



Bu proje Avrupa Birliđi ve Türkiye Cumhuriyeti tarafından finanse edilmektedir  
This project is co-funded by the European Union and the Republic of Türkiye

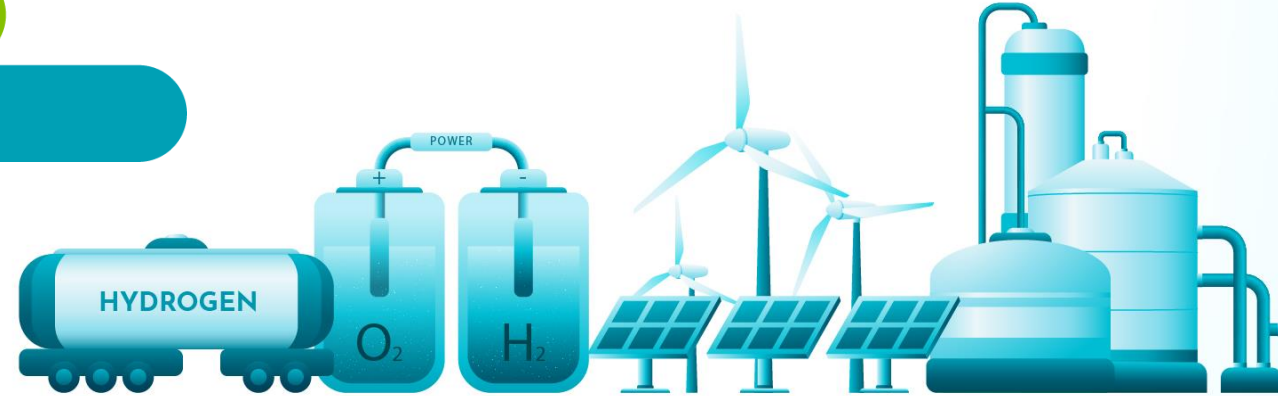


## International Brokerage Event on Clean Hydrogen Partnership 2024 Call



Online

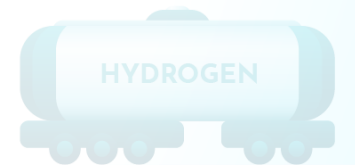
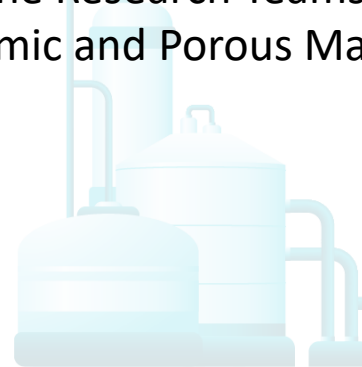
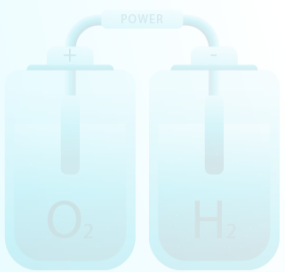
**Presenter Full Name: Ömer EKSİK**  
**Organization: TÜBİTAK MARMARA  
RESEARCH CENTER**  
**E-mail: omer.eksik@tubitak.gov.tr**



**Description of the Organization:** Founded in 1972, TÜBİTAK Marmara Research Center (MAM) continues its studies at the "TÜBİTAK Gebze Campus" in Kocaeli. The center, which aims to be a world-leading center that produces science and technology and adopts the duty of producing sustainable, innovative, scientific and technological solutions by conducting applied research, includes Energy Technologies, Climate Change and Sustainability, Material Technologies and Life Sciences, each with a wide range of competence.

TÜBİTAK MAM is one of the leading organizations of the advanced technology world thanks to its ability and capacity of research, research infrastructure and world class administrative and operational process management. With its customer oriented approach, it offers original solutions to public, private and military agencies and institutions. These solutions are materialized through basic researches, applied research and development, technology transfer, innovation, system and facility construction, national standard and norm setting, professional consulting and training activities.

