

THE SAFEST WAY  
INTO THE FUTURE



# SHOWING THE WAY, WORLDWIDE

“Although there are millions of roads running across our planet, the people who drive on them all share the same goal: reaching their destination safely. Modern road marking systems support them in that respect.”

HARALD MOSBÖCK  
VP REGION EUROPE/APMEA  
(SALES/CONTRACTING)

The world is more mobile now than ever before. Growing traffic volumes also have increased impact on roadways and road markings.

SWARCO is your competent partner for road marking systems: Our Road Marking Systems Division is one of the world's leading manufacturers and suppliers of reflective glass beads and marking materials. We will happily advise you on which system is best suited to your requirements and needs.

Benefit from our expertise in developing holistic solutions: SWARCO Road Marking Systems is your single source for the development of customized integrated solutions made up of both core components, reflective glass beads and marking materials. It's good to work together to enhance the safety and comfort of road users. On motorways and around town, at airports and along cycle paths, at construction zones as well as car parks.

# YOUR SPECIALIST FOR MARKING SYSTEMS

Road markings are an important safety factor in today's road transport. We bring their benefits together on the road surface: SWARCO Road Marking Systems not only produces high-grade reflective glass beads and marking materials – it also manufactures integrated systems combining both product lines. As sole full-range supplier worldwide, we provide you with retro-reflective systems from one source and, where necessary, support you on site in all phases of planning and implementation.

Keep on the safe side with us: Every millimeter of road marking boasts the product quality, service strength and solution competence of a global market and innovation leader.

## LANE MARKINGS



## BIKE LANE MARKINGS



## CONSTRUCTION ZONE MARKINGS



## PARKING



## AIRPORT MARKINGS



## INDOOR MARKINGS



## PLAYGROUND & SCHOOLYARD MARKINGS



## RACE TRACKS



### Cycle path markings / large surface markings

We offer large surface marking materials for a wide range of traffic loads. Depending on requirements, these materials can be highly elastic and flexible to compensate for surface expansion caused by changes in temperature. Further criteria: Good grip and skid resistance as well as colour intensity.

# EXPERTS FOR THE UNIQUE

## Safety creates quality of life

Accessible and inclusive orientation is a basic social need. Tactile marking systems help visually impaired people in particular to find their way in public spaces.

SWARCO Road Marking Systems is your specialist for special markings in all areas of use. Ask us for the appropriate solution for your specific application.

