

HyPACTOR

Pre-normative research on resistance to mechanical impact of composite overwrapped pressure vessels

Grant agreement no: 621194

THEME [SP1-JTI-FCH.2013.5.6]

[Pre-normative research on resistance to mechanical impact of pressure vessels
in composite materials]



6-monthly interim report

DELIVERABLE ID	D1.3.1
Deliverable name	6-monthly interim reporting
Period covered	M1 – M6 (1 st April to 30 th September 2014)
Lead beneficiary	ALMA
Contributors	All partners



This project has received funding from the European Union's Seventh Programme for research, technological development and demonstration under grant agreement n° 621194

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2. Publishable summary

2.1. Summary description of the project objectives

The main objective of HYPACTOR is to provide recommendations for Regulation Codes and Standards (RCS) regarding the qualification of new designs of COPV and the procedures for periodic inspection in service of COPV subjected to mechanical impacts.

To this aim, experimental and numerical work will be combined with feedback from experience in order to:

- Understand & characterize the relationship between the impact, the damage and the loss of performance of COPV at short term and after further pressure loads in service;
- Identify the impact conditions that produce short time failure of COPV and assess long term influence of impacts on COPV performance;
- Develop models to predict short term residual performance of the impacted COPV;
- Assess relevant (non-destructive) inspection procedures and define pass-fail criteria for COPV in service subjected to mechanical impacts;

Disseminate the scientific knowledge and revised methodology for qualification and inspection.

2.2. Brief description of the work performed since the beginning of the project and results achieved

During this first semester, activities have mainly been focused on :

- project management issues (templates, Quality Assurance Plan, website public/private, communication tools)
- literature and industrial reviews on reported incidents involving high pressure cylinders and industrial constraints to perform non destructive inspection on site.
- First testing campaigns to determine impact conditions leading to immediate failure and respective influence of load conditions (cylinder empty, gas 20 & 700bar, water 700bar).

2.3. Expected final results and their potential impact and use

The key expected impacts induced by HYPACTOR results are:

- The development of an extensive experimental database gathering data for mechanical behaviour of composite vessels submitted to impacts
- An improved understanding of short & long terms residual performance of impacted COPV
- The development of a model for quantitative prediction of mechanical behaviour of impacted composite vessels.
- The assessment of Non Destructive Testing with respect to inspection of COPV

2.4. Address of public website

www.hypactor.eu