



MOBILE – Moveable Bearings Innovation Launch in Enlarged Europe

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Summary

Bridge weight and traffic loads as well as braking and wind forces generate a number of different forces that must be transmitted to the ground through bridge piers and abutments. This is the task of bridge bearings, designed, manufactured and installed to permit movements and torsional effects caused by traffic, temperature variations, pre-stress, shrinkage and creep. Bridge bearings are therefore critical components of a bridge structure and demand high quality standards.

An ongoing increase of traffic volume, higher cruising speeds and more flexible structures result in a redefinition of requirements for bearing systems. Furthermore the ambitions and challenges of bridge engineers to exceed not even finalised constructions in their dimensions and technical performances are also transferred to bridge bearing manufacturers.

The lack in reasonable technologies to meet these extreme product specifications mainly results in expensive custom-made products with reduced lifetime performance. To encounter the current situation with sustainable life-cycle costs (LCC) for structures, the bridge bearing manufacturers agree on the potential of reconsidered sliding bearings.

Therefore a consortium initiated the EU-funded project MOBILE to develop a new generation of sliding bearings with higher performance, advanced materials, better constructability and maintainability as well as significantly extended lifetime.

Keywords: Bridge bearings, Support Systems, Sliding Bearing, Sliding Material, Constructability

1. Introduction

The construction sector has a key role in achieving European economic, social and environmental objectives by improving the efficiency and sustainability of the processes involved in the creation, operation and maintenance of the built environment. Targets are that life-cycle costs should be reduced by at least 30% and delivery time should be reduced by 50%. The use of innovative technologies such as virtual design, construction and maintenance methods, embedded systems, product and process simulation technologies should be enhanced to create customer-driven development processes.

The project MOBILE addresses the lack of technology of bridge bearings to meet the extreme requirements within competitive production expenses and sustainable life-cycle costs. It is already well known that improper support systems or failure of bearing systems can result in overload breakage or harm structures through material fatigue. Adequate support systems and a proper monitoring system for bridge bearings are critical for the overall lifetime of bridges.

In existing infrastructure systems the Pareto analysis is a proper approximation of the maintenance costs since about 20% of the components are responsible for 80% of the expenses. Highly critical components are elements such as bearings and expansion joints. These essential components are designed, manufactured and installed to permit movements and torsional effects caused by traffic,