### ANTI-SKID COATINGS



### ROAD REPAIR & REINSTATEMENT



### AFTERGLOW SYSTEMS



### TACTILE MARKINGS



### SPORTS GROUNDS



### SPECIALTY SYSTEMS

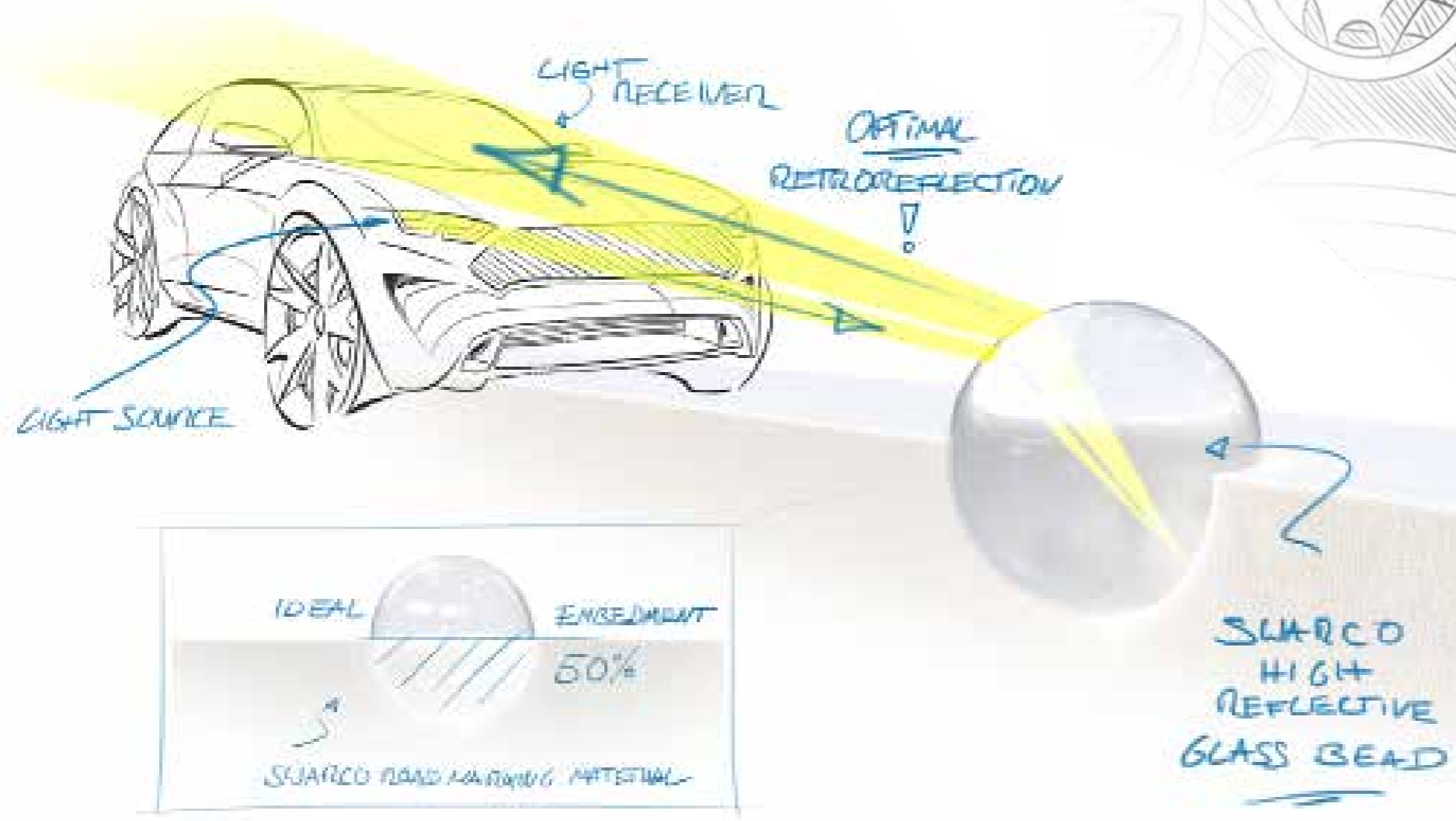


# REFLECTIVE GLASS BEADS

## A brilliant idea

SWARCO Road Marking Systems has been a pioneer in reflective glass bead technology since 1969. The principle is as simple as it is brilliant: The micro-glass beads embedded in the marking material retro-reflect the headlight beam of vehicles, causing the road marking to "light up" at night. This is known as retro-reflection and significantly increases safety and visibility at night.

Nowadays, SWARCO Road Marking Systems is the world's second biggest manufacturer of reflective glass beads. Our glass bead products conform to national and international standards, bearing the CE mark in Europe. The smallest beads are only a few thousandths of a millimeter in size; the maximum diameter is between 1.5 and 2 millimeters.