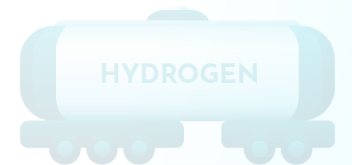
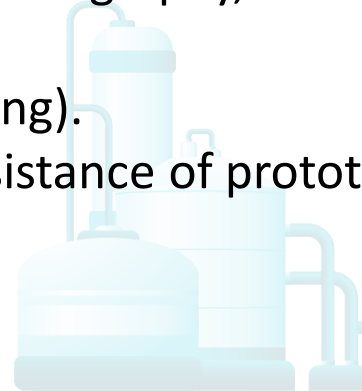
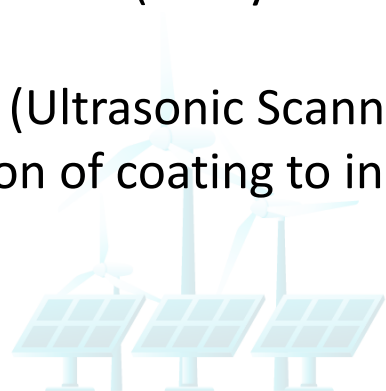
Structural Material Technologies Research Group consists of the Research Teams of Composite Material Technologies, Trace Reducing Material Technologies and Ceramic and Porous Material Technologies.



**Call of Project :** Novel large-scale aboveground storage solutions for demand-optimised supply of hydrogen;  
HORIZON-JTI-CLEANH2-2024-02-02

We have the expertise and skills to make key contributions to

- 1- Advanced composites manufacturing including Vacuum Assisted Resin Transfer Molding, autoclave, compression moulding processing
- 2- Mechanical characterization and testing of composite materials (hardness, tensile, compression, in-plane shear and low velocity impact)
- 3- Finite element modelling of composite pressure vessel using state-of-the-art methods and tools (ANSYS MECHANICAL, ABAQUS, LS-DYNA, WoundSim software is planned to be purchased within the scope of the project proposal.).
- 4- Thermal characterisation (DSC, TGA, DMA,)
- 5- Microstructural characterization (X-Ray Computed Microtomography, Scanning Electron Microscopy, Atomic Force Microscopy).
- 6- Non-destructive Inspection (Ultrasonic Scanning, CT Scanning).
- 7- Development and application of coating to increase fire resistance of prototype composite pressure tank



## Material Characterization: Testing of composite materials (hardness, tensile, compression, in-plane shear and low velocity impact)



Universal Zwick Testing Machine, 250kN



(a)



(b)



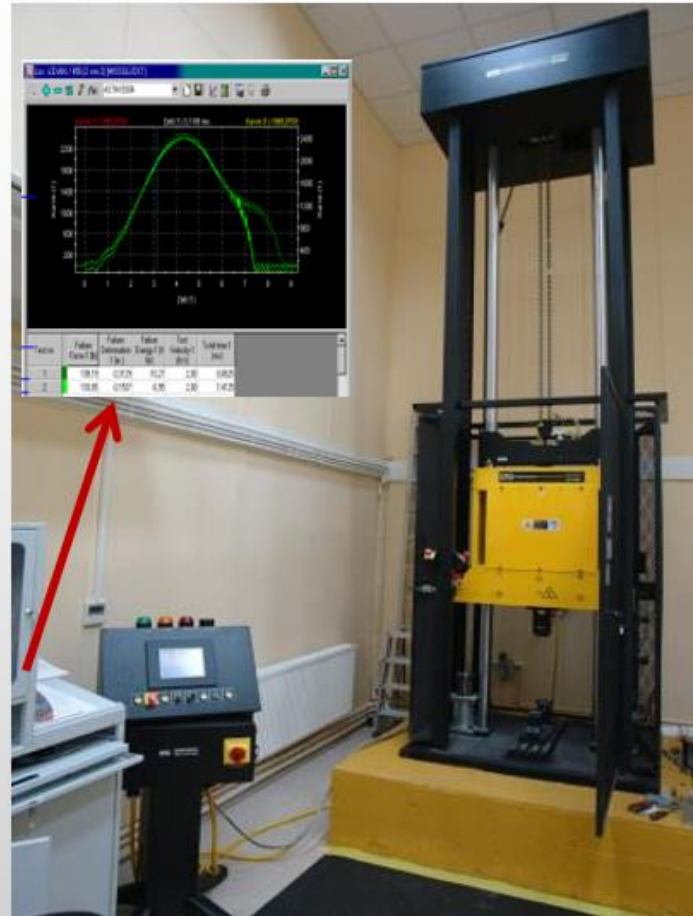
(c)

