PAS 2395:2014

Specification for the assessment of greenhouse gas (GHG) emissions from the whole life cycle of textile products




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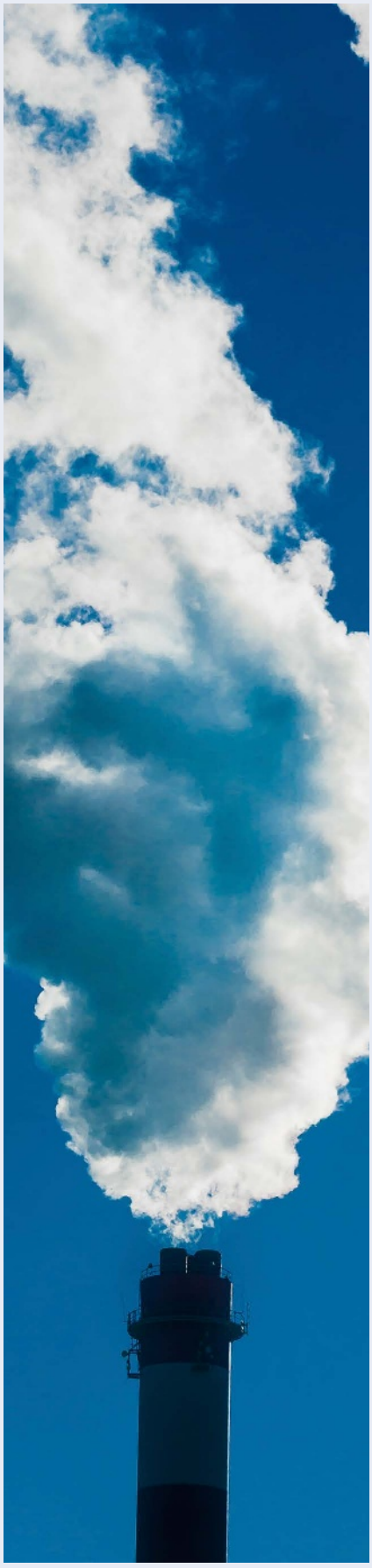

Foreword

This PAS was co-sponsored by Korea National Cleaner Production Center (KNCPC), Korea Institute of Industrial Technology (KITECH) and Ministry of Trade, Industry and Energy, Republic of Korea (MOTIE). Its development was facilitated by BSI Standards Limited and it was published under license from The British Standards Institution. It came into effect on 30 June 2014.

This PAS was based on an initial draft prepared by a technical authoring team consisting of:

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- The Textile Institute
- Waste & Resources Action Programme (WRAP)

This PAS is not to be regarded as a British Standard. It will be withdrawn upon publication of its content in, or as, a British Standard.

The PAS process enables a specification to be rapidly developed in order to fulfil an immediate need in industry. A PAS can be considered for further development as a British Standard, or constitute part of the UK input into the development of a European or International Standard.

Use of this document

It has been assumed in the preparation of this PAS that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is "shall".

Commentary, explanation and general informative material is presented in italic type, and does not constitute a normative element. The word "should" is used to express recommendations, the word "may" is used to express permissibility and the word "can" is used to express possibility, e.g. a consequence of an action or an event.

Spelling conforms to The Shorter Oxford English Dictionary. If a word has more than one spelling, the first spelling in the dictionary is used.

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a PAS cannot confer immunity from legal obligations.

Introduction

This PAS sets out requirements supplementary to PAS 2050:2011 and two other methodologies for the assessment of greenhouse gas (GHG) emissions from the life cycle of any products manufactured substantially from textiles.

The purpose of these supplementary requirements is to aid consistent application of generic methodologies for GHG emissions assessment to the textile products sector, by providing:

- textile product focus for aspects of the assessment where supplementary requirements are permitted and could prove beneficial to assessment outcomes;
- rules or assessment requirements that are directly relevant to the main sources of emissions from textile products;
- clarity on how to uniformly apply specific elements of assessment methodologies within the textile products industrial sector; and
- enhanced synergy between the assessment outcomes provided by different methodologies.

