

# [ ON THE ROAD

**DEGAROUTE® BASED  
ROAD MARKINGS  
APRIL 2016**



On the B4 road in the Upper Harz Mountains, a range of different road marking materials have been regularly monitored to evaluate the impact of snow plows during the winter.

## RESILIENCE OF ROAD MARKINGS WHEN EXPOSED TO WINTER FIELD TESTING

The purpose of road markings is to make driving safer- and they can only do that by meeting prescribed minimum standards in retroreflectivity, skid resistance, and material durability. For around 25 years now, Germany's Federal Highway Research Institute (BASt) and the German Research Association for Road Markings (DSGS) have used a traffic-wear simulator which tests the compliance of road marking systems with the requirements prescribed in Germany. This laboratory test does not, however, evaluate the impact things like snow plows have on markings. That is why a field trial was launched in the Harz Mountains in 2006. The first-ever live testing of this kind in Germany, this trial was initiated to determine how well road marking systems can with-

stand frequent road clearance by snowplow trucks. For this project, the DSGS in Bad Sachsa joined forces with the BASt and the Goslar division of the Roads and Transport Authority of Lower Saxony to set up a live winter testing field on the B4 between Bad Harzburg and Torfhaus in the Upper Harz Mountains. The live test field featured more than 100 different marking systems, each applied to the road in accordance with specific stipulations for performance testing over the course of the subsequent years. During this period of time, the markings were subjected to regular winter road clearance activities. The participants in the project included German companies such as Evonik as well as others from all over Europe.

## EDITORIAL



**Jochen Henkels**  
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**Dr. Alexander Klein**  
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## DEAR READERS,

Highly visible road markings are crucial to road safety. Motorists need to be able to clearly see the lane markings that guide them – especially during nighttime driving or in weather conditions that restrict visibility (fog, rain or snow). Testing has repeatedly, and undeniably, shown that cold plastics based on methacrylate (MMA) resins achieve the best long-lasting retroreflectivity for road markings. And now a field trial in the Upper Harz Mountains in Germany has proven just how extremely durable and resilient this material is even when subjected to the extreme impact of regular road clearing by snow plows during the winter. Featuring a range of different road marking materials, this live testing field was exposed to several years of winter road clearance, with an independent group of experts regularly monitoring material performance, focusing on how it was faring under frequent snow plowing. The results achieved by the DEGAROUTE® based MMA cold plastic markings are impressive!

Enjoy reading more in our Newsletter.

Jochen Henkels

Dr. Alexander Klein



Even after 5 years on the road, the DEGAROUTE® based markings still fulfill the requirements of a Type 2 marking.

## ROAD MARKING TEST FIELD ON THE B4 IN THE UPPER HARZ MOUNTAINS

The performance testing field spanned 400 meters in the right-hand lane of the section of B4 that extends from Bad Harzburg to Torfhaus – specifically, the section of the road that runs past the Baste Estate. Each of the marking systems featured in the project were applied to the road surface in the form of multiple two-meter-long stripes rendered onto the road surface in the direction of travel, laying across the entire width of the right-hand lane (much like a pedestrian crossing). The various marking systems were each applied to the testing field under controlled conditions and left on that road surface for a five-year period to evaluate their performance. This testing was specifically focused on establishing the impact on perfor-

mance when subjected to snow-clearance machinery. The participating road marking systems included thermoplastic, MMA cold plastic, paints, MMA cold spray plastic and tapes. Twice each year (in April/May and August), the testing agencies examined the sample markings to determine how well they were still performing in terms of the various relevant parameters. After the first three winter seasons, some of the sample markings already showed clear signs of deterioration as caused by the snowplows. Road marking tapes, for instance, had been partially eroded, causing, for one thing, the diminishment of nighttime retroreflectivity. Therefore, some 70 sample markings in total required either elimination or at least replacement during

the period of 2009 to 2012. Examinations upon completion of the five-year testing period found only a few samples—including the DEGAROUTE® based, MMA cold plastic agglomerate markings—that still satisfied all technical requirements for Type-2 road markings with increased nighttime retroreflectivity in wet conditions. Those requirements pertain to the degree of a marking's residual surface coverage, its day- and nighttime luminosity and its slip resistance. Upon final examination in 2015 to ascertain their standing technical properties on the road surface after eight respectively nine whole years in service, the condition of the MMA cold plastic markings was such that they still satisfied requirements as set out for Type-1 markings.

## MEASURABLY DURABLE

The results are truly impressive. Despite its exposure, on countless occasions, to snow plowing, all the DEGAROUTE® based MMA cold plastic markings applied to the test field in the Harz Mountains remain essentially intact even after nine years of service life. Government agencies who already use these MMA cold plastic systems can testify to their extreme longevity and resilience. "Because they are so durable,"

says Dr. Alexander Klein, head of Application Technology at Evonik's Road Marking & Flooring Market Segment, "MMA cold plastic systems are a highly resource efficient and environmentally friendly solution for road markings." During nighttime, rain or snow conditions, road markings provide extremely important driver orientation. Therefore, they need to be regularly renewed, but such repair or replacement work is very costly both

financially and in terms of material resources required. The longer a road marking continues to function well, the less energy, material, and production costs will be incurred for restoration work. Evonik's DEGAROUTE® MMA reactive resin binder enables sustainable solutions for road markings with verifiably longer durability and is thus well qualified to meet the ecological challenges ahead.

### IMPRINT

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