Strain gage mounted laminated composite specimen can be tested related ASTM standards namely (a) ASTM D3039; tensile test (b) ASTM D3410 compressive test and (c) ASTM D5379 - Shear test of Composite Materials



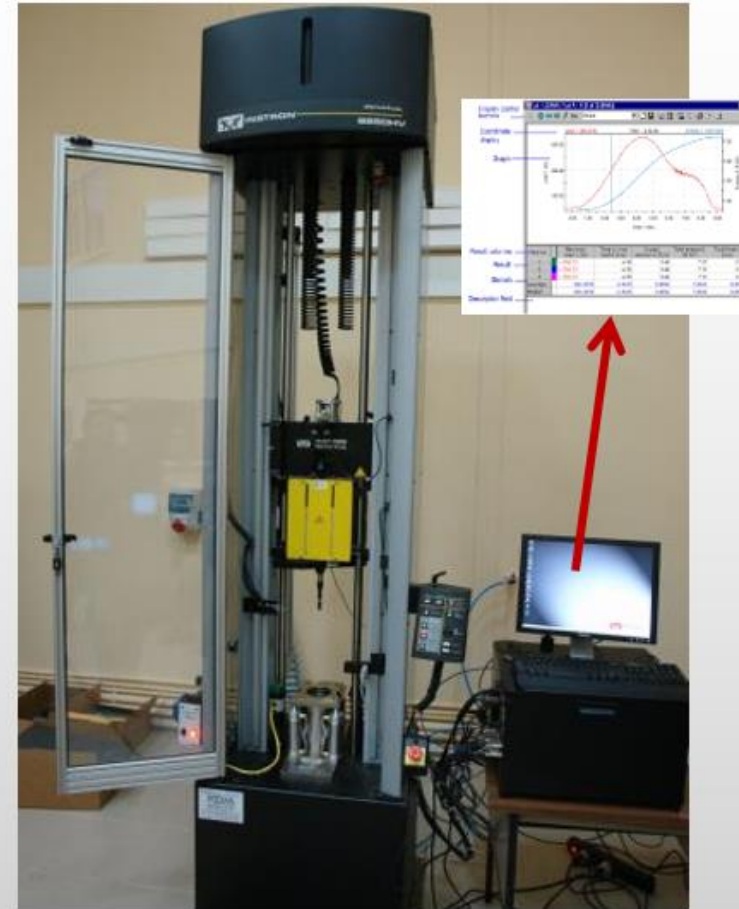
# Material Characterization: Low velocity impact testing of composite materials

## INSTRON DYNATUP 8150



Impact Velocity: **7 m/s**  
Drop height: **2,4 m**  
Maximum impact energy: **27847 J**

## INSTRON DYNATUP 9250HV



Impact Velocity: **20 m/s**  
Drop height: **20,4 m**  
Maximum impact energy: **1600 J**

