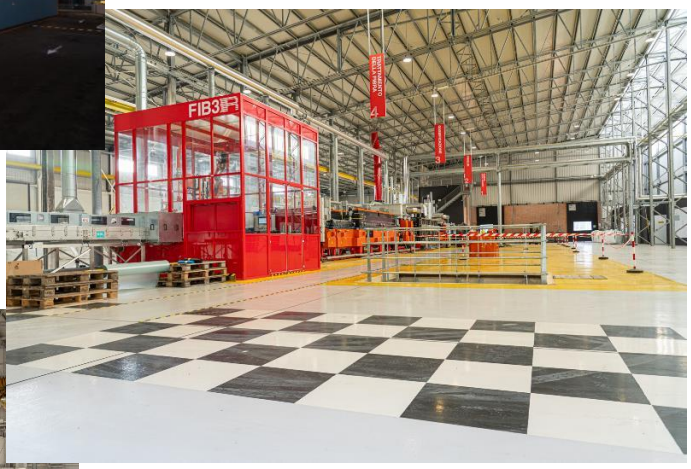
HERAmbiente
Società del Gruppo Hera

FIB3R
Recover Reduce Reuse
Carbon Fiber

TECHNICAL DATA SHEET chopped rCF

Once the resin and additives have been removed through a pyrogasification process, recycled carbon fiber (rCF) retains its lightweight characteristics and mechanical properties.

The industrial plant can treat the following types of composites: prepreg, processing waste, cured waste, and finishing waste.
The regenerated carbon fiber is then ready to be re-woven and re-impregnated for all typical uses of virgin fiber, for autoclave, press, and molding processes: nonwoven fabric (TNT), patchwork, carbon grindings, short fibers, SMC, BMC, and much more.



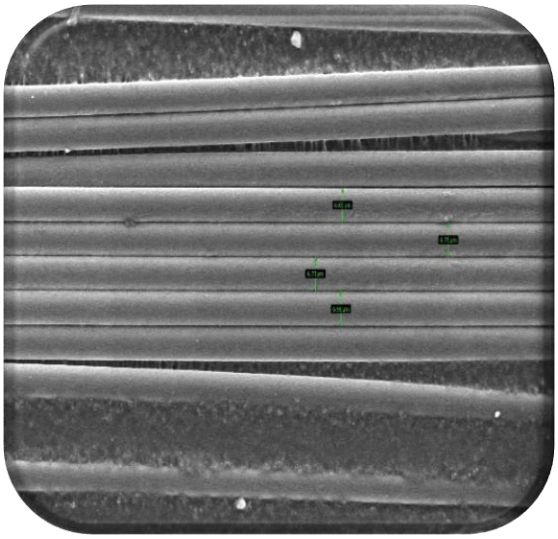
Morphological (SEM) and mechanical (dynamometer) comparison between rCF and respective virgin carbon fibers

CFRP scrap – Image of CFRP BEFORE thermal treatment

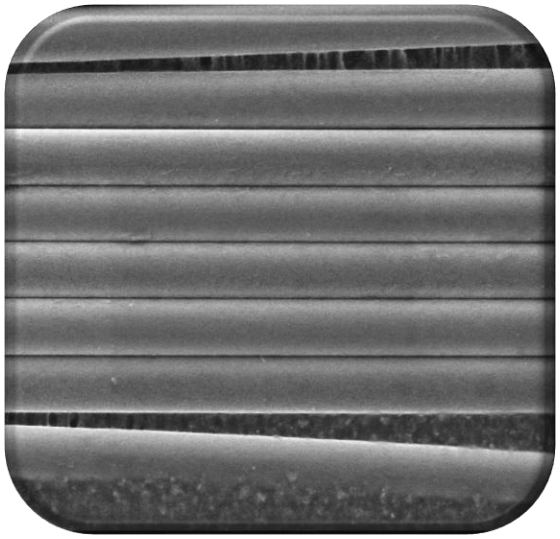
rCF – Image of the rCF obtained AFTER thermal treatment

The regenerated fibers can then be cut uniformly to different lengths to produce semi-finished products such as nonwoven fabric, SMC, BMC and much more.

Pyrogasified rCF – SEM image
Magnification: 3000×



Pyrogasified rCF – SEM image
Magnification: 5000×



The mechanical properties of both virgin fibers (technical data sheet) and rCF are listed below. The results regarding the mechanical properties of rCF were obtained using a dynamometer through single-fiber tensile testing. For each sample tested, 20–30 individual fibers were tested, and the results were then averaged and presented in the table.

Virgin CF – Mechanical properties (Values from TDS – such as T700)

RESULTS	VALUES	σ
E Modulus (GPa)	230	/
Breaking Stress (GPa)	4,9	/
Elongation (%)	2,1	/

Pyrogasified rCF – Mechanical properties (Experimental values)

RESULTS	VALUES	σ
E Modulus (GPa)	210	12
Breaking Stress (GPa)	3,8	0,3
Elongation (%)	1,68	0,10

Types of fibers that can be treated and recycled by industrial furnace:

Within the industrial plant it is possible to process any composite carbon-fiber waste material (and the corresponding virgin prepregs, whether expired or fresh), provided that they meet the incoming material acceptance requirements set out in the protocol. **Downstream** of the process, the **same types of carbon fiber** present in the **input** material are obtained, since the pyrogasification treatment is optimized so as to degrade only the polymer matrix (and any sizing present on the fibers).
Therefore, in detail, it is possible to process and obtain the following types of rCF:

- Standard modules: T300, T400, T600, T700, etc.
- Intermediate modules: T800, T830, T1000, T1100, etc.
- High modules: M35J, M40J, M46J, M55J, M60J, etc.

Health and Safety

Herambiente certifies that its recycled carbon fiber products comply with the provisions of European Union Regulation (EC) No. 1907/2006 governing the registration, evaluation, authorization, and restriction of chemicals (REACH), to the extent applicable, and that they do not contain restricted or authorized substances in concentrations exceeding 0.1% by weight.
The recommended precautions for safe handling are to limit dust formation in the workplace and to handle the fibers while wearing the following personal protective equipment (PPE): gloves, safety goggles, a respirator, and protective clothing.