

# Environmental Statement 2021

With the data from 2020



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## 1 Validity statement of the environmental verifier

The undersigned EMAS environmental verifiers Dr. Ulrich Wilcke with verifier registration number DE-V-0297, accredited and approved for the scope NACE 20 "Production of chemical products", as well as Jochen Buser with verifier registration number DE-V-0324, confirm to have verified that the site, as indicated in the present environmental statement of the organisation Kelheim Fibres GmbH with the registration number DE-166-00081, meets all requirements of Regulation (EC) No.1221 /2009 of the European Parliament and of the Council of 25 November 2009 as amended on August 28, 2017 and December 19, 2018 on the voluntary participation by organisations in a Community eco-management and audit scheme (EMAS).

By signing this declaration, it is confirmed that:

- the verification and validation have been carried out in full compliance with the requirements of Regulation (EC) No 1221/2009 as amended by Commission Regulation (EU) 2017/1505 and (EU) 2018/2026,
- the outcome of the verification and validation confirms that there is no evidence of non-compliance with the applicable legal requirements relating to the environment; and
- the data and information in the environmental statement reflect a reliable, credible and correct image of all the organisation's activities.

This statement cannot be equated with EMAS registration. EMAS registration can only be granted by a competent body under Regulation (EC) No 1221/2009. This document shall not be used as a stand-alone piece of public communication.

Berlin,



Dr. Ulrich Wilcke  
Umweltgutachter DE-V-0297



Jochen Buser  
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## 2 Preamble

Dear Readers,

Contrary to all hopes, the Corona crisis continues to dominate our daily lives. In addition to the health and economic threat posed by the virus itself, the pandemic also shows us the vulnerabilities of our globally networked economy: Covid-19 is causing ongoing disruptions to supply chains. Supply bottlenecks and exorbitant commodity prices are also affecting production in many sectors.

At the same time, new studies paint an increasingly dramatic picture of our environmental and climate situation. Climate protection, resource efficiency, the fight against plastic waste and the preservation of biodiversity are challenges that politics alone cannot solve, so everyone must take on this responsibility.

What is our contribution? As a medium-sized manufacturer of viscose speciality fibres, we want to create solutions that enable a healthy and sustainable lifestyle while protecting the environment for future generations.

The decision of the EU Commission to follow scientific evidence and NOT classify viscose fibres as plastic within the framework of the directive on single-use plastics is of central importance for us in this context. It confirms that our viscose fibres are a fully biodegradable and thus environmentally friendly alternative to synthetic fibres in a variety of disposable products, e.g., in hygiene articles.

But it is not only our products that are designed to protect the environment - in 2020 Kelheim Fibres became the first viscose fibre manufacturer in the world to be validated under EMAS. Above all, this demanding environmental management system requires absolute transparency and a continuous improvement process - and constantly

puts all aspects of our actions to the test, from raw material procurement to energy use and production. Our first published sustainability report provides a comprehensive insight into our environmental performance.

Another milestone in the reporting year is our cooperation with the Swedish textile recycling company Renewcell: together we are working on the large-scale production of viscose fibres from the textile recyclate Circulose®. This collaboration paves the way to a fully closed European loop where textile waste is collected, recycled and regenerated into new Circulose® fibres for people who want to significantly reduce their fashion footprint.

We have achieved a lot this year, despite the difficult conditions caused by the pandemic. I would like to thank all our employees for this. With their commitment and expertise, we will continue to build on our pioneering role in the industry.



Yours, Craig Barker



## 3 Highlights

### Latest awards

- Ranked among the top 3 viscose fibre producers in the 2021 Hot Button Ranking of the non-profit organisation Canopy for the protection of ancient and endangered forests.
- Awarded Gold in the CSR rating by EcoVadis, ranking among the top 3 % of all evaluated companies.
- Nomination for the German Sustainability Award in the category "Biodiversity" for the concept of our biodegradable fibres for absorbent hygiene products (AHP).
- 2nd place in the "Cellulose Fibre Innovation of the Year 2021" Award.
- Finalist in the Sustainability Heroes Award with our fibres for absorbent hygiene products (AHP).

