Supplementary Material

Table S1. Best Available Techniques (BATs) List

BAT Number	Description	Implemented (%)	Potentially to be implemented (%)	Not projected to be implemented (%)
	General measures			
BAT 1	Establishing an environmental management system (EMS)	34	63	3
BAT 2	Training programs to raise awareness about the environment	89	11	0
BAT 3	Preparation of annual waste and emission inventory reports based on mass balances, showing all substance inputs and outputs	52	45	3
BAT 4	Monitoring all inputs and outputs of the production process (raw materials, chemicals, energy, water, product, wastewater, air emissions, sludge, solid waste, hazardous waste and by-products) in terms of quantity and quality	75	25	0
BAT 5	Adopting better practices in maintenance and cleaning activities	86	12	2
BAT 6	Organizing technical training to raise awareness of employees and strengthen the technical infrastructure	82	15	3
BAT 7	Choosing machines that provide resource efficiency in the selection of machines, devices and equipment	89	11	0
BAT 8	Development and effective use of preventive maintenance-repair programs or procedures	75	25	0
BAT 9	Completing the deficiencies in monitoring equipment (such as meters) and creating effectively used manual monitoring procedures to monitor consumption of water, energy, etc. on a process basis	71	29	0
BAT 10	Using process-based monitoring systems and/or conducting cleaner production-efficiency studies periodically	46	54	0
BAT 11	Following new technologies and developments related to the sector	91	9	0
BAT 12	Establishing an efficiency and/or sustainability unit	25	68	7
BAT 13	Preparation and effective use of necessary procedures to implement a cleaner production policy specific to the facility	38	62	0
BAT 14	Determining and monitoring annual efficiency and sustainability targets for continuous development	63	34	3
BAT 15	Establishing necessary procedures for monitoring reprocesses, losses and inefficiencies (evaluating causes and consequences together)	48	49	3
BAT 16	Determining the usage points of all water and other inputs in all production processes in the facility, monitoring, recording consumption, comparative evaluation and reporting	67	33	0
BAT 17	Determining the usage points of all water and other inputs in all production processes in the facility, monitoring them, recording the consumptions, evaluating them comparatively and reporting them. Adapting this information to the environmental management system (if any). "Adapting this information (if any) to the environmental management system	48	49	3
BAT 18	Application of time optimization in production, arranging all processes to be completed in the shortest time	73	27	0
	Products and their quantities			
BAT 19	Preferring in the selection of fiber raw materials, the environmental effects of the fiber in the previous production stages taken into account and the one with the least environmental impact	43	31	26
BAT 20	Establishing procedures that provide supplier control in raw material selection	52	33	15
BAT 21	Ensuring appropriate conditions for storing and storing raw materials	82	18	0
BAT 22	Monitoring raw material losses in production processes and taking precautions against raw material losses	77	23	0
BAT 23	Preferring substances that can provide resource efficiency (increase production performance and improve product properties) in the selection of raw materials and chemicals	84	14	2
	Chemical use			
BAT 24	Optimizing the recipes applied in production, taking into account environmental impacts	71	25	4
BAT 25	Applying and storing all chemical substances in accordance with the instructions given in the Substance Safety Data Guides (MSDS)	86	12	2
BAT 26	Preventing all chemical spills, controlling and cleaning the area if a spill occurs, and preventing chemical spills from mixing with the receiving environment and sewage system	79	19	2
BAT 27	Establishing automatic dosing and distribution systems for dosing chemicals (except paints)	55	41	4

Table S1. (Continue)

BAT Number	Description	Implemented (%)	Potentially to be implemented (%)	Not projected to be implemented (%)
BAT 28	In the selection and use of chemicals, not using chemicals in cases where production without the use of chemicals is possible	55	33	12
BAT 29	The use of the chemical with the least risk, in cases where the use of chemicals is essential in the selection and use of chemicals	84	14	2
BAT 30	In the use of surfactants in the selection and use of chemicals; use of readily biodegradable surfactants instead of alkylphenol ethoxylates and other hazardous substances	63	32	5
BAT 31	Using soft water in the use of complexing substances, especially in pre-treatment and dyeing processes	70	27	3
BAT 32	Applying a dry process to remove iron from the fabric before bleaching, especially in pre-treatment and dyeing processes, when using complexing agents	13	51	36
BAT 33	Removal of iron from the fabric by acidic demineralization or non-hazardous reducing agents in the use of complexing substances, especially in pre-treatment and dyeing processes	30	47	23
BAT 34	Application of hydrogen peroxide under optimum conditions	63	31	6
BAT 35	Use of easily biodegradable complexing substances	63	31	6
BAT 36	Use of float-free air-jets in places where the liquor is not agitated by fabric movement to reduce/prevent the use of antifoam	36	35	29
BAT 37	Reuse of bath contents to reduce/prevent the use of antifoam	25	37	38
BAT 38	Use of antifoam substances that are easily biodegradable and do not contain mineral oil	41	52	7
BAT 39	Conducting chemical inventory and chemical replacement studies, including control of micropollutants in the selection of chemicals	46	49	5
BAT 40	Use of polyether/polyester or polyether/polycarbonates, special polyol esters and special sterically hindered fatty acid esters as an alternative to conventional preparation additives containing mineral oil	23	51	24
BAT 41	Using the emission factor as a system to control and prevent air emissions from textile finishing	25	57	18
BAT 42	Calculation of substrate-based emission factors in textile finishing regularly (at least once a year) and especially before using a new recipe or changing compounds of an existing recipe	18	53	29
BAT 43	To reduce emissions from finishing auxiliary chemicals; use of dimethyloldihydroxyethene, silicone-based antifoams, surfactants with lower emission potential, fillers and hardeners based on natural or synthetic polymers, silicic acid-based anti-slip agents	32	59	9
BAT 44	Ensuring chemistry laboratory (recipe preparation) and dyehouse coordination at the highest level	63	35	2
BAT 45	Reviewing the necessary procedures in the prescription preparation system and making revisions by taking into account the reprocessing rates in practice	66	31	3
BAT 46	Simulating processes at the highest level possible in order to obtain appropriate color combinations in the preparation of recipes	63	34	3
BAT 47	Effective use of pH control methods in acidic and basic processes	70	28	2
BAT 48	Reducing reprocesses by determining, optimizing and monitoring critical parameters such as temperature and pH in production processes	70	28	2
BAT 49	Use of automatic/intelligent automatic/precision systems in the preparation of chemical recipes	52	43	5
BAT 50	Use of automatic kitchens in the preparation of chemicals	48	42	10
	Water resources and supply			
BAT 51	Controlling water consumption and monitoring it on the basis of processes	59	39	2
BAT 52	Establishing a monitoring system to monitor water consumption	34	62	4
BAT 53	Using water flow control devices and automatic shut-off valves in continuously operating machines	54	42	4
BAT 54	Using automatic equipment to control bath volume and temperature in intermittent machines	57	36	7
BAT 55	To prevent water waste, production procedures should be documented and used by employees	50	47	3
BAT 56	Investigating the possibilities of combining different operations in one step	55	35	10
BAT 57	Using low and very low liquor ratio machines in batch processes	59	34	7
BAT 58	Use of continuous processes with low input”	57	39	4

Table S1. (Continue)

