



telaketju

Recycled fibre materials and recyclers review

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Recyclers review – what was studied



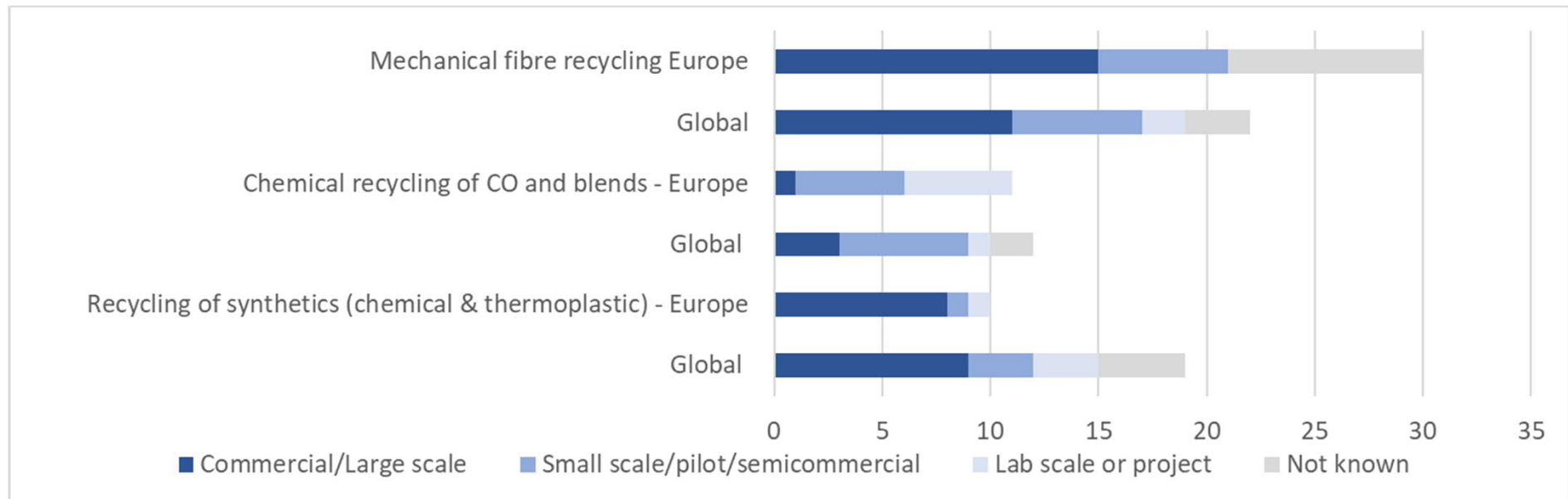
- Main sources of information
 - Fibersort 2020, the online data base <https://docs.google.com/spreadsheets/d/1b7D7Zot18upqV3brGoZKE-M6lay1QRJI4Q6Ti6KEv8Y/edit#gid=2112239499>
 - Preferred Fibres 2020, report https://textileexchange.org/wp-content/uploads/2020/06/Textile-Exchange_PREFERRED-Fiber-Material-Market-Report_2020.pdf
 - LDC 2020, Review of textile recycling plants by Lyfestyle and Design Cluster, presented by G. Constantinou in Telaketju 4. R&D webinar 16.11.2020 [Materials of the 4th R&D webinar have now been published | Telaketju \(turkuamk.fi\)](#)
 - Websites of recycling actors
- Altogether 104 recycling actors were selected from these sources with some additional ones
 - Main focus was textile-to-textile recycling value chain operators, but some others types have been included e.g. textile-to-composite, bottle-to-textile or textile-to-chip

Recyclers review – what was studied



- We categorized recycling methods
 - Mechanical i.e. fibre recycling – all fibres in some category
 - Chemical recycling of CO and blends
 - Recycling of synthetics including thermoplastic recycling (polymer recycling) and chemical recycling (monomer recycling) – all fibres in some category, but organized into sub-categories polyester – PES, polyamides – PA, and others
- We categorized by area (where recycling facilities are mainly)
 - Europe
 - Global - Rest of the world
- We tried to evaluate maturity and scale of operations if information available
 - Commercial/Large scale, marked as ***
 - Small scale/pilot/semicommercial, **
 - Lab scale or project, *
 - Not known, ?

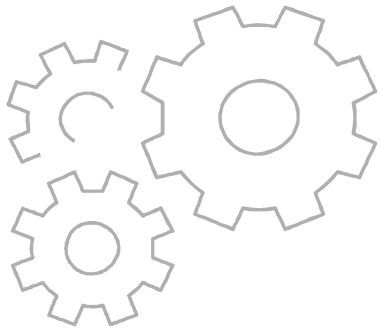
Recyclers review – overview



Recyclers review – limitations



- Information mainly taken only from secondary sources
 - there has been possibilities for misinterpretation in different stages
 - due to limited resources we did not check all details
 - errors are possible and readers should check accuracy when needed
- This is not comprehensive listing
 - it should only be considering as climbs of recycler operators
 - Listing is not a database to be updated later-on



Mechanical recycling

Europe





Area: EUROPE

Method: Mechanical

Material: multiple

Company and/or fibre/trade name: Rifò
Country: Italy
Recycled material and method: mechanical recycling of CO (jeans) and cashmere knit
Origin: post-consumer textiles
Info of scale/state (if known):
Other info:
Source & time: LCD 2020

Company and/or fibre/trade name: Altex Textil Recycling
Country: Germany
Recycled material and method: mechanical recycling of CO, WO, PES, PA to fibres
Origin: post-industrial textiles
Info of scale/state (if known): 6 tearing lines which are equipped with 2-6 big needle rollers
Other info: ISO 9001
Source & time: Fibersort 2020, website, Preferred Fibres 2020??