### Milestones

- Together with Renewcell, we are entering into a long-term commercial collaboration to create the crucial missing link for a circular economy for textiles in Europe.
- The European Commission confirms under SUPD legislation that viscose is NOT classified as a plastic.
- We join the UN Global Compact to support the adoption of sustainable and socially responsible policies.
- We join the ZDHC Roadmap to Zero programme.
- We join the Bavarian Environmental and Climate Pact to support sustainable development in Bavaria.
- Kelheim Fibres becomes the first viscose fibre manufacturer in the world with an EMAS-validated environmental management system.
- Kelheim Fibres is the world's leading viscose fibre manufacturer in terms of air pollution control.

## Legal Compliance

EMAS stands for continuous improvement of environmental performance. This improvement process is based on a functioning environmental management system that has its origins in a legal tracking system. Full legal tracking stands for the consolidation of all applicable areas of law in a legal register that is constantly maintained and updated. Internally, we monitor compliance with regulations through the activities of appointed officers for waste, water protection and immission control, for example, and through internal audits. External monitoring by authorities also takes place in various annual inspections such as

- the IE monitoring (Industrial Emissions Directive),
- the monitoring of the residue incineration plant,
- the annual wastewater discussion on the operation of the biological wastewater treatment plant, the fire protection inspection.

## Key Legislation

Kelheim Fibres is subject to a wide range of legislation. Essential legal regulations include the following laws plus the associated ordinances and administrative regulations:

- the Federal Immission Control Act (BImSchG)
- the Recycling Management Act (KrWG)
- the Water Resources Act (WHG)

## Important legal changes since the last environmental statement

### *Air:*

- TA Luft -> Inclusion of the Odour Immission Directive
- 13th BImSchV
- 17th BImSchV/BVT

### *Water*

- Update of Annex 22 of the Water Framework Directive → implemented in an amendment notice (Wastewater Ordinance)

### *Energy*

- Fuel Emissions Trading
- Implementation of the Greenhouse Emissions Trading Act in the National Allocation Plan IV

### *Sustainability:*

- Labelling Regulation in connection with Single Use Plastic Directive (SUPD): Viscose fibres do not fall under the SUPD
- Green Deal/Fit for 55

### *REACH:*

- Microplastics Restriction Procedure
- Specifications for skin sensitising substances

## 4 Core indicators

Core indicators have been established so as to better present the environmental performance of our company. After the big fire in 2018, we are currently still in the phase of rebuilding our spinning room. Production capacity is therefore limited. Until the completion of the construction measures and the resumption of full production in 2022, the figures are mainly affected by these low production capacities. This has led to an increase in specific indicators as of 2018, as site facilities must continue to operate even if production is lower.

### Production quantity

	Absolute figures				Values for input/output related to production quantities			
	2018	2019	2020	Unit	2018	2019	2020	Unit
<b>Production quantity</b>								
Fibres produces	63.765	40.852	55.521	t				
<b>Energy</b>								
Current	84.473.000	72.133.000	86.376.490	kWh	1.325	1.766	1.556	kWh/t fibre
Steam	478.903.000	370.326.000	411.489.848	kWh	7.510	9.065	7.411	kWh/t fibre
Renewable energy consumption	0	0	0	kWh	0	0	0	kWh/t fibre
Fuel for vehicles	249.882	202.478	178.654,6	kWh	3,92	4,96	3,2	kWh/t fibre
<b>Material</b>								
Pulp	65.890	42.411	57.328	t	1,033	1,038	1,033	t/t fibre
NaOH	33.895	21.195	28.661	t	0,532	0,519	0,519	t/t fibre
H <sub>2</sub> SO <sub>4</sub>	49.758	30.761	41.785	t	0,780	0,753	0,753	t/t fibre
CS <sub>2</sub>	5.645	3.735	4.773	t	0,089	0,091	0,086	t/t fibre
<b>Water</b>								
Well water	13.232.890	13.252.014	14.014.095	m <sup>3</sup>	208	324	252	m <sup>3</sup> /t fibre
Danube water	9.738.877	6.784.123	6.784.080	m <sup>3</sup>	153	166	122	m <sup>3</sup> /t fibre
City water	23.538	22.062	16.181	m <sup>3</sup>	0,369	0,540	0,291	m <sup>3</sup> /t fibre



