

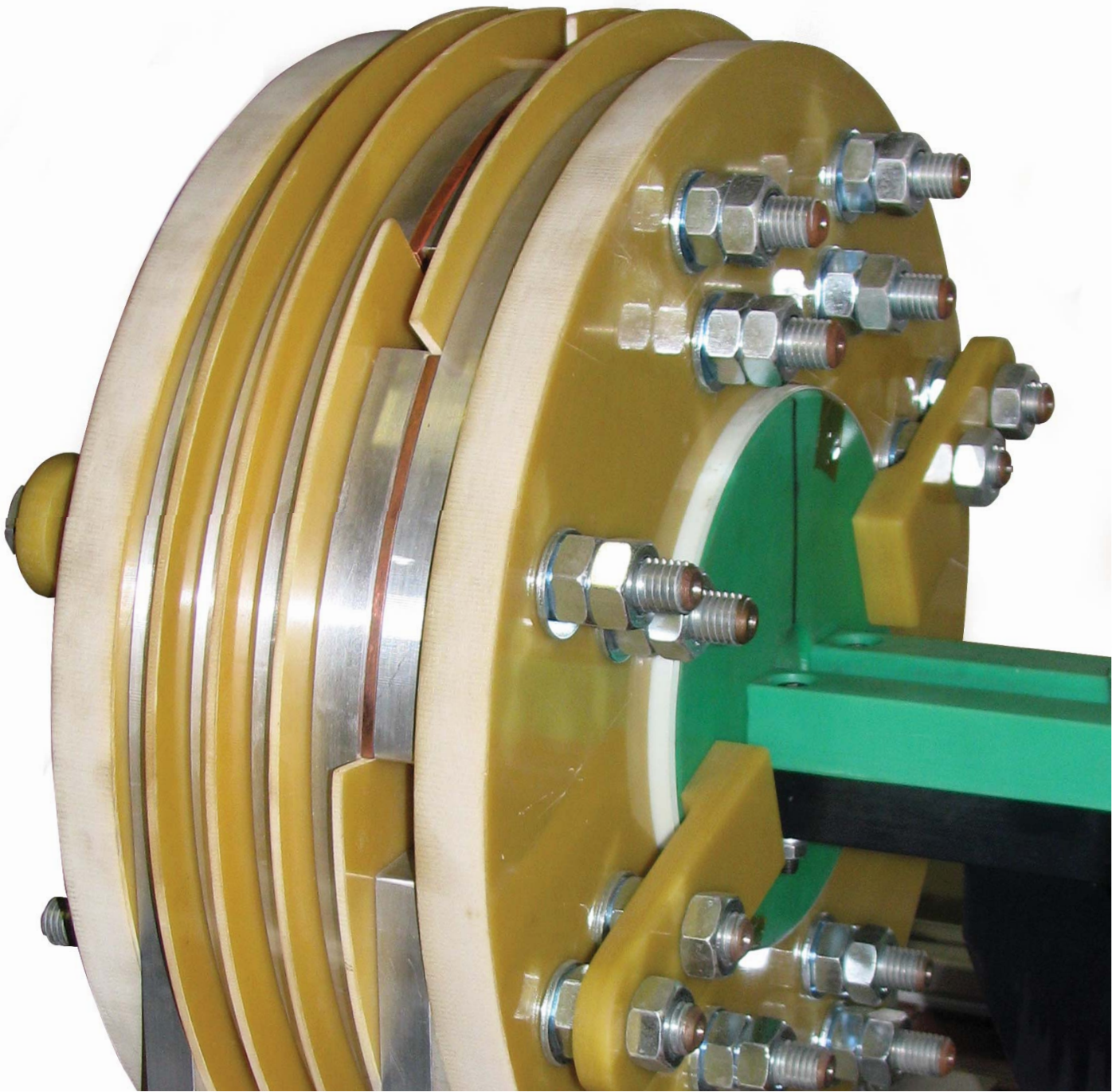


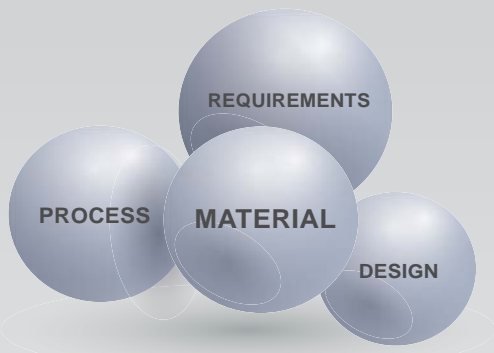
# METAL MORPHOSIS

[www.metalmorphosis.eu](http://www.metalmorphosis.eu)

## OPTIMIZATION OF JOINING PROCESSES FOR NEW AUTOMOTIVE METAL-COMPOSITE HYBRID PARTS

METALMORPHOSIS IS AN INTEGRATED PROJECT OF THE EC 7TH FRAMEWORK PROGRAM





## COMPOSITES

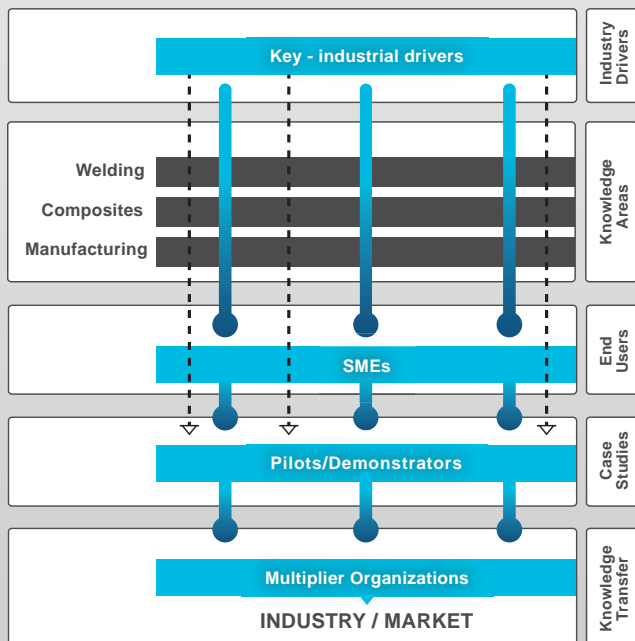
Composites offer the possibility to achieve impressive weight reductions for the next generation products. Composite production processes and materials evolve quickly to fulfil the needs of a diverse range of industries replacing traditional applied materials.



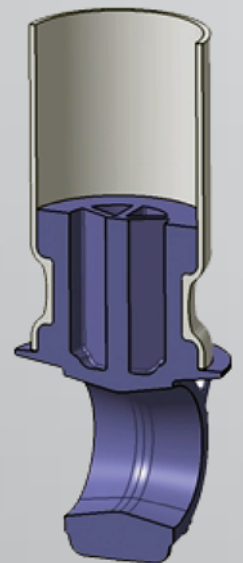
**2.9** MILLIONS EUROS  
**9** PARTNERS  
**6** EUROPEAN COUNTRIES

## GENERAL AIM / OPPORTUNITY

The overall aim of the project “MetalMorphosis” is to develop a range of novel metal-composite hybrid products for the automotive industry, using the new and innovative new electromagnetic pulse technology, which is highly suitable for joining dissimilar metal products towards joining of composites and metals.