Used in conjunction with one of the specified methodologies, PAS 2395 will provide a robust, repeatable assessment of GHG emissions from the whole life cycle of textile products.

PAS 2395 adopts the same content sequence and structure as that of PAS 2050:2011 and, within that sequence, some clauses do no more than defer to the equivalent clause in the base methodology. In other clauses, PAS 2395 provides supplementary requirements and additional guidance on those elements that have been found to present particular difficulties when undertaking GHG emissions assessments on textile products, such as during the use stage and at recycling.

Because of the global nature of trade in textile products it is preferable that the supplementary requirements provided in PAS 2395 are applicable wherever assessment of emissions from textile products is to be made. The development of PAS 2395 has therefore been undertaken with participation by experts from different regions of the world, with the intention of providing a set of supplementary requirements that can be beneficially applied wherever textile products are manufactured and used.

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1 Scope

This PAS specifies supplementary requirements for the assessment of greenhouse gas (GHG) emissions from the whole life cycle of any products manufactured substantially from textiles. The supplementary requirements provided are compatible with, and precisely formatted on, the PAS 2050:2011 methodology, but do not actually require the use of PAS 2050:2011 as a base methodology.

PAS 2395 requires the user, as a first step, to identify, from a predetermined list of internationally applicable methods, a preferred GHG assessment methodology, and to apply the selected method uniformly throughout the subsequent assessment process, applying supplementary requirements provided by this PAS accordingly.

Throughout PAS 2395, the clauses setting out the supplementary requirements for the assessment of GHG emissions from textile products are formatted to align with the relevant PAS 2050:2011 clause, but also provide cross references to the appropriate equivalent clause(s)/section(s) in the alternative methodologies, to facilitate their use in those contexts.

PAS 2395 provides supplementary requirements that, used together with the PAS 2050:2011 methodology, provide a robust specification for the assessment of GHG emissions from textile products. When used with the other specified methodologies, it can also deliver credible GHG emissions assessments that are optimized for textiles and textile-based products.

PAS 2395 follows the precedent set by PAS 2050:2011 in not specifying requirements for communication of the results of a quantification of the GHG emissions from the life cycle of textile products. It does, however, point to the communication approaches provided by the other comparable methodologies as being appropriate for use when communication of the assessment outcome is intended or expected.

The list of base methodologies from which selection may be made are:

- ISO/TS 14067:2013;
- WRI/WBCSD's GHG Protocol *Product Standard*;
- PAS 2050:2011.

PAS 2395 addresses the single impact category of global warming potential (GWP). It does not assess other potential social, economic and environmental impacts arising from the provision of textile products, such as non-GHG emissions, acidification, eutrophication, toxicity, biodiversity or labour standards, or other social, economic and environmental impacts that may be associated with the life cycle of such products. An assessment of the GHG emissions of textile products using PAS 2395 in conjunction with PAS 2050:2011, ISO/TS 14067:2013 or WRI/WBCSD's GHG Protocol *Product Standard* does not, therefore, provide an indicator of the overall environmental impact of these products, such as may result from other types of life cycle assessment.

2 Normative references

At least one of the following referenced documents is indispensable for the application of this specification with the relevant document being determined under the provisions of **4.1**:

- PAS 2050:2011, *Specification for the assessment of the life cycle greenhouse gas emissions of goods and services;*
- ISO/TS 14067:2013, *Greenhouse gases – Carbon footprint of products – Requirements and guidelines for quantification and communication;*
- WRI/WBCSD, GHG Protocol, *Product Life Cycle Accounting and Reporting Standard* (the *Product Standard*).

For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

3 Terms and definitions

For the purposes of PAS 2395, the terms and definitions provided in whichever of PAS 2050:2011, ISO/TS 14067:2013 or the GHG Protocol *Product Standard* is selected under the provisions of **4.1** of this specification, together with the following, apply.

