

RESEARCH PROGRESS REPORT FOR THE QUARTER ENDING: 4th

Wisconsin Department of Transportation
DT1241 2009

Research, Development and Technology Transfer	
Program: (Choose One)	
<input type="checkbox"/> Policy Research	<input checked="" type="checkbox"/> Pooled Fund TPF # 5(092) Clear Roads
<input type="checkbox"/> Wisconsin Highway Research Program	<input type="checkbox"/> Other
Project Title: Development of Standardized Test Procedures for Carbide Insert Snowplow Blade Wear	
Administrative Contact/Phone #: Colleen Bos/ (608) 577-4805	WisDOT Project ID(s): 0092-08-31
WisDOT Technical Contact/Phone #: Michael Sproul/ (608) 266-8680	Other Project ID: Clear Roads 07-01
Project Investigator/Phone # (agency & contact): Cam Kruse Braun Intertec (952) 995-2230	Approved Starting Date: 10/22/2007
WisDOT Comments:	Original End Date: 7/1/2009
	Current End Date: 8/31/2010
Sponsor: Wisconsin Department of Transportation	Number of Extensions: 1

Schedule Status:

- On schedule Ahead of schedule
 On revised schedule Behind schedule (Please explain below)

Total Project Budget	Expenditures Current Quarter	Total Expenditures	% Funds Expended	% Work Completed
\$74,965.00	\$9,655.62	\$48,315.16	64%	65%

Project Description:

Carbide inserts of snowplow blades fail through wear (abrasion) and through durability (fracture). This research project will (Task 1) identify test procedures that have potential to predict the wear and durability performance of the carbide inserts. The most promising test procedures will be developed in the laboratory (Tasks 2 and 3) and compared to the performance of identical sample carbide inserts measured in field tests of actual snowplowing (Task 4). The results of the laboratory and field tests will be analyzed to determine the effectiveness of the tests at predicting performance of the carbide inserts (Task 5). The final deliverables are a report and implementation plan that document the testing and provide recommendations for use of the test procedures and for additional studies, if needed.

Progress This Quarter: (Includes project committee meetings, work plan status, contract status, significant progress, etc.)

Phase 2 Laboratory testing continued this quarter. Various types of tests were evaluated for their likely relevance to wear and fracture qualities. We decided that it would be best to remove inserts from the blades for testing and determined a process for removal that would not alter the inserts. However, we are struggling to find a method to remove the brazing materials remaining on the inserts to prepare the inserts for testing. A search for the best method continues.

The test methods tentatively selected for final testing include:

- ASTM B294 Hardness Test for Cemented Carbides
- ASTM B311 Density of Cemented Carbides
- ASTM B276 Apparent Porosity of Cemented Carbides
- ASTM B390 Apparent Grain Size of Cemented Carbides
- Visual Examination of Fractured Surface of Cemented Carbides (new)

We have learned more about the status of the Saskatchewan Ministry of Transportation evaluation of the modified Vickers Fracture test. They have not actually evaluated it but are only considering having it evaluated. The "modification" has not been tested and may not be defined yet. Thus, it is not available for our use.

However, we do feel a fracture evaluation is potentially a strong indicator of the suitability of the carbide inserts and continue to look for a good way to evaluate the fracture toughness. The Visual Examination listed above is a beginning of that evaluation.

Anticipated Work Next Quarter:

We will complete the Task 2 Development of Laboratory Test Procedures. At the completion of Task 2 we will provide our evaluation and recommendations for the tests to be compared to field testing. We will ask the TAC panel to provide feedback on our analysis and recommendations.

We will complete the laboratory testing of Task 3 and begin preparation of the Draft Final Report and Implementation Plan.

Circumstances Affecting Progress and/or Budget:

The delay in acquiring the blades for testing caused the project to be delayed approximately one year.

Difficulties in developing a laboratory procedure for preparation of carbide insert samples for testing has delayed the progress of Task 2 and subsequent work.

We propose that the intended meeting with the TAC to review the draft report be replaced with a teleconference (or possibly electronic reviews or both). This teleconference is proposed for early July (see schedule on following page).

Gantt Chart:

See following page.