BAT Number	Description	Implemented (%)	Potentially to be implemented (%)	Not projected to be implemented (%)
BAT 59	Increasing washing efficiency	66	31	3
BAT 60	Reuse of cooling water as process water (also providing heat recovery)	54	42	4
BAT 61	Characterization of discrete wastewater streams and evaluation of water/material recovery and reuse opportunities	23	59	18
BAT 62	Developing and effectively implementing procedures to prevent water losses	63	37	0
BAT 63	Increasing washing efficiency by using water-efficient elements (water spray heads, spray nozzles, etc.) in facility and equipment cleaning, thereby saving water and reducing the amount of wastewater	63	32	5
BAT 64	Separate collection and reuse of cooling water	52	48	0
BAT 65	Reducing the number of baths by performing process optimization studies in the dyeing, washing and softening processes	52	37	11
BAT 66	Reducing liquor ratios by using an airbag system in high-temperature (HT) dyeing machines in the dyehouse unit	21	61	18
BAT 67	Saving water in dyeing and post-processing by developing correct dyeing techniques such as right first time dyeing	54	40	6
BAT 68	Determination of water quality standards requirements for each water consumption points	61	34	5
	Process water preparation systems			
BAT 69	Reuse of sand filter backwash water before water softening in appropriate areas	16	77	7
BAT 70	Using hardness monitoring sensors in the ion exchange resin system outlet water (process water-softened) and optimizing regeneration times by integrating it into the regeneration system	29	64	7
BAT 71	Reuse of washing and rinsing water in the regeneration of ion exchangers	14	73	13
BAT 72	Determination of regeneration frequencies depending on raw water quality or determination with a hardness sensor	45	50	5
BAT 73	Determination of regeneration frequencies using online hardness sensors	13	77	10
BAT 74	Optimizing rinse times after regeneration	59	39	2
BAT 75	Reuse of reverse osmosis (RO) concentrates without purification based on their characterization	20	57	23
	Energy supply, distribution and use			
BAT 76	Establishing an energy management system	25	72	3
BAT 77	Controlling energy consumption	59	41	0
BAT 78	Monitoring energy consumption on the basis of machines or processes	48	52	0
BAT 79	Performing process-based energy audits and determining potential saving points	50	50	0
BAT 80	To prevent energy waste, production procedures should be documented and used by employees	36	61	3
BAT 81	Reuse of cooling water as process water and heat recovery”	57	39	4
BAT 82	To prevent steam losses, complete steam insulation in machines	70	30	0
BAT 83	Insulation of pipes, valves, tanks and machines to minimize energy losses	73	27	0
BAT 84	Optimizing boiler rooms with practices such as reusing steam condensates	71	24	5
BAT 85	Recovery of waste heat from waste gas and wastewater”	46	51	3
BAT 86	Establishing a cogeneration system (may be advantageous for some facilities)	16	45	39
BAT 87	Utilization of cold water and air obtained by using an absorption cooling system in cogeneration in the required processes	4	53	43
BAT 88	Heat recovery of the hot wastewater streams to be determined using plate heat exchangers or heat pumps	45	45	10
BAT 89	Using inverters in steam boilers	55	45	0
BAT 90	Preheating of boiler feed water with waste gas heat in the economizer	46	48	6
BAT 91	Preheating to increase the combustion air temperature	38	56	6
BAT 92	Establishment of online monitoring systems for important energy flows and combustion processes in the facility	27	64	9
BAT 93	Evaluation of alternative/renewable energy sources (solar energy for water heating or hot oil production, etc.)	11	68	21

Table S1. (Continue)

BAT Number	Description	Implemented (%)	Potentially to be implemented (%)	Not projected to be implemented (%)
	Steam production and distribution			
BAT 94	Selection or sizing of boilers taking into account the maximum required capacity	73	27	0
BAT 95	Carrying out boiler cleaning as often as necessary	79	21	0
BAT 96	Carrying out regular boiler checks (if there is more than one boiler, consecutive boiler checks)	79	18	3
BAT 97	Installation of flue gas isolation dampers in facilities with more than one boiler	20	54	26
BAT 98	Using more than one boiler with lower capacity rather than a large boiler	23	54	23
BAT 99	Using an automatic feeding system in boilers using coal in order to reduce heat losses that may occur during loading	46	44	10
BAT 100	Use of burners with large contact surface	43	46	11
BAT 101	Reducing blowdown amounts by using extra soft water in steam boilers (1-1.5% increase in fuel consumption can be achieved with every 5% increase in blowdowns)	70	30	0
BAT 102	Heating the boiler feed water as much as possible with the waste gas heat in the economizer (1% reduction in fuel costs can be achieved)	45	49	6
BAT 103	Increasing the combustion air temperature (2% increase in boiler efficiency can be achieved by increasing the combustion air temperature)	39	59	2
BAT 104	Increasing the burner capacity to operate steam boilers at the highest efficiency by controlling the burning rate and load change	55	41	4
BAT 105	In steam production, the recovery of heat from exhaust gases (waste heat from the process, economizers using combustion heat, use of de-vented feed water to heat the condensate, condensation of the steam used for stripping and heating of the feed water going to the deaerator with a heat exchanger) and preheating of boiler feed water with recovered heat	41	45	14
BAT 106	Preventing scale formation and purifying heat transfer surfaces in order to efficiently transfer heat from combustion gases to steam	64	36	0
BAT 107	Recovery of condensate (by recovering 50% of condensate, blowdown can be recovered by 50%)	66	34	0
BAT 108	Minimizing boiler blowdown by increasing water (blowdown rates can be reduced to 3% or less by pre-treatment (using processes such as ion exchange resin, reverse osmosis (RO), demineralization and decarbonization, etc.)	71	29	0
BAT 109	Application of automatic control system for possible total dissolved solids level in boiler feed water	41	53	6
BAT 110	Providing heat recovery from flash steam	18	71	11
BAT 111	Adding/renewing boiler refractors	54	46	0
BAT 112	Optimizing the air release valve in deaerators	54	40	6
BAT 113	Using more than one boiler with lower capacity rather than a large boiler	21	61	18
BAT 114	Having a spare boiler that is well insulated and includes a correct air valve for the burner (minimizes flue gas losses)	27	53	20
BAT 115	Using water softening systems to remove hardness in boiler feed water preparation and using extra softening systems when this is not sufficient	64	36	0
BAT 116	Monitoring combustion efficiency in boilers (monitoring air-fuel ratio and boiler efficiency online)	25	70	5
BAT 117	Continuous operation of drying systems in order to prevent energy loss that may occur during reheating	21	74	5
BAT 118	Online monitoring of boiler flue gas temperature and gas discharge rate	25	68	7
BAT 119	Optimizing steam production by considering both fuel use and costs in case there is more than one steam boiler	36	53	11
BAT 120	Continuous measurement and monitoring of PM, NOx, SOx, and CO emissions in steam boiler combustion systems	43	54	3
BAT 121	Providing maximum performance to reduce exhaust gas temperature; use calculated safety factors for sizing and additional loads	36	58	6
BAT 122	Transferring more heat to the process by increasing the heat transfer rate or heat transfer floors to reduce the exhaust gas temperature	45	48	7

Table S1. (Continue)