NOTE *The definitions provided in this PAS have been developed with assistance from the Textile Terms and Definitions Database with the generous cooperation of The Textile Institute.*

3.1 backing

secondary layer of material attached to the reverse of a textile as a carrier or substrate or to impart particular properties, e.g. heat retention

3.2 coating

application of a film to the surface of a textile to impart colour or particular properties, e.g. water repelling

3.3 extruding

forcing a malleable material (e.g. polymer) through an opening in a die to create a filament or fibre

3.4 fabric

material produced from fibres or continuous filament directly or in the form of yarn, by knitting, weaving or other interlocking process, by fusing using temperature elevation or by bonding with a cementing medium

3.5 fibre

textile raw material (natural or man-made) generally characterized by flexibility, fineness and a high ratio of length to thickness

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE *It can be staple (of finite length) or continuous.*

3.6 ginning

process whereby cotton fibres (lint) are removed from the seed

3.7 greige fabric

textile in its natural, untreated condition, i.e. before washing, bleaching or dyeing

NOTE *Also known as "grey fabric" and, for woven textile products, as "loomstate".*

3.8 heat setting

process of conferring stability of form upon fibres, yarns or textiles by means of single or multiple cycles of heating and cooling in dry or moist conditions

3.9 knitting

process of forming a fabric by the intermeshing of loops of yarn

3.10 non-woven (fabric)

fabric made directly from a web of fibres or continuous filament, without the yarn preparation necessary for weaving or knitting

NOTE *In a non-woven fabric, the assembly of textile fibres is held together by:*

a) a mechanical interlocking in a random web or mat;

b) the fusing of fibres, i.e. as with thermoplastic fibres; or

c) bonding with a cementing medium such as starch, casein, rubber latex, cellulose derivatives, or synthetic resin.

3.11 retting

subjection of flax or hemp to chemical or biological treatment to render the fibre bundles more easily separable from the woody part of the stem

3.12 scouring

treating textiles in aqueous or other media in order to remove natural fats, waxes, proteins and other constituents, as well as dirt, oil and other impurities

3.13 shearing

3.13.1 cutting

process of cutting loose fibre from the surface of a woven fabric

3.13.2 napping

creation of pile or nap (e.g. of a carpet) by cutting the tuft or loops that form the surface

NOTE *Shearing is also referred to as tufting.*

3.13.3 removal

process of removing the fleece from a sheep or other animal

3.14 spinning

drawing out, twisting and further treating of fibres (e.g. of cotton, wool or man-made polymer) to produce yarn

NOTE *This further treatment includes carding, combing, gilling and top making, drawing, roving and sliver formation.*

3.15 textile product

article made from processed, natural or man-made fibres

NOTE *These articles include threads, cords, ropes and braids; lace, nets and embroidery; hosiery, knitwear and made-up apparel; and household linens, soft furnishings, upholstery, carpets, rugs and mats. They also encompass technical, industrial and engineering textiles, including medical textiles and geotextiles.*

3.16 texturing

processing of yarn to introduce durable crimps, coils, loops or other distortions to create different textile surface finishes

3.17 weaving

formation of textiles by the interlacing of threads passing in one direction (weft) with others at right angles to them (warp)

3.18 yarn

assemblage of staple fibres or continuous filaments forming a continuous strand that can be used to create knitted, woven, braided, non-woven or other textiles

4 Principles and implementation

4.1 Overview

This PAS sets out how the assessment of GHG emissions from the cradle-to-grave stages (Figure 1) of textile products (Table 1) can be undertaken, on the basis of the assessment methodology provided by PAS 2050:2011. In addition, through the provision of cross references to the equivalent clauses in ISO/TS 14067:2013 or sections in the GHG Protocol *Product Standard*, it should be possible to use the provisions of this PAS with the methodology provided by one or other of those specifications, to deliver credible GHG emissions assessments that are optimized for textiles and textile-based products.

The primary objective of this PAS is to provide greater clarity as to how the GHG emissions from the various processes, such as land use, raw material sourcing, energy use and end of life recovery or disposal can best be attributed consistently to the textile products under assessment.

The following concepts are important for the proper use and understanding of this PAS.