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known



Area: EUROPE

Method: Mechanical

Material: multiple

Company and/or fibre/trade name: Textil Santanderina - (R/TURN - R/DENIM)
Country: Spain
Recycled material and method: mechanical recycling, weaving and new products of CO
Origin: post-industrial, post-consumer textiles
Info of scale/state (if known): 23 million metres of fabric/year
Other info: GRS; RCS 100; RCS Blended
Source & time: Fibersort 2020

Company and/or fibre/trade name: Re.Verso
Country: Italy
Recycled material and method: mechanical recycling of WO and cashmere into yarns
Origin: post-industrial and post-consumer
Info of scale/state (if known): scale
Other info: GRS
Source & time: Fibersort 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known



Area: EUROPE

Method: Mechanical

Material: multiple

Company and/or fibre/trade name: [Wolkat](#)

Country: Netherlands/Maroc

Recycled material and method: mechanical recycling of CO, PES, Acrylic, other synthetics, WO blends, CO/PES, other blends

Origin: post-consumer, textiles, mattresses

Info of scale/state (if known): 30 000 tonnes/year

Other info:

Source & time: Fibersort 2020

Company and/or fibre/trade name: [Belda Lloréns \(EcoLife\)](#)

Country: Spain

Recycled material and method: mechanical recycling and spinning of cotton and viscose

Origin: post-industrial textiles

Info of scale/state (if known): 65 000 m² production plant

Other info: REMO, GRS, OEKO-TEX 100

Source & time: Fibersort 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known



Area: EUROPE

Method: Mechanical

Material: multiple

Company and/or fibre/trade name: Tesma Cashmere
Country: Italy
Recycled material and method: mechanical recycling and knitting of cashmere
Origin: post-consumer textiles
Info of scale/state (if known): 1500 m ² facility
Other info:
Source & time: Fibersort 2020

Company and/or fibre/trade name: Texcar
Country: Italy
Recycled material and method: mechanical recycling, spinning and weaving of CO
Origin: post-consumer textiles
Info of scale/state (if known): 80 looms
Other info: GRS
Source & time: Fibersort 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known

Area: EUROPE

Method: Mechanical

Material: multiple



Company and/or fibre/trade name: [Cardato](#)

Country: Italy

Recycled material and method: mechanical recycling, spinning, weaving/knitting of wool, WO/PES, WO/PA, cashmere

Origin: post-industrial, post-consumer textiles

Info of scale/state (if known): e.g. 3CFilati: 700 tonnes/year

Other info: Cardato is Recycled Brand of 6 producers

Source & time: Fibersort 2020

Company and/or fibre/trade name: [Frankenhuis](#)

Country: Netherlands

Recycled material and method: mechanical recycling of CO, PES, acrylic

Origin: post-industrial, post-consumer textiles

Info of scale/state (if known): commercial, 7 000 tonnes/year

Other info:

Source & time: Fibersort 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known

Area: EUROPE

Method: Mechanical

Material: multiple



Company and/or fibre/trade name: [Saentis \(RCO100\)](#)

Country: Swiss / sourcing in 3 countries including Singapore

Recycled material and method: mechanical recycling of CO

Origin: pre-consumer textiles

Info of scale/state (if known): RCO100 brand was launched in 2016

Other info:

Source & time: Preferred Fibres 2020

Company and/or fibre/trade name: [Procotex](#)

Country: Belgium

Recycled material and method: Mechanical recycling of WO, PES, Acrylic, PP, CO/PES, other natural fibers, acrylic/PP, Flax/PP

Origin: post-industrial, post-consumer textiles (FS trials)

Info of scale/state (if known): 25 000 tonnes/year

Other info: ISO 9001

Source & time: Fibersort 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known

Area: EUROPE

Method: Mechanical

Material: multiple



Company and/or fibre/trade name: [Hilaturas Ferré \(RECOVER\)](#)

Country: Spain

Recycled material and method: mechanical recycling of CO (& CO rich blends), PET, spinning WO, CO

Origin: post-industrial, post-consumer textiles, bottles

Info of scale/state (capacity): 120-150 tonnes/week
Processed materials in 2018: Post-Industrial & Post-Consumer: 2924 tonnes

Other info: GRS; OEKO-TEX 100 ; OCS

Source & time: Fibersort 2020, Preferred Fibres 2020

Company and/or fibre/trade name: [Marchi & Fildi \(Ecotec Trademark\)](#)

Country: Italy

Recycled material and method: mechanical recycling and spinning of pre-dyed CO

Origin: post-industrial textiles

Info of scale/state (if known):

Other info:

Source & time: Fibersort 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known



Area: EUROPE

Method: Mechanical,

Material: multiple

**

Company and/or fibre/trade name: [Filatures du Parc](#)

Country: France

Recycled material and method: mechanical recycling, spinning of CO, WO, PES

Origin: post-industrial textiles

Info of scale/state (if known): 10 tonnes/day

Other info: ECOCert

Source & time: Fibersort 2020

**

Company and/or fibre/trade name: [A.S.T.R.I](#)

Country: Italy

Recycled material and method: collection, mechanical recycling and weaving of WO

Origin: post-industrial, post-consumer textiles

Info of scale/state (if known): 22 000 tonnes since the end of 2017

Other info: Astri = Associazione Tessile Riciclato Italiana - 160 members

Source & time: Fibersort 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known



Area: EUROPE

Method: Mechanical

Material: multiple

**

Company and/or fibre/trade name: [ETS H. Moncorgé](#)

Country: France

Recycled material and method: mechanical recycling of CO, WO, PES, acrylic, PP, PA, Silk, linen, hemp

Origin: post-industrial, post-consumer textiles

Info of scale/state (if known): 5 000 – 10 000 tonnes/year

Other info: ISO 9001; Alcertex Label; Certifiée Ecovadis

Source & time: Fibersort 2020

**

Company and/or fibre/trade name: [Hilaturas Jesús Rubio](#)

