

The „Textile“ pilot case of the DigiPrime project is nearing its final stage



The main goal of the DigiPrime project, financed by the EU, is the creation of a digital platform that, thanks to its various functions and services, should support the recycling of materials and their interdisciplinary use in new products. The outputs will be verified through several cross-sectoral pilot projects involving several industrial sectors (automotive industry, renewable energy, electronics, **textile industry**, construction).

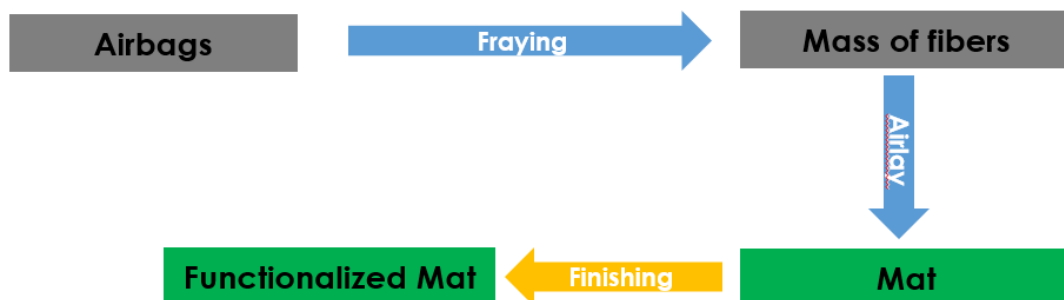
The pilot case dedicated to textiles focuses on the recycling of textiles from the automotive sector (seat belts, airbags, seats, carpets...), but also other textiles for "non-automotive" purposes and their use both again in the automotive industry and outside of it. The software services of the DigiPrime platform should, for example, enable LCA analysis, support for product design from recycled materials, demand and supply of materials, monitoring of material flows, prediction of product properties, design of testing and certification required for a given product, etc.

Practical verification of DigiPrime platform functionalities was carried out during the pilot case on **real samples of recycled textile materials** obtained on a laboratory scale. One such was nonwovens made from recycled *airbags* (PA 66); these were processed by mechanical processes: fraying into fibers, the obtained material was then used by the airlay process to make samples of non-woven textiles.



Airbags (polyamide 66)

Airbags MECHANICAL PROCESSING AND FINISHING



■ mechanical
■ chemical



INPUT material



INPUT material



OUTPUT material

The samples of non-woven fabrics obtained in this way were then treated with final treatments to provide water-repellent, flamm-retardant and antimicrobial properties, since one of their possible potential uses is the use as insulation in the construction industry. The properties of the tanks have been tested by a testing laboratory.



Impregnation:

Werner-Mathis lab foulard, roller pressure 1 kPa



Drying/curing:

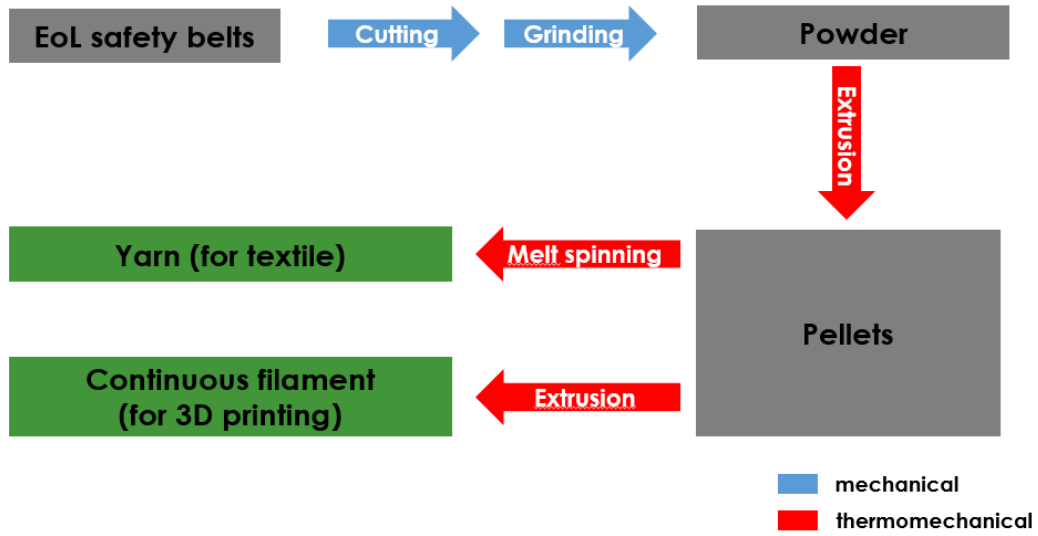
Werner-Mathis lab drying/fixing frame



Safety belts (polyester)