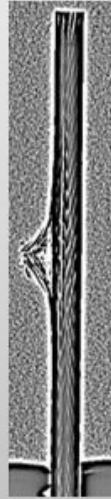
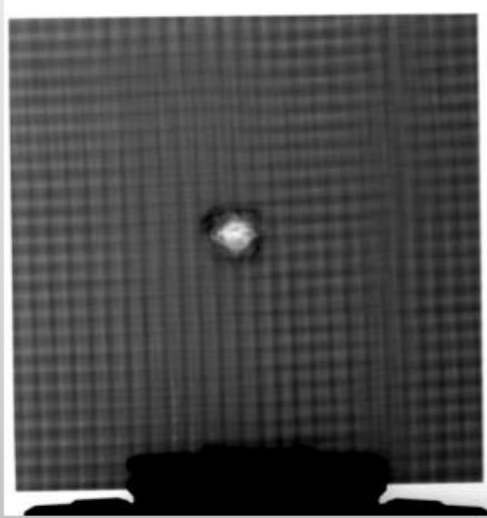
## Non Destructive Testing Laboratory Facilities:



Yxlion 320kV + CT  
Dijital Radyografi



Ultrasonik Fazlı Dizin (Phased Array)



REPUBLIC OF TURKEY  
MINISTRY OF INDUSTRY  
AND TECHNOLOGY



COMPETITIVE  
SECTORS  
PROGRAMME

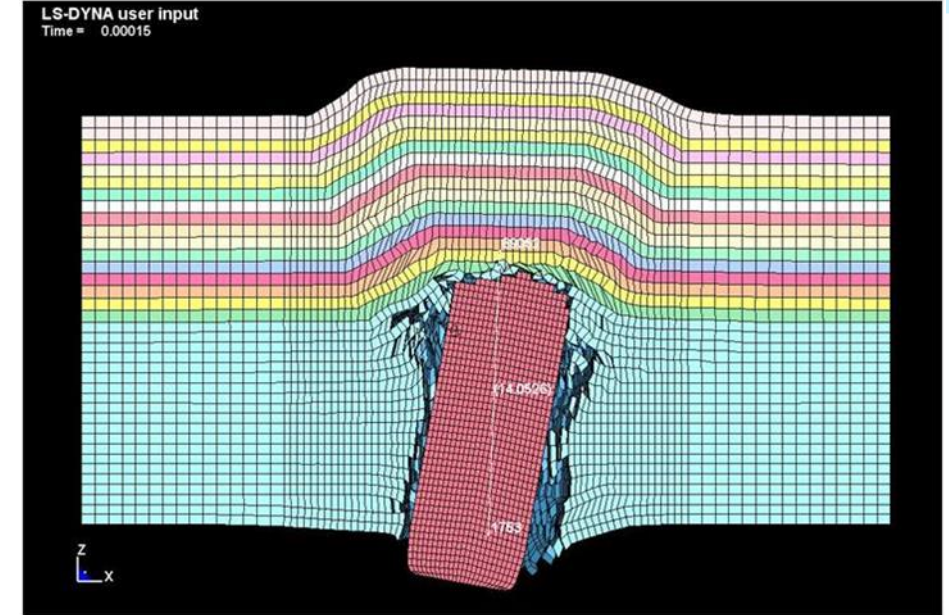
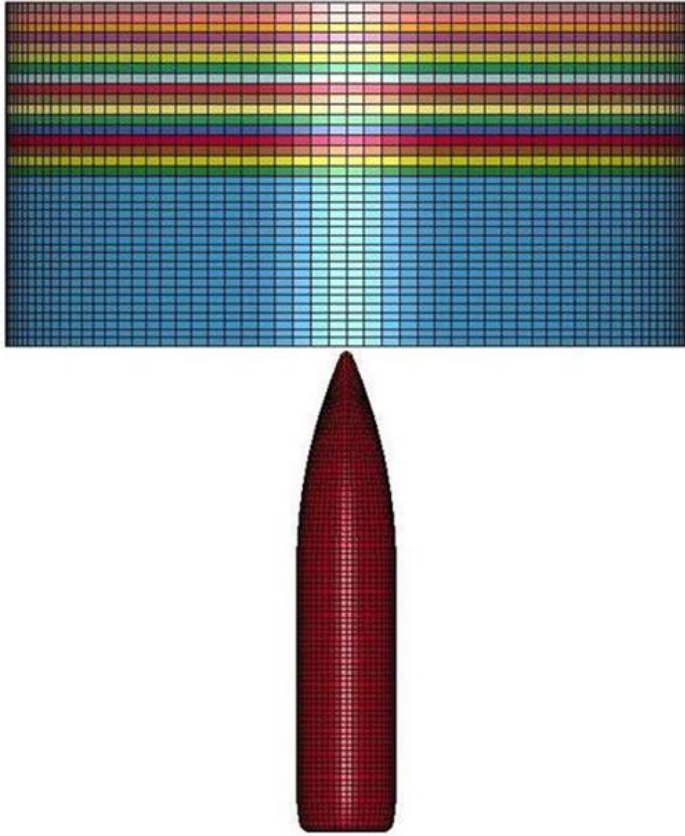


