pressurised containers (2 x 650 l) for cold paints using Airless spraying method, 90 cm wide line marker unit with 4 paint guns and 4 glass bead guns.

⑤ H75-3000P
with unpressurised containers (2 x 1500 l) for sprayable thermoplastics with metering pump (AMAKOS®).

Technical Data

Motor and equipment according to customers' request and application system.

⑥ H75-4000P
with pressureless container (4 x 1000 l) for sprayable thermoplastics with spiral pump, marker units on both sides.

Techniques/Container volumes

Roadmarking trucks can be equipped with all available application systems depending on the marking job they have to fulfil.

⑦ H75-3000EX
incl. preheaters (2x1100 l) as well as pressurised container (800 l) for sprayable thermo plastics marker unit for sprayable thermoplastics as well as MultiDotLine® extruder on both sides. Special features: Self-loading via built-on crane, 360°camera surveillance as well as a material transfer pump system.

H33-4

Most compact machine with very high capacities and excellent hill climbing ability.

- Robust, high-effective 7-ton construction machine axle with hydraulically switchable speed ranges combined with a high-speed hydraulic motor.
- Cooling system with automatic adaption of ventilator speed to ambient temperature and machine load (noise reduction at normal machine load and higher cooling performance at extreme machine load).

- Inlet of whole cooling air from upper side of the machine - far away from spray mist.
- Two pressurised glass bead containers.Filling openings for glass beads at the side of the machine in ideal filling height.
- Cockpit incl. all necessary operational controls laterally adjustable without the need to install guides.
- Arrangement of operating and supervising instruments can be easily modified according to individual requirements.Adjustable, easy extractable spray gun support for centre and edge line markings.
- Motor compartment easily accessible for service work. High ground clearance also eases service works from below.
- Excellent panoramic view, also when driving backwards.
- Available as an option: Individual application units are exchangeable (exchangeable container) with low effort by quick opening device systems and modular design principle.
- Line widths:
  10 up to 100 cm
  (dependent on equipment)

Technical data

4-cylinder 3800 cm³,
Kubota Turbo diesel engine,
water-cooled

Version I**):
Non-Label (comparable to EU Stage II resp. (US) EPA Tier 2)

74,0 kW at 2600 rpm

Version II**):

Low-emission EU Stage V
resp. (US) EPA Tier 4
with diesel oxidation catalyst (DOC) and Diesel Particulate Filter (DPF) as well as SCR catalytic converter with AdBlue® and intercooler

86,4 kW at 2600 rpm

Air output, alternatively:
2600 up to 3500 l/min
at 7,5 bar;
Compressed air cooler

Pressurised glass bead containers:
2 x 160 l (max. 3,0 bar)

Dimensions (L x W x H mm):
5300 up to 6100 x 1340 x 2380
(dependent on equipment)

Weight, equipped:
approx. 2600 up to 4400 kg
approx. 5730 up to 9700 lbs

Techniques / Container volumes *)

Cold paints:
Up to 1080 l

2c cold plastics:
Up to 650 l

Sprayable 2c cold plastics:
Up to 1000 l

Thermoplastics:
Up to 600 l

Sprayable thermoplastics:
up to 800 l

*) dependent on equipment

**) further exhaust stages upon request

H26-4

A compact machine with high capacities.

- Robust, high-effective 7-ton construction machine axle with hydraulically switchable speed ranges combined with a high-speed hydraulic motor.
- Cooling system with automatic adaption of ventilator speed to ambient temperature and machine load (noise reduction at normal machine load and higher cooling performance at extreme machine load).

- Inlet of whole cooling air from upper side of the machine - far away from spray mist.
- Two pressurised glass bead containers.Filling openings for glass beads at the side of the machine in ideal filling height.
- Cockpit incl. all necessary operational controls laterally adjustable without the need to install guides.
- Arrangement of operating and supervising instruments can be easily modified according to individual requirements. Adjustable, easy extractable spray gun support for centre and edge line markings.
- Motor compartment easily accessible for service work. High ground clearance also eases service works from below.
- Excellent panoramic view, also when driving backwards.
- Available as an option: Individual application units are exchangeable (exchangeable container) with low effort by quick opening device systems and modular design principle.
- Line widths:
  10 up to 100 cm
  (dependent on equipment)

Technical Data

4-cylinder 3800 cm³,
Kubota Turbo diesel engine,
water-cooled

***Version I:* **)**
Non-Label (comparable to EU Stage II resp. (US) EPA Tier 2)

74,0 kW at 2600 rpm

***Version II:* **)**
Low-emission EU Stage V resp. (US) EPA Tier 4 with diesel oxidation catalyst (DOC) and Diesel Particulate Filter (DPF)

55,4 kW at 2200 rpm

Air output:
2400 l/min at 7,5 bar;
Compressed air cooler

Pressurised glass bead containers:
2 x 160 l (max. 3,0 bar)

Dimensions (L x W x H mm):
5300 up to 6100 x 1340 x 2380
(dependent on equipment)

Weight, equipped:
approx. 2400 up to 4200 kg
approx. 5290 up to 9260 lbs

Techniques / Container volumes *)

Cold paints:
Up to 920 l

2c cold plastics:
Up to 600 l

Sprayable 2c cold plastics:
Up to 800 l

Thermoplastics:
Up to 500 l

Sprayable thermoplastics:
Up to 600 l

*) dependent on equipment

**) further exhaust stages upon request

H18-2

A compact, narrow and manoeuvrable machine with medium-sized capacities.

- Hydraulic drive with wheel motors with infinitely variable speed adjustment.
- Hydraulic multi-disk parking brake.

- Cooling system with automatic adaption of ventilator speed to ambient temperature and machine load (noise reduction at normal machine load and higher cooling performance at extreme machine load).
- Inlet of whole cooling air from upper side of the machine - far away from spray mist.

- One pressurised glass bead container.
- Cockpit with all operating elements laterally adjustable without the need to install guides.
- High visibility during centre and edge line markings.

- Individual application units (exchangeable container) or exchange of front chassis incl. application unit at low effort by quick opening device systems and modular design principle.
- Motor compartment easily accessible for service work.
- Excellent panoramic view, also when driving backwards.

- Exhaust pipe is under the machine and exhaust outlet is adjustable depending on the application.
- Fold-out ladder on the seat support.
- Line widths: 10 up to 100 cm (dependent on equipment)

Technical data

4-cylinder 2400 cm³,
Kubota Turbo Diesel motor,
water-cooled

Version I**):
Non label (comparable to EU Stage IIIA resp. (US) EPA Tier 4 Interim)

44,0 kW at 2700 rpm

Version II**):
Low-emission EU Stage V resp. (US) EPA Tier 4 with diesel oxidation catalyst (DOC) and Diesel Particulate Filter (DPF)

48,6 kW at 2700 rpm

Air output, alternatively:
1 300 up to 2200 l/min
at 7,5 bar;
Compressed air cooler

Pressurised glass bead containers:
170 l (max. 0,8 bar)

Dimensions (L x W x H mm):
4260 up to 5600 x 1260 x 2300
(dependent on equipment)

Weight, equipped:
approx. 2000 up to 2600 kg
approx. 4409 up to 5732 lbs

Techniques / Container volumes *)

Cold paints:
Up to 540 l

2c cold plastics:
Up to 540 l

Sprayable 2c cold plastics:
Up to 540 l

Thermoplastics:
Up to 420 l

Sprayable thermoplastics:
Up to 320 l

*) dependent on equipment

**) further exhaust stages upon request

H17

A very narrow and extremely manoeuvrable machine with medium capacities.

- Hydraulic drive with wheel motor with infinitely variable speed adjustment.
- Hydraulic multi disk parking brake.
- Cockpit can be moved to both sides. Operating elements can be adapted to the other side and the seat element can be switched to the other side.
- Motor compartment easily accessible for service work.
- Excellent panoramic view, also when driving backwards.
- Line widths:
  10 up to 60 cm
  (dependent on equipment)

Technical data

4-cylinder 1 500 cm³,
Kubota Turbo Diesel motor,
water-cooled

Version I:
Non label (comparable to EU Stage IIIA resp. (US) EPA Tier 3)

Version II:
Low-emission EU Stage V resp. (US) EPA Tier 4 with diesel oxidation catalyst (DOC) and Diesel Particulate Filter (DPF)

33,0 kW at 3 000 rpm

Air output:
800 - 1 200 l/min at 7,5 bar;
(compressed air cooler)

Pressurised glass bead container:
100 l (max. 0,8 bar)

Dimensions (L x W x H mm):
3 580 x 1 210 x 2 270
(dependent on equipment)

Weight, equipped:
approx. 1 700 up to 2 300 kg
approx. 3 748 up to 5 070 lbs

Techniques / Container volumes *)

Cold paints:
Up to 370 l

2c cold plastics:
Up to 370 l

Sprayale 2c cold plastics:
Up to 370 l

Thermoplastics:
Up to 420 l

Sprayable thermoplastics:
Up to 250 l

*) dependent on equipment

H16-3

A narrow and manoeuvrable machine with smaller capacities.

- Hydraulic drive with wheel motors with infinitely variable speed adjustment.Hydraulic multi-disk parking brake.
- Large axle base and mechanical front wheel steering system with zero backlash for best roadability and excellent handling, especially wherever the marking results depend on high manoeuvrability.
- Application units favourably mounted in the back of the machine.
- Low position of driver's seat as well as platform; comfortable get on / off.
- Motor compartment easily accessible for service work.
- Line widths:
  10 up to 50 cm
  (dependent on equipment)

Technical data

Version I**):
4-cylinder 1 500 cm³,
Kubota Diesel motor,
water-cooled, Non label
(comparable to EU Stage IIIA resp.
(US) EPA Tier 2)
26,2 kW at 3 000 rpm

Version II**):
4-cylinder 1 500 cm³,
Kubota Turbo Diesel motor,
water-cooled, low-emission
EU Stage IIIA resp.
(US) EPA Tier 4 Interim
26,2 kW at 3 000 rpm

Air output:
Up to 1 000 l/min at 6,0 bar
(2-cylinder compressor)

Glass bead container:
70 l

Dimensions (L x W x H mm):
3 950 x 1 325 x 1 650
(dependent on equipment)

Weight, equipped:
approx. 1 200 up to 1 400 kg
approx. 2 645 up to 3 090 lbs

Techniques / Container volumes *)

Cold paints:
Up to 225 l

2c cold plastics:
Up to 225 l

Sprayable 2c cold plastics:
Up to 225 l

Thermoplastics:
Up to 200 l

Sprayable thermoplastics:
Up to 200 l

*) dependent on equipment
**) further exhaust stages upon request

H11-1

A manoeuvrable machine with lower capacities, especially perfect for narrow marking conditions.

- Hydraulic drive with wheel motors for infinitely variable speed regulation. Mechanical parking brake.
- Excellent visibility, both during centre and edge line markings.
- No ifs or buts: motor compartment easily accessible for service work.
- Operator's stand can be easily tilted upward for filling the material container. Filling openings only 80 cm above road surface.
- Extraordinary manoeuvrability.
- One container divided in two chambers for marking material and glass beads.
- Line widths:
  10 up to 50 cm
  (dependent on equipment)

Technical data

	3-cylinder 900 cm³, Kubota Diesel motor, water-cooled, low-emission EU Stage V resp. (US) EPA Tier 4
	12,5 kW at 2800 rpm
	Air output: Up to 740 l/min at 6,0 bar (2-cylinder compressor)
	Pressurised glass bead containers: Up to 65 l (max. 0,5 bar) or 2 x 30 l (angular, max. 0,5 bar)
	Dimensions (L x W x H mm): 2150 x 1380 x 2000 (dependent on equipment)
	Weight, equipped: approx. 900 kg approx. 1830 lbs

Techniques / Container volumes *)

<u>Cold paints:</u>	Up to 140 l

*) dependent on equipment

H10-2

A machine with unique maneuverability as well as ideal cornering characteristics.

- Infinitely variable hydraulic drive with hydraulic service brake; parking brake additionally.
- Two rear wheels, one driven front wheel which can be turned to the right and left by almost 80° via steering. This allows an extremely small turning circle of 3.8 m (around stationary right or left rear wheel).
- Good visibility conditions during marking operation.
- Line widths:
  10 up to 30 cm
  (dependent on equipment)

Technical Data

2-cylinder 690 cm³,
Honda gasoline engine,
air-cooled

14,5 kW at 3 200 rpm

Air output:
Up to 670 l/min at 6,0 bar
(2-cylinder compressor)

Pressurised glass bead container:
35 l (max. 1,0 bar)

Turning cycle: Ø 3,8 m
(dependent on equipment)

Dimensions (L x W x H mm):
2650 x 1050 x 1600
(dependent on equipment)

Weight, equipped:
approx. 650 up to 950 kg
approx. 1433 up to 2095 lbs

Techniques / Container volumes *)

Cold paints:
Up to 140 l

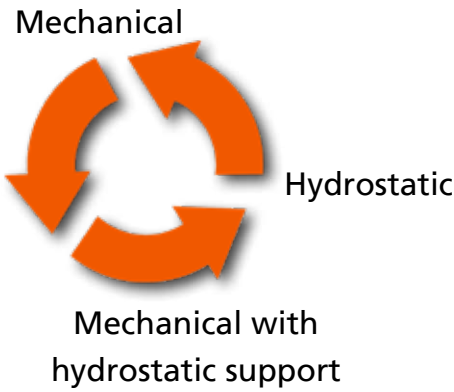
Sprayale 2c cold plastics:
Up to 90 l

Thermoplastics:
Up to 100 l

Sprayable thermoplastics:
Up to 50 l

*) dependent on equipment

Steering systems for marking machines



Mechanical steering has the disadvantage that uncomfortably high effort is required to manoeuvre the machine. In contrast, this type of steering is not sensitive to faults caused by the steering wheel, particularly because of the high effort required and therefore facilitates maintaining the correct direction during marking work in an unsurpassed manner.

Hydrostatic steering has the advantage of low effort, which substantially facilitates manoeuvring the machine, especially when conditions are tight, but makes maintaining the correct direction during marking work more difficult.

Mechanical steering with hydrostatic support combines the advantages of both types of steering. It is just as advantageous as mechanical steering for very slight steering wheel movements – i.e. even during marking work. The hydrostatic support only starts for quicker and larger steering wheel movements and then makes the steering as comfortable as a purely hydrostatic system.

”

We always strive to give you the very best! And that is what we do: for over 70 years, HOFMANN marking technology has delivered top quality „Made in Germany“

Torsten Pape, Director Sales & Marketing

H9-1 Series

Hand-guided, self-propelled marking machine for small varied marking jobs.

H9-1 Airspray
(Low pressure spraying method)

H9-1 Sprayable Thermoplastic

H9-1 Airless 2c M98:2 equipped for Airless (high pressure spraying method), 1-component cold paints as well as sprayable 2-component cold plastics, with mixing ratio 98:2

- Infinitely hydraulic drive. Uniform drive of front wheels by differential drive.
- Vibration isolation for motor/ compressor unit.
- Fixing for marker unit right and left side.
- Pneumatic tires, foam-filled tires or full-rubber tires (as an option).
- Electronic spacing device available as an option.
- Flashlights as an option.
- Straight-run fixing device for rear wheel in order to maintain easily the direction.
- Uniform line widths, even in tight bends.
- Height adjustable handle.
- Drive unit according to CE (declaration of conformity).
- Trailer with driver seat available as an option.
- US-excecution as an option.

