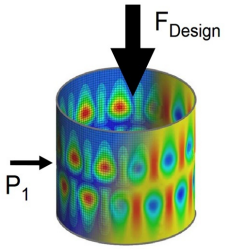
DESICOS



Project title: New Robust Design Guideline for Imperfection Sensitive Composite Launcher Structures (Collaborative Project, 2012-2015)
Acronym: DESICOS
Project description: The Space industry demand for lighter and cheaper launcher transport systems. DESICOS contributes to these aims by a new design approach for imperfection sensitive composite launcher structures, exploiting the Single Perturbation Load Approach (SPLA), which assumes that a large enough disturbing load leads to the worst imperfection. Currently, imperfection sensitive shell structures prone to buckling are designed according the NASA SP 8007 guideline using the conservative lower bound curve. The guideline dates from 1968, and the structural behaviour of composite material is not considered appropriately, in particular since the imperfection sensitivity and the buckling load of shells made from such materials depend on the lay-up design. This is not considered in the NASA SP 8007, which allows designing only so called "black metal" structures.
Here is a high need for a new precise and fast design approach. A recent investigation demonstrated, that an axially loaded unstiffened cylinder, applying the new SPLA, is leading directly to the design buckling load 45% higher compared to NASA SP 8007. This increased allowable in buckling load corresponds to 20% weight reduction, if the load is kept constant. Within DESICOS the new methods will be further developed, validated by tests and summarized in a design handbook. The potential will be demonstrated within different industrially driven use cases.
Homepage: http://www.desicos.eu/