# SMALL BEADS, GREAT EFFECT

## SWARCO SOLIDPLUS

The next generation of glass beads

### Characteristics

- 212 to 1400 µm
- Premium reflective glass beads
- Excellent retroreflection values of over 1000 mcd/m<sup>2</sup>\*lx
- Excellent retroreflection even in coloured road markings
- Exceptionally robust thanks to the special glass composition
- Increased anti-skid values with high retroreflection possible

### Recommendation for use

- For all road marking materials

## MEGALUX-BEADS

Larger beads for enhanced wet night visibility

### Characteristics

- 600 to 1400 µm
- Increased retro-reflective values
- Enhanced wet night visibility achieved by their crystal clear surfaces and large diameter

### Recommendation for use

- Marking systems with increased requirements for visibility in wet conditions (type II markings)

## SWARCOFLEX

The standard in reflective glass beads

### Characteristics

- 100 to 850 µm
- Very good retro-reflective values
- Conforms to all national and international standards

### Recommendation for use

- For all road marking materials

## SWARCOLUX

Heavy-duty bead mix

### Characteristics

- 100 to 1400 µm
- Glass bead mixture comprising SWARCOFLEX and MEGALUX-BEADS
- Exceptional retroreflection

### Recommendation for use

- Marking systems with increased requirements for visibility in wet conditions (type II markings)