BAT Number	Description	Implemented (%)	Potentially to be implemented (%)	Not projected to be implemented (%)
BAT 123	Heat recovery by combining additional processes to recover waste heat in the flue gas to reduce the exhaust gas temperature (e.g. steam production using economizers)	34	54	12
BAT 124	Preheating the fuel by installing an air or water preheater or replacing the heat with flue gases to reduce the exhaust gas temperature (Generally, the efficiency increases by 1% with every 20 ° decrease in the volatile gas temperature), To reduce the exhaust gas temperature "cleaning floors covered with ashes or carbonaceous particles to ensure heat transfer efficiency	25	61	14
BAT 125	Cleaning of floors covered with ashes or carbonaceous particles to ensure heat transfer efficiency to reduce exhaust gas temperature	36	57	7
BAT 126	Ensure that the combustion output matches (and does not exceed) the heat requirements for exhaust gas temperature reduction." "This is controlled by reducing the flow rate and installing a less powerful sprayer for liquid fuels, or by reducing the thermal power of the boiler as a result of reducing the supply pressure for gaseous fuels."	20	46	34
BAT 127	Using recovery (exchanger type air preheater) and regenerative burners (with recovery burner, the combustion air can be preheated using the heat in the flue gas)	13	67	20
BAT 128	Reducing flue gas flow by reducing excess air	55	42	3
BAT 129	Controlling combustion by monitoring and controlling the heat requirement of the burners and the fuel, air flow rates and oxygen ratio in the waste gas	43	47	10
BAT 130	Adjusting the heat energy obtained per unit fuel with the fuel type selected for the combustion process	50	48	2
BAT 131	Use of oxy-combustion technique (provides a reduction in NOx emissions)	38	49	13
BAT 132	Reducing heat losses with appropriate insulation	73	24	3
BAT 133	Reducing heat losses during opening of boilers during loading and unloading	46	54	0
BAT 134	Monitoring and optimizing fuel-air ratio	46	54	0
BAT 135	Using online monitoring-control systems for important energy flows and combustion processes in the facility	16	59	25
BAT 136	Monitoring and controlling the flue gas temperature (increased flue gas temperature may be the cause of scale formation in steam boilers)	46	48	6
BAT 137	Increasing burner capacity to operate steam boilers at highest efficiency by controlling burning speed and load change	46	48	6
BAT 138	Removal of insoluble gas in boiler feed water with the help of deaerator	59	38	3
BAT 139	Turbidity and conductivity control in the condensate return tank	63	37	0
BAT 140	Developing operating procedures and performing boiler controls	63	37	0
BAT 141	Implementation of consecutive boiler controls in facilities with more than one boiler	30	66	4
BAT 142	Installation of flue gas isolation dampers in facilities with more than one boiler	14	68	18
BAT 143	Reuse of flash steam	21	74	5
BAT 144	Ensuring energy recovery from boiler blowdown	21	68	11
BAT 145	Installing an economizer on the steam boiler chimney	46	44	10
BAT 146	Insulating all hot surfaces in the steam distribution system (Insulation reduces heat losses from pipes by 90%)	73	27	0
BAT 147	Ensuring full functionality of steam traps in steam distribution systems	79	21	0
BAT 148	Preventing steam leaks in steam distribution systems	79	21	0
BAT 149	Reducing the steam temperature to the minimum levels required by the process	70	25	5
BAT 150	Optimizing the needs of steam users according to the full load position of the boiler	66	32	2
BAT 151	Maximizing the heat exchanger surface areas of end users in steam distribution systems for adequate air circulation	5	89	6
BAT 152	Closing the valves in the steam line for long periods when there is no work in the relevant unit in the business	77	23	0

Table S1. (Continue)

BAT Number	Description	Implemented (%)	Potentially to be implemented (%)	Not projected to be implemented (%)
BAT 153	Insulation application of heat exchangers (Insulation application in transferring energy from high-temperature outlet streams to the inlet water in heat exchangers)	50	50	0
BAT 154	Isolating steam from unused lines	70	30	0
BAT 155	Proper insulation of steam pipes and condensate conversion pipes (steam system pipes, covers, fittings and chambers)	73	27	0
BAT 156	Installation of replaceable insulation pads or valves and fittings	63	37	0
BAT 157	Establishing an inspection and repair program for steam traps	63	37	0
	Electricity usage			
BAT 158	Establishing an Energy Management System	23	77	0
BAT 159	Controlling and monitoring electricity usage	71	29	0
BAT 160	Monitoring electrical energy consumption on the basis of machines or processes	46	54	0
BAT 161	Conducting process-based energy audits and identifying potential savings points	48	52	0
BAT 162	Documentation of the production procedures and using by employees to prevent energy loss	43	57	0
BAT 163	Use of frequency controlled electric motors	68	32	0
BAT 164	Shutting down when there is no work or the machines are at a standstill	82	16	2
BAT 165	Use of more efficient lighting systems	68	27	5
BAT 166	Use of lighting management control systems (detector, timer, photocell, etc.)	50	39	11
BAT 167	Increasing the use of natural light	55	42	3
BAT 168	Using variable speed drives to reduce the load on fans, compressors and pumps	73	27	0
BAT 169	Elimination of unnecessary drying processes (that do not pose a risk on product quality) in the production flow by process modification/optimization	45	50	5
BAT 170	Avoiding the use of engines with higher power than necessary	80	20	0
BAT 171	Installing capacitors in the alternating current circuit to reduce the size of reactive power	75	25	0
BAT 172	Ensuring that transfarmators are loaded economically or switching off the transfarmators with the least load	61	33	6
BAT 173	By correcting the power factor of the drawn load and replacing the transformers with more efficient ones	61	37	2
BAT 174	Disabling unnecessary transformer powers	63	35	2
	Compressed air systems			
BAT 175	Optimizing the need for compressed air (10% reduction in pressure provides 5% savings in annual compressor operating costs)	73	25	2
BAT 176	Preventing compressed air leaks	82	18	0
BAT 177	Optimizing compressor capacity	77	23	0
BAT 178	Establishing a compressor control system (In establishments with more than one compressor, establishing a control system provides savings between 5% and 20%)	46	46	8
BAT 179	Optimizing compressor inlet air temperature	36	57	7
BAT 180	Installing a humidifier at the air inlet	54	44	2
BAT 181	Installation of the compressor system on the north facade	39	43	18
BAT 182	Preventing compressor pressure from increasing excessively	80	20	0
BAT 183	Controlling of compressors (operating expenses can be reduced significantly by performing compressor control. If appropriate controls are not provided, it increases operating expenses by 20%)	73	27	0
BAT 184	Monitoring and optimizing compressed air need and pressure level	72	28	0
BAT 185	Preventing excessive increase in compressor pressure	79	21	0

Table S1. (Continue)

BAT Number	Description	Implemented (%)	Potentially to be implemented (%)	Not projected to be implemented (%)
BAT 186	Establishing a compressor monitoring system and monitoring load distributions	29	61	10
BAT 187	Automatic shutdown when there is no operation in the compressor system	73	25	2
BAT 188	Ventilation checks of the compressor room	64	33	3
BAT 189	Establishment of ring lines in compressed air systems	63	34	3
	Humidification, ventilation and air conditioning systems			
BAT 190	Preventing excessive energy consumption by determining optimum conditions for humidity and temperature within the facility	52	48	0
BAT 191	Using variable speed and frequency drivers in air conditioning systems	45	55	0
BAT 192	Reducing the condensing temperature (decreasing by 1°C reduces annual cooling costs by 2-4%)	23	68	9
BAT 193	Preventing the formation of non-condensable gas in the condenser to reduce the condensation temperature	25	64	11
BAT 194	Preventing clogging of the condenser heat exchanger and preventing fan and pump failures	39	57	4
BAT 195	Increasing the evaporation temperature (If the evaporation temperature is increased by 1°C, annual cooling costs decrease by 2-4%)	23	72	5
BAT 196	Preventing excessive energy consumption by ensuring optimum conditions for humidity and temperature within the facility	54	46	0
BAT 197	Using serpentine and pulverized (wound) systems in humidification in air handling units, taking into account the cooling needs of the fan (FOG system)	29	67	4
BAT 198	Optimization of electrical energy consumption in air handling units through applications such as pulley diameter, axial fan clearance, distance of the fan tip from the center, and separate connection of fan motors.	32	64	4
BAT 199	In fan systems, connecting electric motors separately from the fan, reducing the number of revolutions of the belt-pulley mechanism by using a belt mechanism and speed control mechanism system, and reducing electrical energy consumption by selecting the motor, power and speed of the fan and aspirator in accordance with the system	29	58	13
BAT 200	Reuse of indoor humid air by mixing it with outdoor dry air in certain proportions in ventilation and humidification systems	36	56	8
	Pre-treatment processes			
	Burning (gauze) process			
BAT 201	Periodic monitoring of air emissions (CO, NOx, etc.) in combustion processes	49	51	0
BAT 202	Use of advanced air purification technologies to remove odor-causing substances and reduce dust	37	50	13
BAT 203	Controlling the burners and fabric passage speed in the combustion unit	49	48	3
	Desizing process			
BAT 204	Selecting raw materials produced with efficient washing systems using low-input techniques and sized with highly biodegradable substances	37	53	10
BAT 205	Application of oxidation desizing process in cases where the raw material source cannot be controlled	29	66	5
BAT 206	Combining desizing/burning processes in a single step	39	61	0
BAT 207	Combining desizing/washing and bleaching in a single step	29	46	25
BAT 208	Recovery and reuse of sizing materials by appropriate methods	7	64	29
BAT 209	Recovery of desizing wastewater by oxidation/advanced oxidation methods	2	42	56
BAT 210	Recovery of sizing chemicals from desizing wastewater by membrane filtration	0	47	53
	Bleaching processes			
BAT 211	Use of pectate lyese enzyme in bleaching/hydrophilization process	16	64	20
BAT 212	Reducing the duration of the hydrophilization process by using reducing agents such as anthraquinan in the hydrophilization process	14	69	17