Determination of product identity: the appropriate identification and definition of products under assessment can be of particular importance for textiles that are frequently used to provide covering for products substantially made of other materials. It is necessary that the reporting of any emissions assessment be unambiguous as to whether the assessment is in respect of the textile component alone or includes all parts of the finished product. It is recommended that the decision as to whether or not to include the emissions and removals from non-textile components be determined by the identification and functionality of the product as marketed. For example, the assessment outcome for a carpet with a non-textile backing should include the emissions arising from the backing material, whereas for a car seat with a textile covering, the assessment outcome could be for the car seat cover, which would include only the emissions and removals from the textile cover. For a car seat alone, the emissions and removals from all components would need to be included.

Unit of analysis: the determination and uniform use of an appropriate functional unit. It is necessary that the specific quantity and quality of products under assessment be determined as part of the scope of the particular assessment, and the functional unit, as such, can only be determined within the scope of such an assessment, in relation to the use and intended purpose of the textile products being assessed. Therefore, this PAS does not specify a standard functional unit but only provides a definition and some guidance on its determination in relation to specific situations.

Completeness of assessment: it is essential that the process to be assessed includes all activities related to the manufacture, use and disposal of the textile products under assessment, including raw material sourcing, energy use, transport, and recovery or reuse.

The potential GHG emissions likely to arise from textile products during their whole life cycle can be assessed in accordance with the requirements of PAS 2050:2011 alone. However, the additional use of PAS 2395 will enable the GHG emissions assessment to be undertaken with greater relevance to the particular life cycle traits of textile-based products.

As already mentioned, this PAS takes account of the whole life cycle of textile-based products. However, in a situation where a partial assessment is being undertaken to provide information to support assessments undertaken at subsequent stages of the supply chain, particular care will be required to ensure that the functional unit used in the earlier stages of the assessment is made known as part of the information provided, so as to facilitate the use of a common functional unit throughout.

4.2 Selection of base assessment methodology (BAM)

4.2.1 Default BAM

Unless selection of an alternative BAM as provided for in **4.1.2** of this PAS is made, an assessment of the GHG emissions and removals from textile products, in conformance with PAS 2395, shall be undertaken on the basis of the general requirements and principles specified in PAS 2050:2011, **4.1** and **4.2**, and the methodology set out in Clauses **5** to **9** of this PAS.