H9-1 Serie

H9-E Airless 2c M98:2

System voltage: 48 volts

Capacity 100 Ah

Power: 5 kW

Charging device: 230 volts

Weight:
approx. 580 kg / 1278 lbs

Trailer with driver seat

Technical Data

Adjustable sitting position

Pneumatic tires

Dimensions (L x W x H mm):
900 x 740 x 1 000

Weight:
20 kg / 44 lbs

… the perfect and comfortable supplement for H9-1 series (dependent on equipment)

H9-1 Series

	H9-1 Airspray	H9-1 Airspray 2c 98:2	H9-1 Airless 2c 98:2	H9-1 Sprayable Thermoplastic
Motor	1-cyl., 390 cm³, Honda gasoline motor, air-cooled 8,4 kW at 3.200 rpm	1-cyl., 390 cm³, Honda gasoline motor, air-cooled 8,4 kW at 3.200 rpm	1-cyl., 390 cm³, Honda gasoline motor, air-cooled 8,4 kW at 3.200 rpm	1-cyl., 390 cm³, Honda gasoline motor, air-cooled 8,4 kW at 3.200 rpm
Drive unit	hydrostatic continuously	hydrostatic continuously	hydrostatic continuously	hydrostatic continuously
Air output [l/min]	Up to 670 l/min (2-cylinder compressor)	Up to 670 l/min (2-cylinder compressor)	Up to 270 l/min (2-cylinder compressor)	Up to 670 l/min (2-cylinder compressor)
Techniques / Container volumes	Cold paints: Up to 48 l (1 container) or 2 x 24 l (2 container for one or two colours)	Sprayable 2c cold plastics: Up to 48 l (1 container)	Cold Paints: without material container Sprayable 2c cold plastics: without material container	Sprayable thermo-plastics: Up to 50 l
Material container with manual agitator	yes	yes	-	Pneuma-tic agitator (Option)
Pressurised glass bead container (max. 1,0 bar)	20 l (1 container) 2 x 20 l (2 container)	20 l (1 container)	20 l (1 container)	20 l (1 container)
Line widths*)	10 - 60 cm	10 - 30 cm	10 - 30 cm	10 - 30 cm
Dimensions **) **Length mm]** **Width [mm]** **Height [mm]**	 1800 1050 1300	 1800 1050 1300	 1800 1200 1400	 1950 1200 (1 Gun) 1500 (2 Guns) 1400 with gas bottle holder
Weight [kg/lbs]	approx. 340 - 370 750 - 815 lbs	approx. 370 815 lbs	approx. 440	approx. 480 - 520

* dependent on material

** dependent on equipment

H9-1 Series

	H9-1 Airspray	H9-1 Airspray 2c 98:2	H9-1 Airless 2c 98:2	H9-1 Sprayable Thermoplastic
Particularities	Can be equipped with additional hand spray gun. Possibility to use commercial paint buckets as an insert container.	Hardener quantity infinitely variable between 1,0 and 4,0 percentage by weight. 2c spray gun can be used also as 2c hand spray gun. Possibility to use commercial paint buckets as an insert container.	Hardener quantity infinitely variable between 1,0 and 3,1 percentage by weight. Equipment for internal mixing (static mixer). 2c spray gun can be used also as 2c hand spray gun. Possibility to use commercial paint buckets as an insert container. Pump delivery rate: Up to 6,0 l/min. for mixing ratio 98:2.	Container and gun indirectly heated by heat transfer oil which is heated by LPG. Equipment for single lines or continuous double lines. Infinitely variable adjustment of the outlet of the gun towards road surface. Marker unit with ground wheel with equipment for double lines.

H5-1 / H9-1
Machines for Race Tracks and Sports Facilities

H5 Losail International Circuit in Doha, Qatar

H5 Olympic stadium in Rome, Italy

H9 Silverstone Circuit in Silverstone, UK

H5 Olympic stadium in Rome, Italy

H9 Nürburgring in Nürburg, Germany

H9 Nürburgring in Nürburg, Germany

Technical Data

	H5-1	H9-1
Engine	1-cyl. 200 cm³, Honda gasoline engine, air-cooled, 4,0 kW at 3.500 rpm	1-cyl. 390 cm³, Honda gasoline engine, air-cooled, 8,4 kW at 3.200 rpm
Drive	manual	mech. infinitely adjustable
Air output [l/min]	up to 360 l/min (2-cylinder compressor)	up to 670 l/min (2-cylinder compressor)
Application method / Container volume	cold paints Airspray (Low Pressure Method) up to 24 l	cold paints Airspray (Low Pressure Method) up to 48 l
Material container with manual agitator	-	yes
Line widths*	5 - 15 cm	10 - 60 cm
Options:		
Use of commercial paint buckets as an insert container	10 l	30 l
Sports facility execution	yes, right	-

* dependent on material and equipment

H5-1

Hand-guided marking machine for smaller marking jobs in public or private areas.

- Easy to dismantle by minimal manual actions and therefore easy to transport.
- Vibration isolation for motor/ compressor unit.
- Fixing for marker unit right and left side.
- Can be equipped with additional hand spray gun.
- Straight-run fixing device for rear wheel in order to maintain easily the direction.
- Uniform line widths, even in tight bends.
- Use of commercial 10 l paint buckets as an insert container possible.
- Sports facilities equipment, right side, available as an option.
- Line widths:
  5 up to 15 cm
  (dependent on equipment)

Technical data

1-cylinder 200 cm³,
Honda gasoline motor,
air-cooled

4,0 kW at 3 500 rpm

Air output:
Up to 360 l/min
(2-cylinder compressor)

Glass bead container:
without

Drive unit:
manually

Dimensions (L x W x H mm):
1 500 x 800 x 1 050
(dependent on equipment)

Weight:
approx. 130 kg
approx. 285 lbs

Techniques / Container volumes

Cold paints:
Up to 24 l

2K50A / 2K60A

Hand-guided 2-component cold plastic machine for agglomerate, plain lines or profiled markings for the application of premixed 2-component material for smaller marking jobs and in sectors of advanced safety standards – ideal supplement for every 2-component cold plastic machine.

- Suitable for 2-component cold plastics for line widths from 10 to 50 cm (2K50A) including spiked roller **and** universal material feed box with infinitely adjustment for agglomerate and plain markings.
- Special execution: up to 60 cm for agglomerate and plain marking jobs (2K60A).
- Shutter of glass bead dispenser adjustable for line widths of 25 **or** 50 cm.
- Mixing ratio 98:2 (premix required) with a processing time of approx. 10-15 min (depending on temperature).
- Conversion between each other of mentioned applications: max. 4 minutes.
- Optional equipment: Additional material supply boxes for agglomerate and plain lines - as well as special screed boxes for 90° cross-profile and markings for blind people.
- Line widths: 10 up to 50 cm (2K50A) 10 up to 60 cm (2K60A)

Technical data

1-cylinder 120 cm³,
Honda gasoline motor,
air-cooled

2,6 kW at 3 600 rpm

Glass bead container:
20 l

Agglomerate marking material consumption:
approx. 2,5 up to 3,0 kg/m²,
up to 3,8 kg/m² möglich

Dimensions (L x W x H mm):
1 500 x 1 000 x 1 200 (2K50A)
1 700 x 1 100 x 1 300 (2K60A)

Weight:
2K50A:
approx. 170 kg / 375 lbs
2K60A:
approx. 190 kg / 418 lbs

Techniques / Container volumes

2c cold plastics:
without material container

RP100-1H

Hand-guided, self-propelled marking machine for medium-sized marking jobs involving frequent changes in direction, where a manual machine would be too small and a larger sit-on machine too big.

- Infinitely variable hydraulic drive unit.
- Uniform drive of rear wheels by differential drive.
- Fixing for marker unit right and left side.
- Low noise emission; important in urban areas.
- Double-line equipment available as an option.
- Electrical starter as an option.
- Indirect and careful heating of material by heat transfer oil with automatic temperature control.
- Drive unit according to CE (declaration of conformity).
- Line widths:
  10 up to 50 cm
  (dependent on equipment)

Technical data

1-cylinder 200 cm³,
Honda gasoline motor,
air-cooled

4,0 kW at 3 500 rpm

Air output:
Up to 320 l/min
(2-cylinder compressor)

Glass bead container:
Up to 20 l

Drive unit:
Hydraulically infinitely variable

Dimensions (L x W x H mm):
1 800 x 1 200 x 1 200
(dependent on equipment)

Weight:
410 up to 450 kg
903 up to 992 lbs

Techniques / Container volumes

Thermoplastics:
Up to 115 l

”

No matter where you are: we are there for you and your project! Our geographical presence in over 160 countries plus the lasting availability of spare parts and machine expertise are guaranteed – now and in the future.

Stephan Stuhr, Technical Service Manager

RP30/50 Thermoplastic screed box and RP30 Thermoplastic screed box with shutters

Hand-guided marking machine for repair or re-marking jobs, etc. as well as for crossroads and parking areas.

- Width-adjustable chassis for the use of different screed box widths.
- The indirect heating of the sreed box (gas burner / heat transfer oil) ensures a high and even temperature of the material outlet flap and prevents it from cooling down due to the effects of wind or during breaks.
- The outlet flaps have wear-resistant sliding skids with hard metal surface.
- A constant layer thickness can be set on the outlet flaps.
- The contact pressure of the screed box on the road surface is adjustable. This makes it particularly easy to push this manual device. The weight is distributed between the skids and wheels.
- Three wheels ensure good straight-line stability and a pointer makes work easier.
- Glass bead dispenser (accelerator roller) with battery (Option).
- Glass bead dispenser (Option).
- Execution to apply markings for blind people (Option).
- Line widths:
  10 up to 50 cm

Technical data

Gas burner ensures correct temperature at material container, sliding skids and material outlet flap.

Glass bead container (Option):
up to 20 l
Battery of glass bead dispenser (Option): 18 V, 5 Ah
Dimensions (L x W x H mm):
Line width 30 cm:
1 600 x 1 000 x 1 000
Line width 50 cm:
1 500 x 1 200 x 1 000
(dependent on equipment)

RP30/50:
Weight (**with** dispenser, without gas bottle): Line width 30 cm:
approx. 120 kg / 264 lbs
Line width 50 cm:
approx. 130 kg / 286 lbs
Weight (**without** dispenser, without gas bottle): Line width 30 cm:
approx. 95 kg / 210
Line width 50 cm:
approx. 105 kg / 231

RP30 set of shutters:
Weight (**with** dispenser, without gas bottle):
Line width 30 cm:
approx. 145 kg / 320 lbs
Weight (**with** battery-powered glass bead dispenser and accelerator roller, without gas bottle):
Line width 30 cm:
approx. 162 kg / 357 lbs
Weight (**without** dispenser, without gas bottle):
Line width 30 cm:
approx. 120 kg / 265 lbs

Techniques / Container volumes
Thermoplastics:
without material container

RP30/50 Thermoplastic screed box and RP30 Thermoplastic screed box with shutters

RP30 – Thermoplastic screed box with set of shutters for line widths up to 30 cm

Alternative:

- The RP30 with a 30 cm thermoplastic screed box can be replaced by a 30 cm thermoplastic screed box equipped with a set of shutters.
- The set of shutters then depends on the desired requirements, **e.g.** 5 cm + 5 cm + 8 cm + 7 cm + 5 cm oder 5 cm + 5 cm + 5 cm + 5 cm + 5 cm + 5 cm, whereby **each flap can be switched individually.**
- Other sets of shutters are available with a **minimum width of 3 cm** and a **maximum width of 30 cm**.

RP30 – Thermoplastic screed box incl. set of shutters for line widths up to 30 cm as well as battery for glass bead dispenser (accelerator roller)

Manual Thermoplastic Screed Boxes and heating station

The manual thermoplastic screed boxes from HOFMANN can be pulled or pushed without modification.

A heating station (without preheater) for manual screed boxes, also operated independently, supplements the marking process.

- Following lines widths are available: 10, 12, 15, 20, 25, 30, 40, 50 and 60 cm. Further line widths available on request.

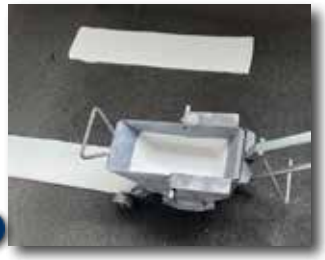
Dimensions and weight varying depending on line width:

Dimensions (L x W x H mm):
1500 x 150 up to 600 x 900

Weight:
approx. 12-20 kg / 26-44 lbs
(screed box)
approx. 45 kg / 99 lbs
(heating station, without preheater)

2c Cold Plastic Screed Boxes

The manual screed boxes are pulled.



- Quick cleaning by removing the inner insert.
- Following lines widths are available: 10, 12, 15, 20, 25, 30, 40, 50 and 60 cm. Further line widths available on request.

Dimensions and weight varying depending on line width:

Dimensions (L x W x H mm):
1500 x 150 up to 600 x 900

Weight:
approx. 12-20 kg / 26-44 lbs

H75/25

Manual marking machine for smaller marking jobs, ideal supplement for self-propelled roadmarking machine for the application of sprayable thermoplastic.

Technical Data

- Container and gun indirectly heated by heat transfer oil which is heated by LPG.
- Distance between gun and road surface adjustable.
- Glass bead dispenser available as an option.
- Line widths:
  10 up to 30 cm

Air- and gas supply directly from a marking machine or a compressor / gas bottle set by means of hoses.

Minimum air capacity:
600 l/min

Glass bead container:
20 l

Option: Pressurised glass bead container:
22 l (max 1,0 bar)

Dimensions (L x W x H mm):
1 500 x 1 050 x 1 150
(dependent on equipment)

Weight:
approx. 250 kg / 551 lbs

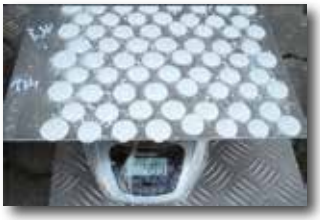
Techniques / Container volumes

Sprayable thermoplastics:
Up to 25 l

Service & Training

Customer service is not only a major part of our range of services but also the philosophy we use when interacting with our customers and business partners.

For more than 70 years HOFMANN has been THE competent contact partner for road marking technology and therefore you can expect more from us than "simply" first-class road marking technology.



Maintenance and Spare Parts

No matter whether we're dealing with retrofits, accident damage or periodic maintenance: In our new Service Centre with its state-of-the-art diagnostic tools our highly qualified technicians work on the goal of getting your machine ready for operation again as fast as possible.

Short-term work on site is not a problem either: we can deal with almost all maintenance tasks and repairs in your house.

The use of modern communications and logistics systems guarantees fast and efficient spare parts supply.You have the choice of prompt express delivery or lower-cost normal delivery.

Upgrades & Retrofitting

Technical developments at HOFMANN advance and bring about new application techniques, more comfortable control and operating concepts, as well as more efficient control algorithms.

You don't have to invest in a new machine to benefit from all this – HOFMANN offers a broad range of components and individually tailored packages, to set up your machine for changed requirements and application areas or to make it able to tackle new future tasks by upgrading it with innovative system technology.

Material testing

In our plant in Rellingen we support manufacturers of marking material with the preparation for material test by the Bundesanstalt für Straßenwesen (Federal Highway Research Institute). HOFMANN offers corresponding application series as a complete package worldwide.

Our service professionals are available to test the interaction between components and materials. The equipment includes ultramodern test rigs for pumps, paint spray guns, bead guns and spray guns.

Trainings

Competent advice and care from purchase to set-to-work have been part for course at HOFMANN for decades.

However, to be able to implement the advantages of a technically complex and highly efficient marking system quickly and efficiently, it needs instruction and training through qualified technicians with plenty of practical experience.

HOFMANN training session consist of theoretical contents tailored individually to your machine park and your applications, which are implemented and deepened in practical training sections.

Hotline +49 18059-463626

Monday to Friday 06:00-20:00
Saturday 08:00-20:00
(UTC+1)

Paint spray and 2-component guns

(For all machine types equipped for 1c and 2c Airless operation method)

VIALINE Airless paint spray gun

Airless 2-component spray gun and double spray gun M98:2 and M1:1

- All parts coming into contact with paint are made of stainless steel (for watercolours).
- Equipment with feedback device is possible.
- With the 2-gun-system a slanted position is possible via additional frame (only paint spay gun).
- Also suitable for 1-component Airless paints by disconnecting hardener (only 2c spray gun).
- Internal mixing and flushing in mixer tube (only 2c spray gun).
- Low solvent consumption (only 2c spray gun).
- Double line widths: 10/10 cm up to 15/15 cm (only 2c double spray gun).