Table S1. (Continue)

BAT Number	Description	Implemented (%)	Potentially to be implemented (%)	Not projected to be implemented (%)
BAT 213	Application of hydrogen peroxide bleaching with techniques that minimize the use of hydrogen peroxide stabilizers or use highly biodegradable complexing substances	58	36	6
BAT 214	Using sodium chlorite in bleaching flax and bast fibers that cannot be bleached with hydrogen peroxide alone, preferring two-step hydrogen peroxide-chlorine dioxide bleaching (chlorine dioxide that does not contain elemental chlorine should be used)	15	52	33
BAT 215	Limiting the use of sodium hypochlorite to situations where high whiteness is desired and to fabrics that are fragile and subject to depolymerization	24	65	11
BAT 216	Using innovative chemicals whenever possible in bleaching processes (e.g. enzyme bleaching and ozone bleaching)	22	63	15
BAT 217	Performing bleaching/hydrophilization processes with enzymes and using peracetic acid in bleaching (Neutralization is not needed by applying these processes sequentially)	14	60	26
BAT 218	Replacing sodium hypochlorite and chlorine-containing chemicals with environmentally friendly substitutes in bleaching processes and thus preventing the formation of AOX (adsorbable organic halogens)	42	48	10
	Mercerization process			
BAT 219	Recovery and reuse of alkali in mercerization rinse water	6	63	31
BAT 220	Reuse of alkaline-containing wastewater in other preliminary processes	4	60	36
BAT 221	Caustic recovery from treatment wastewater by evaporation (In the evaporation method; first, coarse particles must be separated by rotary filters or pressurized micro-filtration and then evaporation is applied with the application of heat. In evaporation, 3-stage evaporation is generally applied. The concentrated caustic obtained It is purified and decolorized by techniques such as precipitation or the addition of hydrogen peroxide)	6	63	31
BAT 222	Caustic recovery from treatment wastewater by membrane filtration (Obtaining permeate water with high caustic content (approximately 6% NaOH) through nanofiltration/reverse osmosis processes using high pH-resistant membranes and concentrating the resulting permeate water by evaporation to produce the desired caustic It is possible to bring it to its content (18-25%)).	2	57	41
	Wool pretreatment, thermosetting and neutralization			
BAT 223	Use of closed-loop equipment and advanced oxidation processes to reduce/prevent air emissions from halogenated solvents in wool pre-treatment	4	56	40
BAT 224	Removal of some process steps performed after dyeing using enzymatic processes (neutralization, etc.)	8	59	33
BAT 225	Performing the thermosetting process before washing and treating the air emissions from the stenter with dry electrofiltration systems that allow separate collection of oils and energy recovery	12	75	13
	Pre-washing and rinsing processes			
BAT 226	Determination of water quality standards required for production processes using water	47	53	0
BAT 227	Controlling water consumption and monitoring it on a process basis	60	40	0
BAT 228	Establishing a monitoring system to monitor water consumption	47	53	0
BAT 229	Using water flow control devices and automatic shut-off valves in continuously operating machines	60	40	0
BAT 230	To prevent water waste, production procedures must be documented and used by employees.	27	64	9
BAT 231	Investigating the possibilities of combining different operations in one step	53	39	8
BAT 232	Increasing washing efficiency	53	40	7
BAT 233	Characterization of discrete wastewater streams and evaluation of water/material recovery and reuse opportunities	7	83	10
BAT 234	Developing and effectively implementing procedures to prevent water losses	40	60	0
BAT 235	Increasing washing efficiency by using water-efficient elements (water spray heads, spray nozzles, etc.) in facility and equipment cleaning, thereby saving water and reducing the amount of wastewater.	44	44	12

Table S1. (Continue)

BAT Number	Description	Implemented (%)	Potentially to be implemented (%)	Not projected to be implemented (%)
	Acidic demineralization processes			
BAT 236	Optimizing the recipes applied in production, taking into account environmental impacts	56	44	0
BAT 237	Handle and store all chemicals in accordance with the instructions given in the Substance Safety Data Guides.	56	44	0
BAT 238	Preventing all chemical spills, controlling and cleaning the area if a spill occurs, and preventing chemical spills from mixing with the receiving environment and sewage system.	56	44	0
BAT 239	Establishing automatic dosing and distribution systems for dosing chemicals (except paints)	44	56	0
BAT 240	In the selection and use of chemicals, in cases where production without the use of chemicals is possible, chemicals should not be used.	33	67	0
BAT 241	In the selection and use of chemicals and the use of surfactants; use of readily biodegradable surfactants instead of alkylphenol ethoxylates and other hazardous substances	44	56	0
BAT 242	In the use of complexing substances, especially in pre-treatment and dyeing processes, iron removal from the fabric by acidic demineralization or non-hazardous reducing agents	33	67	0
BAT 243	In cases where the use of chemicals is essential in the selection and use of chemicals, the use of the chemical with the least risk	56	44	0
BAT 244	Effective use of pH control methods in acidic and basic processes	56	44	0
	Hydrophilization processes			
BAT 245	Using automatic equipment to control bath volume and temperature in batch-operating machines	89	11	0
BAT 246	Determination of water quality standards required for production processes using water	44	39	17
BAT 247	Controlling water consumption and monitoring it on a process basis	67	33	0
BAT 248	Establishing a monitoring system to monitor water consumption	44	56	0
BAT 249	Using water flow control devices and automatic shut-off valves in continuously operating machines	89	11	0
BAT 250	To prevent water waste, production procedures must be documented and used by employees.	44	56	0
BAT 251	Investigating the possibilities of combining different operations in one step	78	22	0
BAT 252	Increasing washing efficiency	78	22	0
BAT 253	Characterization of discrete wastewater streams and evaluation of water/material recovery and reuse opportunities	22	78	0
BAT 254	Developing and effectively implementing procedures to prevent water losses	56	44	0
BAT 255	Increasing washing efficiency by using water-efficient elements (water spray heads, spray nozzles, etc.) in facility and equipment cleaning, thereby saving water and reducing the amount of wastewater.	44	42	14
BAT 256	Recovery of waste heat from waste gas and wastewater	22	78	0
BAT 257	Preheating of boiler feed water with waste gas heat in economizer	22	78	0
	Tubular slitting process			
BAT 258	Appropriate collection, storage and disposal of textile waste for reuse	89	0	11
BAT 259	Ensuring the reuse of textile waste for the production of different textile materials or other related products	67	11	22
	Synthetic Fiber Drawing Extruder (Nonwoven)			
BAT 260	Conducting process-based energy audits and identifying potential savings points	0	100	0
BAT 261	To prevent steam losses, complete steam insulation in machines	17	83	0
BAT 262	In the selection and use of chemicals and the use of surfactants; use of readily biodegradable surfactants instead of alkylphenol ethoxylates and other hazardous substances	0	100	0
BAT 263	Optimizing the recipes applied in production, taking into account environmental impacts	0	100	0

Table S1. (Continue)

