

Evaluation of Recycled Tire Spacer Blocks



COMPLETE!

Recycled Materials Resource Center



University of New Hampshire



Federal Highway Administration

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The final report for Project 25 is available on-line at:

<http://www.rmrc.unh.edu/Research/Rprojects/Project25/P25finalreport.asp>

Project Objectives

- Test spacer block and obtain approval for use by the Federal Highway Administration.
- Gain some experience with this material so its potential may be evaluated as a component in other highway safety devices.
- Change specifications to allow the use of spacer blocks manufactured from recycled materials that have passed the necessary tests.
- Reduce Iowa's waste tire problem.

Project Description

Spacer blocks are usually pieces of wood that sit between the railing of a guardrail and the anchored posts that support the structure. The spacer block has an



Traditional wooden spacer block.

important role in that it helps keep car tires from snagging the posts during a crash. Iowa DOT wanted to replace the current wood spacer blocks with blocks made from recycled rubber. The rubber blocks provide a high-value way to dispose of old tires. However, FHWA approval is required for the use of such hardware on the National Highway System (NHS) and they needed data to support their decision. Iowa DOT was awarded a technical problem solving grant to help them obtain the needed data. The criterion that must be followed for testing safety hardware is defined in National Cooperative Research Program (NCHRP) Report 350. For most hardware, such as barrier systems, this involves full-scale crash testing with both a small car and a 3/4-ton pickup. For spacer blocks, pendulum or what is called "bogie" testing is oftentimes sufficient. This simulates the impact of a crash without the cost of destroying vehicles. The Midwest Roadside Safety Facility (MwRSF) was contracted to determine the extent of the testing and to

actually carry out the bogie tests. The MwRSF has reviewed the results and found that they passed the criteria set forth in Report 350. The results were forwarded to the FHWA, who also evaluated the crash test results and found that the blocks were acceptable for use on the NHS. A formal letter of acceptance was issued by FHWA in March 2003. Iowa DOT requires Report 350 systems on the rest of their highway system as well, so FHWA acceptance allowed Iowa DOT to revise their specifications. However, during a pilot scale demonstration, it was found that the blocks exhibited higher than expected deformation during installation and were not sufficiently stiff. This is a design issue with the blocks that



Spacer block manufactured from recycled tires.

they got FHWA approval. However, the block design will have to be fine tuned by the manufacturer before widespread use can take place.

can be rectified, however, Iowa DOT will not continue installing them until the design is changed. At the conclusion of the project, Iowa DOT met all of its goals in that the project has shown that the blocks satisfied Report 350 requirements and

Project Partners

- FHWA
- Midwest Roadside Safety Facility, University of Nebraska
- Iowa Dept. of Natural Resources
- Welch Products, Inc.

End Products

- Test results shared with twelve states in the Midwest States Pooled Fund Crash Test Program
- FHWA approval of spacer blocks
- Iowa DOT specifications for recycled tire spacer blocks

Further Information

The Recycled Materials Resource Center (RMRC), a cooperative agreement between the University of New Hampshire and the Federal Highway Administration, is a national center that promotes the appropriate use of recycled materials in the highway environment. Its focus is on the long-term performance and environmental implications of using recycled materials.