

Project title: Experimentele beproeving van een prototype taatslager voor puntdeuren in sluizen met UHMWPE-schijven

Project number: InfraQuest-2011-61, zaaknummer 31063886

Start date: 1 October 2011 **End date:** 5 March 2012

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Embedding in IQ-programme:

The project relates to the InfraQuest Masterplan 'Materials'; it addresses the questions related to innovative materials and techniques for management and maintenance .
Before this project an earlier research showed that application of the composite material HAWE Ferroform T814 with a Lunac coating seemed to be positive for the lifecycle time of pivot bearings, the lower hinge points of lock gates. For this study see TNO report TNO-060-DTM-2012-00781.
With simple commercial available 5 mm thick PE disks the friction performance of these pivot bearings can be significantly improved. The considered applications clearly show the advantages of composites bearings compared with conventional full steel pivot bearings.
The improved behaviour and availability of commercial composites, with big advantages for wet constructions, clearly fit with the starting points of composite materials determined in the masterplan 'Materials'.

Type of project: Fundamental concept Integration & development Validation of results XProduct-in-context / valorisation

Graphical abstract:

The graphical abstract illustrates the experimental setup and results. On the left, a black circular UHMWPE 5mm disk is shown. An arrow points to a photograph of a bus with HAWE Ferroform T814 coating. Another arrow points to a photograph of a pin with Lunac coating. A final arrow points to a table of friction coefficients.

Test	Friction coefficient [-]
Levensduurtest	0.18
Wrijvingstest PE01	0.12
Wrijvingstest PE02	0.07

Research question(s):

- Can the addition of a simple uniform UHMWPE disk contribute positively to the performance of composite pivot bearings?

Conclusions:

The addition of a thin 5mm UHMWPE disk in thrust bearings of lock gates reduces the friction significant. For surfaces in contact with the disk the friction coefficients reduce with more than 60%. This reduction of friction is expected to be positive for the live cycle time of these composite bearings. An increase of life cycle time is not demonstrated yet.

Other results: Because of the design no issues about the creep behaviour of PE.

Dissemination: Reported

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