BAT Number	Description	Implemented (%)	Potentially to be implemented (%)	Not projected to be implemented (%)
BAT 264	Preventing all chemical spills, controlling and cleaning the area if a spill occurs, and preventing chemical spills from mixing with the receiving environment and sewage system.	17	83	0
BAT 265	Using automatic equipment to control bath volume and temperature in batch-operating machines	0	100	0
BAT 266	Characterization of discrete wastewater streams and evaluation of water/material recovery and reuse opportunities	0	100	0
BAT 267	Developing and effectively implementing procedures to prevent water losses	17	83	0
BAT 268	Optimizing the recipes applied in production, taking into account environmental impacts	0	100	0
BAT 269	Preventing all chemical spills, controlling and cleaning the area if a spill occurs, and preventing chemical spills from mixing with the receiving environment and sewage system.	0	100	0
BAT 270	In the selection and use of chemicals and the use of surfactants; use of readily biodegradable surfactants instead of alkylphenol ethoxylates and other hazardous substances	0	100	0
	Drawing and tensile processes			
BAT 271	Optimizing the recipes applied in production, taking into account environmental impacts	0	100	0
BAT 272	To prevent energy waste, production procedures must be documented and used by employees.	33	67	0
BAT 273	Controlling and monitoring energy consumption	0	100	0
	Drying processes			
BAT 274	Increasing the burner capacity to operate steam boilers at the highest efficiency by controlling the burning rate and load change (70-90% level)	17	83	0
BAT 275	Boiler efficiency should be optimized (Too frequent changes in boiler load negatively affect boiler efficiency)	33	67	0
BAT 276	Steam storage (Allows balance of changes in steam need)	0	100	0
BAT 277	Optimizing boiler firing times and control systems	17	83	0
BAT 278	Preventing cold air from cooling the boiler by closing the chimney inlets after shutting down the boiler.	0	100	0
BAT 279	Obtaining equivalent capacity with more than one boiler instead of a single boiler increases boiler efficiency	17	83	0
BAT 280	Increasing the combustion air temperature (2% increase in boiler efficiency can be achieved by increasing the combustion air temperature)	17	83	0
BAT 281	In steam production, heat is recovered from the exhaust gases (waste heat from the process, economisers using combustion heat, use of de-vented feed water to heat the condensate, condensation of the steam used for stripping, and heating of the feed water going to the deaerator with a heat exchanger) and pre-treatment of the feed water with this recovered heat. heating	17	83	0
BAT 282	In order for heat to be transferred efficiently from combustion gases to steam, it is necessary to prevent the formation of boiler scales and to remove heat transfer floors.	33	67	0
BAT 283	Conducting process-based energy audits and identifying potential savings points	33	67	0
BAT 284	To prevent steam losses, complete steam insulation in machines	33	67	0
BAT 285	Optimizing boiler rooms with practices such as reusing steam condensates	17	83	0
BAT 286	Preheating of boiler feed water with waste gas heat in economizer	0	100	0
	Texturing			
BAT 287	Conducting process-based energy audits and identifying potential savings points	17	83	0
BAT 288	To prevent steam losses, complete steam insulation in machines	17	83	0
BAT 289	In the selection and use of chemicals and the use of surfactants; use of readily biodegradable surfactants instead of alkylphenol ethoxylates and other hazardous substances	17	83	0
BAT 290	Optimizing the recipes applied in production, taking into account environmental impacts	0	100	0

Table S1. (Continue)

BAT Number	Description	Implemented (%)	Potentially to be implemented (%)	Not projected to be implemented (%)
BAT 291	Preventing all chemical spills, controlling and cleaning the area if a spill occurs, and preventing chemical spills from mixing with the receiving environment and sewage system.	0	100	0
	Cutting			
BAT 292	Optimizing the recipes applied in production, taking into account environmental impacts	17	83	0
BAT 293	To prevent energy waste, production procedures must be documented and used by employees.	33	67	0
BAT 294	Controlling energy consumption	17	83	0
	Wrapping to dock			
BAT 295	Optimizing the recipes applied in production, taking into account environmental impacts	17	83	0
BAT 296	To prevent energy waste, production procedures must be documented and used by employees.	33	67	0
BAT 297	Controlling energy consumption	17	83	0
	Carding processes			
BAT 298	Optimizing the recipes applied in production, taking into account environmental impacts	17	83	0
BAT 299	To prevent energy waste, production procedures must be documented and used by employees.	33	67	0
BAT 300	Controlling energy consumption	17	83	0
	Texturing in nonwoven production			
BAT 301	Determination of water quality standards required for production processes using water	33	67	0
BAT 302	Controlling water consumption and monitoring it on a process basis	17	83	0
BAT 303	Establishing a monitoring system to monitor water consumption	17	83	0
BAT 304	Using water flow control devices and automatic shut-off valves in continuously operating machines	33	67	0
BAT 305	To prevent water waste, production procedures must be documented and used by employees.	33	67	0
BAT 306	Investigating the possibilities of combining different operations in one step	0	100	0
BAT 307	Increasing washing efficiency	33	67	0
BAT 308	Characterization of discrete wastewater streams and evaluation of water/material recovery and reuse opportunities	0	100	0
BAT 309	Developing and effectively implementing procedures to prevent water losses	33	67	0
BAT 310	Increasing washing efficiency by using water-efficient elements (water spray heads, spray nozzles, etc.) in facility and equipment cleaning, thereby saving water and reducing the amount of wastewater.	33	67	0
	Texture bonding processes in nonwoven production			
BAT 311	Controlling water consumption and monitoring it on a process basis	33	67	0
BAT 312	Establishing a monitoring system to monitor water consumption	17	83	0
BAT 313	Using water flow control devices and automatic shut-off valves in continuously operating machines	33	67	0
BAT 314	To prevent water waste, production procedures must be documented and used by employees.	33	67	0
BAT 315	Investigating the possibilities of combining different operations in one step	0	100	0
BAT 316	Increasing washing efficiency	33	67	0
BAT 317	Characterization of discrete wastewater streams and evaluation of water/material recovery and reuse opportunities	0	100	0
BAT 318	Developing and effectively implementing procedures to prevent water losses	33	67	0
BAT 319	Increasing washing efficiency by using water-efficient elements (water spray heads, spray nozzles, etc.) in facility and equipment cleaning, thereby saving water and reducing the amount of wastewater	33	67	0

Table S1. (Continue)

BAT Number	Description	Implemented (%)	Potentially to be implemented (%)	Not projected to be implemented (%)
	Thermosetting process			
BAT 320	Performing the thermosetting process before washing and treating the air emissions from the stenter with dry electrofiltration systems that allow separate collection of oils and energy recovery	0	100	0
	Dyeing processes			
BAT 321	Use of dyes that have high adhesion to fiber	64	36	0
BAT 322	Using auxiliary chemicals that will not prevent the dyes from adhering to the fiber at a high rate	61	39	0
BAT 323	In dosing and distribution of paint formulations; reducing the number of dyes (e.g. by using trichromatic systems) and using automatic dosing and dispensing systems (manual systems can be used only for infrequently used dyes).	48	50	2
BAT 324	Reuse of dyeing wastewater in dyeing (By separating the dyeing bath wastewater from the washing wastewater after dyeing, it is possible to reuse the waste dyeing bath. By reusing the dyeing bath, a significant reduction in wastewater flow rate, BOD and COD loads can be achieved. In addition, with this method, dyeing wastewater can also be recycled. may be possible)	13	53	34
BAT 325	Storage of the dyeing bath (The bath solution is stored in a tank or in a second dyeing machine. At that time, the emptied dyeing machine is washed. The dye bath can continue to be used on the side line. On the finished washing line, the bath solution is pumped again.)	14	51	35
BAT 326	Elimination and reuse of dye and chemical deficiencies in the dyeing bath (Even if there is turbidity in the dyeing bath, the turbidity is first eliminated by extraction (for example, using toluene). Then, the missing dye and chemicals are added. Different dyeing bath improvement methods may need to be developed for different bath solutions.)	9	43	48
BAT 327	Reuse of dyeing wastewater after treatment (Thus, the concentration of dissolved solids in the washing wastewater after dyeing can decrease from 3500 mg/l to 5000-6000 mg/l)	2	39	59
BAT 328	Reuse of washing wastewater after dyeing by membrane filtration (As a result of purifying the dyeing bath wastewater by nanofiltration/reverse osmosis with a pressure application of approximately 7-10 bar, 65-70% reusable filtrate can be produced. It is obtained from the hot dyeing bath wastewater and hot filtrate can be reused in washing after dyeing)	0	57	43
BAT 329	Reuse of washing wastewater after dyeing by adsorption (It is possible to purify the dyeing wastewater (especially the first washing wastewater) with activated carbon and thus ensure the effective removal of organic components. The salt content of the wastewater passed through activated carbon columns (approximately 80 g/l) does not change, the wastewater is bright and shiny. It turns into a colorless form; therefore, it can be used to prepare bath solutions. The fact that hot wastewater can be passed through activated carbon also saves energy.)	2	58	40
BAT 330	Treatment of dyeing wastewater by chemical precipitation (It is possible to recycle dyeing wastewater resulting from cotton textile manufacturing by chemical precipitation. The best results can be obtained if aluminum sulfate, cationic organic polyelectrolyte and very low doses of anionic polyelectrolyte are used together. With this process, high (> 90%) color removal and low COD removal (40-50%) can be achieved. It is possible to use the resulting water for different purposes. This method is negatively affected by high dissolved solids, temperature, detergent and COD content.)	7	52	41
BAT 331	Use of the final washing tank wastewater after dyeing in dyeing (Wastewater from the last washing applied after dyeing is used in the preparation of the dyeing bath since they are relatively clean)	11	55	34
	Exhaust dyeing processes			
BAT 332	Using equipment with automatic control mechanisms and a good insulation system to minimize steam losses	50	50	0
BAT 333	Selecting the machines most suitable for the lot sizes to be processed	61	39	0
BAT 334	Low or very low liquor ratio in the selection of new machines; Separation of process liquor and washing liquor; Looking for features such as the ability of the liquor to be separated from the product during the process	57	43	0
BAT 335	Application of fill and empty systems instead of overflow washing method	52	45	3