The second textile material processed was automotive *seat belts* (PES); these were processed by thermomechanical processes: first by cutting and grinding into powder, from which pellets were prepared by extrusion. These were then further used to prepare textile fiber and to prepare continuous fiber for 3D printing.

Safety belts THERMOMECHANICAL PROCESSING (EXTRUSION)



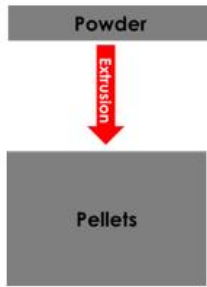
Safety belts THERMOMECHANICAL PROCESSING



Blades and safety belts powder

Grinder →





Safety belts powder from grinding

Feeder

Safety belts powder and resulting pellets




Safety belts → Powder → Pellets → Yarn

The data obtained during sample processing was then inserted into the various services that the DigiPrime Platform offers to users in order to test the functionality of the platform. The services selected as the most suitable for the textile pilot case include, for example, Product info management, Testing and certification, or the LCA/LCC module.

service Product info management

Upload of the finished product information

InfoCircular - DigiPrime								Pilot 4 ▾	Preferences	Notifications	Search	Upload	All information	Manage service ▾	omar.maschi@centrocot.it
<input type="checkbox"/>	Non automotive	Recycled	202303RNW	Finished product	Nonwoven	Mass per unit area (kg/m2)	String-based	2,0							
<input type="checkbox"/>	Non automotive	Recycled	202301RNW	Finished product	Nonwoven	Fiber composition	String-based	85% Polyamide 66 + 15 Polyester							
<input type="checkbox"/>	Non automotive	Recycled	202303RNW	Finished product	Nonwoven	Product picture	File (jpeg)	Download							
<input type="checkbox"/>	Non automotive	Recycled	202301RNW_FR	Finished product	Nonwoven	Product data sheet	File (pdf)	Download							
<input type="checkbox"/>	Non automotive	Recycled	202301RNW_WR	Finished product	Nonwoven	Product data sheet	File (pdf)	Download							
<input type="checkbox"/>	Non automotive	Recycled	202301RNW_AB	Finished product	Nonwoven	Product data sheet	File (pdf)	Download							



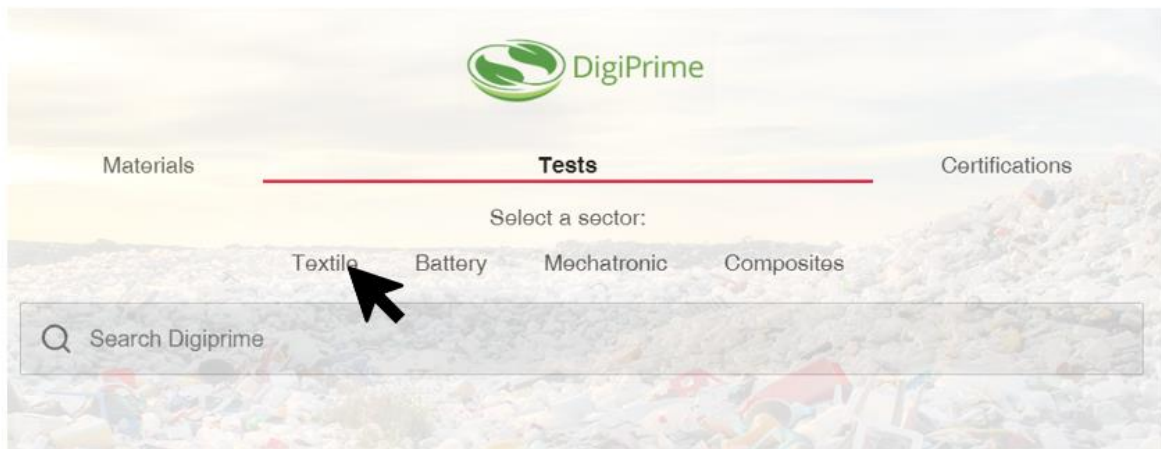
DIGIPRIME
PILOT 4
PRODUCT / MATERIAL DATASHEET

ID: 202301RNW_FR
Nonwoven from airbags mechanical recycling
Finished with flame retardant TEXAFAM CU

