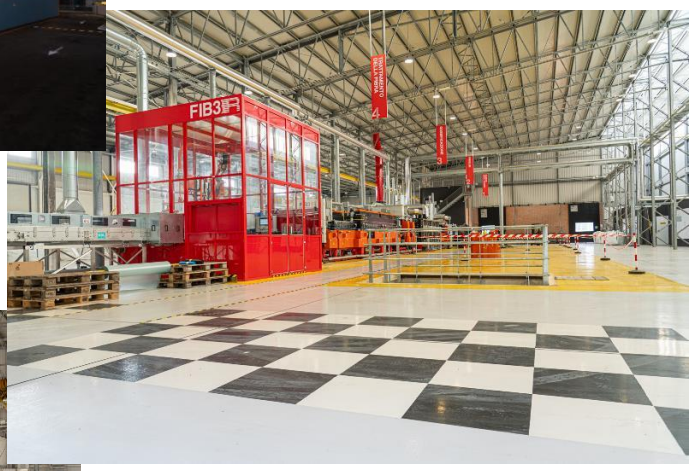
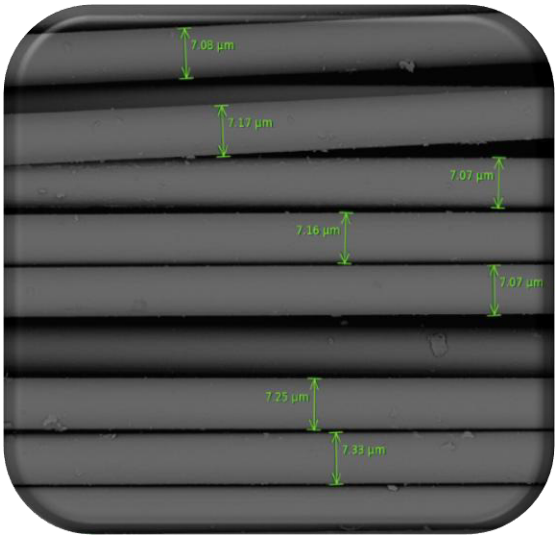
TECHNICAL SPECIFICATIONS – NONWOVEN FABRIC

Recycled carbon fiber (rCF), once the resin and added additives have been removed through the pyrogasification process, retains its lightness and mechanical properties unchanged.
The industrial plant is capable of processing the following types of composites: prepregs, process scrap, cured materials and finishing scrap.
The regenerated carbon fiber is therefore ready to be rewoven and re-impregnated for all typical uses of virgin fiber, for autoclave, press and moulding processes: nonwoven fabric, patchwork, carbon milled products, short fibers, SMC, BMC and much more.
The technical characteristics of one of the above-mentioned applications are specified below: nonwoven fabric.

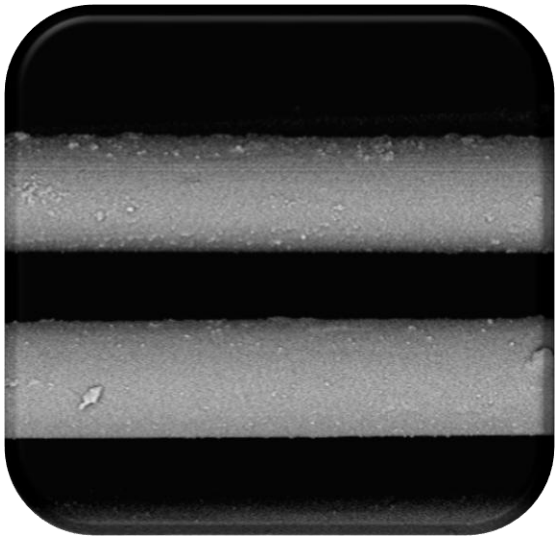


Shown below are scanning electron microscope (SEM) images of virgin carbon fibers and fibers obtained through pyrogasification treatment from which the nonwoven fabric is produced. The images are intended to highlight the effectiveness of the treatment, through which fibers with an appearance and diameters comparable to virgin fibers are obtained.

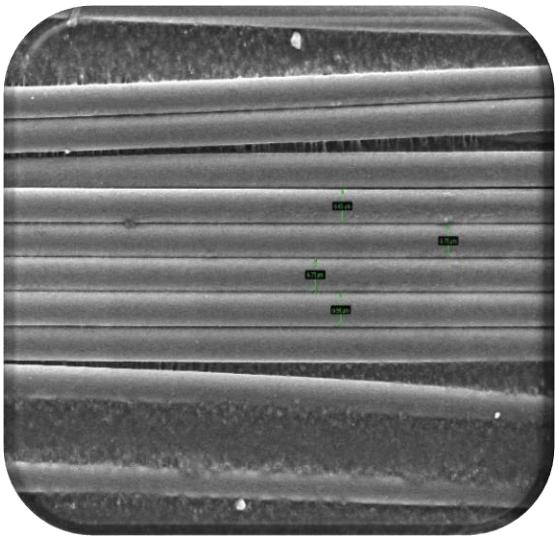
Virgin CF – SEM image
Magnification: 3000×