Table S1. (Continue)

BAT Number	Description	Implemented (%)	Potentially to be implemented (%)	Not projected to be implemented (%)
BAT 336	Avoiding overflow as much as possible (investigating the causes of overflow, optimizing or using automated systems)	52	45	3
BAT 337	Reuse of rinse water for next dyeing	13	60	27
BAT 338	Reuse of dye bath whenever technically possible	9	35	56
	Continuous dyeing processes (Impregnation technique)			
BAT 339	Reducing concentrated liquor losses	34	66	0
BAT 340	Using low-input processes and minimizing the volume of the impregnation vessel when impregnation and dyeing techniques are used	34	66	0
BAT 341	Adoption of distribution systems where chemicals are dispensed on-line through separate lines and mixed immediately before application	25	75	0
BAT 342	Use of advanced systems in dosing impregnation liquors	25	75	0
BAT 343	Using countercurrent washing	25	75	0
BAT 344	Removing the remaining dirty water from the fiber using squeezing rollers and similar equipment before the next washing step	29	71	0
	Dyeing of polyester and its mixtures with disperse dyestuff			
BAT 345	Avoiding the use of dangerous carrier	63	37	0
BAT 346	Instead of organic carriers containing chlorine, use of carriers containing benzylbenzoate and N-alkylphthalimide groups, which do not contain chlorine groups, cause less odor problems in the operation and have low volatility	59	37	4
BAT 347	Using polytrimethylene terephthalate (PTT) instead of standard Polyethylene terephthalate (PET), which can be dyed without the use of carriers, to reduce emissions in the workplace/environment and reduce energy consumption	19	46	35
BAT 348	Using reducing agents based on sulfinic acid derivatives instead of sodium dithionite	38	51	11
BAT 349	Avoiding the use of sodium dithionite by using disperse dyes that can be removed by hydrolytic solubilization in an alkaline environment rather than by reduction.	28	40	32
BAT 350	Use of optimized paint formulations with high biodegradability and containing dispersants	53	38	9
	Dyeing process with sulfur dyestuffs			
BAT 351	Instead of conventional powder and liquid sulfur dyes, use of pre-reduced liquid dye formulations with sulfur content less than 1% or stabilized non-pre-reduced sulfur-free dyes	8	92	0
BAT 352	Using primarily sulfur-free reducing agents or sodium dithionite instead of sodium sulfur	10	90	0
BAT 353	Taking precautions to ensure that only the amount of reducing agent required to reduce the dyestuff is used (for example, using nitrogen to remove oxygen from the liquor and air in the machine)	8	92	0
BAT 354	Preferring hydrogen peroxide as oxidant	14	86	0
	Dyeing process with reactive dyestuffs			
BAT 355	Use of reactive dyes that have high adhesion to fiber and require low salt	54	43	3
BAT 356	Avoiding the use of surfactants and complexing substances in the rinsing and neutralization steps after dyeing by applying hot rinsing and recovering energy.	48	43	9
BAT 357	Avoiding the use of urea and using silicate-free fixing methods	41	51	8
BAT 358	Use of continuous (semi-continuous) dyeing methods that do not use urea, sodium silicate and salt when dyeing cellulose fibers with reactive dyes	19	33	48
	Dyeing of woolen fabric			
BAT 359	Using reactive dyes instead of chrome-containing dyes or, where this is not possible, using very low chromium-containing dyes	23	61	16
BAT 360	Minimizing the mixing of heavy metals into wastewater during dyeing with metal complex dyes	15	52	33
BAT 361	Application of pH control methods in dyeing with acid and basic dyes	23	61	16

Table S1. (Continue)

BAT Number	Description	Implemented (%)	Potentially to be implemented (%)	Not projected to be implemented (%)
	Printing processes			
BAT 362	Reducing water consumption in cleaning processes	25	67	8
BAT 363	Avoiding the use of urea by using a one-step printing method with controlled moisture addition	14	62	24
BAT 364	Use of suitable printing pastes with low volatile organic carbon emissions (emission value < 0.4 g Org.-C/kg textile)	20	72	8
BAT 365	Use of suitable printing pastes that do not contain alkyl phenol ethoxylate (APEO) and have high biodegradability	25	71	4
BAT 366	Use of suitable printing pastes with reduced ammonia content (emission value: 0.6 g NH3/kg textile)	21	72	7
BAT 367	Use of new generation printing thickeners containing polyacrylic acid or polyethylene glycol instead of mineral oils	21	74	5
BAT 368	Optimizing and minimizing the volumes of printing paste feeding systems in rotary and flat printing machines	16	77	7
BAT 369	Recycling of printing pastes remaining in the feeding systems of rotation printing machines	20	73	7
BAT 370	Using more efficient washing techniques (in terms of water consumption) in washing the printing cylinders after rotation printing	13	87	0
BAT 371	Making the printing paste feeding system more efficient and automating in flat printing machines	4	96	0
BAT 372	Reducing the paste remaining on the template by modifying the squeegees in flat printing machines	5	95	0
BAT 373	Energy savings are achieved by eliminating the fixation step in pigment printing or fixing at low temperatures using ammonium chloride and ammonium sulfate catalysts.	11	62	27
BAT 374	Optimizing the size and covering of feeding equipment/tanks in print dyeing	20	76	4
BAT 375	Avoiding washing after pigment printing	25	71	4
BAT 376	Reducing printing paste losses in rotation printing	25	71	4
BAT 377	Using digital ink-jet printing machines for short-run (less than 100 m) production of plain fabrics	16	77	7
BAT 378	Using digital printing machines for printing bulky fabrics	11	75	14
	Finishing processes			
BAT 379	Using fill-drain washing or smart rinsing techniques instead of overflow washing/rinsing	45	44	11
BAT 380	Reducing water and energy consumption in continuous operations by using high-efficiency washing machines and energy recovery equipment	43	46	11
BAT 381	In cases where the use of halogenated organic solvents cannot be avoided, the use of completely closed circuit equipment and the evaluation of the use of relatively clean washing/rinsing wastewater for cleaning purposes.	21	59	20
BAT 382	Use of new generation equipment that includes active carbon filters that work in a completely closed system during the washing of textiles.	11	57	32
BAT 383	Avoiding extra washing and overwashing as much as possible in fabric dyeing (if possible, reusing the last washing-rinsing bath).	48	41	11
BAT 384	Reducing the number of washing baths by increasing washing and dyeing efficiency with the use of chemicals such as cyclodextrin, liposome and dendliner.	18	60	22
BAT 385	Reuse of wastewater generated during the last rinse in fabric dyeing without purification	16	64	20
BAT 386	Reusing rinse water in technically possible processes without purification	11	66	23
BAT 387	Reusing the rinse water as process water after combining it with similar wastewater streams and after treatment	9	60	31
BAT 388	Evaluation of the use of relatively clean washing/rinsing wastewater for cleaning purposes	11	51	38
BAT 389	Reuse of finishing wastewater in other processes	7	66	27
BAT 390	Neutralization of finishing wastewater with alternative methods instead of sulfur/citric acid	7	50	43
BAT 391	Minimizing wastewater generation with application techniques such as foam and spraying	11	72	17

