iv2splus INFONET

I2V, 3rd Call (2009)

CELICON

Cellular lightweight parts for transport containers

Steel is a valuable resource, which is used in the construction of transport containers. The weight of containers gains an important object. The target of this project is to design containers with significant weight reduction and at least consistent stability and multi functionality through innovation in design, construction and material structure.

Primary target of the project:
The target is to find an alternative solution to the traditional used steel girder for two different types of containers (1x bulk cargo container, 1x general cargo container) to reach a weight reduction up to 40 %. As a final result two innovative 30 feet ultra-light-prototypes should be built and tested. Other benefits are – for example – savings of steel or material costs, energy or transport costs, improvement in transport logistics, extended shipping volume and carrying capacity.

Brief description:
Transport containers in use these days, which are used on the road, by rail or by ship, need to be manufactured of steel due to financial reasons. The dead weight of the containers takes an important role concerning material costs as well as transport costs. The average weight of a multi functional 30 feet container obtains 3500 to 4500 kg – 75 % of the dead weight are allotted to soil and frame structure and 25 % to cladding (walls, doors, hatchs and roofing). The intended enhancement of container systems allow a reduction of death weight and for this reason a great cost-reducing potential at material costs as well as fuel and energy costs and an intended reduction at CO2-emissions. Transport logistics could be enhanced through shipping volume and carrying capacity. Below introduced innovation consists of developing a novel girder with higher rigidity at lower weight. Therefore hollow profiles of metallic material - consisting of sorted metallic hollow balls - will be reviewed with innovative technology. To get significant results FE-simulations as well as practical tests will be held, which should simulate and demonstrate stability as well as tension, expansion and deformation behavior ex ante. Results shall be used to develop a design-program and to be considered as a new code for girder-constructions at different loading conditions and cross-sections. Significant improvement opportunities in all fields are considered by project partners. The combination of long lasting experience in design and construction of containers and the exclusive provided technology to reduce weight enables this project to develop an innovative product in Austria.

Programme

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Project coordination

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