Graco® Airless paint hand spray gun

Airless 2c hand spray gun M98:2 and M1:1

- All parts coming into contact with paint are made of stainless steel (for watercolours).
- Approved and robust hand spray gun for floor & wall jobs.
- Handle incl. circlip.
- Extension is possible via additional tube (only Graco® paint handspray gun).
- Internal mixing and flushing in mixing tube (only 2c hand spray gun M98:2).
- Two-nozzle external mixing (mixing inside of atomising blower) (only 2c hand spray gun M1:1).
- Low solvent consumption (only 2c hand spray gun M98:2).

Paint spray guns and 2-component guns
(for all machine types equipped for operation with atomising air)

VIALINE Airspray atomising air paint spray gun

Airspray 2-component spray gun M98:2

- All parts coming into contact with paint are made of stainless steel (for watercolours).
- Can be used for 1-component airless paints due to hardener cut-off (only 2c spray gun).
- Automatic cutoff of atomising air.
- With the 2-gun-system a slanted position is possible via additional frame (only paint spray gun).
- Equipment with feedback device is possible.

Atomising air hand spray guns

- All parts coming into contact with paint are made of stainless steel (for watercolours).
- Automatic cutoff of atomising air.
- Approved and robust hand spray gun - available in three different lengths - for floor and wall jobs.
- Handle incl. circlip.

Bead guns and bead dispensers
(For all machine types equipped for dispensing glass beads)

CONEX® Bead dispenser

CONEX® bead dispenser adjustable

Bead dispenser, fixed and adjustable

- Dispensing unit with metering drum for path-dependent dispensing on road markings at constant dispensing density [g/m²] independent of working speed (metering of quantity).
- Continous distribution of abrasives due to large volume housing over complete line width.
- Adjustable embedding depth of glass beads by changing scattering speed.
- Connection at pressure containers as well as at unpressurised containers possible.
- Fine tuning of dispensing quantity via set of sprockets (does not apply to electrical bead dispenser).
- Manual adjustment of dispensing width from 10 - 30 cm possible.

Bead guns and bead dispensers
(For all machine types equipped for dispensing glass beads)

CONEX®
Electrical bead dispenser

Electrical bead dispenser, fixed and adjustable

- Path-dependent dosage of the drop-on materials with subsequent acceleration by means of a accelerator roller operated by means of an air motor or electric motor.
- In the path-dependent mode (constant flow rate per square meter also during speed changes), the control takes place together with the control of the marking material pumps via the MALCON4/4E line gap electronic. Setting of spread quantity per square meter is set here as well, a separate control unit is not needed.
- Manual adjustment of the spreading width of 10 - 30 cm possible.
- The motor requires a voltage of 24 V. For machines with 12 V a voltage converter is needed.

Bead guns and bead dispensers
(For all machine types equipped for dispensing glass beads)

Glass bead gun

Double glass bead gun

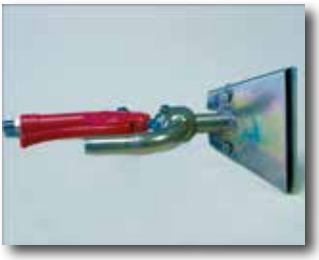
- Pneumatic dispensing unit, wear resisting.
- Continous distribution of abrasives via acceleration of glass beads via atomizing air over complete line width.
- Adjustment of dispensing quantity infinitely variable.
- Connection at pressure containers as well as at unpressurised containers.
- Adjustable delay of post-glass bead application (start of glass bead application cannot be set).
- Adjustable bead distribution - front / rear diffuser (only with double bead gun).

Metering glass bead gun

Double metering glass bead gun

- Dispensing unit with integrated feeding system for path-dependent dispensing of roadmarking at constant dispensing density [g/m²] independent of working speed (metering of quantity).
- Continous distribution of abrasives via acceleration of glass beads with atomizing air over entire width of line.
- Connection at pressure containers as well as at unpressurised containers.
- Fine tuning of dispensing quantity via set of sprockets.
- Adjustable bead distribution front / rear diffuser (only with double metering bead gun).

Bead guns and bead dispensers
(For all machine types equipped for dispensing glass beads)



Hand bead gun

- Dispensing unit with suction system for supply of glass beads out of every kind of boxes.
- Even distribution of abrasives by acceleration of the glass beads by atomising air over the entire width of the line (e.g. barrier areas, zebra crossings, arrows).

Sprayable thermoplastic guns

Sprayable thermoplastic gun „Type H"

Sprayable thermoplastic gun „Type S"

- For machines of serie H9 / H16 / H17 / H18 / H26 / H33 as well as for roadmarking trucks which are equipped for operation of sprayable thermoplastic.
- Automatic cutoff of atomising air.
- Gun with heating via thermal oil jacket.
- Adjustable limiter.

Info: Material quantity

*Applied **material quantity** is **always** dependent on:*

- *marking speed*
- *material pressure*
- *marking material*
- *environment conditions*

H95-2
Road drier

Hand-guided road drier in order to fulfil smaller marking jobs even in adverse weather conditions.

- Efficient and economic due to Diesel motor drive.
- Independent and convenient carry of the machine as there is no need for a separate air compressor.
- Drying unit allows effective drying close to curbstones.
- Useful melting function for effortless removal of marking tapes.
- Drying width:
  approx. 30 cm,
  approx. 50 cm
  (available as an option)

Technical Data

1-cylinder 232 cm³,
Hatz Diesel motor,
air-cooled

2,8 kW at 2 300 rpm

Blower output:
10 500 l/min at
approx. 600 °C outlet temperature

Dimensions (L x W x H mm):
2 200 x 800 x 1 100

Weight:
approx. 185 kg / 408 lbs

HK Range
Horizontal preheaters

Horizontal preheaters are heated indirectly (with heat transfer oil) by gas- or oil burners (12V, 24V or 230V).

- Oil heated dividing wall (with passing) increases melting capacity.
- Two-chamber-system: prevents preheated material in the rear chamber from cooling down when fresh solid material is being fed into the front chamber.Therefore, ready melted material always at your disposal.
- Reliable sealing of agitator shaft mechanics against heat influences.
- Circulation system for heat transfer oil.
- Heated agitator shaft.
- Heating module for preheating the heat transfer oil (option, see page 60).

Gross filling quantities / Weights
(with heat transfer oil, without power station)

HK800-1:
880 l / approx. 1 310 kg / 2 885 lbs

HK1000-1:
1 100 l / approx. 1 485 kg / 3 270 lbs

Weights

Power station 3,1 kW:
approx. 115 kg / 253 lbs
Power station 4,6 kW:
approx. 242 kg / 533 lbs
Power station 10,0 kW:
approx. 390 kg / 860 lbs

Pre-Heating Unit:
approx. 65 kg / 143 lbs

Info: Heating

Direct Heating

- *This method of heating offers the greatest melting capacity.*
- *However, the danger of local overheating in the melting pot requires a careful control of the heating dependent on melting temperature, filling level and agitator operation.*

Indirect Heating

- *By means of a heat transmission oil bath which encloses the melting pot an uniform heat transmission is ensured.*
- *This Therefore, a gentle heating without local overheating is guaranteed.*
- *This Especially suitable for sensitive melting material and reduction of control effort.*

D- / ID Range
Vertical preheater

Vertical preheaters are heated directly (without heat transfer oil) or indirectly (with heat transfer oil) by gas- or oil burners (12V, 24V or 230V).

- Increased heat transfer surface.
- Heated central column for further enlargement of heating surface. Core of the material filling cannot rotate.
- Hydraulically top-driven agitator, agitator shaft mounted in central colum.
- No seals exposed to material.
- Removal of agitator shaft possible, even if the preheater is filled and material is cold.
- High level of torque of agitator.
- Optimum access to the inside. Comfortable cleaning by easy removal of entire top section.
- Three material outlets (ID840-2 and ID1100-2).

Options:

- Air intake kit for oil burner.
- Material transfer system with side outrigger.
- Electrical adjustment for clockwise / counterclockwise rotation of the agitator.
- Electric agitator drive (Electric motor or battery).
- Diesel oil burner for use with100 % biodiesel.
- Heating module to preheat the heat transfer oil (please refer also to page 60).

Gross filling quantities / Weights

with thermal oil,
without power station:

ID1100-2:
1 100 l / approx. 1 535 kg / 3384 lbs
(1 preheater, without platform, stairs)
2 200 l / approx. 3 070 kg / 6768 lbs
(2 preheaters, without platform,stairs)

ID840-2:
840 l / approx. 1 480 kg / 3262 lbs
(1 preheater, without platform, stairs)

ID630-2:
630 l / approx. 1 200 kg / 2645 lbs
(1 preheater, without platform, stairs)

ID420-2:
420 l / approx. 1 040 kg / 2293 lbs
(1 preheater, without platform, stairs)

with thermal oil,
with 3,1 kW power station,
only with LPG burner:

ID100:
100 l / approx. 415 kg / 914 lbs

without thermal oil,
without power station:

D520:
520 l / approx. 640 kg / 1410 lbs

D350:
350 l / approx. 445 kg / 980 lbs

Info: e-Preheater

- *It is an e-agitator drive and not an e-heating.*
- *Heating can be done in an environmentally neutral way using biodiesel.*

Weights
Power station 3,1 kW:
approx. 115 kg / 253 lbs
Power station 4,6 kW:
approx. 242 kg / 533 lbs
Power station 10,0 kW:
approx. 390 kg / 860 lbs

Platform, stairs, 1 preheater:
approx. 110 kg / 242 lbs
Platform, stairs, 2 preheaters:
approx. 192 kg / 423 lbs

Pre-Heating Unit:
approx. 65 kg / 143 lbs

Electrical thermal oil pre-heating

Heating module for connection to machine or preheater

With the external heating module HM-6, the thermal oil of an indirectly heated preheater or a thermoplastic marking machine can be preheated even before the oil or gas burner is started. The preparation time for the marking work can thus be shortened.

The preparation time for the marking work can thus be shortened.

Warm up or keeping warm:

- Heating to approx. 120 °C oil temperature, automatic temperature control.
- Electric heater, heating capacity: 6,000 W (380 V).
- Electric oil circulation pump (230 V).
- For ID and HK preheater and thermoplastic machines.
- The module can be connected quickly and easily by means of quick couplings (preparation of the machine required).
- Compact module; can be flexibly and portably mounted on a hand truck or for permanent attachment.

Advantages:

- Reduced heating time - Faster start in the morning.
- Less emissions / CO2 savings (when using electricity from renewable energy).

Current offers ...

Browse to our website to get more information on our „current offers“:

... and more!

All our marking machines, equipments and accessories undergo strict quality controls which are properly documented:

Well-known high HOFMANN standard - a factor you can rely on!

Peter Senger
Quality Inspector
+49 4101 3027-170
ps@hofmannmarking.de

MTS
Material Transfer System

The material transfer system uses a screw to convey abrasive and highly viscous marking material. It is used to convey thick-layered thermoplastics as well as sprayable thermoplastics in order to achieve a high transfer rate in the shortest possible time.

- Closed, oil-jacketed system.

Option:

- Hydraulic unit 28.0 kW

  Dimensions (L x W x H mm):
  152 x 80 x160

  Weight: approx. 580 kg

Technical data

Delivery rate*:
approx. 200 l (approx. 400 kg)
in approx. 60 sec

Screw speed:
approx. 630 U/min

Hydraulic pressure:
150 bar

Dimensions (L x W x H mm):
2 500 x 90 x 190 - 230

Weight:
approx. 500 - 610 kg
1 100 - 1345 lbs

* at a marking material temperature of approx. 180 °C (approx. 360 °F) and using ATM material (ThermLite®) from GEVEKO Markings as well as without material sieve.

WPS
Glass bead dispenser

The hand-guided glass bead dispenser is suitable wherever glass beads cannot be applied by a marking machine and manual application is uneconomical or prohibited.

- Dispensing width of glass beads infinitely variable, manually adjustable.
- The dispensing drum is chain driven by means of a ground wheel (path-depending).
- Line widths:
  10 up to 50 cm

Technical data

Glass bead container:
Up to 22 l

Dispensing quantity**:
approx. 380 - 660 g/m²
approx. 540 - 1020 g/m² (option)

Dimensions (L x W x H mm):
1 000 x 850 x 1 000

Weight:
approx. 45 kg / 100 lbs

** These data are test results. The actual quantity depends on the bead size and mixing ratio.

Extensive and future-proof – these are the attributes of our product range. Combined with our flexibility, we offer you the perfect solution to suit your needs.

Andreas Dudat, Area Sales Manager

MALCON4/4E

Electronic control systems and documentation unit

Control unit for manual, semiautomatic and automatic marking.

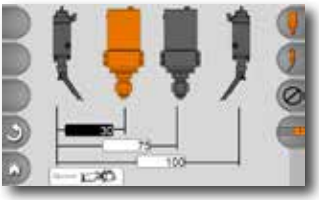
MALCON4/4E offers to execute country-specific marking mode up to 3 parallel applied lines automatically.

Data export via PDA, USB flash drive or even GPS/GSM modul (localization via GPS and data transfer via GSM) is possible, in order to prepare marking or line width proofs.

- You can change between programmes during the marking operation, whereby the current line-space cycle must be terminated before starting the new programme.
- In case a second parallel running programme (e.g.to execute a drain pipe for rain on the marking during marking operation) is requested, also this is possible with the MALCON4/4E.This means you can mark two different line-gap combinations.
- You can activate or deactivate spray guns during the marking operation. Line begin for the activated spray gun and line end for the deactivated spray gun run synchronously.

- Recognition system for direction of travel ensures that whenever the programme step is located inside a space between lines, you can manoeuvre the machine at random without worry. This means that you can be sure of resuming your marking operation again at the correct point.

- You can generate profiled markings in extruder mode, e. g. „Spotflex®“.



- Control of up to 4 marking units arranged in series like e.g. guns and bead guns or extruder flaps.

Options:
- Feedback system
- Rear view camera
- MultiDotLine® control

Info: MALCON4/4E ...

... a multi purpose device consisting of

- *electronic control unit*
- *control unit for material quantity*
- *documentation unit*

MALCON4/4E
Electronic control systems and documentation unit

The operation is selfexplanatory on a graphically brilliant, clearly arranged display.

Documentation and control of current delivery rate of metering pumps for:

- 1c-cold paints and sprayable 2c-cold plastics (plunger pump) in low pressure (Airspray) and high-pressure (Airless) method.
- 2c cold plastics (bellow pump).
- Sprayable thermoplastics (bellow pump) incl. temperature display.

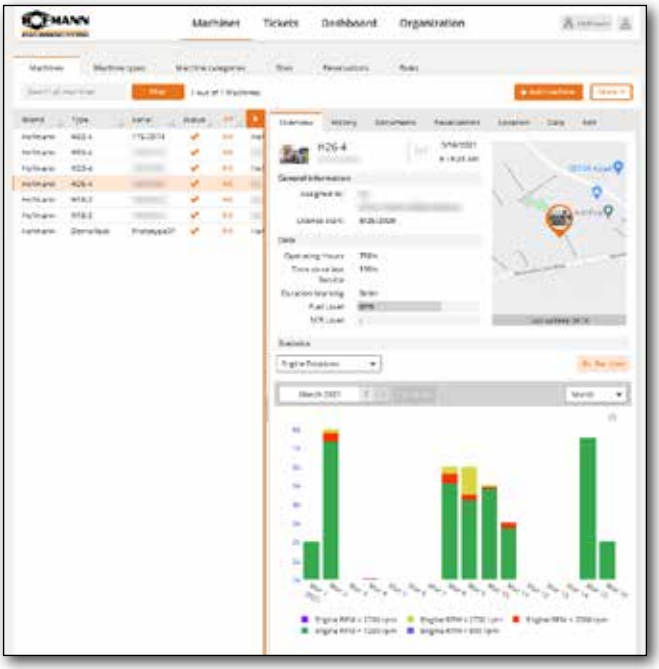
You have the possibility to enter the number of measurements within e.g. 250 m by yourself in order to create an analysis of the line thickness of the marked road (according European regulation).

Compliment with regional requirements demanding selfsupervision of the marking operation can be met by recording of ambient and road surface temperature, relative humidity and use of additives.

