

STRUCTURAL RECYCLING

Structural applications with automotive recyclates

“The results of this project show interesting perspectives. We will certainly continue research within this topic.”

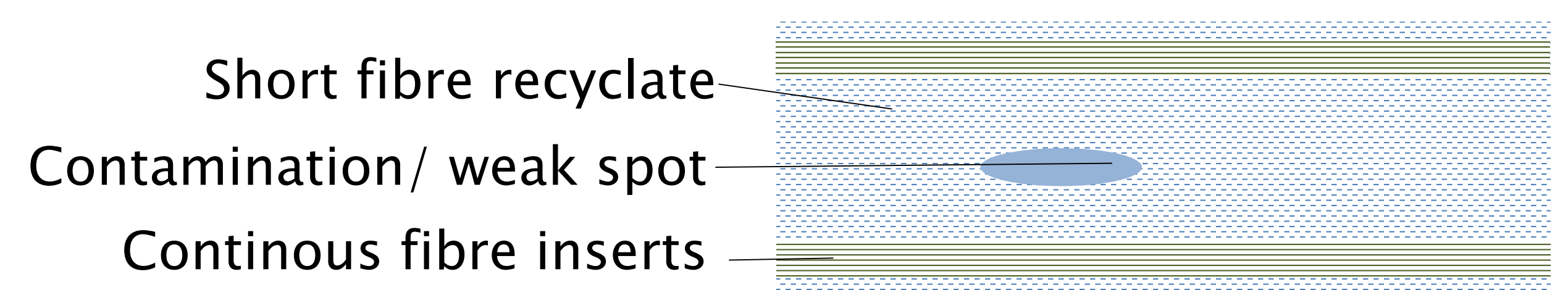


Introduction

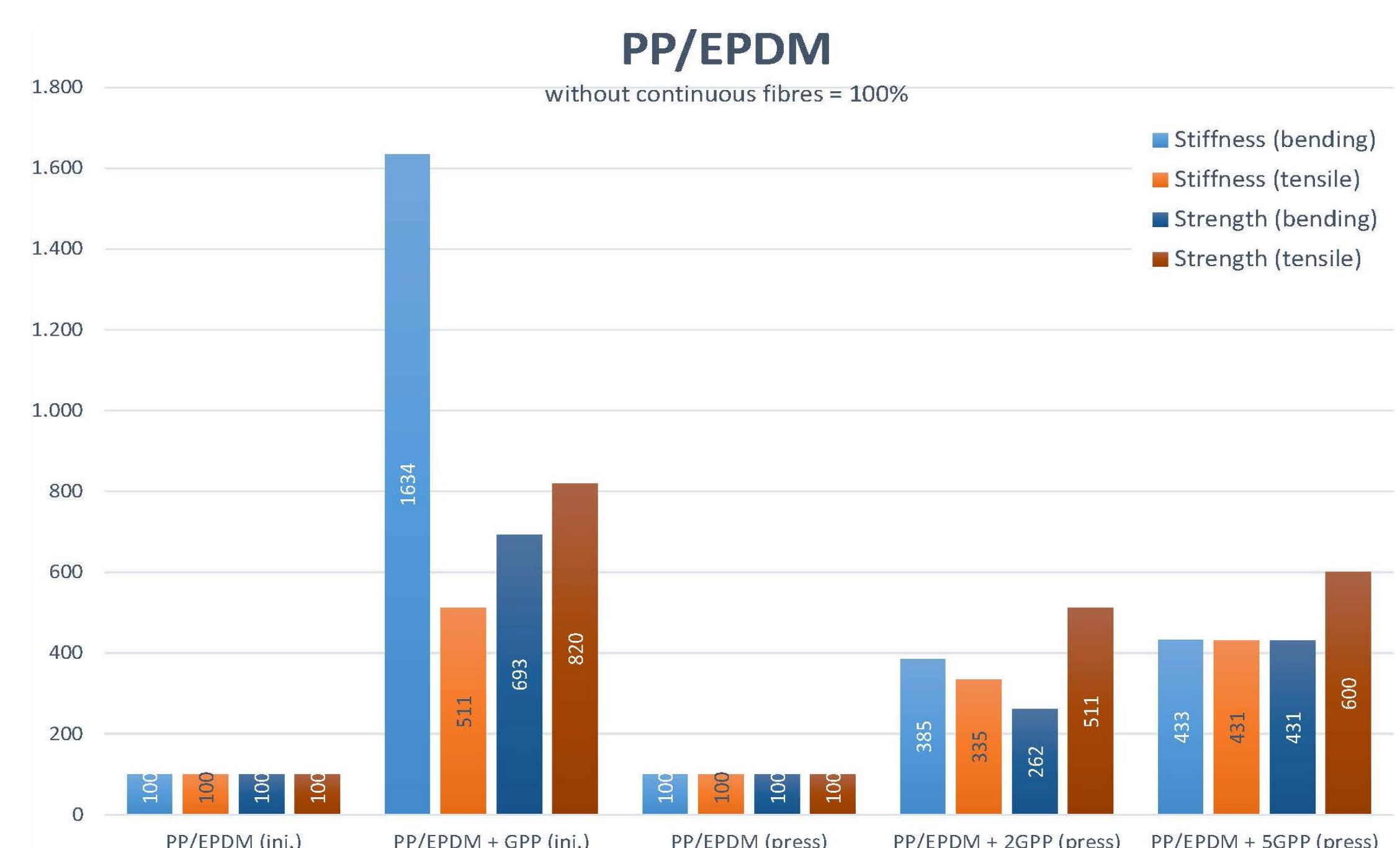
Europe has imposed impressive recycling goals on the car industry. For that reason, the sector continuously works on improvement of recycling technologies. Short fibre reinforced plastics are used to reduce weight in e.g. dashboards and other car components. Although glass fibres introduce better mechanical properties in recyclates, it is hard to find applications in which these materials are applied. A possible reason is that although stiffness is maintained in these recyclates, the strength become unreliable due to local and unpredictable material imperfections or contaminations. The aim of this project is to compensate for local imperfections by addition of a small amount of continuous fibre reinforcement, at the same time offering semi-structural properties to the final product.