<b>Waste management</b>								
<b>Total waste</b>	5.644	5.613	5.984	t	88,5	137,4	107,8	kg/t fibre
Process waste for recycling	212	195	117	t	3,3	4,8	2,1	kg/t fibre
Process waste for disposal	2.184	2.114	2.062	t	34,3	51,8	37,1	kg/t fibre
Other waste	3.248	3.304	3.805	t	50,9	80,9	68,5	kg/t fibre
<b>Total hazardous waste</b>	867	1.099	1.201	t	13,6	26,9	21,6	kg/t fibre
Hazardous process waste for recycling	102	73	35	t	1,6	1,8	0,6	kg/t fibre
Hazardous process waste for disposal	153	141	113	t	2,4	3,5	2,0	kg/t fibre
Other hazardous waste	612	885	1.053	t	9,6	21,7	19,0	kg/t fibre
<b>Land consumption</b>								
Total land consumption	211.934	211.934	211.934	m <sup>2</sup>	211.934	211.934	211.934	m <sup>2</sup>
Total sealed area	177.544	177.544	177.544	m <sup>2</sup>	177.544	177.544	177.544	m <sup>2</sup>
Total near-natural area at the site	34.390	34.390	34.390	m <sup>2</sup>	34.390	34.390	34.930	m <sup>2</sup>
Total near-natural area off the site	-	-	-		-	-	-	
<b>Emissions</b>								
Total greenhouse gas (Scope 1+2)	98.195	96.015 <sup>1</sup>	102.081	t	1,54	2,35	1,84	t/t fibre
Total dust	123	92	83	kg	1,92	2,25	1,49	g/t fibre
SO <sub>2</sub>	102.168	93.153	129.590	kg	1,60	2,28	2,33	kg/t fibre
NO <sub>x</sub>	48.262	40.836	55.904	kg	0,76	1,00	1,00	kg/t fibre

<sup>1</sup> Due to the more detailed calculation, this value was adjusted in comparison to the Environmental Statement 2020.

## 5 Environmental goals

With EMAS, we commit ourselves to doing what is already anchored in our business strategy: to further optimize our environmental performance. Our environmental program covers the greatest environmental aspects and includes measures in all areas of our plant.

● = implemented; ● = in progress ● = not implemented



### Water

Target		Activities	21	22	23	Status	Status November 2021	Responsibility
Qualitative	Quantitative							
Guarantee for safe plant operation	Savings of compressed air (energy relevant)	Conversion of the flotation plant	x	x		●	One plant implemented, currently examining whether project should be continued.	Environmental plants
	Saving of compressor air and thus energy savings (energy relevant)	Automatic return of sludge from post-clarification to activation	x			●	Currently under reconstruction, completion by the end of the year.	Environmental plants
Homogenizing the inflow loads		Integration of the BHR 1 as an upstream expansion tank		x		●	Concept in place, further conceptualisation planned in 2022, implementation expected in 2023	Environmental plants


## Air

Target		Activities	21	22	23	Unit	Status	Status November 2021	Responsibility
Qualitative	Quantitative								
	Reduction of specific sulphur emissions	tow extraction at the spinning lines and then transfer to the CS <sub>2</sub> recovery plant	-0,8	-1		[kg S/t fibre]	●	With the exception of one spinning line, all tow extractor units now feed into the CS <sub>2</sub> recovery plant.	Spinning area
	Reduction of immissions values CS <sub>2</sub>	Discharge of defined individual sources (washing sectors) into the viscose stack and thus improvement of discharge conditions		-55		Annual average: [µg/Nm <sup>3</sup> ]	●	In the meantime, all washing sectors have now feed into the viscose stack. In the coming years, dispersion calculations for the relevant substance parameters and for odour will be commissioned.	
				-233		Daily average: [µg/Nm <sup>3</sup> ]	●		
	Reduction of odour hour frequency		-5		[%/a]	●			
Improved measurement acquisition		Installation of an emissions evaluator as well as with extended monitoring spectrum for the parameters CS <sub>2</sub> and COS		x			●	The emission evaluation computer was installed and has been successfully in operation since 01.07.21.	