HofConnect®
Machine management in the cloud

With **HofConnect®**, you can manage your machines on a common platform – via internet or smartphone app.

Combined with a telemetry module on the machine, the location and a multitude of status data can be retrieved from the machine in real-time. Even the MALCON4 / MALCON4-E marking report* can be transferred to the cloud via the telemetry module and can be downloaded at your convenience to your office computer.



HofConnect®
Machine management in the cloud

Following functions are available for all machines in the cloud:

Even **without** telemetry module:

- **Machine** management in the cloud: Create groups, e.g. to map company structures or different machine types. The working devices of other manufacturers can be integrated as well.
- **Inventory**: Manage the location of a machine, e.g. for several branches.
- **Logbook** entries (text, pictures): Document the machine life cycle, e.g. for a clear overview of error messages, service and repairs.
- **Document storage** for machines: Manage service contracts, manuals etc. for every machine.
- **Reminders**: Set reminders for maintenance and inspections, e.g. TÜV (Technical Supervisory Association), UVV (Accident prevention regulation), etc.
- **Calendar management**: Manage assignments, reservations or the leasing for every machine.
- **Dashboard:** Get a clear overview of fleet evaluations.

With telemetry module**:

- **Location** identification: Locate the machine via GPS (every 15 min.).
- **Geofencing**: Notifies you of machine movements, e.g. due to theft.
- **Machine data** and operating times are transferred to record machine use.
- **Error messages** and operating data are transferred to support the fault diagnosis by HOFMANN.
- **HofCalc data** are transferred from the machine to the cloud to be downloaded (.csv file) at your convenience, e.g. for prompt billing.

The telemetry module is available as an optional add-on for the H18-2, H26-4, H33-4. Retrofitting of older machine models on request (data volume may be limited).

* = HofCalc-Data
** = An annual user fee is charged per telemetry module for data transfer

HofCalc
Software

In addition to the line-gap electronics MALCON4/4E, HOFMANN has developed the software HofCalc, which includes the possibility to create invoices and evaluations very easily.

Special features:

- Stored data can be downloaded directly from the MALCON4/4E via **USB stick**, which considerably reduces the sources of error due to incorrect reading or illegible writing.
- Recorded data from several machines with MALCON4/4E line-gap electronics can be **combined in the HofCalc software** to produce an overall evaluation.
- Marked routes and the associated measuring points can be displayed on a map (see Fig. 2), which allows **geographical assignment** of the markers to an order.
- Orders can be divided into different positions (e.g. margin line - solid, middle line - divided (see Fig. 1 - Orders) to get a better **overview of the different marking types**.
- Assignment of the markers to the positions is carried out by **Drag & Drop** procedure (see Fig. 1 - MALCON4/4E data/ orders).
- The **layer thickness** can be checked at the measuring points (see Fig. 1 - Measuring points).
- Recorded data is summarised per day and **stored** on the MALCON4/4E **for 30 days** before being deleted.

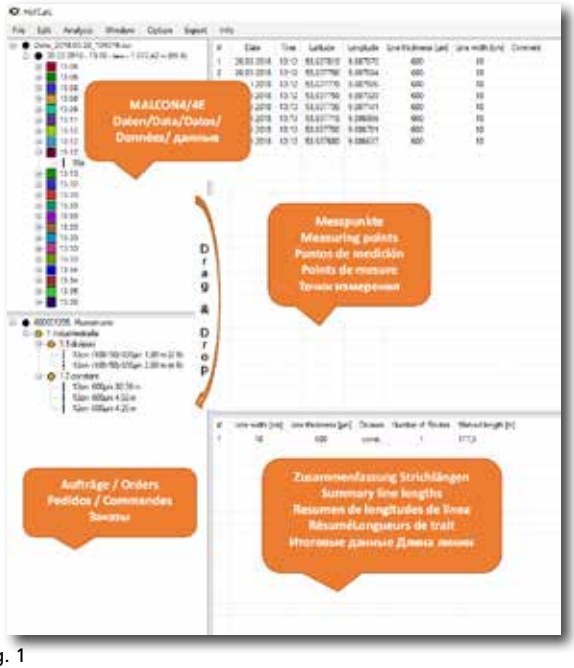

MAILCON4/4E
Daten/Data/Datos/
Données/ данные
Drag & Drop
Messpunkte
Measuring points
Puntos de medición
Points de mesure
Точки измерения
Aufträge / Orders
Pedidos / Commandes
Заказы
Zusammenfassung Strichlängen
Summary line lengths
Resumen de longitudes de línea
Résumélongueurs de trait
Итоговые данные Длина линии

Fig. 1


Marker setzen
Zoom
Karte
Map
Mapa
Carte
Карта
Messpunkte
Measuring points
Puntos de medición
Point de mesure
Точки измерения
Strichanfang
Start of line
Inicio de línea
Début du trait
Начало линии

Fig. 2

ELC1
Electronic Control System for hand-guided machines

To control one magnetic valve (e.g. for one spray gun).

- Storing of up to max. 4 line-space programmes at any given time.
- The number of metres marked by the spray gun is constantly being recorded.
- Switching of programmes (P1 to P4) during the marking operation is possible, as long as the current line-space cycle is terminated before starting the new programme.You can also activate or deactivate spray guns during the marking operation.

ELC1plus
Electronic Control System for self-propelled machines

To control 4 magnetic valves (e.g. for 2 spray guns and 2 bead guns)

- Max. up to 10 line-space programmes can be stored simultaneously.
- The number of metres marked by each spraygun and the cumulative length for all sprayguns is constantly being recorded.
- The detection of running direction ensures that whenever the programme step is located inside a space between lines, you can manoeuvre the machine at random without worry and marking can always be resumed at the correct position.
- Combinations of line-gap programs and gun outputs can be freely assigned to 12 keys (if a keypad is available).
- Guns can be switched on (and off) synchronously in the running line-gap cycle.
- Parallel programm possible for drain pipe for rain.
- Integrated pump control.
- 2.8 “color display.
- Keypad (option).

ELC4

Electronic Control System for self-propelled machines

To control six magnetic valves (e.g. for three spray guns and three glass bead guns in combination).

- Max. up to 12 line-space programmes can be stored simultaneously.
- Special program for drain pipe for rain.
- The number of metres marked by each spraygun is constantly being recorded.
- Switching of programmes and control of the gun can be carried out between the keys "1 to 12" during the marking operation, whereby the current line-space cycle is always terminated before starting the new programme.
- Switching can be done in the line or in the gap.
- Synchronous line begin for the activated spray gun and line termination for the deactivated one.

Info: ELC1 / ELC1plus / ELC4

- *Manual marking: The operator determines for how long and with which spray guns the marking operation is carried out.*
- *Semi-automatic marking: The operator determines with which spray guns and at which point the marking operation is to begin.The operation is terminated after reaching the programmed line length.*
- *Fully automatic marking: The machine carries out the marking operation automatically in accordance with the programme the operator has entered.*

Info: What is telemetry?

Transmission of measurement data

This makes it possible to transmit machine data. A diagnosis with a statement about the functionality of a machine can be supported by this data.

In the specific case for HOFMANN machines this means:

- *Obtaining an **overview** of the condition of the machine*
- *Assistance in finding the **cause of an error***
- ***Remote access** to marking log data*
- ***Locating** the machine*

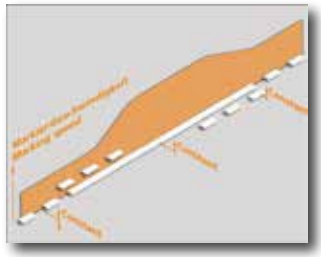
Measurement data sources (where does the measurement data come from?):

- ***GPS** coordinates (internal GPS, which is located in the telemetry module or telemetry box - MALCON4/4E has its own GPS).*
- *MALCON4/4E Ethernet interface. The **HofCalc protocol** and ZTV M (german regulation) data are available to the telemetry module.*
- ***Machine data** [H17, H18-2, H26-4 and H33-4] via CAN* bus (fuel level and AdBlue (Diesel Exhaust Fluid), cooler temperatures, operating hours counter, service interval, oil pressure, marking duration (counter), speed, error codes of the engine and machine control units).*

**CAN = Controller Area Network*

Metering technology

HOFMANN metering systems comply with even the strictest demands and requirements regarding the observance and verifiability of values given.



- Constant line thickness in spite of varying marking speeds.
- Constant delivery volume, irrespective of the number of rotations per minute, as well as regardless of pressure and material viscosity.
- No pulsations (without pulsation dampers).
- No progressive wear and tear that would reduce delivery volume and make it necessary to calibrate and readjust at regular intervals.

This technology was introduced in 1980 under the name AMAKOS®.

AMAKOS® means

Application of
Marking material with
Automatic
COnstant
Line Thickne**S**

HOFMANN offer the AMAKOS® technology for the following methods and marking materials:

	Spray methods		Extrusion
	Airspray	**Airless**	
Cold Paints	•	•	
2-component cold plastics			•
Sprayable 2-component cold plastics	•	•	
Thermoplastics			•
Sprayable Thermoplastics	•		

CONEX®
Metering Pump System

Metering pump for CONstant EXacte metering of different materials.

Use of plunger- or bellow pumps according to application technique.

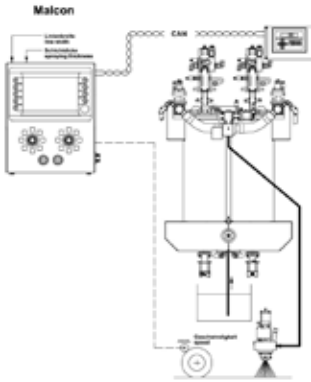
For nearly all cold and hot applied marking materials with and without mixed-in glass beads / anti skid materials (abrasive materials).

- **Plunger pump (Fig 2, 3, 4 + 5):** No concealed working pistons inside the discharge cylinder, just visually inspectable seals against the outside. Optimum strain effect on the sealing. The stress on the sealing is a stretch load, in contrast to conventional piston pumps with pulling and strongly stressed pressing sealing process. Precondition for the application of abrasive materials.
- **Bellow pump (Fig 1 + 3):** No concealed conveyor pistons inside the discharge cylinder since it is a seal-free system.

Applies to both systems:

- MALCON4/4E: Control unit that allows to enter marking line values for width and thickness.
- The necessary material quantity in accordance with the speed is transmitted via CAN bus to the pump which supplies the controlled quantity of material.
- The spray thickness resulting from the feedback is logged with GPS coordinates in compliance to ZTV-M (German Additional Technical Contractual Conditions and Directives for Marking on Streets).
- By entering other specification data you can create logs which are often required by contractors.
- No negative pulsation and no flow losses which could be detrimental to the spraying quality.
- Diagnostic system for malfunctions.
- Automatic switch-off of the pump system if there is a shortage of hardener or layer thickness falls below the set level.

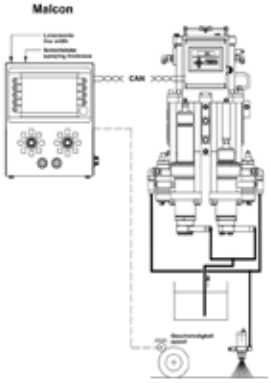
Metering process: Bellow pump for sprayable thermoplastics with MALCON4E



3-line-system possible

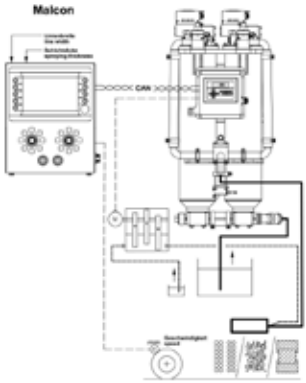
CONEX®
Metering Pump System

Metering process: Plunger pump for cold paints Airless (high-pressure method) or Airspray (low-pressure method) with MALCON4E



3-line-system possible

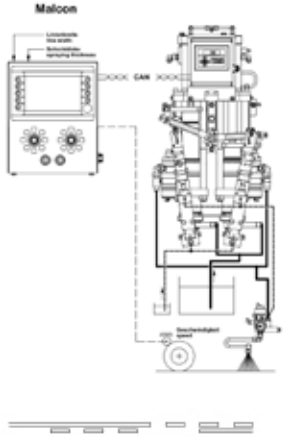
Metering process: Bellow pump for 98% main component as well plunger pump for 2% hardener component, for 2c cold plastics (thick layer) with MALCON4E



2-line-system possible

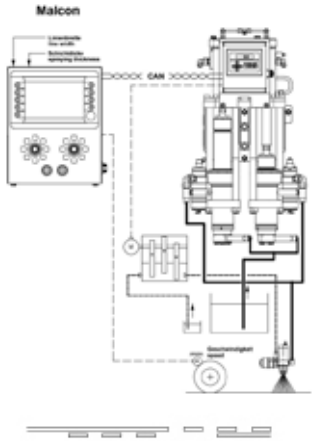
CONEX®
Metering Pump System

Metering process: Plunger pump for 98% main component as well for 2% hardener component, for sprayable 2c cold plastics Airless (high pressure method) with MALCON4E



2-line-system possible

Metering process: Plunger pump for 98% main component as well as for 2% hardener component, for sprayable 2c cold plastics Airspray (low pressure method) with MALCON4E



2-line-system possible

Dry Compressed Air in Marking Machines
Maintenance units with air dryer

Moisture in the form of water in compressed air often causes extremely unpleasant faults in pneumatic control systems and in bead-dispensing equipment. The greater the concentration of moisture in the air, the more likely vapour will condense to form water in the compressed air whenever it cools down or the pressure drops. The consequences can be, for example, malfunctions in pneumatic valves (delayed switching) or a deteriorated flow behaviour of the beads.

So-called water separators only remove a portion of the moisture, i.e. only that portion that constitutes vapour already condensed to water when it enters the water separator. **This means that the air passing through is by no means dry**. The moisture, i.e. the vapour still in the air, passes through the water separator and does not condense into water until it cools down at a later point. Even when it cools down further by 1 °C, it produces water again.

It is possible to achieve a considerably closer-to-perfect solution by using an **additional air-drying apparatus**. This entails extracting the majority of the moisture present in the form of vapour, so that the annoying water cannot be produced until it has cooled down considerably further.

For optimum moisture removal, HOFMANN offers maintenance units consisting of a water separator, a dirt filter and a compressed air membrane dryer.

The membrane dryer offers reliable compressed air drying with low air consumption, does not require any electrical energy and does not contain any drying agents that are harmful to the environment.

For cost reasons, these units should only be used where air is used for control purposes or for pressurising the bead containers.

HOFMANN offers membrane dryers with nominal capacities of **25, 250** and **500** l/min.

For compressed air membrane dryers, **please note** that:

- the devices for the drying process divert so-called purge air to a proportion of 10 to 20 % of the dryer nominal capacity and discharge it into the open air. This air is lost for other purposes.
- the maximum air inlet temperature must not exceed 60 °C and must not fall below 2 °C. Frost below 0 °C can damage the filter and membrane elements.

Line combinations
Pressure container vs. metering pump

Suitability of pressure container and metering pump for double lines (line combinations).

The **disadvantage** of **pressure container** delivery is that the outflow volume is dependent on the changes of the total discharge cross-section of all connected application units, like e.g. Spotflex® nozzle bar or paint guns. When the total discharge cross-section is changed, the discharged total volume also changes – however, **not** always as desired.

When opening a second application unit – e.g. when generating the line combinations shown in Fig. 1 – it requires double the material volume. This however doesn't happen when using a pressure container as has been shown by the measuring results of a simple test (see fig.1 and 2).

The outflow volumes from only **one** opened Spotflex nozzle bar, dependent on container pressure, are shown in column 1 and the values for **two** opened nozzle bars are shown in column 2.

With test n° 2 (fig. 2) there is a material volume of 10.7 kg/min available for the single line with a container pressure of 3 bar. The double material volume of 21.4 kg/min is necessary in the area of the double line (column 4). The actual result, however, was a volume of only 15.9 kg/min (column 2), which represents 25 % less than necessary.