## DEMONSTRATORS:

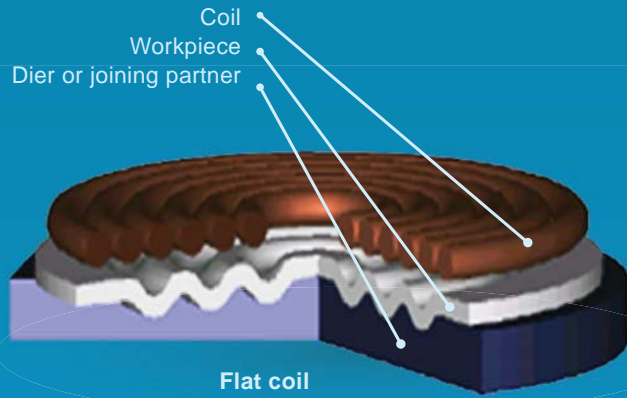
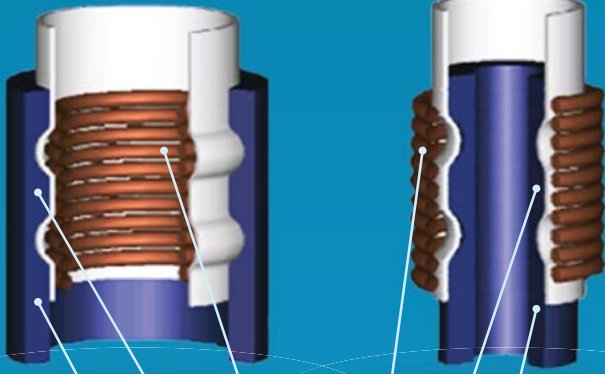


## SHOCK ABSORBERS

- Connection of two tubular products, made of steel and composite.
- Structural part should be gas tight (high pressures). Minimum bending to withstand (good angular alignment).
- High pressures and temperatures of work.
- Weight decrease and easy integration in existing process lines.

Expansion

Compression

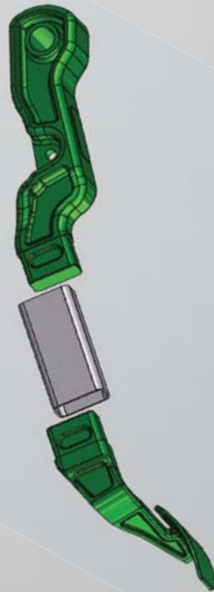


Flat coil

Coil  
Workpiece  
Dier or joining partner

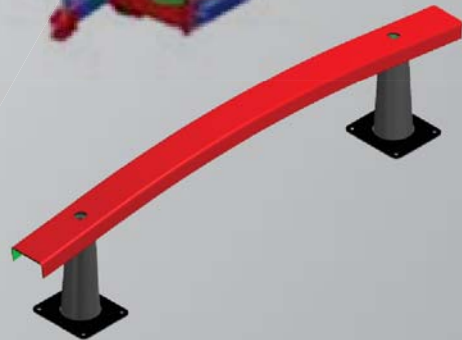
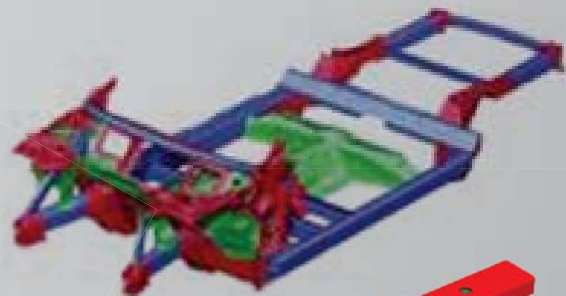
### TECHNOLOGY

The joining technology Electromagnetic Forming (EMF) uses pulsed electromagnetic forces to contactless deform and/or join workpieces. This process also offers the possibility to join material combinations, which are difficult or impossible to join using conventional processes. The process offers technical advantages like high repeatability and being environmentally friendly compared to conventional joining processes.



### BRAKE PEDALS

- Reduction of the risk of serious lower limb injuries the driver in a frontal collision through the use of composite materials, simultaneously ensuring compliance with legal requirements and international statutory.
- Reduction of the weight of the brake pedal assembly, less than the weight of existing components made entirely of metal.
- Due to the smaller number of operations and components it's possible to reduce the cost and production time.



### HYBRID CRASH ABSORBER

- Transform the impact energy very quickly away from the impact in a direction transversal to the impact front (90°).
- Crash absorbing materials positioned transversal to the impact.
- Using unidirectional energy transforming hybrid material for driver protection.

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GRANT AGREEMENT NR: 609039  
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