HYDROGEN



TUBITAK

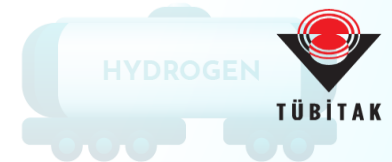
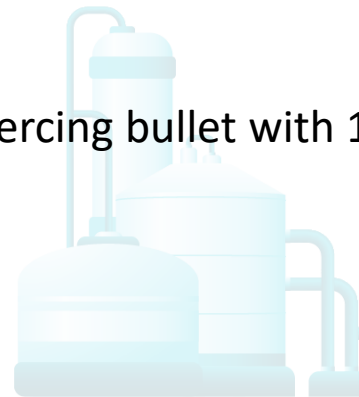
# Ballistic Impact Analysis of Composite Armor Systems : Finite Element Analysis by using LS DYNA



Ballistic simulation analysis results of stopping a 7.62 mm AP armor-piercing bullet with 10 mm ceramic and 10.2 mm composite armour

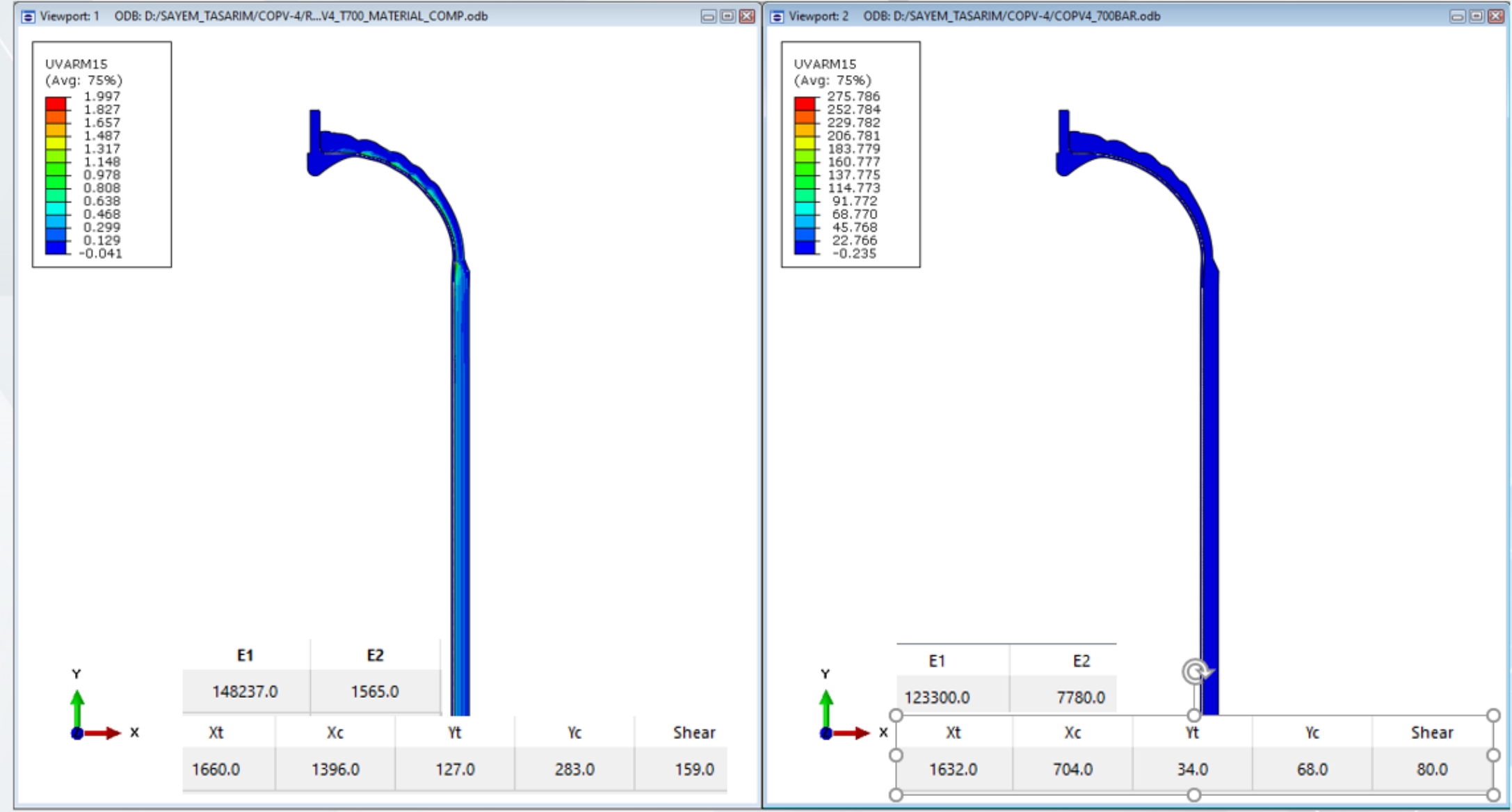


REPUBLIC OF TURKEY  
MINISTRY OF INDUSTRY  
AND TECHNOLOGY





Structural Analysis of Composite Pressure Vessel: Finite Element Analysis by using ABAQUS, and WoundSim



REPUBLIC OF TURKEY  
MINISTRY OF INDUSTRY  
AND TECHNOLOGY





## Consortium - profile of known partners (if any)

No	Partner Name	Type	Country	Role in the Project
01	TUBITAK	R&D Institution	TURKIYE	Composite material characterization and pressure vessel structural design and Development and application of coating to increase fire resistance of prototype composite pressure tank