A combination of lines would look similar to the one shown in Figure 3. In the area of the double line the agglomerates are visibly leaner, in the area of the single line they are more voluminous.

Explanation:
With a higher flow rate, the resistance in the line system rises up to the intersection V (fig.1), which could only be compensated by increasing the air pressure.

As one can see from the few measuring values, the required double volume would only be reached when the container pressure is 1 bar higher, that is at 4 bar. When opening the spray header for the second line, the container air pressure would have to be increased by 1 bar within milliseconds and when closing it again, it would have to be lowered by 1 bar just as quickly. That this is not possible needs no further explanation.
Systems with **HOFMANN metering pumps** behave differently on principle. A pump is not simply a substitute for a pressure container because:

1. The discharge flow is proportional to the speed and this independent of the viscosity and the viscosity changes of the material, as well as independent of pressure and changes of pressure.
2. When the speed is doubled abruptly, the discharge flow also doubles abruptly.

The cause-effect correlation between **pressure container** and **metering pump** is fundamentally different:

- in the case of the pressur container method the discharged volume of material is the result of air pressure, viscosity and resistances in the system.
- Pressure, viscosity and resistance play no role whatsoever in the case of metering pumps. The material flow rate is servo-hydraulically controlled.

The material flow rate can thus be adjusted to the required quantity within a few milliseconds (double, triple - halve, third).

Line combinations
Pressure container vs. metering pump

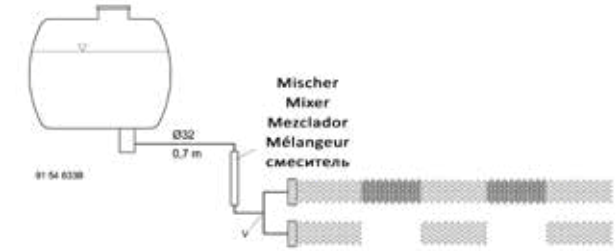


Fig. 1

		1	2	3	4
Test N°	Container Pressure	Outflow **Single Line** (kg/min)	Outflow **Double line** (kg/min)	Relation	Actual required quantity double line (kg/min)
1	2 bar	6,6	8,7	1,3	13,2
2	3 bar	**10,7**	15,9	1,48	**21,4**
3	4 bar	14,3	**21,8**	1,53	28,6

Fig. 2

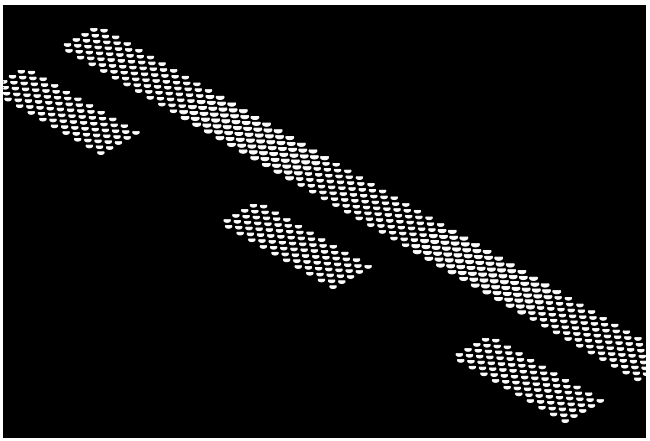
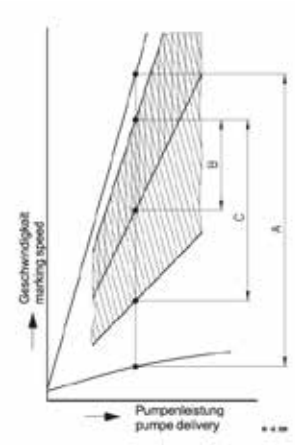


Fig. 3

AMAKOS®
Path-depending marking system

Speed proportional Application of Marking materials with Automatic COnstant of Sprayfilm thickness.

Most of the HOFMANN systems with pumps are suitable for the AMAKOS®-mode of operation as well as the Non-AMAKOS®-mode.



The diagram shows the speed ranges within which it is possible to vary the marking speed.

A Atomizing air spraying method
B Airless spraying method
C Airless spraying method with line width stabilizer

The range of speed variation available with the airless spray method is restricted in comparison with the atomizing air method. The practicable maximum speed is generally equivalent to 1.5 times of the practicable minimum speed. When using the line width stabilizer factor 3 is here possible.

- **HOFMANN AMAKOS®**
  Operating mode for the application in proportion to travel speed. In this mode of operation you may vary your travel speed within a wide range. The spray thickness will nevertheless remain at a constant level. Maintaining a specified spray thickness is no longer dependent on specialist skill and reliability. AMAKOS®: advantages like you have with Non-AMAKOS® but in addition no more need to supervise speed.

- **HOFMANN Non-AMAKOS®**
  Operating mode enabling you to set a delivery volume that remains constant irrespective of travel speed. Whenever you alter your travel speed in this mode of operation, also the spray thickness changes. No more need to supervise constantly pressure and viscosity.

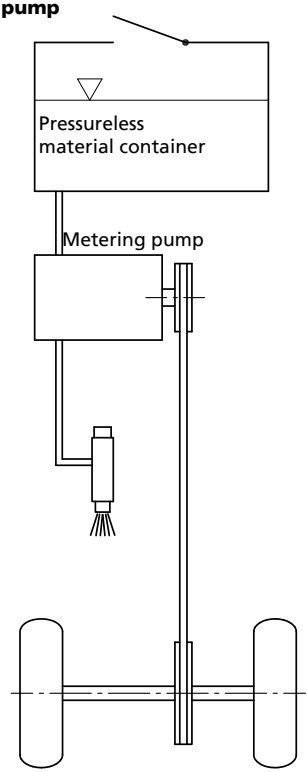
- **Conventional** (**pressure controlled pumps**):
  Spray thickness depends on pressure, viscosity and speed. High work load for operating personnel.

No problem with line combinations with up to three spray guns (does not apply to 2-component materials).

Whenever a second or third spray gun is opened, the pump switches over to the corresponding delivery volume of material.

HOFMANN Technology

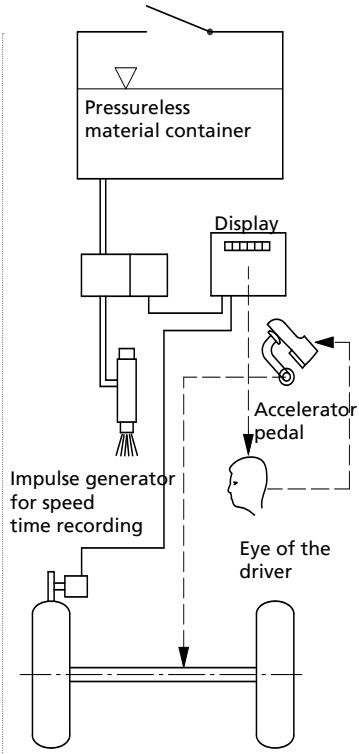
Keeping the line thickness consistent with speed-proportionally driven metering pump



- Paint quantity is dispensed speed-proportionally.
- The amount conveyed by the pump follows changes to the running speed without delay.
- The running speed may even be changed actively almost any way by the driver.
- Line thickness remains consistent.
- Lower dependency on due care of the operator.

Conventional Technology

Line width display system (with flowmeter)



- Display of calculated averages of line thickness.
- Delayed reaction of operator to target-actual deviations.
- Delayed compensation of target-actual deviation.
- Large dependency on care and fatigue of the operator.
- Operator acts as controller.
- At target-actual deviation zero, the operating speed must not change.
- Any change leads to a line thickness change in the opposite direction.

Path-dependent Airless markings and line width stabilizer

Line width stabilizer keeps variation in line width during path-dependent Airless spraying method (AMAKOS®) automatically in minimum ranges.

HOFMANN pumps for Airless spraying permit variation of marking speed over a large range at a constant paint quantity per metre of line length (AMAKOS®). The paint quantity pumped by the pump is thus proportional to the speed of travel of the machine.

Hence, as the speed increases, so too does the quantity of paint that is pressed through the spraying nozzle per unit of time, accompanied by an increase of pressure in the paint pipe to the nozzle. It is well-known that an increase in the spraying pressure results in an enlargement of the spraying angle. With an unchanged distance between the gun and the road surface this results in an enlargement of the line width. This effect is dependent on the nozzle and the paint used. However, due to the pressure influence variator line width variation can be kept within minimum ranges in a large speed area.

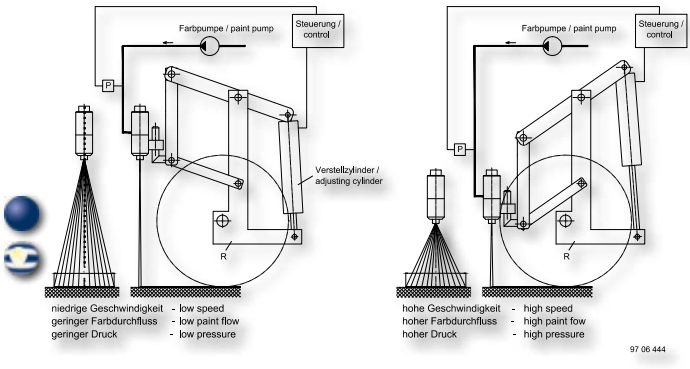
Functional principle

The component marked by an **R** in the illustration is a frame that always moves parallel to the road surface. The pistol holder with the spray gun fastened to it is connected to the frame via articulated arms. An electrical adjustment cylinder is attached between the frame **R** and the upper articulated arm and the operation of the same moves the spray gun upwards or downwards.

A pressure sensor **P** continuously records the actual spraying pressure of the paint and is transmitting the values to a control unit, which calculate the height of the spray gun in such a way that the line width almost remains constant even in case the spraying angle varies.

With increasing marking speed, i.e. with increasing paint pressure, the spray gun is pushed further and further downwards as a result of which the effect of the enlargement of the spraying angle on the spraying width is compensated.

See also on Wikipedia at application and web links:



Thermoplastic thick-layer systems

Alternative for road markings applied with sprayable thermoplastic (sprayplastic)?

With regard to the range of hot applied materials and sprayable thermoplastic (thin-layer), you can apply thick-layer markings with thermoplastic by means of either a screed box or extruder.

The main difference between the application of sprayable thermoplastic (sprayplastic) and thermoplastic using a screed box or extruder is the line thickness of the material on the road.

- Sprayable thermoplastic approx. 1,2 mm *)
- Thermoplastic (Screed box/Extruder) approx. 3 mm *)

Of course, this means in particular that you can benefit from a longer road marking durability resulting in increased safety on our roads.

Essential differences between the two application methods:

Screed box application	Extruder application
more accurate line edges	quick change of line width
marking speed approx. 1,5 – 2 km/h**)	marking speed approx. 4 – 8 km/h **)
	combined double lines (optional)
	path dependence (optional)
	low material consumption

*) depending on quality of material

**) depending on line width, line thickness and quality of material

Thermoplastic MultiDotLine® Universal Extruder / MultiDotLine® Plus Extruder

Line combinations consisting of continuous and interrupted lines for ...

- **full-cover markings (plain line)**
- **profiled markings (Kam- and Longflex, chessboard, lettering)**
- **defined agglomerate markings**
- **defined agglomerate markings on plain lines in one single marking operation (MultiDot-Line® Plus).**

- The exact application of marking patterns improves verifiability during acceptance by the customer.

- Accurately defined distances between the individual marking dots enable water to drain easily. Any dirt is thus rinsed from the marking reliably. The result is better maintenance of the retroreflection values.

- Variable generation of spaces between dots as well as size of dots (different perforated cylinders and different perforated cylinder revolutions).

- The rotating hollow cylinder for the exact determination of the marking patterns is located inside of the extruder housing. Thus, no heat problems resulting from too low ambient temperatures and wind.

- Agglomerate and plain line markings with exact line beginnings and endings as well as no material splashes between the "dots" and in line-gaps due to heated extruder shutters. Furthermore by heating until outlet onto the road surface, the temperature of the material is kept constant (no problems with cooling down).

- Noise reduction when using long dots in acoustic, sensitive areas. A fine adjustment of the acoustics can be made via the length of the Longs Dots.

- Marking speeds up to 10 km/h*) can be achieved (MultiDotLine® universal extruder).

- Application of double lines and line combinations in one single marking operation, possible with "Dots" (drop-shaped, round and long) and "Longflex.

- Ensurance of path-dependency (AMAKOS®) with MultiDot-Line®- and MultiDotLine® Plus systems.

*) *dependent on material and equipment, continuous line, line width 12 cm*

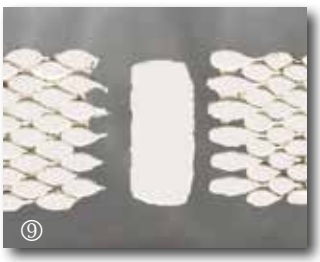
Longflex marking

With the 180° rotatable extruder head you can apply dropshaped (MultiDotLine® system) as well as round "dots" – path-dependently at the usual high speeds.

Drum rotating in driving direction ⇨ drop shaped pattern

Drum rotating against driving direction ⇨ round pattern

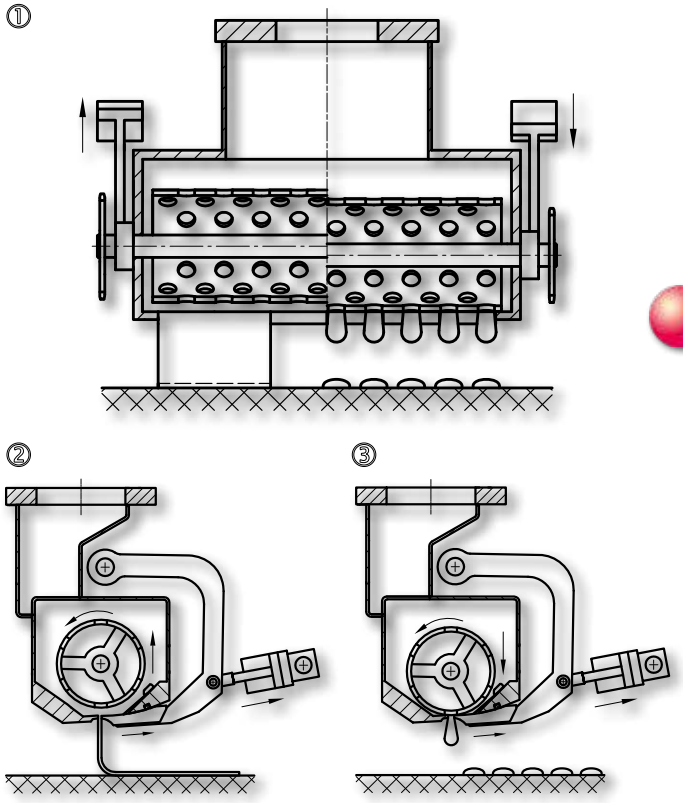
Thermoplastic MultiDotLine® Universal Extruder



Road Marking Patterns

① Kamflex
② Longflex
③ „Dot“ (drop shaped)
④ „Dot“ (round)
⑤ „Dot“ (long) [LongDot®]
⑥ Chessboard
⑦ Lettering
⑧ ATM - Audio Tactile Marking
⑨ „Rip‘N‘Dots“

Functional principle



① Rotation of a hollow cylinder (scattering drum) equipped with outlets inside of the extruder housing.

② Execution of plain markings at raised scattering drum.

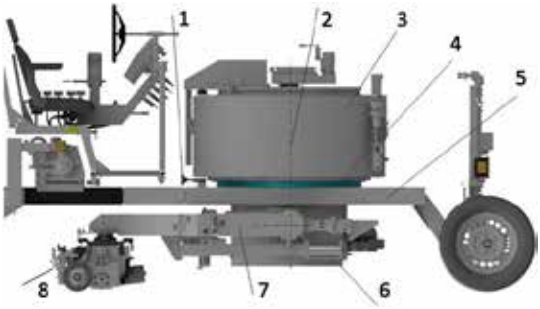
③ Execution of profiled markings (MultiDotLine®) at lowered drum.

Pneumatical lowering and raising during marking operation from operator's stand possible.

