



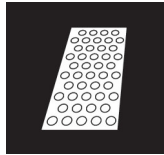
LINE TYPES



FLAT LINE



DOTS



DOT'N LINE



EDGEFLEX



CHESS

# DOT'N LINE EQUIPMENT

## 3-IN-1 SOLUTION FOR THERMOPLASTIC EXTRUSION

The Dot'n line system offers a 3-in-1 solution for thermoplastic markings. This equipment can apply flat lines, dots and unique combinations of lines and dots using only one extruder head.

REVISION-004

# WHY CHOOSE THE DOT'N LINE EQUIPMENT?

**3-1 SOLUTION** that allows you to make flat lines, dots and a combination of dots over the line using only one equipment.

**EFFECTIVE HOT-OIL HEATING OF ALL SIGNIFICANT PARTS OF THE EXTRUDER** ensures that the thermoplastic material does not stiffen and set inside the equipment. Borum uses a centrifugal pump, which opposite to often used gear pumps, increases the flow of oil when the heat transmission oil heats up.

**A CONTINUOUS CIRCULATION OF THE THERMOPLASTIC MATERIAL INSIDE THE EQUIPMENT** ensures its homogeneous viscosity. The circulation avoids settling and catching of the heavy/solid parts and prevents unnecessary wear of the mechanical parts.

**BUILD-IN PRESSURE REGULATING SYSTEM** ensures that line width and thickness does not change no matter the number of shutters involved in the current marking assignment.

- Less material consumption for dotted lines compared to flat lines
- Relatively fast application speed
- Highest possible retro reflexion thanks to many vertical "walls" during both day and night time
- Having numerous dots gives the light a lot of possible areas to fall onto and create a retro-reflective effect
- Rain will easily drain away from the line, so road lines will remain highly visible
- Having clear visibility, especially while driving during night time
- Noise will alert the driver when driving on the line and will prevent him from driving off road

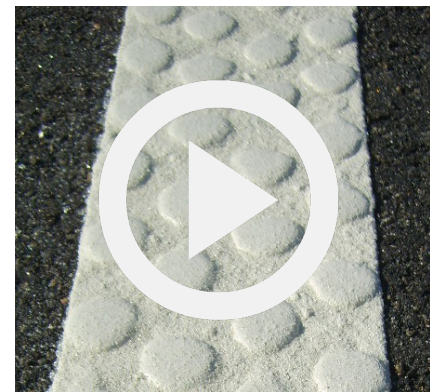
**CLICK THE PLAY BUTTONS AND TAKE A LOOK AT THE VIDEOS DEMONSTRATING DIFFERENT LINE TYPES**