Country: Spain

Recycled material and method: Mechanical recycling of WO

Origin: post-industrial, post-consumer textiles

Info of scale/state (if known): (3500 m2 facilities)
Post-Consumer pilot

Other info:

Source & time: Fibersort 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known



Area: EUROPE

Method: Mechanical

Material: multiple

**
Company and/or fibre/trade name: Brightloops (Loop.a.life)
Country: Netherlands
Recycled material and method: mechanical recycling of wool, spinning and knitting to garment
Origin: post-consumer textiles
Info of scale/state (if known): Pilot
Other info:
Source & time: Fibersort 2020

?
Company and/or fibre/trade name: Robert Levy
Country: France
Recycled material and method: mechanical recycling of CO and aramid to fibre
Origin: post-industrial textiles
Info of scale/state (if known):
Other info:
Source & time: Fibersort 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known



Area: EUROPE

Method: Mechanical

Material: multiple

?
Company and/or fibre/trade name: COM.I.STRA (Rigenius.it line)
Country: Italy
Recycled material and method: mechanical recycling, spinning and weaving of wool, WO/PES, WO/PA
Origin: post-industrial, post-consumer textiles
Info of scale/state (if known):
Other info: GRS; ICEA
Source & time: Fibersort 2020

?
Company and/or fibre/trade name: European Spinning Group (ESG Green)
Country: Belgium
Recycled material and method: mechanical recycling of CO (denim) and PES to OE yarns
Origin: post-consumer textiles
Info of scale/state (if known):
Other info: GRS; OEKO-TEX 100
Source & time: Fibersort 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known

Area: EUROPE

Method: Mechanical

Material: multiple



?
Company and/or fibre/trade name: MPO Recycling
Country: Netherlands
Recycled material and method: mechanical recycling of CO, WO, PES, PA, VI, PP, jute
Origin: post-industrial, post-consumer textiles
Info of scale/state (if known):
Other info: SCS for Recycled Content
Source & time: Fibersort 2020

?
Company and/or fibre/trade name: Velener Textil GmbH (WECYCLED)
Country: Germany
Recycled material and method: mechanical recycling, spinning of CO
Origin: post-industrial textiles
Info of scale/state (if known):
Other info:
Source & time: Fibersort 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known

Area: EUROPE

Method: Mechanical

Material: multiple



?
Company and/or fibre/trade name: Vicente Barber Belda
Country: Spain
Recycled material and method: mechanical recycling of CO, PES, acrylic to fibres
Origin: post-industrial textiles
Info of scale/state (if known):
Other info:
Source & time: Fibersort 2020

?
Company and/or fibre/trade name: Soprana - Filati e Tessuti Tecnici
Country: Italy
Recycled material and method: mechanical recycling of Aramid (meta/para)
Origin: post-industrial, post-consumer (protective gear)
Info of scale/state (if known):
Other info:
Source & time: Fibersort 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known



Area: EUROPE

Method: Mechanical,

Material: multiple

?
Company and/or fibre/trade name: Hivesa Textil SL
Country: Spain
Recycled material and method: mechanical recycling of CO, WO, PES, PA, acrylic, VI
Origin: post-industrial textiles
Info of scale/state (if known):
Other info:
Source & time: Fibersort 2020

?
Company and/or fibre/trade name: Hilaturas Arnau
Country: Spain
Recycled material and method: mechanical recycling, spinning, knitting/weaving of CO, WO, mohair, silk
Origin: post-industrial textiles
Info of scale/state (if known):
Other info: ECOcert
Source & time: Fibersort 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known



Area: EUROPE

Method: Mechanical

Material: multiple

To nonwovens and/or composites

Company and/or fibre/trade name: [Really](#)

Country: Denmark

Recycled material and method: mechanical recycling of CO, WO to nonwovens and engineering materials

Origin: post-industrial, post-consumer textiles

Info of scale/state (if known):

Other info:

Source & time: Fibersort 2020

**

Company and/or fibre/trade name: [convert](#)

Country: Denmark

Recycled material and method: mechanical recycling into nonwoven products and composites

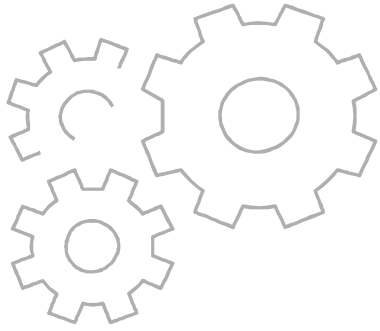
Origin: post-consumer textiles, bottles, other (carpets, wood and glass fibres)

Info of scale/state (if known):

Other info: <http://www.advancednonwoven.dk/>

Source & time: LCD 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known



Mechanical recycling

Global





Area: GLOBAL

Method: Mechanical

Material: multiple

Company and/or fibre/trade name: [Pure Waste Textiles](#)

Country: Finland / recycling facilities in India

Recycled material and method: mechanical recycling and spinning of CO to new products

Origin: post-industrial, post-consumer textile

Info of scale/state (if known): post-industrial, post-consumer

Other info:

Source & time: Fibersort 2020

Company and/or fibre/trade name: [Kishco](#)

Country: India

Recycled material and method: mechanical recycling of CO, PES, PA, PES/CO blends, PES, EL into pulled fibres

Origin: post-industrial, post-consumer textiles

Info of scale/state (if known):

Other info:

Source & time: Fibersort 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known



Area: GLOBAL

Method: Mechanical

Material: multiple

Company and/or fibre/trade name: b (The [Billie](#))

Country: China

Recycled material and method: mechanical recycling to sliver

Origin: pre-consumer, post-consumer, mix with virgin materials

Info of scale/state (if known): 3000 tons per day

Other info:

Source & time: LCD 2020

Company and/or fibre/trade name: [Usha Yarns](#)

Country: India

Recycled material and method: mechanical recycling and spinning of CO

Origin: pre-consumer, post-consumer, textiles

Info of scale/state (if known): 11 400 tonnes/year

Other info: Gold Certificate by ICBG, Global Recycled Standard, ISO 14001

Source & time: Fibersort 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known



Area: GLOBAL

Method: Mechanical

Material: multiple

Company and/or fibre/trade name: [Leigh Fibers](#)

Country: US

Recycled material and method: mechanical recycling of CO, WO, Nylon 6, 6.6, PP

Origin: post-industrial textiles (carpets, thread waste, tow waste)

Info of scale/state (if known): 136 000 tonnes/year of textile waste purchased

Other info: ISO 9001

Source & time: Fibersort 2020

Company and/or fibre/trade name: [Texloop - Circular Systems](#)

Country: US

Recycled material and method: mechanical recycling of CO, and blends spinning, weaving

Origin: post-industrial, post-consumer textiles

Info of scale/state (if known):

Other info: H&M Global Change Award 2018, hydrothermal process also mentioned in Preferred fibres report, but information cannot be not easily found

Source & time: Fibersort 2020, LDC 2020, Preferred Fibres 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known



Area: GLOBAL

Method: Mechanical

Material: multiple

Company and/or fibre/trade name: MartexFiber (Eco2cotton)
Country: US
Recycled material and method: mechanical recycling of CO, CO/PES
Origin: post-industrial textiles and post-consumer
Info of scale/state (if known):
Other info:
Source & time: Fibersort 2020

Company and/or fibre/trade name: Woolagain
Country: US/India
Recycled material and method: mechanical recycling, spinning, new products of WO
Origin: post-consumer, textiles
Info of scale/state (if known): 1 facility US, 1 facility India. Division of The Brickle Group
Other info:
Source & time: Fibersort 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known



Area: GLOBAL

Method: Mechanical

Material: multiple

Company and/or fibre/trade name: [North American Wool Stock](#)

Country: Canada

Recycled material and method: Mechanical recycling of CO, WO, PES,

Origin: post-industrial, post-consumer knits & denim

Info of scale/state (if known):

Other info:

Source & time: Fibersort 2020

Company and/or fibre/trade name: [Artistic Milliners - Fabric & Garment Industries](#)

Country: Pakistan

Recycled material and method: mechanical recycling, spinning and weaving of cotton (denim)

Origin: post-industrial and post-consumer textiles

Info of scale/state (if known): 60 million metres fabric and 25 million garments/year

Other info: e.g. LEED Gold

Source & time: Fibersort 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known

Area: GLOBAL

Method: Mechanical

Material: multiple



Company and/or fibre/trade name: [Geetanjali Woollens](#)

Country: India

Recycled material and method: mechanical recycling, spinning and weaving of CO, WO

Origin: post-industrial, post-consumer textiles

Info of scale/state (if known): 3 manufacturing units

Other info: ISO 9001:2008 ; GRS

Source & time: Fibersort 2020, Preferred Fibres 2020

**

Company and/or fibre/trade name: [Giotex](#)

Country: US

Recycled material and method: mechanical recycling, spinning of CO

Origin: post-industrial, pre-consumer textiles

Info of scale/state (if known): 10 886 tonnes/year

Other info: GRS; OEKO-TEX 100; RCS

Source & time: Fibersort 2020, Preferred Fibres 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known



Area: GLOBAL

Method: Mechanical

Material: multiple

**

Company and/or fibre/trade name: [AKSA](#)

Country: Turkey

Recycled material and method: mechanical recycling and spinning of acrylic

Origin: post-industrial waste from their own production

Info of scale/state (if known): post-industrial waste from their own production

Other info: OEKO-TEK 100

Source & time: Fibersort 2020

**

Company and/or fibre/trade name: [The Brickle Group/ H. Brickle Fiber Trading & Recycling](#)

Country: US

Recycled material and method: mechanical recycling of WO, PES, PA into pulled fibres

Origin: post-industrial textiles

Info of scale/state (if known): 9100 tonnes/year

Other info:

Source & time: Fibersort 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known



Area: GLOBAL

Method: Mechanical

Material: multiple

**

Company and/or fibre/trade name: [HKRITA](#)
([Garment2Garment in collaboration with The Mills](#))

Country: Hong Kong

Recycled material and method: mechanical recycling, spinning, garment knitting of CO, WO, acrylic, WO blends

Origin: post-consumer textiles

Info of scale/state: Demo Scale (Garment to Garment recycling demo facility - 40 foot container)

Other info:

Source & time: Fibersort 2020, Preferred Fibres 2020

**

Company and/or fibre/trade name: [Dunya Tekstil](#)

Country: Turkey

Recycled material and method: mechanical recycling (& sorting) of cotton (combers, linter), wool, jute

Origin: post-industrial

Info of scale/state (if known): 24 000 tonnes/year

Other info:

Source & time: Fibersort 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known



Area: GLOBAL

Method: Mechanical

Material: CO

**

Company and/or fibre/trade name: [Osomtex](#)

Country: US

Recycled material and method: Mechanical recycling, spinning to new products of cotton

Origin: post-industrial, post-consumer textiles

Info of scale/state (if known): pilot

Other info:

Source & time: Fibersort 2020

*

Company and/or fibre/trade name: [Iris Textiles - The new denim project](#)

Country: Guatemala

Recycled material and method: mechanical recycling of CO, spinning, weaving

Origin: post-industrial, post-consumer textiles

Info of scale/state (if known):

Other info:

Source & time: Fibersort 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known