## PLUS9BEADS

High-index beads in top-notch quality

### Characteristics

- 200 to 1000 µm
- Top-quality reflectors with refractive index  $\geq 1.9$

### Recommendation for use

- Airport markings



# MARKING MATERIALS

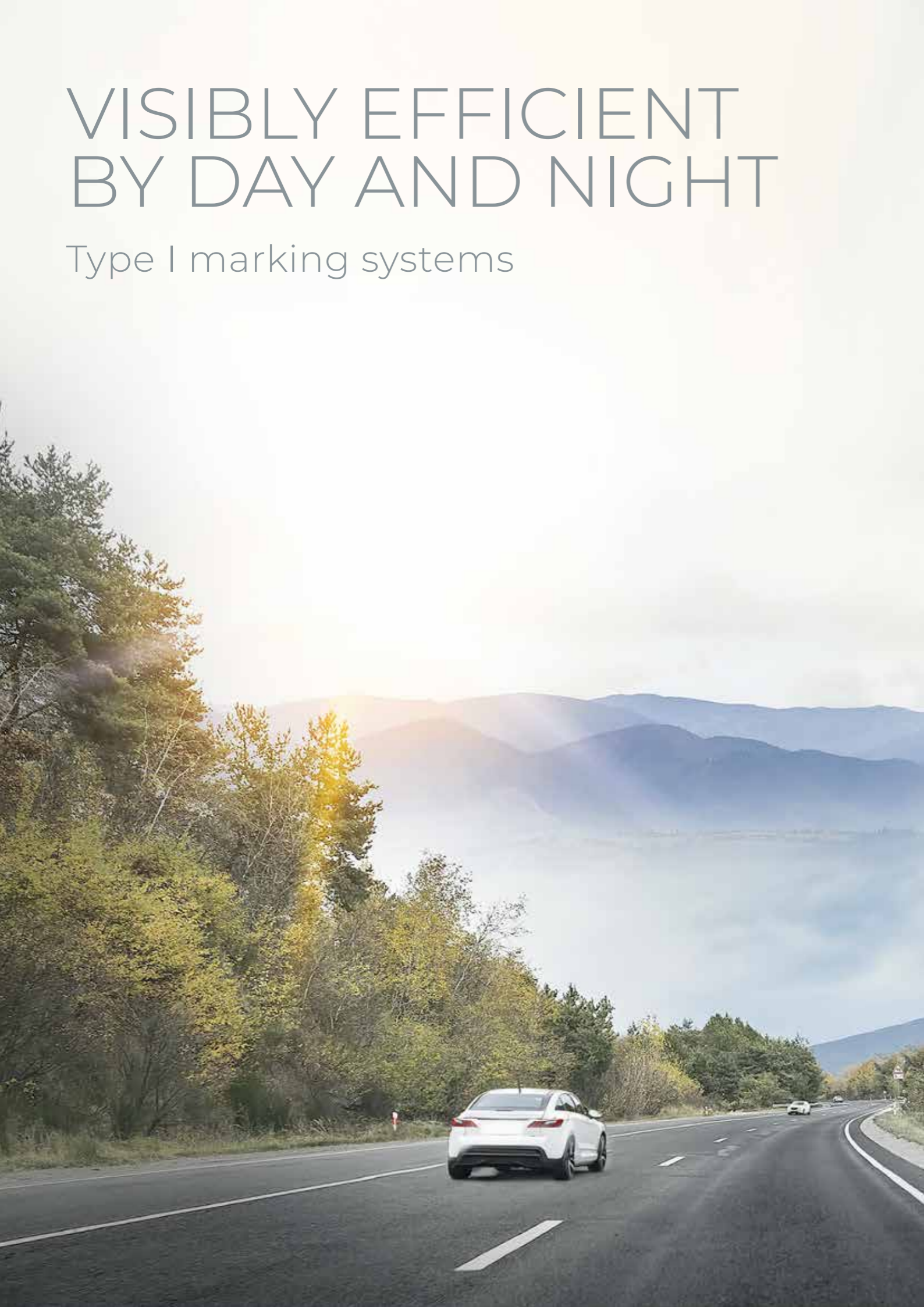
## A COLOURFUL SPECTRUM

From liquid and multi-component high-solid-paints through thermo- and cold-spray plastics: Our marking materials are based on proven raw materials and innovative formulations. They guarantee best daytime visibility and perfect embedding of drop-on materials. At our production sites, we produce a comprehensive range of products with a wide array of paints for all areas of application. The optimum adhesion and durability, even on surfaces with residual moisture, allows an extensive application window from spring through to late autumn.

	Layer thickness	Characteristics	Recommendation for use
1-C HIGH-SOLID-PAINTS	<ul style="list-style-type: none"> <li>Wet film thickness 0.3–0.6 mm</li> </ul>	<ul style="list-style-type: none"> <li>Cost-efficient marking</li> <li>Low resistance to wear</li> </ul>	<ul style="list-style-type: none"> <li>Edgeline marking, on roads with lower volumes of traffic or in poor condition</li> </ul>
2-C HIGH-SOLID-PAINTS	<ul style="list-style-type: none"> <li>Wet film thickness 0.3–0.6 mm</li> </ul>	<ul style="list-style-type: none"> <li>Good resistance to wear</li> <li>Good adhesion on wet, mineral surfaces</li> <li>Longer drying time</li> </ul>	<ul style="list-style-type: none"> <li>Edgeline marking, in forest areas and alleys, on wet roads, long application window</li> </ul>
WATERBORNE PAINTS	<ul style="list-style-type: none"> <li>Wet film thickness 0.3–0.6 mm</li> </ul>	<ul style="list-style-type: none"> <li>Environmentally sound</li> <li>Low emissions</li> <li>Note the WOT</li> </ul>	<ul style="list-style-type: none"> <li>On roads with low volumes of traffic and in sunny weather locations</li> </ul>
THERMO SPRAY PLASTIC	<ul style="list-style-type: none"> <li>0.6–1.2 mm</li> </ul>	<ul style="list-style-type: none"> <li>High cost-efficiency</li> <li>Higher, but intentional wear</li> </ul>	<ul style="list-style-type: none"> <li>Longitudinal markings along roads with low volumes of traffic</li> </ul>
THERMOPLASTIC & PREFORMED THERMOPLASTIC	<ul style="list-style-type: none"> <li>2.0–3.0 mm</li> <li>applied on top 2.0–3.0 mm</li> <li>inlay 3.0–8.0 mm</li> </ul>	<ul style="list-style-type: none"> <li>Rapid trafficability</li> <li>High wear resistance</li> <li>Low wear resistance when laid by extruder</li> </ul>	<ul style="list-style-type: none"> <li>On roads with higher volumes of traffic, city roads</li> </ul>
COLD SPRAY PLASTIC	<ul style="list-style-type: none"> <li>0.3–0.6 mm</li> </ul>	<ul style="list-style-type: none"> <li>Cost-efficient marking</li> <li>Good resistance to wear</li> <li>Rapid trafficability</li> </ul>	<ul style="list-style-type: none"> <li>Marking along the edges of roads with high volumes of traffic</li> </ul>
COLD PLASTIC	<ul style="list-style-type: none"> <li>2.0–3.0 mm</li> </ul>	<ul style="list-style-type: none"> <li>Very high wear resistance</li> <li>Longer drying time</li> </ul>	<ul style="list-style-type: none"> <li>Longitudinal / transverse markings, on roads with very high volumes of traffic</li> </ul>