Thermoplastic MultiDotLine® Universal Extruder, swivelling - Series H26/H33

Thermoplastic extruder system for application of markings **on both sides** of the machine.

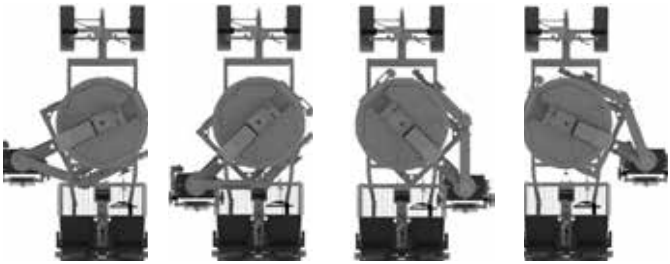
Assembly:
The material container is rotatably mounted on a special machine frame. The lifting gear and extruder attachment are swung through under the machine frame. The tank can be locked on either side into position at 4.5° / 45° / 55° or 65°.



1 Locking (pneumatically)
2 Rotation axis
3 Material container
4 Bearing
5 Frame
6 Lifting gear (with float position)
7 Worm pump
8 MDL universal extruder head

Advantages

Driving direction:
Application of marking lines on both sides of the machine ⇨ edge and center markings can be applied always in the driving direction. Even the application of marking lines in the middle of the machine is possible (limited view).



65° left **45° left** **45° right** **65° right**

Time saving:
Conversion process takes only approx. 3 minutes and can be easily carried out on site.

Safety at work:
The conversion of the extruder to the other side is quick, easy and user-friendly ⇨ there is no need to separate hot material or thermal oil lines!

Front view:
Excellent view forward to the pointer and road
⇨ neither worm pump nor lifting gear disturb the driver's field of vision.

Transport width:
The width of the machine during transport is only approx. 1,5 m.

- Marking position: Extruder **on the side** next to the container

- Transport position: Extruder **under** the container

Integrated 2-stage lifting gear:
With the 2-stage lifting gear, operation of the extruder is also possible when slightly raised ⇨ if the road surface is poor, this means that no shocks or vibrations are transmitted to the extruder head.

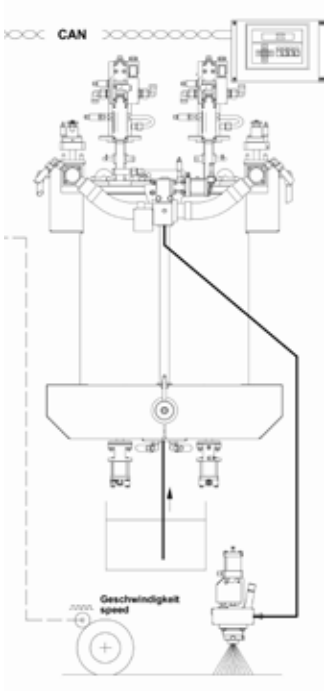
More uniform reflection values:
On multi-lane highways and motorways ⇨ no deviations in reflection values due to the direction of marking. If both the right and left border line are marked in the direction of travel, the influence of the direction of the glass bead application is avoided - this is particularly advantageous for structural markings.

Sprayable thermoplastic with pump

Volume-controlled bellow pumps for sprayable thermoplastics automatically apply the required material quantity and therefore offer constant, high quality markings.

- Consistently high visibility by day and night and grip across the entire technical usage duration by clearing the mixed-in reflection beads and grip agents in the course of gradual daily wear.
- The requirements to permanently visible and therefore safe type I and II lane markings are met.
- No requirements regarding industrial safety and water protection and no application of the hazardous substance regulation.
- Storage for an extended period of time, without any changes to the technical and physical properties.
- Short cooling times that make the type of marking safe for traffic and driving over very quickly.
- Marking speeds up to 15 km/h (material- and equipment-dependently with an unbroken line, line width 12 cm) can be achieved.
- Execution of up to triple lines and line combinations in one work step possible.
- Hermetically sealed displacement system (bellows in the housing), which prevents wear of seals.
- Automatic gap pressure control for very good line starts.
- Special intake of highly abrasive, difficult materials.
- Marking of a 3-lines-combination is possible.
- Application in AMAKOS® operation possible.

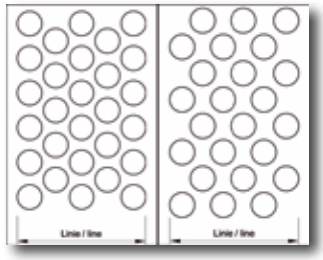
Functional principle



- Metering of sprayable thermoplastic material by means of a bellow pump

2-component cold plastic Spotflex®
Agglomerate marking

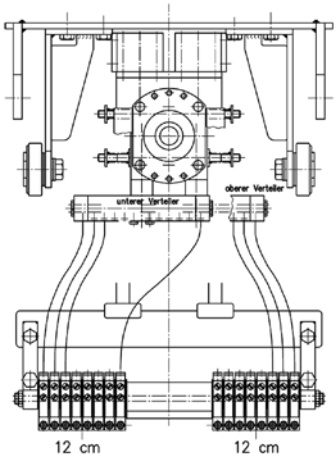
Defined 2-component cold plastic agglomerate markings, applied with a 98:2 mixing ratio using air pulsed method – Spotflex®.

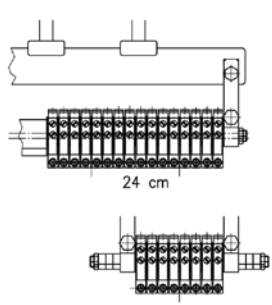


- Marking system for agglomerate markings, which efficiently applies defined, profiled markings in order to increase night visibility during rain and wet conditions.
- Such profiled markings can be renewed (re-marked) or can be applied on already existing roadmarkings in case a plain effect is requested during daylight and reduced inspection distance.
- Application of whole container filling without intermediate flushing of the system thus longer stops can be avoided.
- Exact compliance of mixing ratio, therefore mixing as a matter of trial and error is eliminated.
- Marking speeds up to 6 km/h*) can be achieved (bellow pump and pressurised container).
- Suitable for the application of highly abrasive mediums and solid matters with a size of up to Ø 2,5 mm (bellow pump and pressurised container).
- Due to the optimum drainage the individual dots having a height of 3 – 5 mm remain accessible for headlights and will reflect even during heavy rainfall.
- This system is also suitable for applying roadmarkings combined with a noise effect (depending on the height of dots) when crossing the roadmarking.
- At the customer's request large and small dots as well as different raster (distance between the rows) with open or closed edge can be applied.
- Acoustic warning signal in case of lack of hardener.
- Due to high application speeds and short flushing periods obstruction to traffic can be reduced.
- Using the bellow pump system double lines and line combinations in one single marking operation are possible. Using the pressurised container system double lines are also possible, however line combinations only restricted [refer to Hofmann Info N° 396].
- Fulfilment of regulations is ensured with regard to automatic compliance of adjusted line thickness/material quantity.
- Possibility to use AMAKOS® method of operation.

**) dependent on material and equipment, continuous line, line width 12 cm*

Functional principle





- Modular build of spray bar.
- Nozzles and nozzle holder can be attached variably, therefore line width and line distance can be determined by yourself.
- Very efficient system by reason of the quick exchange of nozzles.

2-component cold plastic stochastic structures
Agglomerate marking with scattering drum

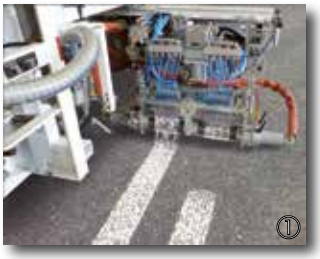
Stochastic agglomerate markings with 2-component cold plastic, mixing ratio 98:2 applied with ...

① **Bellow pump system (path-dependent)**

② **Universal-extruder-system (path-dependent)**

- **Pressurised container system (not path-dependent)** *(without picture)*

③ **Screed box system (not path-dependent)**



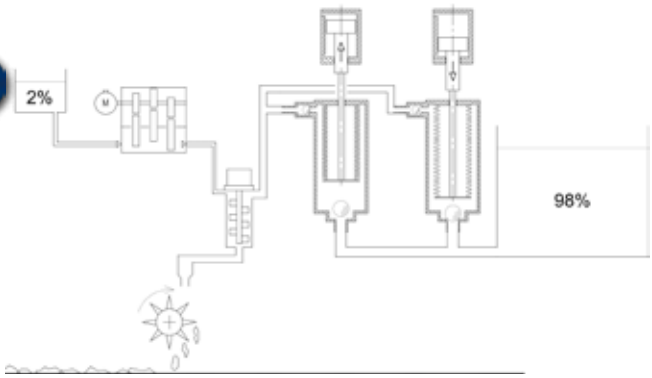
- Marking system for agglomerate markings, which efficiently applies structure markings on the road in order to increase night visibility during rain and wet conditions.
- These structure markings can be renewed (re-marked) or can be applied on already existing roadmarkings in case a plain effect is requested during daylight and reduced inspection distance.
- Application of whole container filling without intermediate flushing of the corresponding systems (bellow pump, extruder and pressurised container) thus longer stops can be avoided.
- Exact compliance of mixing ratio, therefore mixing as a matter of trial and error is eliminated.
- Marking speeds up to 10 km/h*) can be achieved (bellow pump, extruder and pressurised container). Using the screed box system up to 4 km/h*).
- Suitable for the application of highly abrasive mediums and solid matters with a size of up to Ø 2,5 mm (bellow pump and pressurised container) as well as up to Ø 0,6 mm (extruder and screed box).
- Due to the optimum drainage the peaks of the stochastic marking remains reachable for headlights and will reflect even during heavy rainfall.
- Acoustic warning signal in case of lack of hardener.

**) dependent on material and equipment, continuous line, line width 12 cm*

- Using the bellow pump system double lines and line combinations in one single marking operation are possible. Using the pressurised container system double lines are also possible, however line combinations only restricted [refer to Hofmann Info N° 396].
- Fulfillment of regulations is ensured with regard to automatic compliance of adjusted line thickness/material quantity.
- Possibility to use AMAKOS® method of operation.

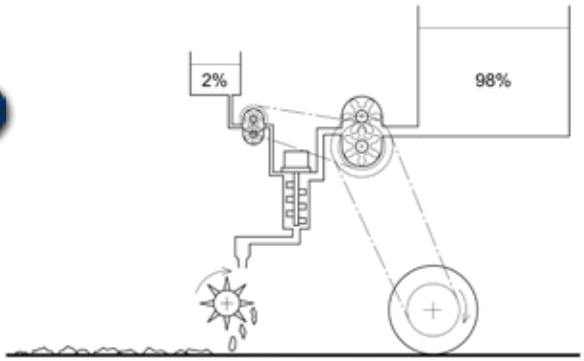
Functional principle

Bellow pump system



→ Driving direction

Universal extruder system



→ Driving direction

- Dynamic mixing system for mixing of the two components
- Dosage of 2 % hardener component by means of a plunger pump (bellows pump system) or gear pump (universal extruder system) as well as 98 % base component by the bellows pump or the extruder
- Spiked roller for generating stochastic agglomerates

”

Since 1952, we have not only been manufacturers with a high level of technological competence and experience, but also your global consultant for road markings! Make the most of our potential and contact us with your questions.

Björn Tiegel, Area Sales Manager

2-component cold plastic
Plain and profiled lines

Plain and profiled markings markings with 2-component cold plastic, mixing ratio 98:2 applied with ...

① **Bellow pump system (path-dependent)**

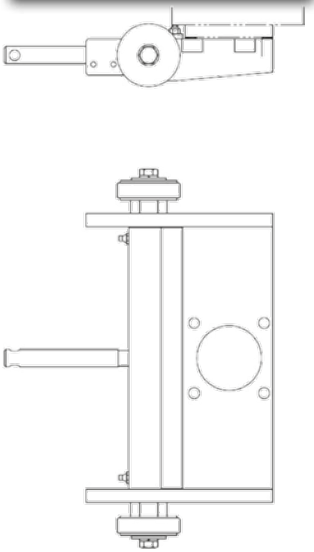
- **Universal-Extruder-System (path-dependent)** *(without picture)*
- **Pressurised container system (non-path-dependent)** *(without picture)*

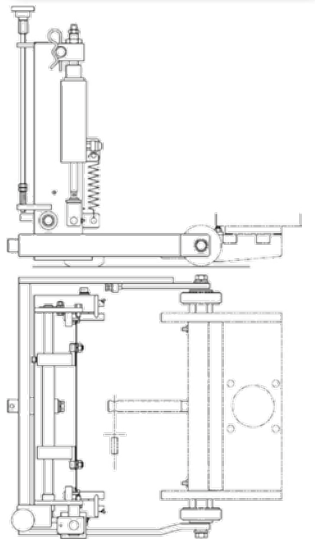
② **Screed box system (non-path-dependent)**

- Application of whole container filling without intermediate flushing of the corresponding systems (bellow pump, extruder and pressurised container) thus longer stops can be avoided.
- Exact compliance of mixing ratio, therefore mixing as a matter of trial and error is eliminated.
- Marking speeds up to 8 km/h*) can be achieved (bellow pump, extruder and pressurised container). Using the screed box system up to 2 km/h*).

Functional principle
Shutter / Flap system

① Closed mixing and application unit: for plain markings *(left)* and profiled markings *(right)*





- Plain double lines and line combinations in one operation are possible with the bellow pump system.
- Profiled markings: speeds up to 2 km/h*) can be achieved.
- Suitable for the application of highly abrasive mediums and solid matters with a size of up to Ø 2,5 mm (bellow pump and pressurised container) as well as up to Ø 0,6 mm (extruder and screed box).
- Acoustic warning signal in case of lack of hardener.
- Fulfillment of regulations is ensured with regard to automatic compliance of adjusted line thickness/material quantity.
- Possibility to use AMAKOS® method of operation.

Functional principle

Screed box system

② Closed mixing system with open material supply box for plain and profiled markings, without *(above)* and with *(below)* chamfered edges

- Quick exchange system for screed boxes.
- 90° cross profiled markings up to 16 mm height (depending on material) with and without chamfered edges.

Following applications are possible:

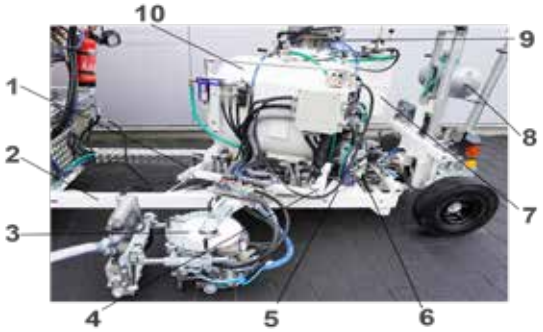
- Profiles on base line, possible as continuous line and line-gap combinations.
- Profiles without base line.

*) *dependent on material and equipment, continuous line, line width 12 cm*

2-component cold plastic extruder system, swivable, Series H18

2-component extruder system for application of markings **on both sides** of the machine.

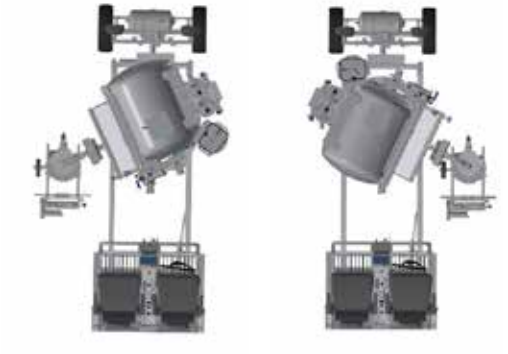
Setup:
The material container is supported turnably on the machine frame. The application unit is swiveled over above the machine frame. The container can be latched in 45° / 55° or 65° positions on either side.



1 Locking (pneumatic)
2 Frame
3 Application unit (incl. mixer, rinsing valve)
4 Lifting device (hydraulic)
5 Bearing
6 Hardener pump (AMAKOS®)
7 Hardener container
8 Rinsing agent container
9 2c-bellow pump (AMAKOS®)
10 Material container

This setup has a number of advantages:

Lane direction:
Application of marking lines **on both sides of the machine** ⇨ edge and center markings can always be applied in the lane direction if necessary.