Parameter	standard	unit	RUN 6 TEXAFAM CU	RUN 6 untreated
Flammability	EN 1195-2	-	pass*	fail
Square weight	EN 12127	g/m ²	922	629
Thickness	EN ISO 5084	mm	7,23	7,07
Air permeability	EN ISO 9237	mm/s	935	928
Water absorptivity	ČSN 80 0831	%	415	682
Structure change	visually	-	no	-
Colour change	visually	-	no	-
Handle change	subjectively by touch	-	slightly sticky	-
Linting	visually	-	reduced	high

service Testing and Certification

Searching for test to assess product performances



Textiles. Oil repellency. Hydrocarbon resistance test. (click for details)

Fabrics for external use. Determination of Ultraviolet Protection Factor (UPF) with treatment.
(click for details)

Textiles. Burning behaviour for automotive interior materials

Describes a method for determining the horizontal burning rate of materials used in the passenger compartment of motor vehicles (cars, industrial vehicles, breaks, buses), after they have been exposed to the action of a low energy flame.

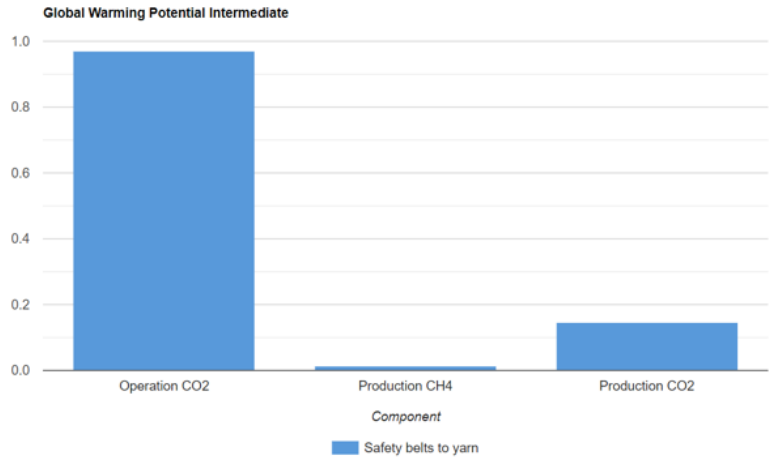
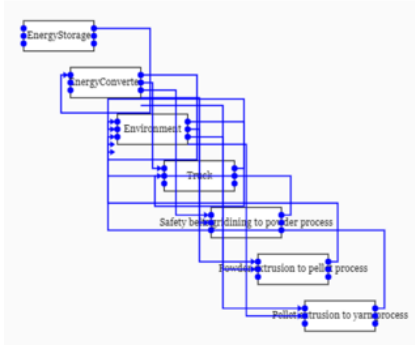
CODE: UNI ISO 3795.

Laboratories:

Centro Tessile Cotoniero e Abbigliamento Spa
Piazzale Sant'Anna, 2, 21052 Busto Arsizio VA
(Email: info@centrocot.it)

Nonwoven fabrics. Tensile strength and elongation. Strip method. (click for details)

service LCA/LCC
Calculation of the GWP for the thermomechanical recycling



DigiPrime project partners in the "Textile" pilot case



Pilot leader – Textile

Research center and test house that provides business solutions to the textile industry leaders.



Automotive

Automotive engineering specialist for vehicle development and plant realization.



Textile

Private technological research, innovation and technology transfer company.



Automotive

Car dismantler for disassembling and resold of reusable parts and sending to further processing for car carcasses.



The DigiPrime project (GA No. 873111) received funding from the European Union's Horizon 2020 framework program, topic DT-ICT-07-2018-2019 "Digital Manufacturing Platforms for Connected Smart Factories".

More information about the project www.digiprime.eu