# VISIBLY EFFICIENT BY DAY AND NIGHT

Type I marking systems



The standard system for secondary road networks: So-called type-I markings are a widespread and very cost-effective form of marking in many European countries.

**Special characteristics:** This type of marking is very visible in the daylight and – depending on the glass bead – offers adequate to good visibility at night in dry road conditions.

**Disadvantage:** In darkness and poor weather (fog, rain), a film of water on the glass beads prevents retro-reflection of the headlight beam. In that case, the marking offers poor visibility and is hard to spot. The film of water causes a mirror reflection that creates a glare for oncoming traffic.

**Good to know:** Type-I markings can be created with all approved, sprayable marking materials as well as thermo and cold-spray plastics as a plain marking. Glass bead blends sized between 100 and 850  $\mu\text{m}$  are especially adjusted for this.



# VISIBLY BETTER AT NIGHT AND IN WET CONDITIONS

## Type II marking systems

State of the art in modern marking systems: So-called type-II markings also demonstrate their visible strength at night on wet roads. Compared to type I, this means ever greater traffic safety, particularly on motorways.

### The principle:

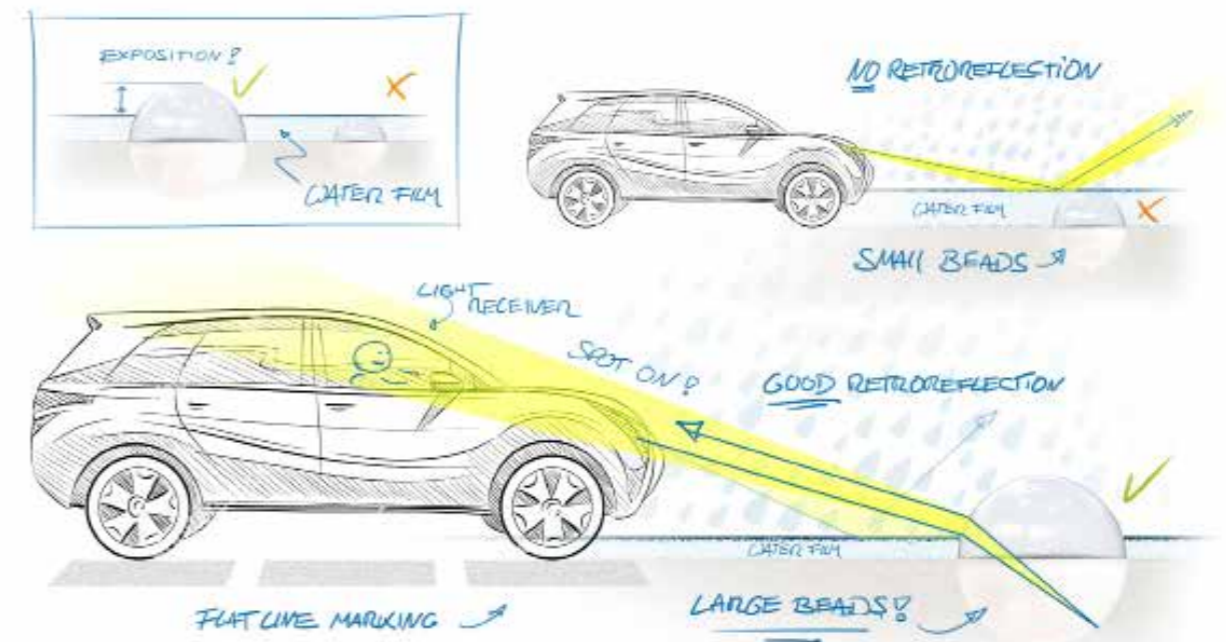
Type-II systems optimize the retro-reflection of the headlight beam. This is because the glass beads are embedded in such a way that they protrude from the film of water.