## Noise

Target	Activities	21	22	23	Unit	Status	Status November 2021	Responsibility
Reduction of immissions	Performance of immissions measurements at the relevant receptor points to verify the measures taken so far under the noise remediation programme (reference: specifications from subsequent injunction)	x			dB(A)		Postponed to 2022/23 when the construction work in the spinning area is completed.	HSE
Reduction of immission guide value	Installation of silencers in the viscose stack to reduce the sound level in connection with further measures on the spinning area roof	(- 6) - (-13)			dB(A)		The project is successfully implemented.	Technology

## Waste management






Target	Activities	21	22	23	Status	Status November 2021	Responsibility
Improvement of operational safety	Feasibility study for the addition of fractions with high calorific value such as wood	x				Trial operation with extensive emission measurements planned for December 2021.	HSE/environmental facilities




## Energy

Target	Activities	21	22	23	Unit	Status	Status November 2021	Responsibility
Increasing the proportion of CO <sub>2</sub> - free energy production	Feasibility study for erection of a 300 kWp PV plant as a basis for operational implementation	x					Technical possibility checked. Quotations requested.	HSE/Energy department
Reduction of primary energy consumption	Potential analysis for optimized energy generation and utilization	x					Against the background of the requirements of the Green Deal and the changed energy sector, studies on the reorientation of the energy supply will be in the foreground in the coming years. Specifically, the focus will be on how the previous primary fuel, natural gas, can be replaced and supplemented.	HSE/Energy department
	Continuous improvement process from energy management as the sum of all energy projects	-1	-1	-1	[%]		In 2020, a reduction of 1.1% was achieved through energy saving projects.	Technology / facilities
	Installation of an Alphasizer for better air utilization and thus for more energy-efficient operation of the compressor units.	-9,6	-9,6		[t CO <sub>2</sub> /a]		The project is successfully implemented.	Environmental plants

## Sustainability

With the various measures to be implemented within the framework of the environmental programme, we aim to improve our environmental performance.

Target	Activities	21	22	23	Status	Status November 2021	Responsibility
Biodegradability tests according to OECD 301 B	Proof of biodegradability of viscose fibres under maritime conditions according to OECD 301 B	x				During 2021, the fibres, Olea, Galaxy and Bramante were successfully tested according to OECD 301 B. The <b>objective for 2022</b> is to extend the scope of the test to the DIN ISO methods (for all compartments).	HSE/quality assurance
Annual capture of 10 t of CO2 per hectare with a humus build-up of 0.2 %	Project sponsorship for humus build-up programmes in agriculture to capture CO2	x	x			Kelheim Fibres continues to be involved in the local project developments. A further concretisation of the participation or the targets has not yet taken place.	Management
Sustainable cultivation with sustainable materials	Project cooperations with regional farmers using biodegradable viscose products in hop and tomato cultivation	x	x			<ul style="list-style-type: none"> <li>Phase: Review of technical and economic feasibility / practicability</li> <li>Talks with regional hop growers / farmers</li> <li>Internal internship (Bachelor) to explore possibilities for viscose fibre use in plant cultivation and agriculture as well as urban farming</li> <li>Exchange with commercial suppliers of plant cultivation products (e.g. string) to clarify the potential for replacing synthetic solutions.</li> </ul>	New Business Development
Creating the basis for further energy projects	Creation of a multi-stage carbon footprint / corporate footprint as a basis for further energy projects	x				Carbon Footprint, sources and values are still being specified and interpreted. In 2020, an external calculation was still used. From 2021, an internal calculation with clearly detailed limits and gradations is planned. The result of the calculation will then also make it possible to set targets.	HSE
Enforcement of Circular Economy	Feasibility study on the use of alternative pulps	x	x			<ul style="list-style-type: none"> <li>LOI signed with Renewcell. Goal: large-scale production of high-quality viscose fibres from up to 10,000 tonnes of the 100% textile recyclate Circulose® per year.</li> <li>Screening of possible other alternative raw materials.</li> </ul>	Fibre & Application Development