Time savings:
The entire changeover process takes just **three minutes** and can be performed easily on the construction site.

Operator friendliness:
Side change requires much less conversion work than before. The entire application unit can be lifted much farther than before (hydraulically): this improves **accessibility** of the individual system components even more – when changing equipment and during service and repair work.

The new swivel system makes the marking machine particularly **flexible** in use.

Transport width:
The machine is only approx. 1.5 meters wide in the transport position.

- Marking position: Extruder **laterally** next to the tank

- Transport position: Extruder **behind** the tank

Integrated 2-level lifting device:
The 2-level lifting device permits operation of the extruder in the slightly raised condition as well ⇨ bad road surfaces do not transfer impacts and vibrations to the extruder head.

More consistent retroreflection values:
For freeways and motorways with multiple lanes ⇨ no deviations of the retroreflection values due to marking direction. Marking both the right and left edge lines in lane direction avoids directional influence on bead formation. This is a particular advantage for structured markings.

Sprayable 2-component cold plastics
Airless and Airspray Marking 98:2

Airless- and Airspray Application of 98:2 sprayable cold plastics

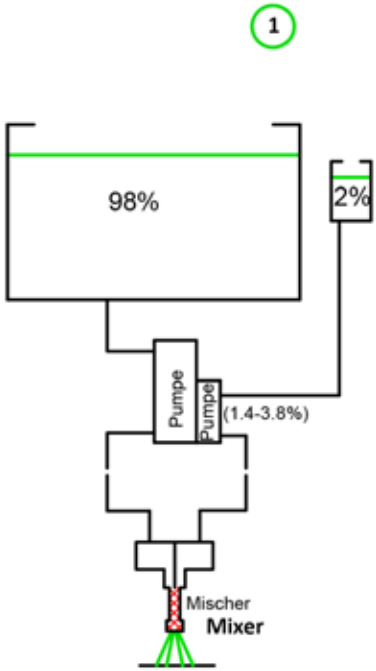
Characterics

- No second storage container, thus no risk to interchange erroneously the material during refilling.
- No premixing of a basic component which starts to cure after some time and will become useless.
- No necessity to process the premixed material inside of the machine in due course by reason of highly variable storage stability of material.
- No loss of material as a result of partial curing of premixed material.
- Intensive cleanings of container, pump, pipes, etc. with solvent are not necessary.
- Metering of hardener with the Airless 98:2 system adjustable from 1,4 % up to 3,8 %. Using the Airspray 98:2 system with pump or pressurised container adjustable from 1.0 % to 4.0 %.
- Pulsation free metering of the two components which are proportionately extremely different.
- Application of whole container filling without intermediate flushing of the system thus longer stops can be avoided (not applicable with 98-2 Airspray system).
- Exact compliance of mixing ratio therefore mixing as a matter of trial and error is eliminated (except with 98:2 pressurised container Airspray-System).
- No intermediate cleaning of the system during work interruptions (marking stops) at e.g. traffic lights (only 98-2 Airspray system).
- In case of lack of hardener automatic pump shutdown.
- Marking speeds up to 15 km/h (depending on material and equipment, continuous line, line width 12 cm).
- Double lines and line combinations in one single marking operation are possible.
- Possibility to use AMAKOS® method of operation (except 98:2 pressurised container Airspray-System).
- Application of line combinations with two 2-component spray guns possible.

*) *dependent on material and equipment, continuous line, line width 12 cm*

Functional principle

HOFMANN 98:2 Airless-System

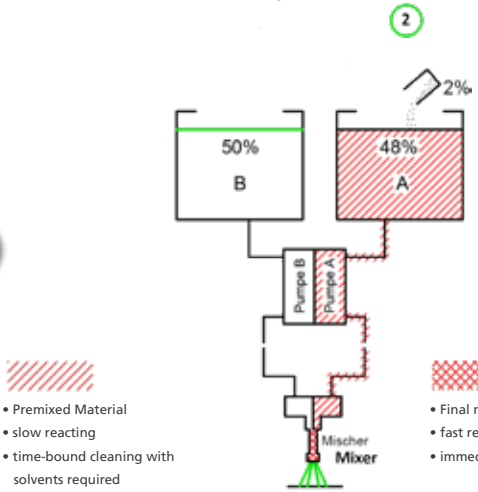


- Final mixed material
- fast reacting
- immediate flushing required

- Only one container for basic component
- No risk of confusion during filling of the different basic components
- Only flushing of the gun is necessary (hatched area)

Function principle

HOFMANN 50:48:2 Airless-System (also called 1:1-System)



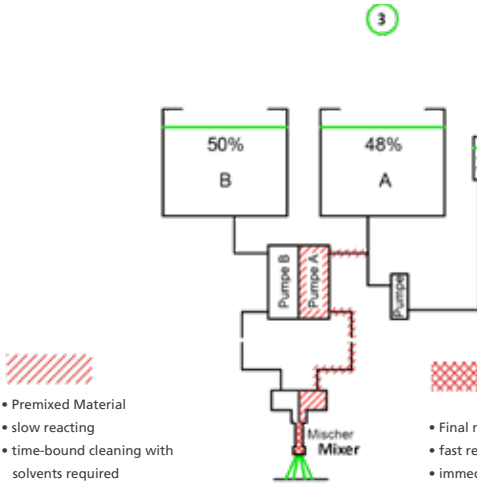
- Premixed Material
- slow reacting
- time-bound cleaning with solvents required

- Final mixed material
- fast reacting
- immediate flushing required

- Two containers for basic components
- Risk of confusion when filling the different basic components
- Cleaning of container A, rinsing of pump A, hose to gun and gun required (hatched area)

50:48:2 Airless-System (also called 1:1-Plus-System)

with suction side hardener injection



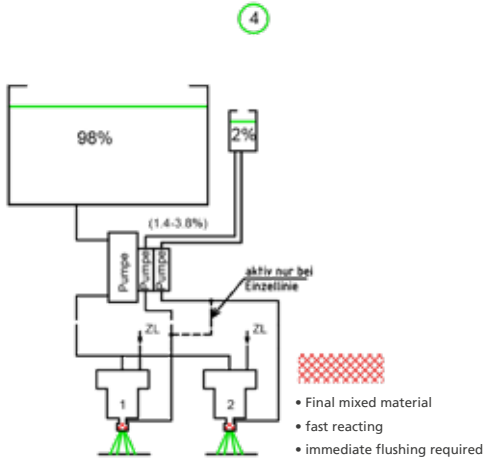
- Premixed Material
- slow reacting
- time-bound cleaning with solvents required

- Final mixed material
- fast reacting
- immediate flushing required

- Two containers for basic components
- Risk of confusion when filling the different basic components
- Cleaning of pump A, hose to gun and gun required (hatched area)

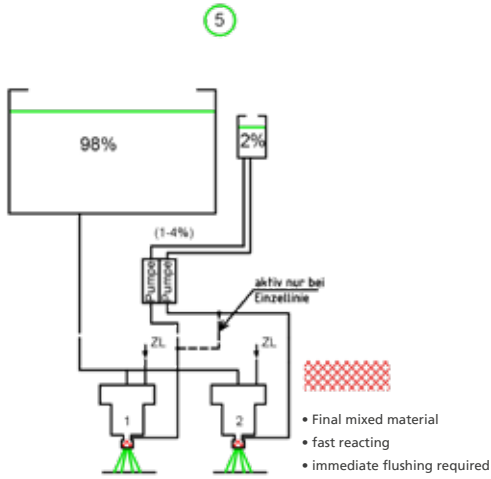
Function principle

HOFMANN 98:2-Airspray-System - Pump



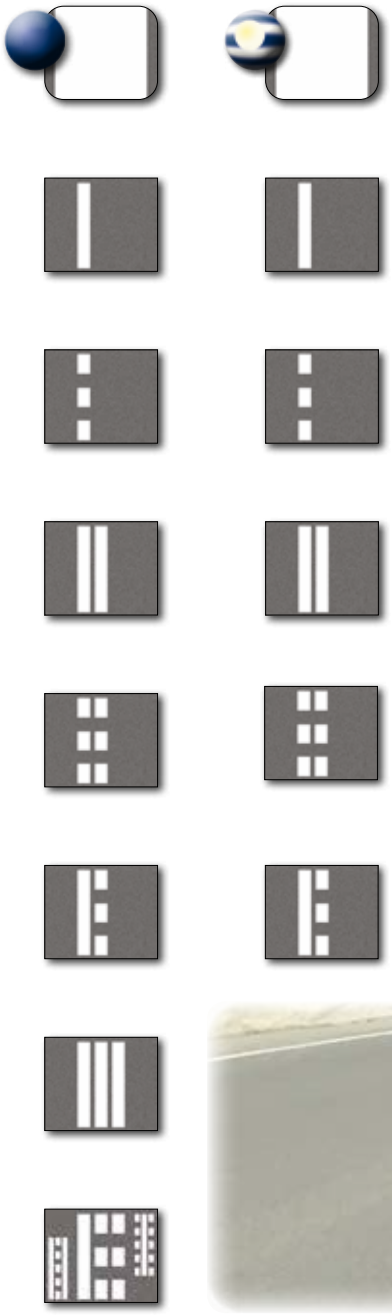
- Only one container for basic component
- No danger of confusion when filling in the different basic components
- Aim: Flushing of the gun not necessary or only necessary with air

HOFMANN 98:2-Airspray-System - Pressurised container



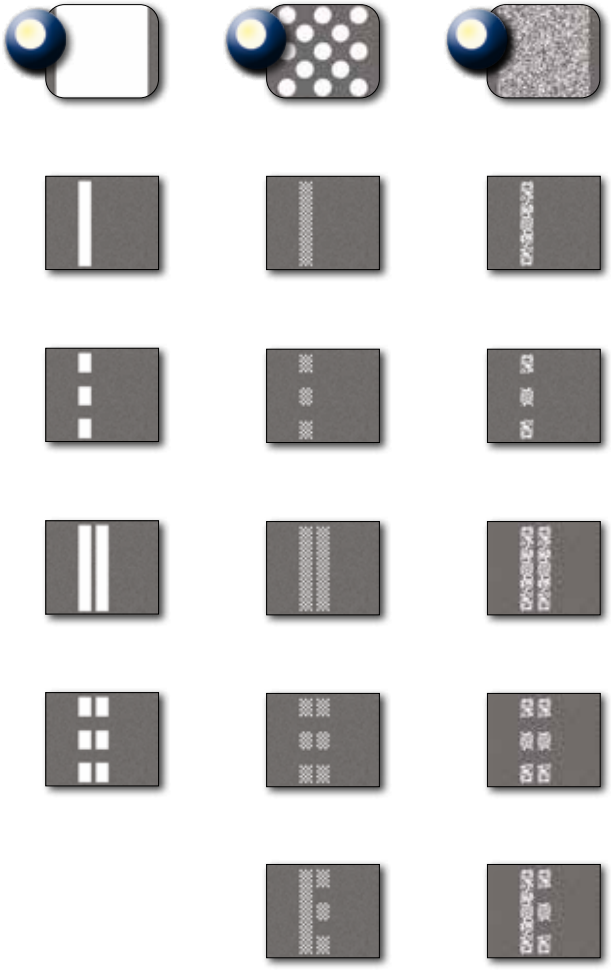
- Only one container for basic component
- No danger of confusion when filling in the different basic components
- Aim: Flushing of the gun not necessary or only necessary with air

Portfolio Road Marking Pattern
Cold Paints /
Sprayable 2-component cold plastics (liquids)



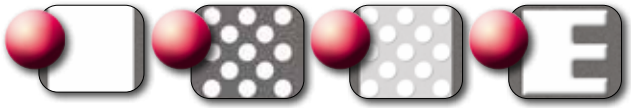
Portfolio Road Marking Pattern
Sprayable Thermoplastics

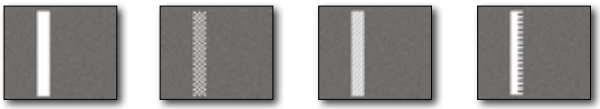
Portfolio - Road Marking Patterns
2-component cold plastics (liquids)

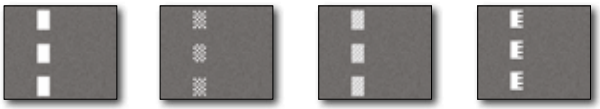


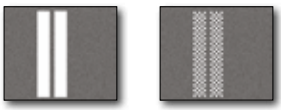
Portfolio - Road Marking Patterns
2-component cold plastics (liquids)

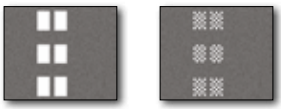
Portfolio Road Marking Patterns
Thermoplastics

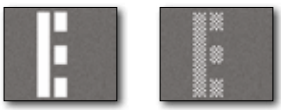




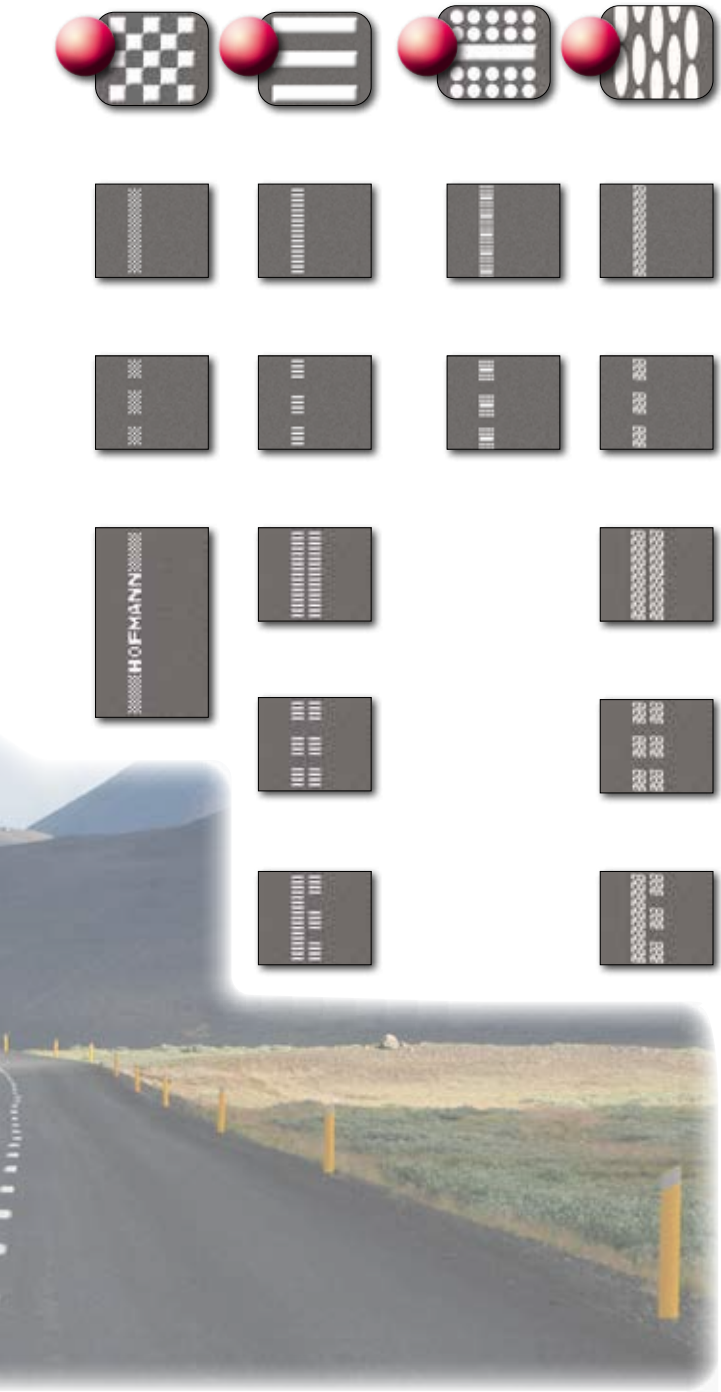








Portfolio Road Marking Patterns
Thermoplastics

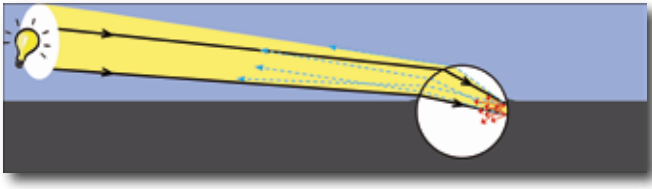


Safety through visibility

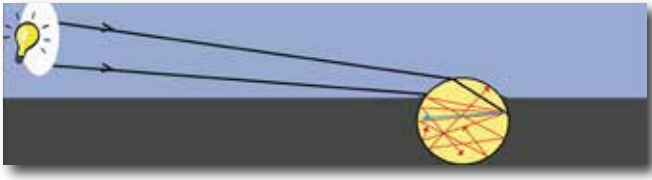
I Retroreflection R_L (night visibility) of glass beads