**DOTS ALONE**



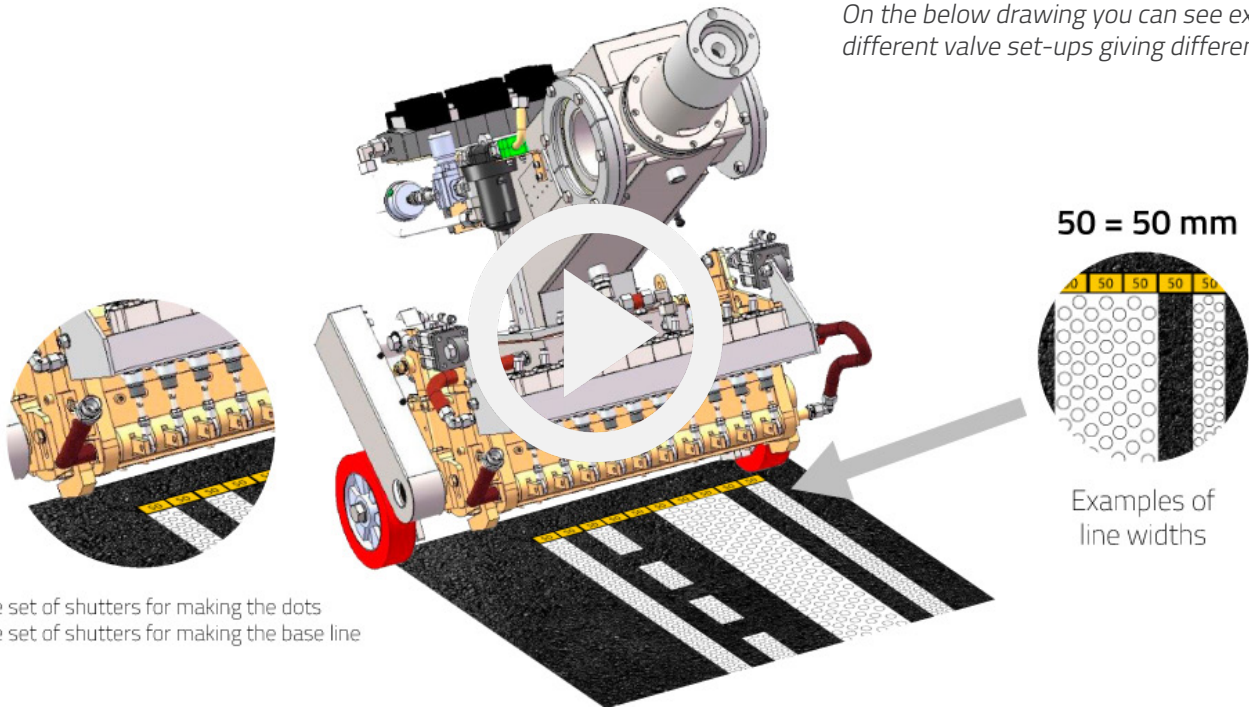
**EXTRUDED LINE**



**DOTS ON A BASE LINE**

# HOW THE DOT'N LINE WORKS

On the below drawing you can see examples of different valve set-ups giving different widths.



One set of shutters for making the dots  
One set of shutters for making the base line

50 = 50 mm

Examples of line widths

The equipment's width can be up to 50 cm/20" (maximum width depends on the machine model). The line width starts at 5 cm (2") and can be built up with 5 cm (2 inches) standard valves. Line thickness is usually between 3 - 5 mm (0.12"-0.2"). Available in 30, 40, 45 and 50 cm widths as standard (12", 16", 18", 20").

## CLICK THE PLAY BUTTON TO SEE A 3D ANIMATION OF HOW THE EQUIPMENT WORKS.

By using two sets of shutters the base line has time to cure slightly before the Dots are applied and consequently, the Dots will settle on top of the line with sharp edges, securing the optimum retroreflection.

The shutters are all placed on a shaft, which gets heated. This ensures uniform and efficient heating of the shutters as they are heated up from the inside.

The shutters do not touch the high tensile steel drum and therefore the lifetime is prolonged.

The standard shutters are 5 cm (2") and 10 cm (4") width. The shutters of other sizes are delivered by special orders.

Cleaning function is triggered by the push of a button from the LineMaster and can be activated while driving. This will open all active shutters and push the extra material out.

The application speed depends on the type of application and goes up to 6 km/h (3.8 mph).

## SCREW PUMP WITH CONTINUOUS RECIRCULATION SYSTEM

The transport of material from a tank to Dot'n'Line head is done by a hydraulically driven screw pump, which is electronically controlled. The screw pump has a permanent thermoplastic recirculation system, which ensures a constant flow also passes the inactive extrusion valves, keeping solid parts from adhering and ready for opening.

# DOT SPECIFICATIONS



The number of Dots per meter line can be set from 15 – 35. The number of Dots is controlled by Borum's LineMaster, and can be varied while marking is performed.

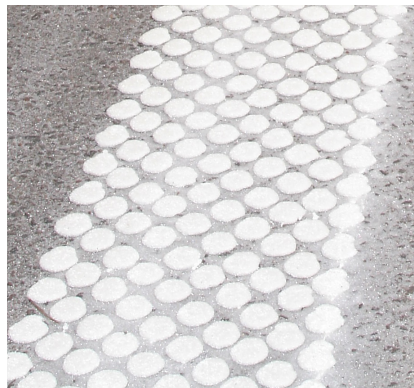
Diameter of Dots can be chosen between  $\varnothing 20$  and  $\varnothing 45$  mm ( $\varnothing 0.8''$  and  $\varnothing 1.8''$ ). The Dot size is a function of the diameter of the holes in the rotating drum in the equipment and the pump pressure.