Target	Activities	21	22	23	Status	Status November 2021	Responsibility
Plastic reduction, materials from renewable resources	Project Femcare - development of sustainable feminine hygiene products	x	x			<ul style="list-style-type: none"> <li>Phase: Incorporation of the fibres into end products.</li> <li>Product development (commercial end-products together with end-product manufacturers (established players and start-ups)) in the area of single-use (sanitary napkins, panty liners, tampons) and reusable products (menstrual underwear).</li> <li>Target for single-use products: Replacement of petroleum-based fibre solutions by biodegradable / bio-based special viscose fibres with comparable performance of the end product.</li> <li>Goal for reusable products: Textile solution for multiple use with high performance to further increase sustainability values</li> </ul>	New Business Development
Tracing of sustainable textiles through viscose marker fibres	Go-to-market activities for viscose fibres with incorporated marker pigments for the representation of traceable supply chains (block chain) for the unequivocal identification of sustainable solutions and identification of product compositions for a meaningful feed to circular loops.	x	x	x		New target 2021	New Business Development
Use of alternative / cellulosic raw materials (other than wood) to diversify the raw material landscape and presentation of circular approaches	Screening of cellulose-containing raw materials with regard to their applicability in the viscose fibre process (feasibility study on a laboratory scale) (e.g. food waste, recovered cellulose from textile recycling, agricultural by- / waste products).	x	x	x		New target 2021	New Business Development

## Consumption

Target	Substance	Target				State	Unit
		19	20	21	22	20	
Progress of the process	Pulp	1,038	1,031	1,025	1,025	1,033	[t pulp/t fibre]
Progress of the process	Sodium hydroxide solution <sup>2</sup>	0,519	0,514	0,52	0,52	0,516	[t NaOH/t fibre]
Progress of the process	Sulphuric acid <sup>3</sup>	0,752	0,747	0,75	0,75	0,753	[t H <sub>2</sub> SO <sub>4</sub> /t fibre]
Progress of the process	Zinc sulfate	6,2	5,7	5,7	5,7	5,71	[kg ZnSO <sub>4</sub> /t fibre]
Progress of the process	Carbon disulphide	91,4	87	87	87	86	[kg CS <sub>2</sub> /t fibre]
Progress of the process	Process water consumption	42	42	45	43	50 <sup>4</sup>	[m <sup>3</sup> water/t fibre]

## Generation

Substance	Activities	Target				State	Unit
		19	20	21	22	20	
Sodium sulphate	Increased evaporation from drawing bath	0,55	0,57	0,57	0,58	0,56	[t Na <sub>2</sub> SO <sub>4</sub> /t fibre]

<sup>2</sup> In terms of the consumption factor for caustic soda, all technical possibilities for further improvement are currently exhausted. The goal is therefore to maintain this high level.

<sup>3</sup> In terms of the consumption factor for sulphuric acid, all technical possibilities for further improvement are currently exhausted. The goal is therefore to maintain this high level.

<sup>4</sup> The production mix - consisting of hygiene and textile fibres - has shifted towards a greater share of hygiene fibres in 2020. As hygiene fibres require a higher degree of purity, water consumption has increased.



## Emissions

Substance	Target				State	Unit
	19	20	21	22	20	
Sulphur emissions	6,9	6,4	6,1	6	5,97	[kg S/t fibre]
CSB	4,8	5,57	5	5	5,52	[kg CSB/t fibre]
Zinc	0,16	0,17	0,15	0,15	0,177	[kg Zn/t fibre]

## Immissions

Substance	Target				State	Unit
	19	20	21	22	20	
CS <sub>2</sub>	80	75	75	25	75	Annual mean value: [µg/Nm <sup>3</sup> ]
Frequency of odour immissions	19	18	18	14	18	[%/a]

## 6. Abbreviations

a	Year	NaOH	Sodium hydroxide solution
AHP	Absorbent Hygiene Products	OECD 301 B	Biodegradability test
CS <sub>2</sub>	Carbon disulphide	S	Sulphur
CSB	Chemical oxygen demand (COD)	SUPD	Single use plastic directive
H <sub>2</sub> SO <sub>4</sub>	Sulphuric acid	t	Ton
HSE	Department of Health, Safety, Occupational Health	Zn	Zinc
kWh	Kilowatt hour	ZnO	Zinc oxide
Na <sub>2</sub> SO <sub>4</sub>	Sodium sulphate salt	ZnSO <sub>4</sub>	Zinc sulphate

## 7 Contact persons and deadlines

Contact person for the environmental statement of Kelheim Fibres GmbH:

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The deadline for the next environmental statement is 12/2022.