

Recycled structural self-compacting precast concrete elements as example of sustainability in the precast industry

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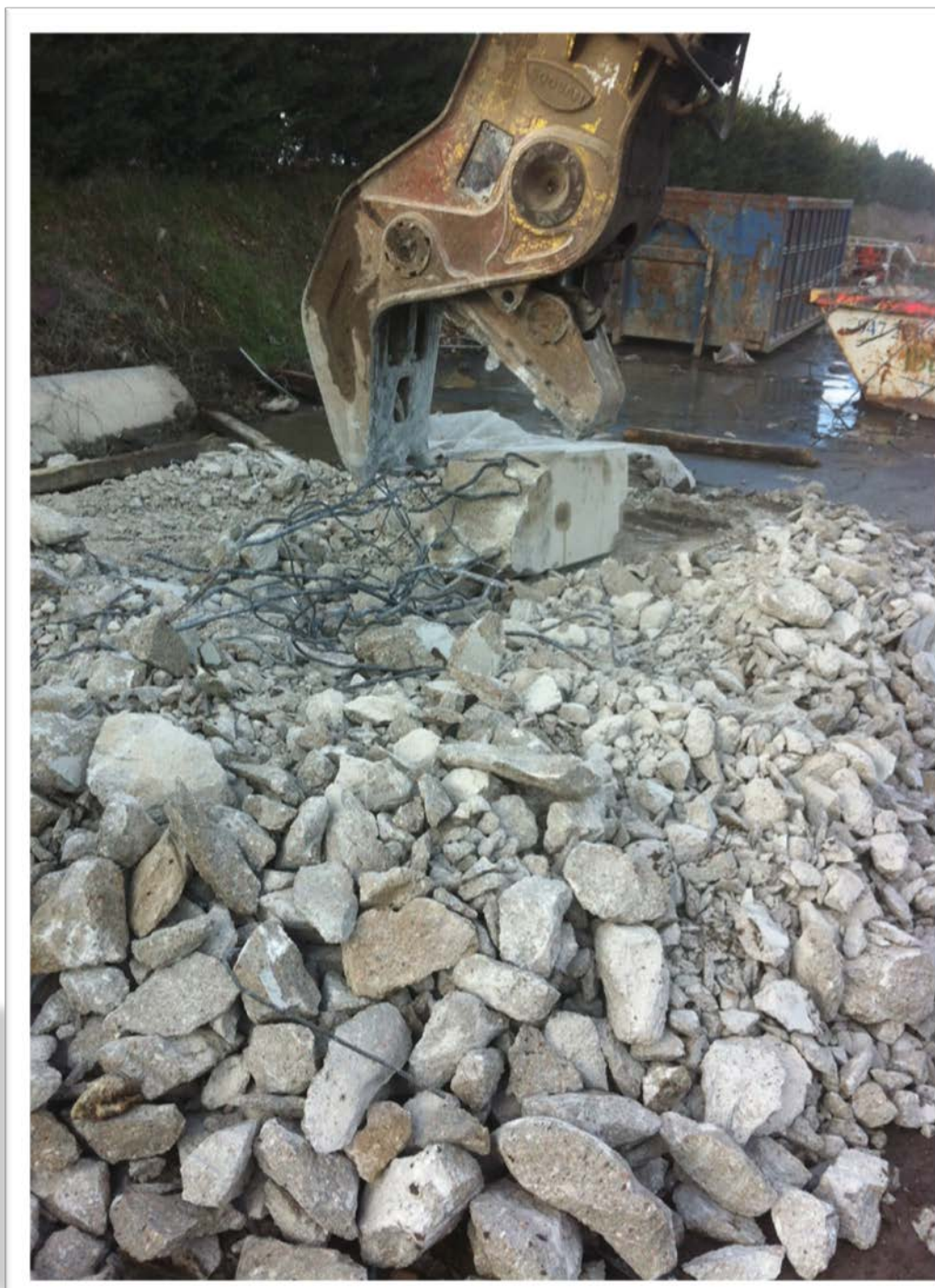
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INTRODUCTION

High amounts of good quality concrete wastes in a precast plant: use of recycled aggregate in new self-compacting recycled concretes.



Discarded elements of concrete



First crushing



Self compacting concrete fabrication



Laboratory testing

In this research, **recycled aggregates** coming from concrete precast components are used as aggregate for new self-compacting concretes.

STUDIED MATERIAL

Four different mixtures were studied. A control mixture and incorporation three degrees of recycled coarse aggregate.

Mix prop. [kg]	Sand 0-2	Gravel 2-12.5	RA 2-12.5	Filler	Cement	w/c
HR-45-0%	650	1150	0	270	320	0.35
HR-45-20%	650	920	230	270	320	0.35
HR-45-50%	650	575	575	270	320	0.35
HR-45-100%	650	0	1150	270	320	0.35



Production process of the recycled aggregate on site.