Area: GLOBAL

Method: Mechanical

Material: multiple

*
Company and/or fibre/trade name: Takiho
Country: Japanese company, International projects
Recycled material and method: mechanical recycling of CO and other natural fibres
Origin: pre-consumer, post-consumer textiles
Info of scale/state (if known): projects in Guatemala (in collaboration with The New Denim Project) and Thailand (No Waste Project)
Other info:
Source & time: Preferred Fibres 2020

?
Company and/or fibre/trade name: SOGÉ International
Country: Mauritius
Recycled material and method: mechanical recycling of CO, WO/synthetic blends
Origin: post-consumer textiles
Info of scale/state (if known):
Other info:
Source & time: Fibersort 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known



Area: GLOBAL

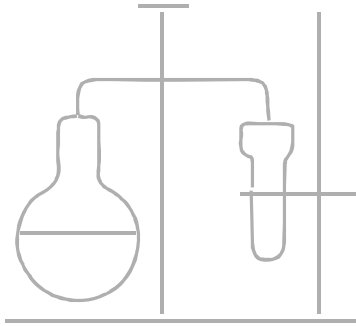
Method: Mechanical

Material: multiple

?
Company and/or fibre/trade name: Bonded Logic
Country: United States
Recycled material and method: mechanical recycling of cotton (denim) to fibres, nonwovens, insulation materials
Origin: post-industrial, post-consumer textiles
Info of scale/state (if known):
Other info: USGBC Member; Cotton from Blue to Green
Source & time: Fibersort 2020

?
Company and/or fibre/trade name: PWO Industries Sdn Bhd
Country: Malaysia
Recycled material and method: Mechanical recycling to fibre and yarn from CO, PES
Origin: post-industrial textiles
Info of scale/state (if known):
Other info: RCS 2.0
Source & time: Fibersort 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known



Chemical recycling of cellulosics and blends

Europe



Area: EUROPE

Method: Chemical

Material: CO



Company and/or fibre/trade name: [Lenzing \(Refibra\)](#)

Country: Austria

Recycled material and method: chemical recycling of CO, cellulose-based materials, spinning

Origin: post-industrial textiles

Info of scale/state (if known): Tencel Refibra commercially available

Other info: RCS, EU Ecolabel, USDA, OEKO-TEX 100, ISO 9001, ISO 14001, NS OHSAS 18001:2007, FSC and PEFC, Fair Trade, Responsible Care

Source & time: Fibersort 2020, Preferred Fibres 2020

**

Company and/or fibre/trade name: [Infinited Fiber](#)

Country: Finland

Recycled material and method: chemical recycling of CO

Origin: post-industrial, post-consumer textiles

Info of scale/state (if known): Scalable technology to incorporate to viscose plants

Other info:

Source & time: Fibersort 2020, Preferred Fibres 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known



Area: EUROPE

Method: Chemical

Material: CO, blends

**
Company and/or fibre/trade name: Saxion (SaXcell)
Country: Netherlands
Recycled material and method: chemical recycling of CO to fibre
Origin: post consumer textiles
Info of scale/state (if known): pilot (building in 2020 a plant to process 10 000 tonnes/year)
Other info:
Source & time: Fibersort 2020

**
Company and/or fibre/trade name: Worn Again
Country: UK
Recycled material and method: chemical recycling to pulp and pellets of CO, PES, Viscose, CO/PES
Origin: post-consumer, textiles
Info of scale/state (if known): pilot, scale expected in 2021 with commercial plant opening
Other info:
Source & time: Fibersort 2020, Preferred Fibres 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known



Area: EUROPE

Method: Chemical

Material: CO, blends

**
Company and/or fibre/trade name: Södra
Country: Sweden
Recycled material and method: chemical recycling of CO, CO/PES to pulp
Origin: post-consumer textiles
Info of scale/state (if known): pilot (20 tonnes of used textiles in 2019), long-term target: 25 000 tonnes
Other info:
Source & time: Fibersort 2020, Preferred Fibres 2020

**
Company and/or fibre/trade name: Renewcell
Country: Sweden
Recycled material and method: chemical recycling of CO, viscose to pulp
Origin: post-consumer textiles
Info of scale/state (if known): scale. Demo plant 7kT Renewcell pulp/year
Other info:
Source & time: Fibersort 2020, Preferred Fibres 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known



Area: EUROPE

Method: Chemical

Material: CO, blends

*
Company and/or fibre/trade name: Re:Wind (Mistra Future Fashion)
Country: Sweden
Recycled material and method: chemical separation of PES/CO
Origin: post-consumer textiles
Info of scale/state (if known): research scale
Other info:
Source & time: Fibersort 2020, Preferred Fibres 2020

*
Company and/or fibre/trade name: RISE (The Regenerator)
Country: Sweden
Recycled material and method: chemical recycling of CO/PES to pulp and pellets
Origin: post-industrial, post-consumer textiles
Info of scale/state (if known): research scale (RISE Sweden)
Other info:
Source & time: Fibersort 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known



Area: EUROPE

Method: Chemical

Material: CO, blends

*
Company and/or fibre/trade name: Aalto loncell
Country: Finland
Recycled material and method: chemical recycling of CO, other cellulose based materials into fibres
Origin: post-consumer textiles, other (pulp, old newspapers)
Info of scale/state (if known): Lab scale (Spin-off from research at Aalto University.
Other info:
Source & time: Fibersort 2020, Preferred Fibres 2020

*
Company and/or fibre/trade name: VTT Biocelsol
Country: Finland
Recycled material and method: chemical recycling of cotton and separation of cotton/PES blends
Origin: post-consumer textiles
Info of scale/state (if known): research scale
Other info:
Source & time: VTT 2021

