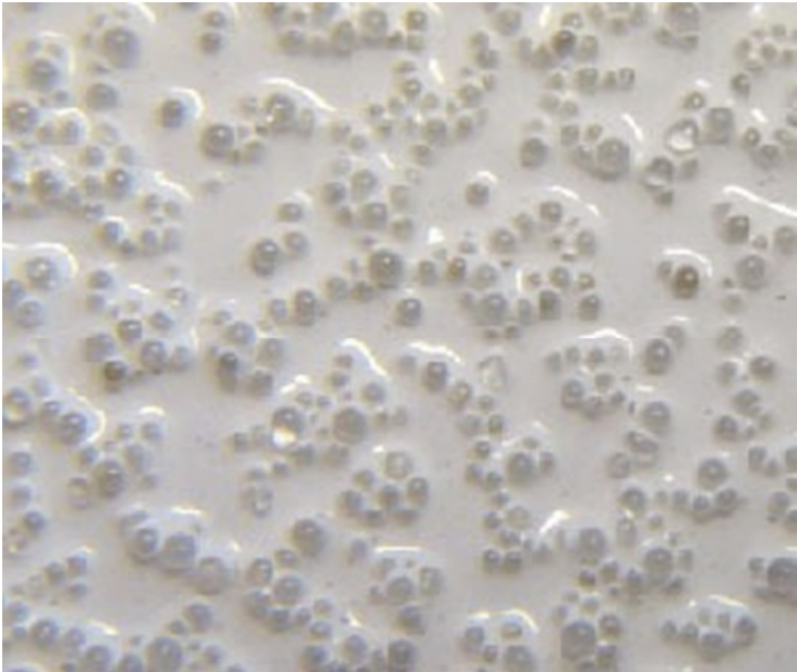


Basic principles Retroreflection R_L (night visibility) of road markings caused by glass beads



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Exclusion of liability

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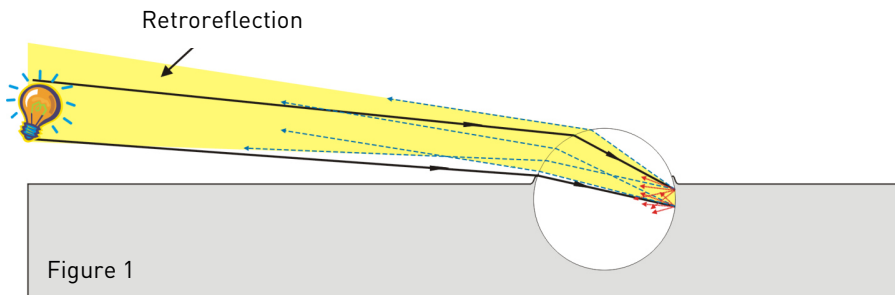
1 Introduction

Retroreflection is obtained by glass beads which protrude from the road marking. It depends on different conditions like for example:

- degree of embedding / size
- quantity
- quality

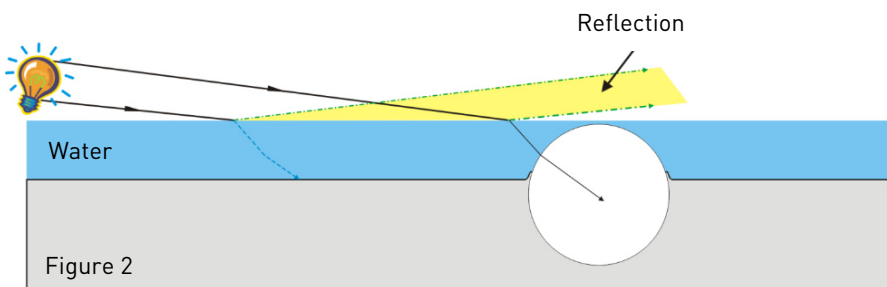
Subsequently you will find more detailed information on the subject of retroreflection of road markings.

