PROCESS FOR A RESERVOIR INTERNAL SURFACE COVER LAYER

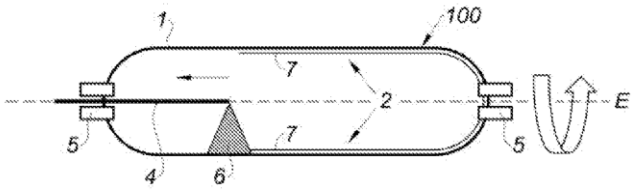
Technological advantages

Innovative :

- Internal cover using a fluoropolymer.

Efficient :

- Compatible with cryogenic conditions, liquid propellants, small molecules (He, H_2).
- Cover layer created in situ : no additional component and no microcrack.
- Good internal cover adherence.



Schematic representation of a reservoir

(2) Internal surface
(4) Endoscopic tube
(5) Reservoir mount
(6) Liquid component spraying
(7) Cover layer
(100) Reservoir

Invention synthesis

The invention deals with covering with a thin layer a reservoir inner side.
A reservoir must be light, strong, watertight and cost effective. Alloys (watertight and strong) are replaced with composites (simpler to manufacture and light). Storing pressurized fluids (LOX, GOX, …), with cryogenic conditions, poses issues when using composite materials (leaks, microcracks). Inserting an internal alloy or polymer envelop in a composite reservoir is complex, adds mass, costly and produces an heterogenous reservoir.
The invention presents a composite reservoir (thermoplastic or thermoset) within which a mixture (fluoropolymer + prepolymer and crosslink) is polymerized using heating or UV to produce a thin fluorinated cover layer.

Commercial benefits

- Reduced manufacturing time, simpler to produce compared to double envelop methods.
- Cost effective, very good thermomechanical performances, watertight, avoid micro-cracks.

Potential applications

- Reservoirs and fuel tanks for aerospace, aeronautical, automotive applications.

Patented invention - under license.

For more information :

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