02	Gebze Technical University	University	TURKIYE	Modifying Liner with nano graphene particle
03	Floteks	SME	TURKIYE	Manufacturing Composite Pressure Vessel
04				
05				

## Consortium – required partners

No	Expertise	Type	Country	Role in the project
----	-----------	------	---------	---------------------

01				
----	--	--	--	--

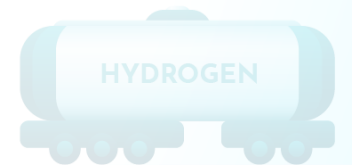
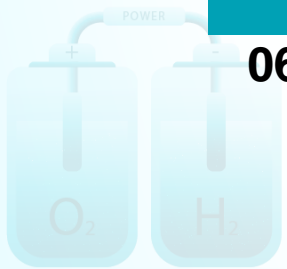
02				
----	--	--	--	--

03				
----	--	--	--	--

04				
----	--	--	--	--

05				
----	--	--	--	--

06				
----	--	--	--	--





***Presenter Contact Details:***

Full Name: Ömer EKSİK

Organization and Department: TÜBİTAK MARMARA RESEARCH CENTER

Country: TÜRKİYE

Tel/E-mail/Web:

+90262 677 3024

omereksik@tubitak.gov.tr

<https://malzeme.mam.tubitak.gov.tr/en/research-areas/structural-material-technologies>