2 Retroreflection in general



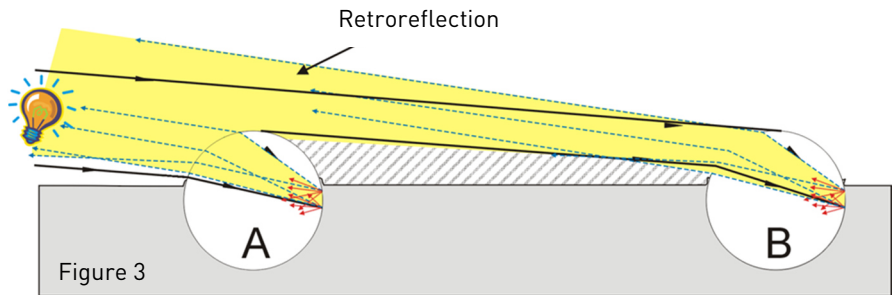
The optimal embedding depth for glass beads in road markings is approx. 50% - 60% [good night visibility]

3 Wet surface



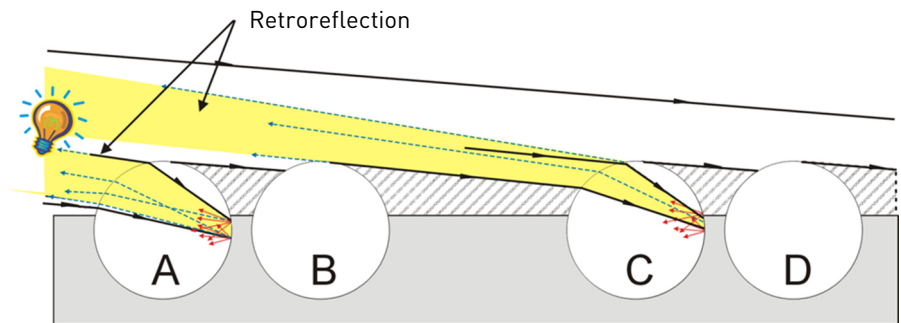
The same illustration as above under wet road conditions. Traffic driving in the opposite direction can be blinded by the reflection. No retroreflection is possible as the light does not enter the glass bead.

4 Optimal retroreflection



The night visibility can be improved by increasing the amount of glass beads in the road marking. The illumination of glass bead A and glass bead B is optimal, resulting in the best retroreflection.

5 Excess of glass beads

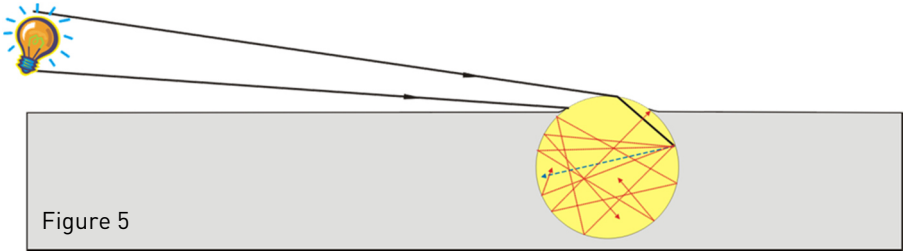


If there are too many glass beads, the night visibility will not improve. With extreme excess of glass beads it can even deteriorate. This phenomenon is shown in Figure 4.

Explanation Picture 4:

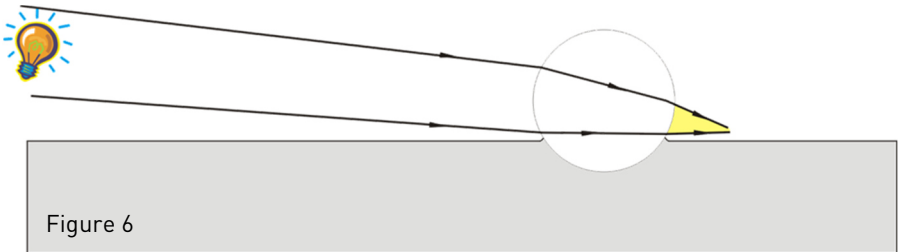
Glass bead A retroreflects the light best. Glass beads B and D are in the shadow of glass beads A and C, no light can reach them, therefore there will be no retroreflection from these beads. Glass bead C is slightly overshadowed by glass bead B, so it will not give the best retroreflection. So the night visibility has not been improved compared to picture A, despite the use of more glass beads.

6 Embedding too deep



The glass bead is embedded too deeply in the road marking. The light beam is reflected inside the glass bead (no night visibility).

7 Embedding not deep enough



The glass bead is not embedded deeply enough in the road marking. The light passes the glass bead without being retroreflected (no night visibility).

8 Conclusion

A road marking with high visibility attributes has a big impact on the the safety on the road. By decreasing accidents the consequential costs can be reduced.

With using Zehntner testing instruments you can easily check if the road marking has a sufficient night- and day visibility.

A selection of our testing instruments for road markings:



ZRM 6006
Retroreflectometer RL & Qd



ZRM 6014
Retroreflectometer RL & Qd



ZVR 6000
Visual Retroreflectometer RL



ZRM 6013+
Retroreflectometer RL & Qd



ZDR 6020
Dynamic Retroreflectometer RL