Table S1. (Continue)

BAT Number	Description	Implemented (%)	Potentially to be implemented (%)	Not projected to be implemented (%)
BAT 392	Minimizing energy consumption in stenters through methods such as insulation, energy recovery, and the use of mechanical pre-drying devices.	48	41	11
BAT 393	Use of optimized recipes with low air emissions	34	42	24
BAT 394	Oxidation techniques (thermal combustion, catalytic combustion), condensation techniques (e.g. heat exchangers), absorption techniques (e.g. aqueous scrubbers), particle separation techniques (e.g. electrostatic precipitators, cyclones, fabric filters) to reduce flue gas emissions from textile finishing processes) and using adsorption techniques (e.g. activated carbon adsorption)	27	57	16
BAT 395	By using minimal volume application equipment, including solution cleaning and recycling systems, electronic measurement and process control are performed on these equipment.	21	62	17
BAT 396	Use of low or formaldehyde-free products in anti-crease processes (Dimethylolurea, melamine formaldehyde condensation products, diBAThyloldihydroxyethyleneurea (DMDHEU) derivatives instead of dimethyloldihydroxyethyleneurea (DMDHEU), use of modified dimethyldihydroxyethyleneurea)	39	48	13
BAT 397	Instead of applying softeners in batch dyeing machines, they are applied in pads or, better yet, by spraying or foam systems.	41	43	16
BAT 398	Periodic monitoring of PM, CO, NOx, formaldehyde and VOCs in direct heated dryers (stenters)	38	45	17
BAT 399	Optimizing the exhaust air flow inside the oven (up to 15% energy savings can be achieved): Reducing the exhaust air flow inside the oven by minimizing the moisture content of the fabric before it enters the stenter	43	39	18
BAT 400	Heat recovery (up to 70% energy savings can be achieved): Heat recovery from exhaust using heat exchangers (air-to-water)	30	59	11
BAT 401	Insulation (up to 20% energy savings can be achieved): proper insulation of the stenter lining	48	41	11
BAT 402	Heating systems: Use of new indirect gas combustion systems, in which, thanks to a flue gas/air heat exchanger, the heat generated by the burner flame is transferred directly to the circulating air in the center	23	59	18
BAT 403	Burner technology (methane emissions can be minimised): use of optimized ignition systems and regular maintenance of the burner in directly heated stenters	46	41	13
BAT 404	Various techniques: Use of optimized nozzles and air direction systems	36	45	19
BAT 405	Use of easy-care products that do not contain formaldehyde or have reduced formaldehyde content (<0.1% formaldehyde content in the formulation) that create cross-linking during final treatments	50	37	13
BAT 406	Saving natural gas by modifying the burners (air mixed or structural modification) in direct heated stenters	39	45	16
BAT 407	Optimizing passage speeds in stenters	55	34	11
BAT 408	In suitable stenters, making use of the hot air inside the stenter as effectively as possible and making modifications to the stenter chimneys for this purpose.	43	44	13
BAT 409	Monitoring the fabric moisture content in stenters and optimizing or adjusting the stenter passage speed by taking this factor into account	36	53	11
BAT 410	Removing excess water remaining on the fabric before drying by using effective squeezing processes and thus reducing the energy need for drying where technically possible	50	39	11
BAT 411	Use of low-emission preparation chemicals (e.g. caprolactam is formed during thermosetting of PA 6)	23	57	20
BAT 412	Avoiding the use of perchlorethylene in dry cleaning processes	16	63	21
BAT 413	Adapting appropriate material preparation procedures	52	37	11
BAT 414	Ensuring that the chemical used passes into the fiber with 98% efficiency	36	45	19
BAT 415	If the chemical used is applied in a dye bath; Ensuring pH<4.5 at the end of the process and if this is not possible, applying the chemical used against pests in a separate step and reusing the liquor	21	61	18
BAT 416	Preventing spills as a result of overflow	65	35	0
BAT 417	If the chemical used is applied in a dye bath; Selection of dyeing auxiliaries that do not delay or prevent the uptake of the insect protection substance by the fibers in the dyeing process	21	61	18

Table S1. (Continue)

BAT Number	Description	Implemented (%)	Potentially to be implemented (%)	Not projected to be implemented (%)
BAT 418	Installation of an electric filter for odor removal and oil recovery during pre-fixation	0	0	100
BAT 419	Pre-washing before pre-fixing stenters	0	0	100
	Wastewater streams and wastewater treatment systems			
BAT 420	Identifying and characterizing process wastewater sources and thus investigating reuse possibilities with or without treatment.	16	77	7
BAT 421	Reuse of process wastewater with similar characteristics after combining and purifying	7	70	23
BAT 422	Characterization of composite wastewater and reuse as process water after purification with appropriate treatment processes	5	70	25
	Separated wastewaters			
BAT 423	Thermal Fenton Process is applied for separate collection and separate treatment of wastewater containing high COD, ensuring the values (color, toxicity, COD) in the discharge standards.	4	43	53
BAT 424	Evaluation of the possibilities of reuse of rinse water in the next dyeing	20	54	26
BAT 425	Recycling of other wastewaters, except pre-treatment and finishing process wastewaters (Except for wastewaters from pre-treatment (hydrophilization and bleaching) and finishing processes (impregnation bath wastes), other wastewaters can be combined and recycled into the production process by ultrafiltration + nanofiltration + reverse osmosis application)	7	53	40
BAT 426	Determination and implementation of options that allow water, energy and chemical reuse (reuse of mercerization washing water without purification in bleaching)	14	57	29
BAT 427	Reuse of cooling water (It is possible to recycle the cooling water that does not come into contact with the product in a closed circuit and transfer the used water to a tank and reuse it in the process)	45	55	0
BAT 428	Separate collection and reuse of cooling water (Cooling water that does not come into contact with the fabric/yarn can be collected in a tank and used in processes that require hot water such as dyeing, bleaching, washing. For example: condenser-cooling water, heat exchanger water, water from compressors, etc.)	43	57	0
BAT 429	Preventing contamination risks by checking coils and cooling water quality	45	55	0
BAT 430	Reuse of waste dyeing bath water in the same process without purification (after chemical deficiencies are eliminated)	14	48	38
BAT 431	Reuse of final washing tank wastewater without purification in dyeing. Reuse of process wastewater streams (washing, rinsing, softening, neutral washing, acidification, etc.) without purification in the same process (considering chemical and energy recovery) or in processes where appropriate water quality is required (dyeing, etc.).	13	63	24
BAT 432	Use of relatively clean washing/rinsing wastewater for cleaning purposes	13	49	38
BAT 433	Reuse of washing wastewater from printing and dyeing band cleaning (It is possible to collect this wastewater, which is slightly colored and may contain fiber, in a tank after mechanical filtration and reuse it in the same process. This practice is especially valid in cases where the addition of clean water is low, and 70% water content is can save money)	11	66	23
BAT 434	Wastewater recovery from printing dye sludge (Water recovery (90%) is possible by applying microfiltration/ultrafiltration (with polypropylene filters) to the printing dye sludge after the coagulation/precipitation pre-treatment stage. Nanofiltration application after microfiltration/ultrafiltration is used as washing water in printing dyeing. can supply water)	4	59	37
	Treatment of composite wastewater and reuse			
BAT 435	Biological treatment (Aerobic or anaerobic biological treatment systems)	20	61	19
BAT 436	Activated sludge system with low nutrient/microorganism (F/M) ratio	18	63	19
BAT 437	It is anaerobic treatment (Textile wastewater containing high concentrations of dyestuffs can be treated anaerobically)	2	28	70
BAT 438	It is an anaerobic-aerobic purification process. (Aerobic process can be applied after the anaerobic process to remove aromatic amines remaining in the water after anaerobic treatment)	4	49	47