LABORATORY MIXING PROCESS



Weighting of recycled self-compacting concrete components.



Pre-saturation of the recycled aggregate.



Mixing in a vertical laboratory mixer.



PRECAST PLANT MIXING PROCESS

The industrial test was performed using a 3 cubic meter industrial mixer.



Mixing process using the equipment of the precast factory.



Filling of the molds for industrial beams and the test specimen molds.



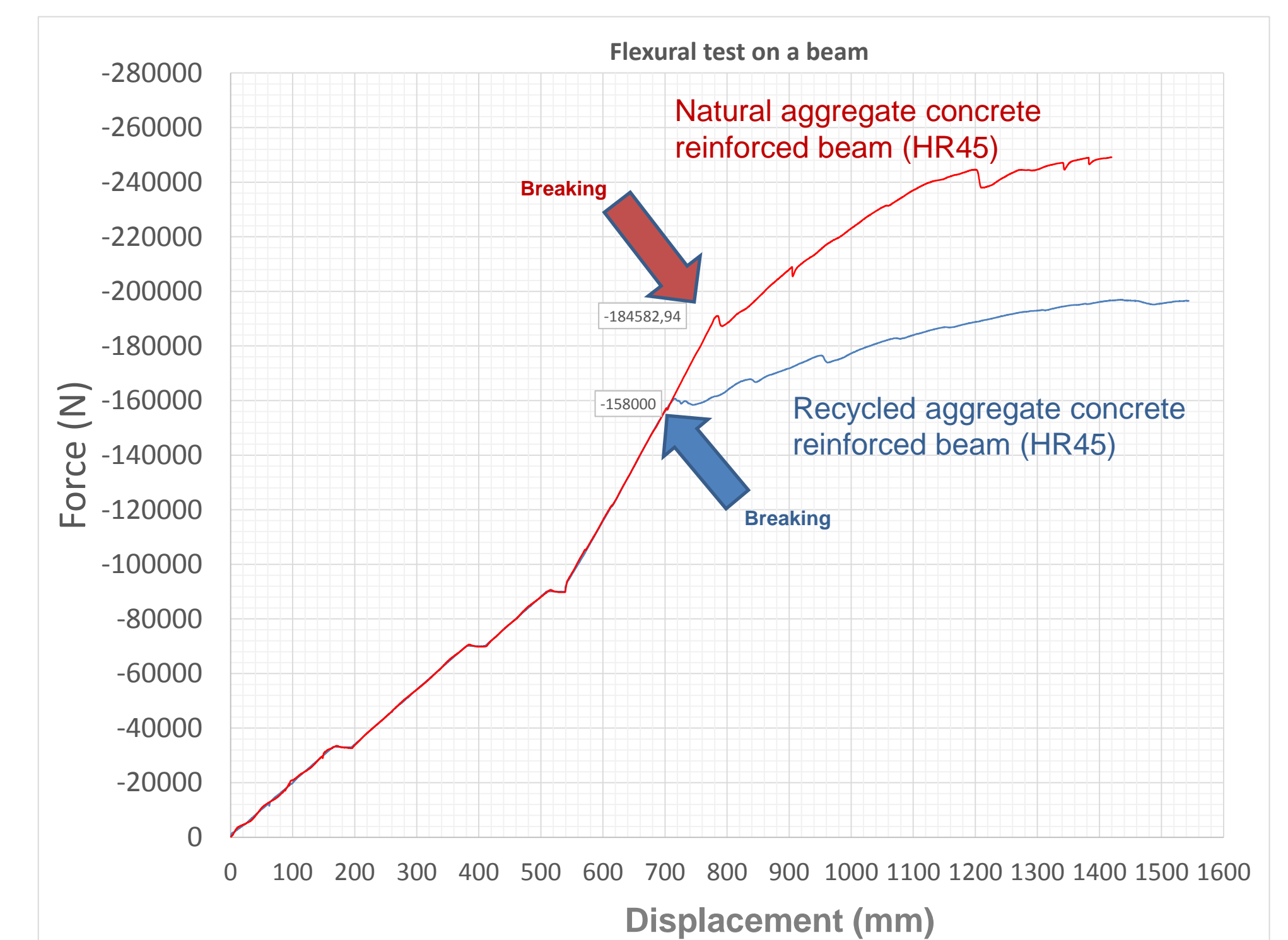
Three points and shear testing on a reinforced recycled beam performed on the laboratory.

CONCLUSIONS

The recycled aggregates of a precast plant are high quality and can be used into self-compacting concrete precast elements. However, the observed losses of mechanical properties are proportional to the degree of substitution but very small in the case of percentages below 20% of recycled aggregate.

INDUSTRIAL TESTING RESULTS

Comparison of the behavior of a beam made with 100% recycled aggregate and a natural aggregate beam, both concretes with 45 MPa.



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