

# SIZE DOES MATTER. ABOUT THE ISSUES WITH SCALING UP THE HYDROGEN STORAGE CONTAINERS. HYDROGEN HYBRID CAR PROJECT.

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Solid state hydrogen storage materials are being investigated for decades. Despite the fact that the problem was not solved till now, many groups of materials are still quite promising as potential candidates for onboard applications. Some of them are able to store reasonable amounts of hydrogen in relatively low temperatures and desorb just in minutes.

However, it is becoming more and more clear that the greatest problem concerning those materials are engineering issues with application in large scale tanks. Reaction that takes place in seconds in milligram scale in laboratory will need long minutes in gram scale and many hours to proceed when material is used in kilogram quantities. This is caused by the heat and mass exchange problems. By that reason using even most popular and well known AB5 and AB2 alloys is complicated when it comes to “real life” applications.

In this talk our experiences with scaling up the hydrogen storage tank for hydrogen hybrid car (fig. 1) will be presented. Heat management issues (fig. 2), structural materials issues, safety issues, particles filtering issues will be shown and discussed more in detail.



Fig1.1 Rendered model of hydrogen hybrid car.

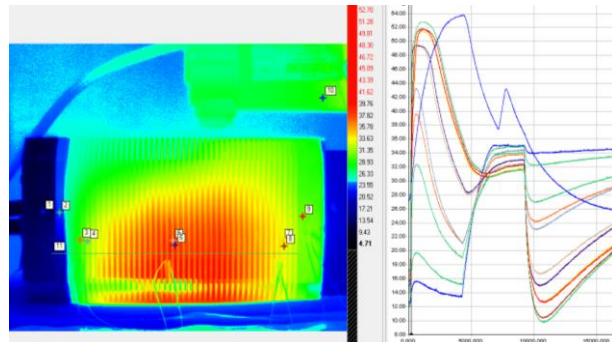


Fig1.2 Thermal imaging of the medium scale solid state hydrogen storage tank.



**Marek Polanski** graduated from faculty of Mechanical Engineering of Military University of Technology, Warsaw, Poland and received PhD degree in Materials Science at the same University. Since 2006 he is working on synthesis and modification of different types hydrogen storage materials, as well as improving and discovering new synthesis and research techniques. Recently he is utilizing new laser based additive manufacturing techniques as a tool for combinatorial synthesis of both structural and functional materials.