### Even more visible, even safer:

Thanks to their open structures, agglomerate marking systems are characterized by excellent drainage properties. This guarantees the utmost safety in wet conditions.

### This can be achieved in three ways:

- Agglomerate marking systems with a structured surface
- Profiled marking systems with haptic and warning effects
- Flat line systems with coarse drop-on materials



## FLAT LINE SYSTEMS

with coarse drop-on materials

	Characteristics	Innovations
<b>THIN-LAYERED TYPE II</b> 1-C high-solid-paints 2-C high-solid-paints Waterborne paints Thermo spray plastic Cold spray plastic	<ul style="list-style-type: none"> <li>• Minimum layer thickness of 0.6 mm</li> <li>• Glass beads are directly exposed to traffic and wear</li> <li>• High wear when snowploughs are deployed</li> </ul>	<ul style="list-style-type: none"> <li>• SWARCO SOLIDPLUS with cold spray plastic</li> </ul>
<b>THICK-LAYERED TYPE II</b> Cold plastic applied on top Thermoplastic applied on top or inlay	<ul style="list-style-type: none"> <li>• Layer thickness: Cold plastic applied on top 2.0 – 3.0 mm, Thermoplastic applied on top 2.0 – 3.0 mm, inlay 3.0 – 8.0 mm</li> <li>• Glass beads are directly exposed to traffic and wear</li> <li>• Thermoplastic wear more quickly than cold plastic</li> <li>• With the increasing abrasion of the thermoplastic, premix beads appear on the surface, ensuring that good night-time visibility is maintained longer, even in wet conditions</li> <li>• Cold plastic are easy to refurbish with cold spray plastic over-markings</li> <li>• Less effective drainage</li> </ul>	<ul style="list-style-type: none"> <li>• For example: LIMBOPLAST D480/ SWARCO SOLIDPLUS 50 100–800 T18 successfully deployed with very high requirements (R5, RW5), e.g. on motorways in Thuringia</li> <li>• SWARCO SOLIDPLUS beads are also available as premix beads</li> </ul>