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known

Area: EUROPE

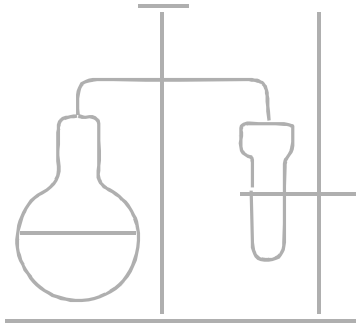
Method: Chemical

Material: CO, blends



*
Company and/or fibre/trade name: Wageningen University
Country: Netherlands
Recycled material and method: chemical recycling of cotton/elastane blends (elastane separation)
Origin: post-consumer, textiles
Info of scale/state (if known): research scale
Other info:
Source & time: Fibersort 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known



Chemical recycling of cellulosics and blends

Global



Area: GLOBAL

Method: Chemical

Material: CO



Company and/or fibre/trade name: Newstartex
Country: ?
Recycled material and method: chemical recycling of cotton linter into man-made fibre filament
Origin: pre-consumer
Info of scale/state (if known): commercially available
Other info: RCS
Source & time: Preferred Fibres 2020

Company and/or fibre/trade name: Sateri
Country: ?
Recycled material and method: viscose fibres of pulp made from CO (pulp by Södra & ReNewcell)
Origin: post-consumer textiles
Info of scale/state (if known): commercial lines with below 5 % recycled content announced in March 2020, aims to increase recycled content to 20 %
Other info: collaborates with pulp suppliers Södra and Re:newcell
Source & time: Preferred Fibres 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known



Area: GLOBAL

Method: Chemical

Material: CO

Company and/or fibre/trade name: Jilin Chemical Fiber' White Mountain
Country: ?
Recycled material and method: chemical recycling of cotton linter into viscose filament
Origin: pre-consumer
Info of scale/state (if known): commercially available
Other info: RCS
Source & time: Preferred Fibres 2020

**
Company and/or fibre/trade name: EVRNU (NuCycl™)
Country: US
Recycled material and method: chemical recycling of cotton to fibre, yarn and fabric
Origin: post-consumer textiles
Info of scale/state (if known): small scale operations
Other info:
Source & time: Fibersort 2020, LDC 2020, Preferred Fibres 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known



Area: GLOBAL

Method: Chemical

Material: CO

**
Company and/or fibre/trade name: Birla Cellulose (Adita Birla Group)
Country: India
Recycled material and method: chemical recycling and spinning of cotton
Origin: post-industrial textiles
Info of scale/state (if known): Pilot (25 tonnes of viscose with min. 20% recycled PI cotton waste so far)
Other info: RCS
Source & time: Fibersort 2020, Preferred Fibres 2020

**
Company and/or fibre/trade name: Ambercycle
Country: US
Recycled material and method: chemical separation PES from PES/CO blends, thermoplastic process into pellets
Origin: post-consumer textiles
Info of scale/state (if known): Pilot (Demo plant) or operational
Other info: H&M Global Change Award 2016
Source & time: Fibersort 2020, LDC 2020, Preferred Fibres 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known



Area: GLOBAL

Method: Chemical

Material: CO

**
Company and/or fibre/trade name: HKRITA (Novetex Upcycling Factory in collaboration with H&M Foundation)
Country: Hong Kong
Recycled material and method: chemical recycling of PES/CO blends
Origin: post-consumer textiles
Info of scale/state (if known): Pilot. (Cotton recycling + Test set up for blends)
Other info:
Source & time: Fibersort 2020

**
Company and/or fibre/trade name: Asahi Kasei (Bemberg)
Country: Japan
Recycled material and method: chemical recycling of cotton linter into cupro fibres
Origin: post-industrial
Info of scale/state (if known): 16 000 tonnes/year (Preferred Fibres: 17 000 mt/year)
Other info: GRS, OEKO-TEX, ISO 14001, EcoMark product Fibers, INNOVHUB-SSI
Source & time: Fibersort 2020, Preferred Fibres 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known



Area: GLOBAL

Method: Chemical

Material: CO

**
Company and/or fibre/trade name: Tyton Biosciences
Country: US
Recycled material and method: chemical recycling of CO/PES to pulp and PES monomers
Origin: pre-consumer, post-consumer textiles
Info of scale/state (if known): pilot
Other info: can handle some elastane and PA,
Source & time: Fibersort 2020, Preferred Fibres 2020

*
Company and/or fibre/trade name: BlockTexx
Country: Australia
Recycled material and method: chemical recycling of cotton, polyester and polycotton blends to pellets, fibre, cellulose powder
Origin: pre-consumer, post-consumer textiles
Info of scale/state (if known): Early stage concept, pilot facility with a commercial scale plant due Q4 2020
Other info:
Source & time: Fibersort 2020, LDC 2020, Preferred Fibres 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known



Area: EUROPE /
GLOBAL

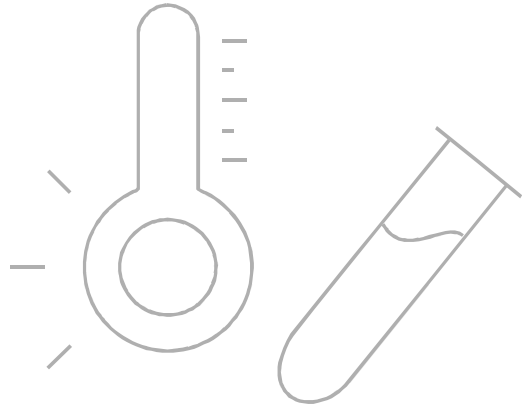
Method: Mechanical,
thermoplastic, chemical

Material: CO, WO, PES, PA, other,
multiple

?
Company and/or fibre/trade name: GP Cellulose GmbH
Country: ?
Recycled material and method: chemical recycling of cotton linter into pulp (for making acetate fibres)
Origin: pre-consumer linter
Info of scale/state (if known):
Other info: RCS
Source & time: Preferred Fibres 2020