Table S1. (Continue)

BAT Number	Description	Implemented (%)	Potentially to be implemented (%)	Not projected to be implemented (%)
BAT 439	Coagulation/flocculation (Both inorganic (alum, lime, magnesium and iron salts) and organic (polymers) coagulants are used individually or in combinations to remove color from dyestuff-containing textile wastewaters)"	11	64	25
BAT 440	Purification of wastewater by flocculation/sedimentation and burning of the resulting sludge	4	44	52
BAT 441	Adsorption process (Active carbon is the most used adsorbent in the treatment of textile wastewater, especially for color removal)	2	38	60
BAT 442	Oxidation/advanced oxidation processes (Oxidants (ozone, chlorine, chlorine dioxide, permanganate, oxygen, etc.) can provide COD and color removal by mineralizing and/or partially oxidizing organic dyes in wastewater.	4	36	60
BAT 443	Membrane processes (Pressure membrane processes used in the treatment of textile wastewater are microfiltration (MF), ultrafiltration (UF), nanofiltration (NF) and reverse osmosis (TO))	0	40	60
BAT 444	Treatment and reuse of textile wastewater with membrane processes (Wastewater originating from the textile industry can be treated with membrane processes, respectively, following balancing and neutralization works, and the purified water taken from the RO or NF output can be directly used back in the textile industry production processes)	0	40	60
BAT 445	Treatment with membrane bioreactors (MBR) (With the MBR system, which is a combination of aerobic biological treatment and membrane process, the treatment of textile wastewater with high and complex pollution can be achieved with very high efficiency)	0	40	60
BAT 446	Membrane bioreactor (MBR) + Nanofiltration (NF) (One of the best techniques for the purification and reuse of textile wastewater is the purification of MBR effluent in the NF process. In this composite membrane configuration, the purified water at the NF outlet can be reused within the facility)	0	40	60
BAT 447	Treatment of wastewater with approximately 60% water recovery (Activated sludge + adsorption + sedimentation + flocculation/precipitation/flotation + sand filtration + activated carbon filtration + RO)	0	40	60
BAT 448	Treatment with coagulation/flocculation/sedimentation and microfiltration processes (COD removal efficiency obtained from this treatment combination can be in the range of 80-90%. Water taken from the microfiltration outlet can be reused for cleaning purposes within the facility)	4	64	32
BAT 449	Application of oxidation/advanced oxidation before biological treatment	4	64	32
BAT 450	Treatment with ozonation + activated sludge system (In the treatment system where ozonation and activated sludge are used together, the effluent COD value can be reduced to 50 mg/l)	0	68	32
BAT 451	Oxidation/advanced oxidation application after biological treatment (The aim is to mineralize the organics that remain after biological treatment and are difficult to decompose/not biodegradable and to provide additional color removal)	4	64	32
BAT 452	Activated sludge system + flocculation + settling + ozonation application (In this system, the outlet COD value can be reduced to 50-100 mg/l)	4	64	32
BAT 453	Activated sludge system + coagulation + flocculation + sedimentation + powder activated carbon application (80-95% COD and 85-95% color removal can be achieved from treated textile wastewater with this combination)."	2	66	32
BAT 454	Activated sludge system + flocculation / sedimentation + sand filter application (In this system, the outlet COD value can be reduced to 100 mg/l)	4	64	32
BAT 455	Activated sludge system + powdered activated carbon + sand filter implementation (The exit water COD value can be reduced to 20 mg/l and a good color removal efficiency can be achieved)	0	68	32
BAT 456	Treatment with biological and membrane processes (Textile wastewater can be treated well and treated with membrane processes following biological treatment, especially for the reuse of the treated water)	4	71	25
BAT 457	Treatment by aerobic treatment and nanofiltration (Usually >85% COD, >90% color and approximately 50% conductivity removal can be achieved by applying nanofiltration to textile wastewater pre-treated with aerobically activated sludge process)	2	66	32
BAT 458	Treatment with anaerobic treatment and nanofiltration (Usually >85% COD, >90% color and approximately 50% conductivity removal can be achieved by applying nanofiltration to anaerobically pre-treated textile wastewater)	0	68	32

Table S1. (Continue)

BAT Number	Description	Implemented (%)	Potentially to be implemented (%)	Not projected to be implemented (%)
	Prevention and control of waste gas emissions			
BAT 459	Use of less toxic and lower-emitting substances as raw materials and auxiliaries for fugitive emissions arising from all textile production processes (textile raw materials, auxiliary materials and chemicals, and machines)	61	31	8
BAT 460	Reducing fuel consumption and pollutant emissions through energy savings for fugitive emissions from all textile production processes (textile raw materials, auxiliaries and chemicals, and machinery)	48	38	14
BAT 461	Using water-based products instead of solvent-based products	54	43	3
BAT 462	Controlling particle emissions using aqueous washing systems	45	49	6
BAT 463	Reducing NOx and SO2 emissions through operational optimization of steam boilers	57	38	5
BAT 464	Using equivalents instead of toxic chemicals, taking into account MGBF information	50	47	3
BAT 465	Determination of air pollutant sources and their emissions	70	27	3
BAT 466	Planning the production program in a way that does not create toxic and harmful air pollutants	45	45	10
BAT 467	Preventing chemical substances from spilling and evaporating and causing air pollution	71	29	0
BAT 468	Controlling volatile organic compounds (VOCs) in emission sources at the source using methods such as concentration, aqueous washing and thermal combustion	38	59	3
BAT 469	Determining and periodically monitoring air emission sources in the facility	43	30	27
BAT 470	Using fuels that will create less waste gas emissions and have high calorific value	68	29	3
	Prevention and control of noise			
BAT 471	Taking precautions to reduce the vibration of equipment and providing sound insulation on the walls	29	60	11
BAT 472	Noise insulation to reduce noise in the weaving unit	20	51	29
BAT 473	Noise insulation to reduce noise in the spinning unit	13	47	40
BAT 474	Maintenance and replacement of old equipment	70	28	2
BAT 475	Operating equipment at different operating speeds (not operating the same type of equipment at the same speed)	41	35	24
BAT 476	Placing noise sources as far away from each other as possible	45	39	16
BAT 477	Use of flexible plastic machine joints	48	39	13
BAT 478	Use of sound-insulated buildings or sound insulation in buildings	21	63	16
BAT 479	Use of personal protective equipment to prevent employees from being affected by indoor noise	75	25	0
	Prevention and control of solid waste generation			
BAT 480	Separate collection of solid waste	86	14	0
BAT 481	Using bulky or recyclable containers	70	26	4
BAT 482	Monitoring/separate collection at the source of hazardous, non-hazardous or recyclable wastes generated during the production phase of basic and auxiliary processes	84	16	0
BAT 483	Expired (lost function) activated carbon used for solvent recovery during wool pre-treatment should be disposed of as hazardous waste or sent to specialized companies for regeneration.	15	85	0
BAT 484	Appropriate collection, storage and disposal of textile waste for reuse	88	12	0
BAT 485	Ensuring the reuse of textile waste for the production of different textile materials or other related products	63	31	6
BAT 486	Less fabric waste in purchasing parts/samples in production processes	66	31	3
BAT 487	Taking precautions/developing procedures to reduce waste amounts	63	35	2
BAT 488	Use of waste in regenerated yarn production	38	52	10