1. Embedding

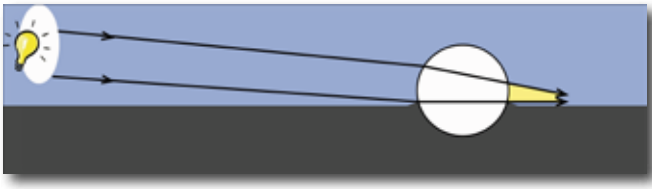
Optimal embedding (50-60 %):



Wrong embedding
• embedding is too *deep*:

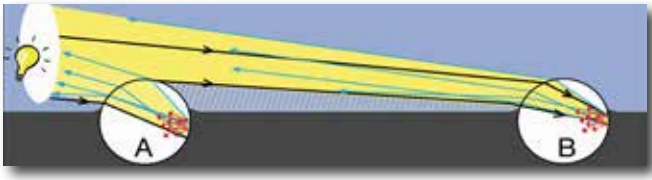


• embedding is to *shallow*:

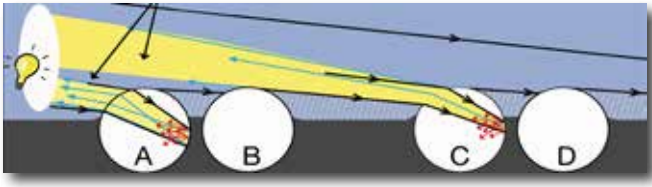


2. Distribution

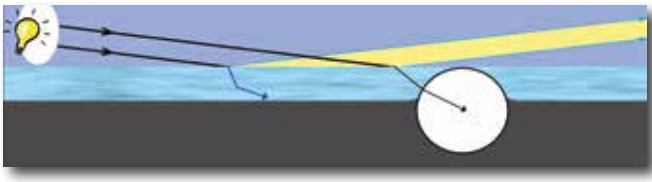
Optimal distribution:



Wrong distribution – surplus of glass beads
Glass beads **B** and **D** are in the shadow of **A** and **C**:

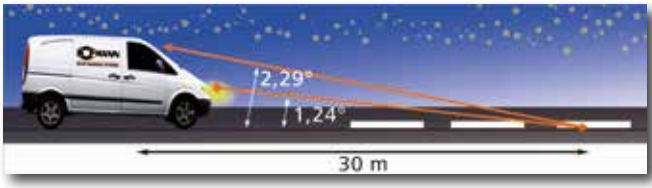


II Retroreflection R_L (night visibility) of glass beads on wet markings

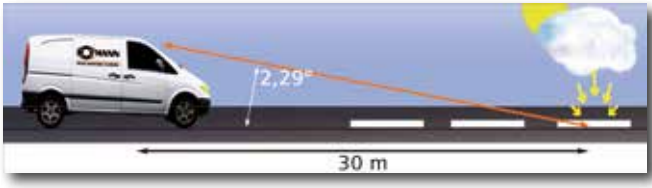


III Measuring geometry acccording EN 1436

R_L Retroreflection (night visibility) – measuring geometry



Q_d Daylight visibility – measuring geometry



Air temperature, relative humidity and the dew point

Moisture on the road surface can lead to adhesion problems with many marking materials. Knowledge of the relationship between air temperature, relative humidity and dew point is therefore of great importance for the operator.

Air has the ability to absorb water in a gaseous state. This invisible moisture in the air is also known as water vapour. However, the amount of **water vapour** that can be contained in the air is limited. The **relative humidity** indicates the percentage of air that is saturated with water vapour. At 100% relative humidity, the air is completely saturated with water vapour. If the 100 % relative humidity is exceeded, the **dew point** occurs and the excess humidity becomes condensed water.

Laws of air humidity:

- The warmer the air, the more water (in form of water vapour) it can absorb.
- The colder the air, the less water it can absorb.

Important:

When warm air meets cold surfaces, it is cooled down. Above a certain temperature, the air becomes saturated (= 100 % relative humidity = dew point). The part of water vapor, which can no longer be absorbed by cooled air, precipitates as water droplets. This process is known as **condensation**.

Air temperature, relative humidity and the dew point

Example:

At an air temperature of 18 °C and at an atmospheric humidity of 75 % you have a dew point of 13,5 °C. Hence it follows the **temperature of the road surface should not** be lower than 13,5 °C!

Übliche Verarbeitungstemperaturen	Luft-tempe-ratur (°C)	Taupunkt-Temperaturen in °C bei einer relativen Luftfeuchte von %															
		20 %	25 %	30 %	35 %	40 %	45 %	50 %	55 %	60 %	65 %	70 %	75 %	80 %	85 %	90 %	95 %
	2						-7,7	-6,6	-5,4	-4,4	-3,2	-2,5	-1,8	-1,0	-0,3	0,5	1,2
	4						-6,1	-4,9	-3,7	-2,6	-1,8	-0,9	0,1	0,8	1,6	2,4	3,2
	6						-4,5	-3,1	-2,1	-1,1	-0,1	0,9	1,9	2,7	3,6	4,5	5,4
	8						-2,7	-1,6	-0,4	0,7	1,8	2,8	3,8	4,8	5,7	6,5	7,3
	10			-6,0	-4,2	-2,6	-1,3	0,0	1,3	2,5	3,7	4,8	5,8	6,8	7,7	8,5	9,3
	12			-4,5	-2,6	-1,0	0,4	1,8	3,2	4,5	5,6	6,7	7,8	8,7	9,6	10,5	11,3
	14			-2,9	-1,0	0,6	2,2	3,7	5,1	6,4	7,6	8,7	9,7	10,7	11,6	12,6	13,4
	15			-2,2	-0,3	1,5	3,1	4,7	6,1	7,4	8,5	9,6	10,7	11,7	12,6	13,5	14,4
	16			-1,4	0,5	2,4	4,1	5,6	7,0	8,3	9,5	10,6	11,7	12,7	13,6	14,6	15,5
	17			-0,6	1,4	3,3	5,0	6,5	7,9	9,2	10,4	11,5	12,5	13,6	14,5	15,4	16,2
	18			0,2	2,3	4,2	5,9	7,4	8,8	10,1	11,3	12,4	13,5	14,6	15,4	16,3	17,3
	19			1,1	3,2	5,1	6,8	8,3	9,8	11,1	12,3	13,4	14,5	15,5	16,4	17,4	18,2
	20			1,9	4,1	6,0	7,7	9,3	10,7	12,0	13,2	14,4	15,5	16,5	17,4	18,4	19,2
	21			2,8	5,0	6,9	8,6	10,2	11,6	12,9	14,2	15,4	16,4	17,4	18,4	19,3	20,2
	22			3,7	5,9	7,8	9,5	11,2	12,5	13,9	15,2	16,3	17,4	18,4	19,4	20,3	21,2
	23			4,5	6,7	8,7	10,4	12,0	13,5	14,8	16,0	17,3	18,4	19,4	20,4	21,3	22,2
	24			5,4	7,6	9,6	11,3	12,9	14,4	15,7	17,0	18,2	19,2	20,3	21,4	22,3	23,2
	25	0,5	3,6	6,2	8,5	10,5	12,2	13,8	15,4	16,7	18,0	19,1	20,2	21,4	22,3	23,3	24,2
	26	1,3	4,5	7,1	9,4	11,4	13,2	14,8	16,3	17,7	18,9	20,1	21,3	22,3	23,3	24,3	25,2
	28	3,0	6,1	8,8	11,1	13,1	15,0	16,6	18,1	19,4	20,9	22,0	23,2	24,2	25,3	26,2	27,2
	30	4,6	7,8	10,5	12,9	14,9	16,8	18,4	20,0	21,4	23,7	23,0	25,1	26,1	27,2	28,2	29,1
	32	6,2	9,5	12,2	14,6	16,7	18,6	20,3	21,9	23,3	24,7	25,8	27,0	28,2	29,2	30,2	31,2
	34	8,7	12,0	14,8	17,2	19,4	20,4	22,2	23,7	25,2	26,5	27,8	28,9	30,1	31,2	32,1	33,1
	36	12,8	16,2	19,1	21,6	23,8	22,2	24,1	25,5	27,0	28,4	29,7	30,9	32,0	33,1	34,2	35,1

Technical Data

	H33-4	H26-4	H18-2	H17
Motor (Further exhaust stages upon request)	Turbodiesel Non-Label (comparable to EU Stage II resp. (US) EPA Tier 2) Alternatively: Low-emission EU Stage V resp. (US) EPA Tier 4	Turbodiesel Non-Label (comparable to EU Stage II resp. (US) EPA Tier 2) Alternatively: Low-emission EU Stage V resp. (US) EPA Tier 4	Turbodiesel Non-Label (comparable to EU Stage IIIA resp. (US) EPA Tier 4 Interim) Alternatively: Low-emission EU Stage V resp. (US) EPA Tier 4	Turbodiesel Non-Label (comparable to EU Stage IIIA resp. (US) EPA Tier 3) Alternatively: Low-emission EU Stage V resp. (US) EPA Tier 4
Cylinder	4	4	4	4
Displacement [cm³]	3800	3800	2400	1500
Cooling	Water	Water	Water	Water
Motor power [kW]	74,0 or 86,4	74,0 or 55,4	44,0 or 48,6	33,0
Revolution [rpm]	2600	2600 or 2200	2700	3000
Fuel tank [l]	150	150	75	42
Hydraulic oil tank [l]	85	85	65	40
Air output [l/min]	2600 - 3500 at 7,5 bar	2400 at 7,5 bar	1300 - 2200 at 7,5 bar	800 - 1200 at 7,5 bar
Length [mm] *) **Width [mm] *)** **Height [mm] *)**	5300 - 6100 1340 2380	5300 - 6100 1340 2380	4260 - 5600 1260 2300	3580 1210 2270
Weight, equip. [kg]	2600 - 4400	2400 - 4200	2000 - 2600	1700 - 2300
Permissible total weight [kg]	6800	6800	4000	3300
Glass bead tank [l] **)	2 x 160 (max. 3,0 bar)	2 x 160 (max. 3,0 bar)	170 (max. 0,8 bar)	100 (max. 0,8 bar)
Line widths / tank volume*)	10 - 100 cm	10 - 100 cm	10 - 100 cm	10 - 60 cm
[l] **)	bis 1080	up to 920	up to 540	up to 370
[l] **)	bis 650	up to 600	up to 540	up to 370
[l] **)	bis 1000	up to 800	up to 540	up to 370
[l] **)	bis 600	up to 500	up to 420	up to 420
[l] **)	bis 800	bis 600	bis 320	bis 250

**) dependent on equipment*

***) Special sizes upon request*

Technical Data

	H16-3	H11-1	H10-2
Motor (Further exhaust stages upon request)	Diesel Non-Label (comparable to EU Stage IIIA resp. (US) EPA Tier 2) Alternatively: Turbodiesel EU Stage IIIA resp. (US) EPA Tier 4 Interim	Diesel low-emission EU Stage V resp. (US) EPA Tier 4	Gasoline
Cylinder	4	3	2
Displacement [cm³]	1500	900	690
Cooling	Water	Water	Air
Motor power [kW]	26,2	12,5	14,5
Revolution [rpm]	3000	2800	3200
Fuel Tank [l]	26	26	20
Hydraulic oil tank [l]	31	29	11
Air output [l/min]	1000 at 6,0 bar	740 at 6,0 bar	670 at 6,0 bar
Length [mm] *) **Width [mm] *)** **Height [mm] *)**	3950 1325 1650	2150 1380 2000	2650 1050 1600
Weight, equip. [kg]	1200 - 1400	900	650 - 950
Permissible total weight [kg]	2100	1300	1300
Glass bead tank [l] **)	70	65 or 2 x 30 (max. 0,5 bar)	35 (max. 1,0 bar)
Line widths / tank volume*)	10 - 50 cm	10 - 50 cm	10 - 30 cm
[l] **)	up to 225	up to 140	up to 140
[l] **)	up to 225	-	-
[l] **)	up to 225	-	up to 90
[l] **)	up to 200	-	up to 100
[l] **)	up to 200	-	up to 90

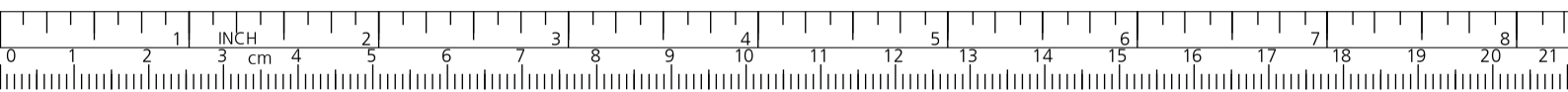
**) dependent on equipment*

***) Special sizes upon request*

Metric conversion table

	Unit	x Factor	result in	Unit	x Factor	result in
Length	mm	0,0394 0,0033 39,37	in. ft. mil	in. ft. mil.	25,4000 304,8000 0,0254	mm
	m	39,3701 3,2808 1,0936	in. ft. yd.	in. ft. yd.	0,0254 0,3048 0,9144	m
	km	1093,6100 0,6214	yd. mi.	yd. mi.	0,0009 1,6093	km
Area	cm²	0,1550 0,0011	sq. in. sq. ft.	sq. in. sq. ft.	6,4516 909,0909	cm²
	m²	1550,0031 10,7639 1,1960	sq. in. sq. ft. sq. yd.	sq. in. sq. ft. sq. yd.	0,0006 0,0929 0,9137	m²
	ha	11959,9005 2,4711 0,0039	sq. yd. ac. sq. mil.	sq. yd. ac. sq. mil.	- 0,4046 256,4102	ha
	km²	247,1054 0,3861	ac. sq. mil.	ac. sq. mil.	0,004 2,59	km²
Volume	cm³ = ml	0,0610	cu. in.	cu. in.	16,3934	cm³ = ml
	l	33,8140 1,0567 0,2642	fl. oz. (US) qts (US) gal (US)	fl. oz. (US) qts (US) gal (US)	0,0295 0,9463 3,785	l
	m³	35,3147 1,3080	cu. ft. cu. yd.	cu. ft. cu. yd.	0,0283 0,7645	m³
Weight	kg	35,2740 2,2046	oz. lbs.	oz. lbs.	0,0283 0,4536	kg
	t	2204,6226 1,1023	lbs. T (Short ton)	lbs. T (Short ton)	0,0004 0,9072	t
Power	kW	1,3561 1,3410	PS (DIN) b.h.p.	PS (DIN) b.h.p.	0,7374 0,7457	kW
	PS (DIN)	0,9863	b.h.p.	b.h.p.	1,0139	PS (DIN)
Pressure	bar	14,5038	PSI	PSI	0,0689	bar
Temperature	°C	(°C x $^{9}/_{5}$)+32	°F	°F	$^{5}/_{9}$ (°F-32)	°C

All data on this page subject to errors!


1
INCH
2
3
4
5
6
7
8
0
1
2
3
cm
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21

HOFMANN GmbH
Industriestrasse 22
25462 Rellingen
Germany

☎ +49 4101 3027-0
+49 4101 31022
@ info@HOFMANNmarking.de
www.HOFMANNmarking.de
www.SundSroadmarking.de