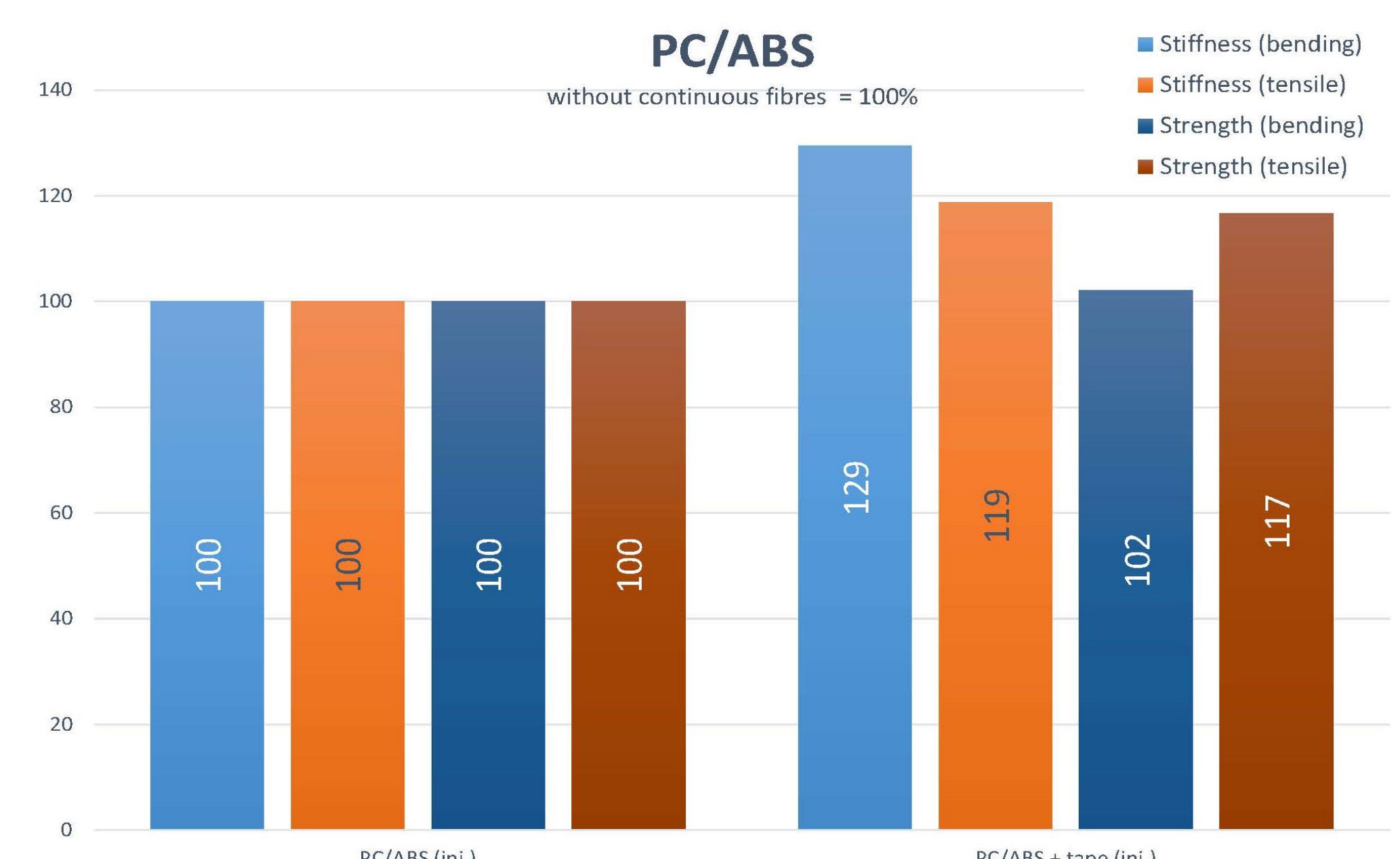
Another test series was produced by compression moulding PP/EPDM recyclate with continuous fibre reinforced material.