Figure 1 – Representative textile life cycle model

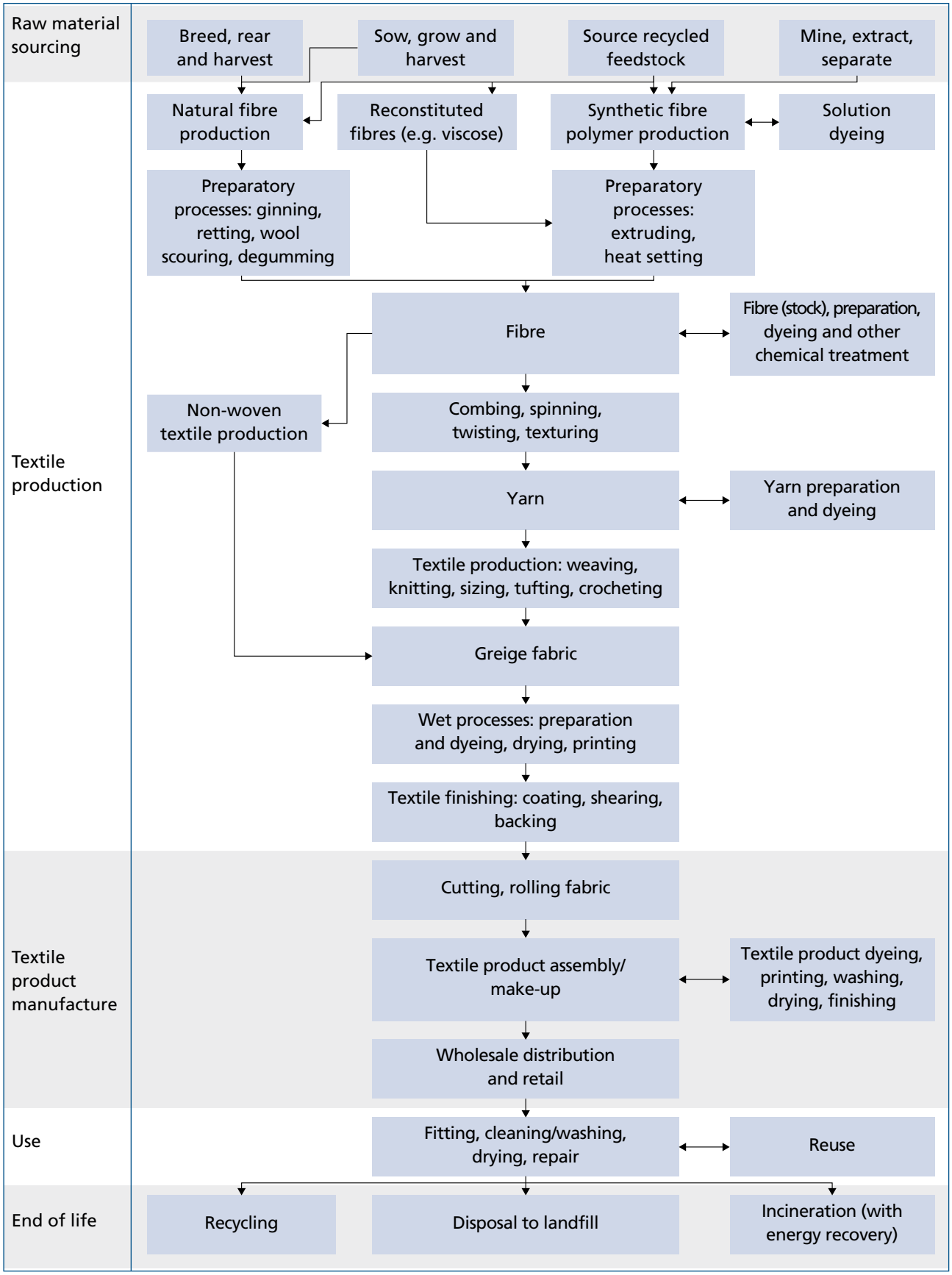

Table 1 – Indicative product categories under the heading of textile products

Clothing	Household	Industrial textiles and geotextiles
• Suits, dresses and ensembles • Shirts, t-shirts, blouses, sweaters, etc. • Trousers, skirts • Underwear, nightwear, hosiery • Sportswear and swimwear • Gloves, scarves, shawls, ties	• Carpet and floor coverings • Bed linen • Table linen • Curtains, blinds and furnishing fabrics • Blankets, rugs, etc. • Dishcloths, dusters, dust sheets, cleaning cloths • Kitchen and bathroom towels	• Anti-static • Electricity-conducting • Humidity-sensing • Insulating • Moisture-managing • Radiation-filtering • Thermal-regulating
NOTE 1 *The products listed under the three categories in the table are examples only and users of this PAS are likely to find the PAS equally applicable to other products under the same general headings.* ***NOTE 2*** *The examples provided under the industrial textiles and geotextiles category are referenced by their functionality for applications other than clothing and household products. It is acknowledged, however, that some of this functionality could be incorporated in clothing or household products, in which condition the PAS should be equally applicable.*		

4.2.2 Alternative BAM

Where PAS 2050:2011 is not used as the BAM, the methodology provided in either ISO/TS 14067:2013 or the GHG Protocol *Product Standard* shall be used as the BAM, provided only that the selected alternative is applied:

a) in accordance with the requirements of the respective specification;

b) at all stages of the life cycle of the textile product under assessment; and

c) uniformly throughout any given assessment.

4.3 The use of supplementary requirements – implementing PAS 2395 in conjunction with the selected BAM

This PAS sets out supplementary requirements that enable the assessment methodology provided in PAS 2050:2011 to be applied in an assessment of the GHG emissions from textile products with greater certainty of application than might be the case if PAS 2050:2011 were to be applied alone.

These supplementary requirements are presented sequentially in relation to the clause(s) of PAS 2050:2011 to which they apply and shall be implemented accordingly, where the selected BAM is PAS 2050:2011.

For GHG emissions assessments using one of the alternative BAMs specified in **4.1.2**, each clause of this PAS provides cross references to the relevant clauses in ISO/TS 14067:2013 and sections in the GHG Protocol *Product Standard* respectively, which shall be substituted for the designated PAS 2050:2011 clause, on a clause-by-clause or section-by-clause basis, throughout the assessment.