?
Company and/or fibre/trade name: Tangshan Sanyou (ReVisco™)
Country: ?
Recycled material and method: viscose staple fibres of pulp made from CO (pulp by ReNewcell)
Origin: 50 % post-consumer textiles supplied by Re:newcell
Info of scale/state (if known):
Other info:
Source & time: Preferred Fibres 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known



Thermoplastic and chemical recycling of synthetic polymers

Europe



Area: EUROPE

Method: Chemical

Material: PES



**
Company and/or fibre/trade name: CARBIOS
Country: France
Recycled material and method: enzymatic process to depolymerize PET into its monomers
Origin:
Info of scale/state (if known): pilot
Other info:
Source & time: Preferred Fibres 2020

**
Company and/or fibre/trade name: Cure- technology (formerly Cumapol)
Country: Netherlands
Recycled material and method: chemical polyester recycling
Origin: any type of polyester
Info of scale/state (if known):
Other info: e.g. certificates, additional web addressed etc.
Source & time: Preferred Fibres 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known

Area: EUROPE

Method: Chemical

Material: PES (different kinds)



**

Company and/or fibre/trade name: [loniqa](#)

Country: Netherlands

Recycled material and method: chemical recycling of PES to pellet/chip

Origin: post-consumer food packaging, textiles in research

Info of scale/state (if known): Demo plant 10 000 tonnes for PET from food packaging

Other info:

Source & time: Fibersort 2020, Preferred Fibres 2020

**

Company and/or fibre/trade name: [Antex \(EcoAntex\)](#)

Country: Spain

Recycled material and method: Thermoplastic recycling and spinning of polyester and PP, PBT, PTT, PLA

Origin: post-industrial, post-consumer

Info of scale/state (if known): post-consumer: pilot

Other info:

Source & time: Fibersort 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known



Area: EUROPE

Method: Thermoplastic

Material: PA

Company and/or fibre/trade name: MERYL® RECYCLED - NYLSTAR
Country: Spain
Recycled material and method: Thermoplastic(?) recycling of PA
Origin: Post-industrial PA 50 % or 100 %
Info of scale/state (if known):
Other info:
Source & time: Preferred Fibres 2020

Company and/or fibre/trade name: Nurel (RecoNylon)
Country: Spain
Recycled material and method: Thermoplastic recycling of PA
Origin: post-industrial textiles
Info of scale/state (if known): RecoNylon is a new product
Other info: GRS
Source & time: Fibersort 2020, Preferred Fibres 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known

Area: EUROPE

Method: Chemical

Material: PA



Company and/or fibre/trade name: [Aquafil \(Econyl\)](#)

Country: Italy, textile plant in Slovenia

Recycled material and method: chemical recycling and spinning of nylon 6

Origin: post-industrial, post-consumer (fishing nets and carpets)

Info of scale/state (if known): commercial

Other info: ISO 9001, OEKO-TEX, REACH Compliance

Source & time: Fibersort 2020, LCD 2020

Company and/or fibre/trade name: [Renycle® - Radici GroupiciGroup](#)

Country:

Recycled material and method: Chemical (repolymerisation) recycling of PA6 into textile yarn

Origin:

Info of scale/state (if known):

Other info: e.g. certificates, additional web addressed etc.

Source & time: Preferred Fibres 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known



Area: EUROPE

Method: Thermoplastic

Material: PA

**

Company and/or fibre/trade name: [Fulgar \(Q-NOVA\)](#)

Country: Italy

Recycled material and method: thermoplastic recycling of PA to fibre

Origin: post-industrial nylon 6.6 textiles

Info of scale/state (if known): licenced process applicable to a factory

Other info: GRS; EU Ecolabel

Source & time: Fibersort 2020, company web pages

*

Company and/or fibre/trade name: [Re:Mix](#)

Country: Sweden

Recycled material and method: Thermomechanical separation of PA and Elastane from blends

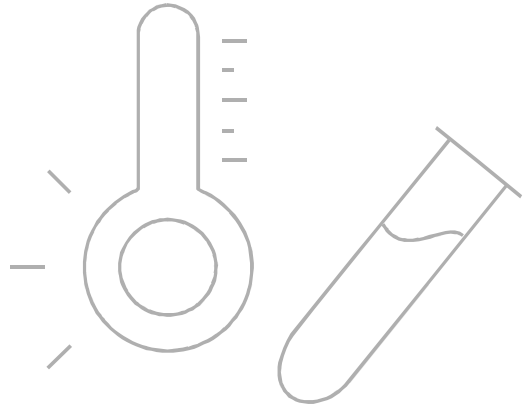
Origin: textiles

Info of scale/state (if known): research scale

Other info: <http://mistrafuturefashion.com/wp-content/uploads/2017/11/Remix.pdf>

Source & time: Fibersort 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known



Thermoplastic and chemical recycling of synthetics

Global



Area: GLOBAL

Method: Chemical

Material: PES



Company and/or fibre/trade name: Teijin
Country: Japan
Recycled material and method: chemical recycling (purification, repolymerisation of PET-bottles)
Origin: post-consumer, textiles, bottles
Info of scale/state (if known):
Other info: min 80 % PES, 10-20% more expensive than new PET
Source & time: LCD 2020

Company and/or fibre/trade name: Itochu RENU
Country: Japan
Recycled material and method: Chemically recycled PET
Origin: post-industrial & post-consumer textiles
Info of scale/state (if known):
Other info: e.g. certificates, additional web addressed etc.
Source & time: Preferred Fibres 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known

Area: GLOBAL

Method: Chemical

Material: PES



Company and/or fibre/trade name: [Eastman](#)

Country: US

Recycled material and method: chemical recycling of PES from carpets to textiles

Origin: post-consumer carpets

Info of scale/state (if known):

Other info:

Source & time: Preferred fibres 2020

Company and/or fibre/trade name: [Nan Ya Plastics SAYA](#)

Country: Taiwan

Recycled material and method: chemically recycled PET

Origin: also made from pre- and post-consumer textiles

Info of scale/state (if known):

Other info:

Source & time: Preferred fibres 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known

Area: GLOBAL

Method: Chemical

Material: PES, PA



Company and/or fibre/trade name: [Polygenta's perPETual](#)

Country: India

Recycled material and method: chemically recycled PET

Origin: from plastic bottles and pre-consumer textiles

Info of scale/state (if known):

Other info:

Source & time: Preferred Fibres 2020

Company and/or fibre/trade name: [Unifi \(Repreve\)](#)

Country: US

Recycled material and method: chemical and/or thermoplastic recycling of PA and PET

Origin: pre-consumer waste, post-consumer bottles

Info of scale/state (if known):

Other info: U TRUST®, SCS, GRS, OEKO-TEX 100

Source & time: Fibersort 2020, LDC 2020, Preferred Fibres 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known

Area: GLOBAL

Method: Chemical

Material: PES



**
Company and/or fibre/trade name: Jeplan BRING Material™
Country: Japan
Recycled material and method: chemical recycling (repolymerisation) of PES to resin and pellets
Origin: pre- and post-consumer textiles, mix with PET bottles
Info of scale/state (if known): pilot
Other info:
Source & time: Fibersort 2020, LDC 2020, Preferred Fibres 2020

**
Company and/or fibre/trade name: Loop Industries & Indorama JV
Country: Canada
Recycled material and method: chemical recycling of PES
Origin: textiles
Info of scale/state (if known): Pilot
Other info:
Source & time: Fibersort 2020, Preferred Fibres 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known

Area: GLOBAL

Method: Thermoplastic, chemical

Material: PES



*
Company and/or fibre/trade name: FENC (TopGreen rTex)
Country: China
Recycled material and method: thermoplastic recycling, spinning, knitting rPET
Origin: bottles
Info of scale/state (if known): research for post-consumer textiles
Other info:
Source & time: Fibersort 2020

*
Company and/or fibre/trade name: Volcat (IBM)
Country: US
Recycled material and method: chemical recycling of PES
Origin: post-consumer plastics and textiles
Info of scale/state (if known): research scale (scale expected in approximately 5 years)
Other info:
Source & time: Fibersort 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known



Area: GLOBAL

Method: Thermoplastic, chemical

Material: PA

Company and/or fibre/trade name: [Nilit \(EcoCare\)](#)

Country: Israel

Recycled material and method: Thermoplastic recycling of nylon 6.6 to chips and yarns

Origin: post-industrial

Info of scale/state (if known):

Other info:

Source & time: Fibersort 2020

**

Company and/or fibre/trade name: [Chain Yarn \(Chainlon, Greenlon Re\)](#)

Country: Taiwan

Recycled material and method: chemical recycling of polyamide

Origin: post-industrial, post-consumer textiles

Info of scale/state (if known): Pilot (1 tonne of recycled nylon waste so far)

Other info:

Source & time: Fibersort 2020; Preferred Fibres 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known

Area: GLOBAL

Method: Thermoplastic, chemical

Material: PA



*

Company and/or fibre/trade name: [Far Eastern \(FEFC eco\)](#)

Country: Taiwan

Recycled material and method: thermoplastic recycling of PA

Origin: bottles

Info of scale/state (if known): research for post-consumer textiles

Other info: GRS

Source & time: Fibersort 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known

Area: GLOBAL

Method: Thermoplastic, chemical

Material: PA



?
Company and/or fibre/trade name: Hyosung (Regen™)
Country: South Korea
Recycled material and method: thermoplastic recycling to chip and spinning of PA
Origin: post-industrial textiles
Info of scale/state (if known):
Other info: GRS
Source & time: Fibersort 2020, Preferred Fibres 2020, http://www.hyosungtn.com/en/fiber/nylon.do (Jan 2021)

?
Company and/or fibre/trade name: Premiere Fibers (EcoInnovationFiber)
Country: US
Recycled material and method: Chemical or thermoplastic recycling and spinning of Nylon 6.6
Origin: post-industrial textiles
Info of scale/state (if known):
Other info:
Source & time: Fibersort 2020, Preferred Fibres 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known

Area: GLOBAL

Method: Chemical

Material: PA



?
Company and/or fibre/trade name: Toray (CYCLEAD TM)
Country: Japan
Recycled material and method: chemical recycling, spinning of nylon 6
Origin: post-industrial, pre-consumer textiles
Info of scale/state (if known):
Other info:
Source & time: Fibersort 2020

?
Company and/or fibre/trade name: Formosa (Sunylon)
Country: Taiwan
Recycled material and method: chemical recycling of PA to chips
Origin: post-industrial, post-consumer textiles
Info of scale/state (if known):
Other info: OEKO-TEX 100; Green Mark (Taiwan's EPA)
Source & time: Fibersort 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known

Area: GLOBAL

Method: thermoplastic, chemical

Material: others



Company and/or fibre/trade name: [INVISTA LYCRA® T400® EcoMade](#)

Country:

Recycled material and method: thermoplastic recycling of fiber into elastane

Origin: 65 % from PET bottles, rest plant based polymers

Info of scale/state (if known):

Other info:

Source & time: Preferred Fibres 2020

Company and/or fibre/trade name: [Spanflex® \(Sheico Group\)](#)

Country: Taiwan

Recycled material and method: chemical recycling and spinning of elastane

Origin: post-industrial textiles

Info of scale/state (if known): 4200 tonnes/year of recycled spandex waste from the manufacturing process

Other info: GRS

Source & time: Fibersort 2020

*** commercial, ** small scale/pilot/semicommercial, * lab, project, ? Not known