Results



The figure above shows that combining G/PP continuous fibre and PP/EPDM with overmoulding will significantly increase the stiffness and strength: the stiffness increases by a factor of more than 16, while the strength is increased by a factor 7. Looking at the samples from pressed plates, these values are somewhat lower. In this case, when using a 5-layer continuous fibre insert: the stiffness increases by a factor of 4,3 and the strength by a factor of 6.



The above figure shows that when applying G/PCABS continuous fibre in PC/ABS recyclate, the stiffness and strength will slightly increase. Both the stiffness as the strength will increase by a factor of approximately 1,2.

Approach

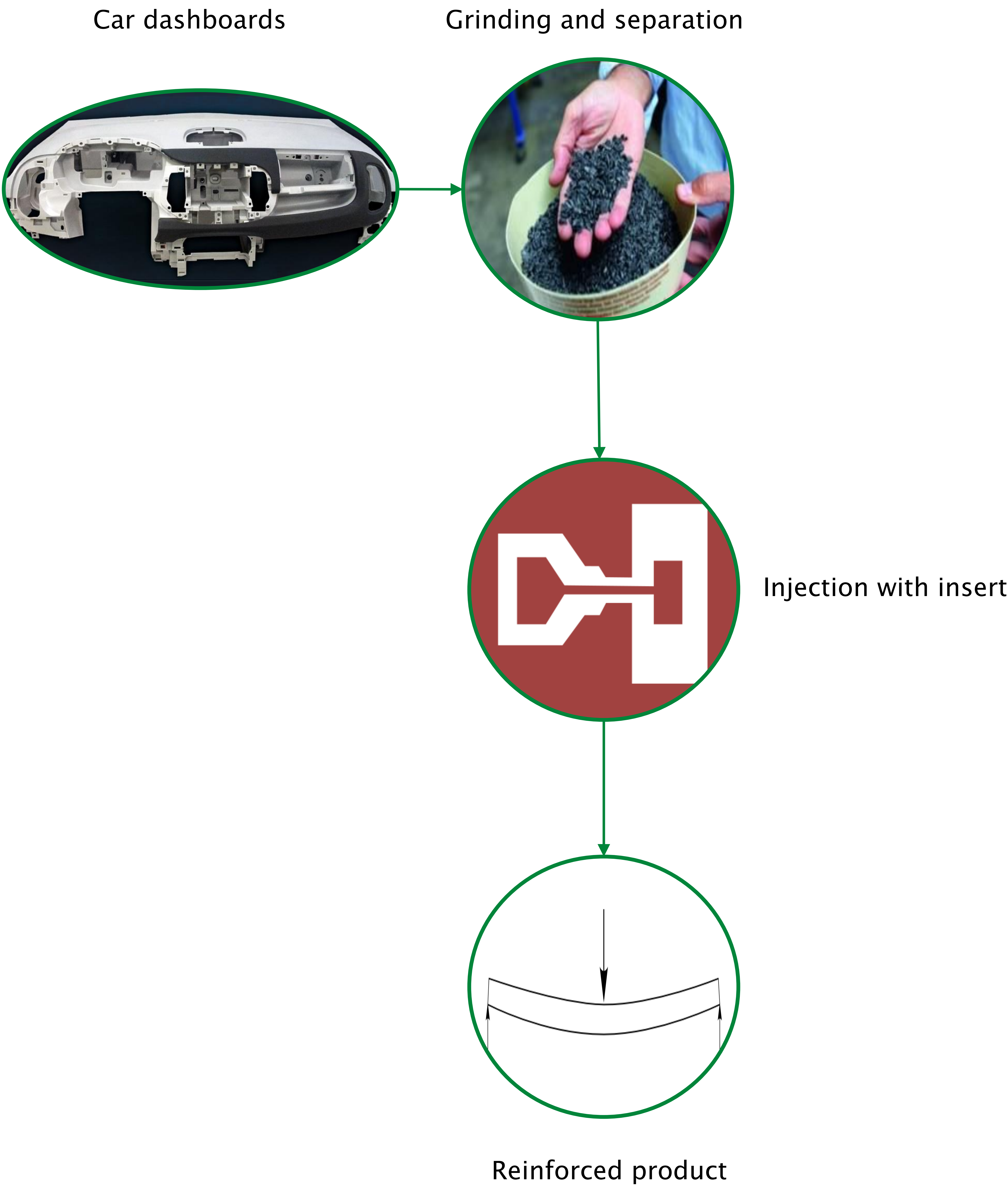
In order to apply continuous fibres in products, recently developed technology was used for insert moulding. First continuous fibre reinforced inserts were produced, and positioned in a test mould cavity. After this, the mould cavity is filled by injecting the recycled material (PC / ABS). Both reinforced and unreinforced samples were subjected to three point bending and tensile tests.

This research is co-financed by Regieorgaan SIA, part of The Netherlands Organisation for Scientific Research (NWO)

STRUCTURAL RECYCLING

Structural applications with automotive recyclates

The process



Recycling

www.ecotrade.online.com
www.jpi-polymers.nl
www.saxion.nl/lightweight