- Holes  $\varnothing 12$  mm ( $0.5''$ ) in the drum give DOT diameter of 18 to 25 mm ( $0.7''$  to  $1''$ ).  $\varnothing 12$  mm ( $0.5''$ ) holes are chosen when marking with Dots on base line shall be made.
- Holes  $\varnothing 15$  mm ( $0.6''$ ) in the drum give DOT diameter of 25 to 30 mm ( $1''$  to  $1.2''$ ).
- Holes  $\varnothing 18$  mm ( $0.7''$ ) in the drum give DOT diameter of 30 to 35 mm ( $1.2''$  to  $1.4''$ ).
- Holes  $\varnothing 22$  mm ( $0.9''$ ) in the drum give DOT diameter of 35 to 45 mm ( $1.4''$  to  $1.8''$ ).

Number of Dots across the line is determined by the size of the shutters.

- For 50 mm ( $2''$ ) shutters there will be 25 mm ( $1''$ ) space between the centres of the Dots.
- For 60 mm ( $2.4''$ ) shutters there will be 30 mm ( $1.2''$ ) space between the centres of the Dots.
- For shutters with a width of 70, 80 and 90 mm ( $2.8''$ ,  $3.1''$  and  $3.5''$ ) the distance between the holes will be determined together with the customer.

## SEE BELOW EXAMPLES OF DOT MARKINGS IN DIFFERENT SIZES.



# LINEMASTER COMPUTER AND DOT'N LINE



The Dot'n Line equipment is able to start up after several hours of pausing in idle mode and still deliver the exact same quality from the first millimeter. **There is no need for a start-up distance - the LineMaster simply leaves the equipment in idle mode.**

**The Dot'n line performance is 100% automatically adaptable to changes in speed.** Within a specific speed range, the BM LineMaster automatically increases or decreases an internal circulation rate according to the speed of the machine and thus compensate for the difference in thermoplastic consumption at different speeds.

**The feeding pump for the thermoplastic is also controlled by the LineMaster and can be adjusted** while performing marking work. Furthermore, each shutter can be individually controlled from the LineMaster. So you can digitally control the shutters, without any mechanical interference.

**CLICK THE PLAY BUTTONS AND TAKE A LOOK AT THE VIDEOS DEMONSTRATING DIFFERENT LINE TYPES**



# WHAT ARE PROFILED MARKINGS?



Profiled road markings are the newest road marking technology where a part of the road marking typology is raised over the road surface. This type of markings are becoming more and more popular because of the increased road safety it provides due to high visibility in wet conditions and at night.

## THE MAIN ADVANTAGES ARE:

The drainage effect of the profiled markings ensures that rainwater will easily drain away from the lines, thus maintaining high reflective values in rainy weather. This is possible thanks to the structure that allows the water to drain.

Furthermore, the profiled nature of the road marking produces a noise when driven over that will warn the driver against driving off the road. Dot'n line is generally used on roads with high traffic and low night visibility as highways and motorways.

## CLICK ON THE PLAY BUTTON TO SEE A VIDEO OF THE DIFFERENCE IN RETROREFLECTION BETWEEN A FLAT LINE AND A PROFILED LINE.

### THERMOPLASTIC MATERIAL REQUIREMENTS

The Dot'n line requires special types of premium thermoplastic material that fulfills the demands for thermal stability and viscosity.

To have a practical way of handling the material, the following general guidelines have been given by leading thermoplastic material manufacturers:

- A melting temperature (and working) range: 180-210 °C (356-410 °F).
- Relatively slow agitator speed in the thermoplastic tank (the boiler): Max 30 rpm
- Minimum and maximum heating time - achieve the correct homogenization but also avoid a degrading of the thermoplastic: From ½ to max 6 hours (total heating of the material – incl. the time in a premelter)