# A CLOSE-UP

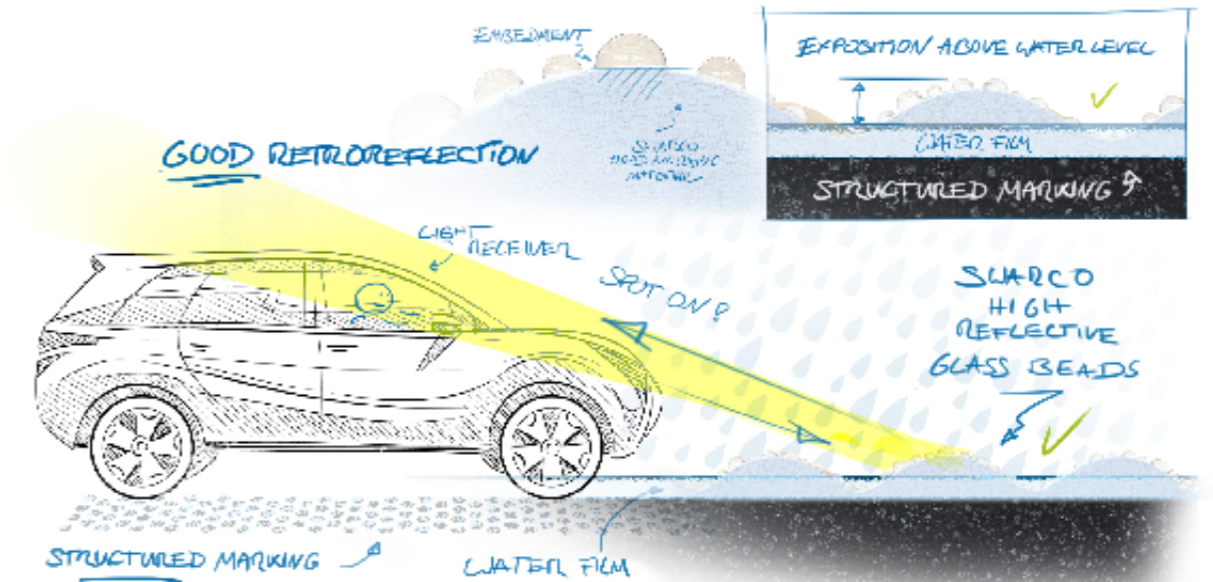
## Type II agglomerate markings

The structure makes the difference: Type II agglomerate markings with a structured surface deflect the wet better than any other system.



This results in an unbeatable combination of road safety, economic efficiency and sustainability. After our many years of research and development, these innovative markings are among the most sought after Type II systems in Germany today.

Good to know:  
Depending on the application technique, a distinction is made between a regular and a stochastic structure. We will be happy to advise.



## AGGLOMERATE MARKINGS

from reactive materials / thermoplastic materials

	Characteristics	Innovations
FROM REACTIVE MATERIALS	<ul style="list-style-type: none"> <li>• Low material usage: 2.2 – 2.8 kg/m<sup>2</sup></li> <li>• Good resistance to wear and ability to withstand winter road services</li> <li>• More effective drainage</li> </ul>	<ul style="list-style-type: none"> <li>• Trials with new structures that reduce noise emissions from agglomerate markings</li> <li>• Combination of high-grade, proven and tested products (2-C Epoxy paint or cold spray plastic) to create a marking system in combination with SWARCO SOLIDPLUS beads delivering high retro-reflective values of over 500 mcd/m<sup>2</sup>*lx</li> <li>• For example:               <ul style="list-style-type: none"> <li>• For preliminary traffic release markings with 2-C Epoxy paint on mineral surfaces with residual moisture</li> <li>• For refurbishing or refreshing worn, weathered agglomerates by spraying them over with cold spray plastic</li> </ul> </li> </ul>
FROM THERMOPLASTIC MATERIALS	<ul style="list-style-type: none"> <li>• Material usage: approx. 3.5–4.5 kg/m<sup>2</sup></li> <li>• With the increasing abrasion of the thermoplastic, premix beads appear on the surface and ensure good, longer-term daytime and nighttime visibility</li> <li>• Lower wear resistance against winter road services, particularly with irregular agglomerates compared to agglomerates from reactive materials</li> <li>• Higher application temperature compared to flat line systems made from thermoplastic materials</li> <li>• More effective drainage</li> </ul>	<ul style="list-style-type: none"> <li>• Use of new, high grade SWARCO SOLIDPLUS beads with a high degree of roundness and a higher refractive index for excellent nighttime visibility values</li> </ul>

# SHOWING THE WAY, WORLDWIDE

**SWARCO** | The Better Way. Every Day.

In 1969 we started out with the manufacture of tiny reflective glass beads. Today we have grown into the world's largest systems provider for road markings. Making roads safer and saving lives on a daily basis. Our high quality products and services, safely direct traffic flow from A to B, every day and night. On all roads, in any weather, and all from SWARCO.

We prepare for the future, by fusing knowledge with innovation at our Competence Center for Glass Technology and Marking Systems. So, even with smart and autonomous driving, we continue to blaze the trail of premium road markings to the world. Jump in and drive with us; we will be happy to help you find your ideal road marking solutions.

[www.swarco.com/rms](http://www.swarco.com/rms)



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