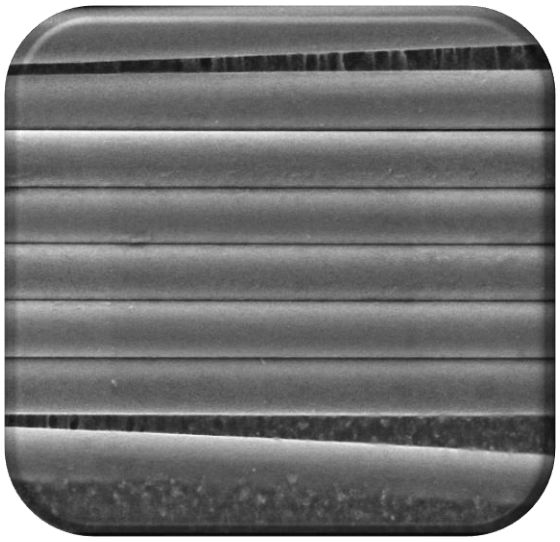
Virgin CF – SEM image
Magnification: 5000×



Pyrogasified rCF – SEM image
Magnification: 3000×



Pyrogasified rCF – SEM image
Magnification: 5000×

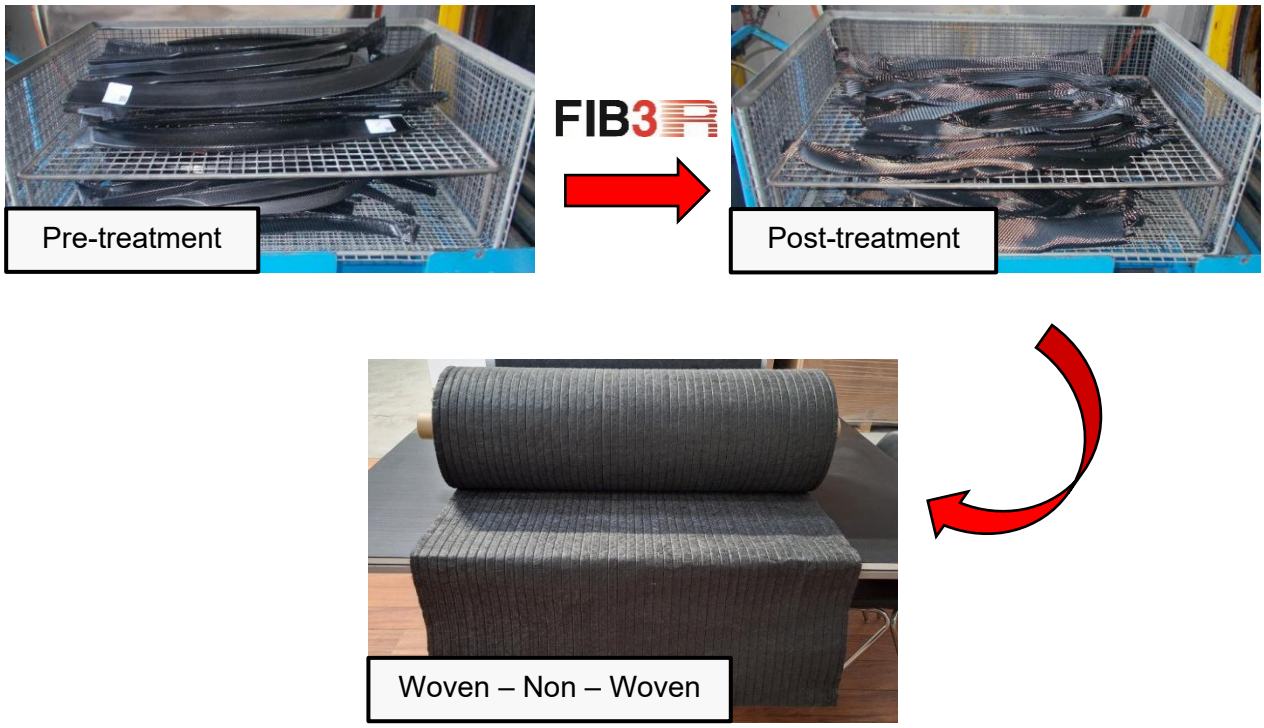


Types of fibers that can be processed and recycled using the pilot and/or industrial furnace:

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.

EXAMPLE OF NONWOVEN MAT



HERAmbiente
Società del Gruppo Hera

FIB3R
Recover Reduce Reuse
Carbon Fiber

TECHNICAL CHARACTERISTICS – 100% rCF NONWOVEN FABRIC

Grammage (Areal weight)	200 ÷ 500 gsm
Grammage tolerance (50 ÷ 100 gsm)	± 10 %
Grammage tolerance (100 ÷ 200 gsm)	± 5 %
Grammage tolerance (> 200 gsm)	< 5 %
Nonwoven width	1200 mm
Contamination from other fibers	< 2 %

TECHNICAL CHARACTERISTICS – NONWOVEN FABRIC WITH THERMOPLASTIC

Content	*Carbon* *≤ 40 %* *Polypropylene* *60 %* *Binder* *0,5 ÷ 1 %*
Grammage (Areal weight)	50 ÷ 500 gsm
Grammage tolerance	± 10 %
Fiber length	35 ÷ 90 mm
Grammage tolerance (> 200 gsm)	< 5 %
Nonwoven width	1000 ÷ 1250 mm

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), as 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.