Assessments claimed to be in conformance with PAS 2395 shall not refer to more than one BAM in any given assessment.

4.4 Record-keeping

Records developed and maintained in support of an assessment undertaken in accordance with PAS 2395 shall meet the requirements of PAS 2050:2011, **4.4**.

4.5 Openness of declarations

All communication of assessment outcomes and declarations of conformance with this PAS (see Clause **10**) shall include unambiguous identification of the product under assessment [see **4.0**a)] and a reference to the BAM used for the assessment, and be presented in a manner that precludes any misunderstanding as to its scope (see PAS 2050:2011, **4.5**).

4.6 Substitution of an alternative BAM

4.6.1 General principles

The application principles that underpin the three assessment methodologies provided for in this PAS were derived from the same source and are broadly in alignment. However, users of this PAS are expected to confirm that the principles they work to in undertaking any assessment of GHG emissions from textile products are fully in accordance with the requirements of the selected BAM.

4.6.2 ISO/TS 14067:2013

Where the methodology provided in ISO/TS 14067:2013 has been selected as the BAM, the PAS 2050:2011 principles incorporated by Clause **4** shall be replaced by the equivalent ISO/TS 14067:2013 clauses, identified in Table 2.

4.6.3 GHG Protocol *Product Standard*

Where the methodology provided in the GHG Protocol *Product Standard* has been selected as the BAM, the PAS 2050:2011 principles incorporated by Clause 4 shall be replaced by the equivalent GHG Protocol *Product Standard* sections, identified in Table 2.

Table 2 – Assessment principles – BAM equivalence

Topic	PAS 2050:2011 clauses	ISO/TS 14067:2013 clauses	GHG Protocol *Product Standard* sections
1) General requirements	4.1	5.1	3.3
2) Principles	4.2	5.2 to 5.14	4.2
3) Supplementary requirements	4.3	6.2	5.3.2, Appendix A
4) Record-keeping	4.4	7	C.2.7, Appendix C
5) Implementation	4.5	6.3.4.2	7.2

5 Emissions and removals

5.1 Primary requirement

Unless selection of an alternative BAM as provided for in **4.1.2** of this PAS has been made, the requirements of PAS 2050:2011, Clause **5** shall be applied, supplemented by **5.2** of this PAS.

5.2 Supplementary requirements implementing PAS 2395 in respect of sources and emissions – inclusion of sources of GHG emissions

In accordance with PAS 2050:2011, **5.1**, the cradle-to-grave assessment of GHG emissions from textile products shall include GHG emissions and removals arising from all processes, inputs and outputs in the cradle-to-grave stages of textile products, including but not exclusive to:

- "emissions and removals of biogenic carbon… (e.g. in burning biomass for fuel) where that biogenic carbon does not become part of the [textile] product";
- CO_2 emissions arising from fossil carbon sources, e.g. fossil fuels and mineral conversion;
- CH_4 (methane) emissions arising from animal enteric fermentation and manure used as fertilizer or removed through waste disposal;
- N_2O (nitrous oxide) emissions arising from soils and agricultural processes.

NOTE *CO_2 emissions and removals related to biogenic carbon captured in a plant product intended for human or animal consumption (food and feed) may be excluded in accordance with PAS 2050:2011.*

Where atmospheric CO_2 sequestered during the raw material production phase is identified as a removal of CO_2, it shall subsequently be modelled as a release of CO_2 during the disposal phase.

5.3 Substitution of an alternative BAM

5.3.1 ISO/TS 14067:2013

Where the methodology provided in ISO/TS 14067:2013 has been selected as the BAM, the PAS 2050:2011 clauses referred to in **5.1** shall be replaced by the equivalent ISO/TS 14067:2013 clauses, identified in Table 3.

5.3.2 GHG Protocol *Product Standard*

Where the methodology provided in the GHG Protocol *Product Standard* has been selected as the BAM, the PAS 2050:2011 clauses referred to in **5.1** shall be replaced by the equivalent GHG Protocol *Product Standard* sections, identified in Table 3.

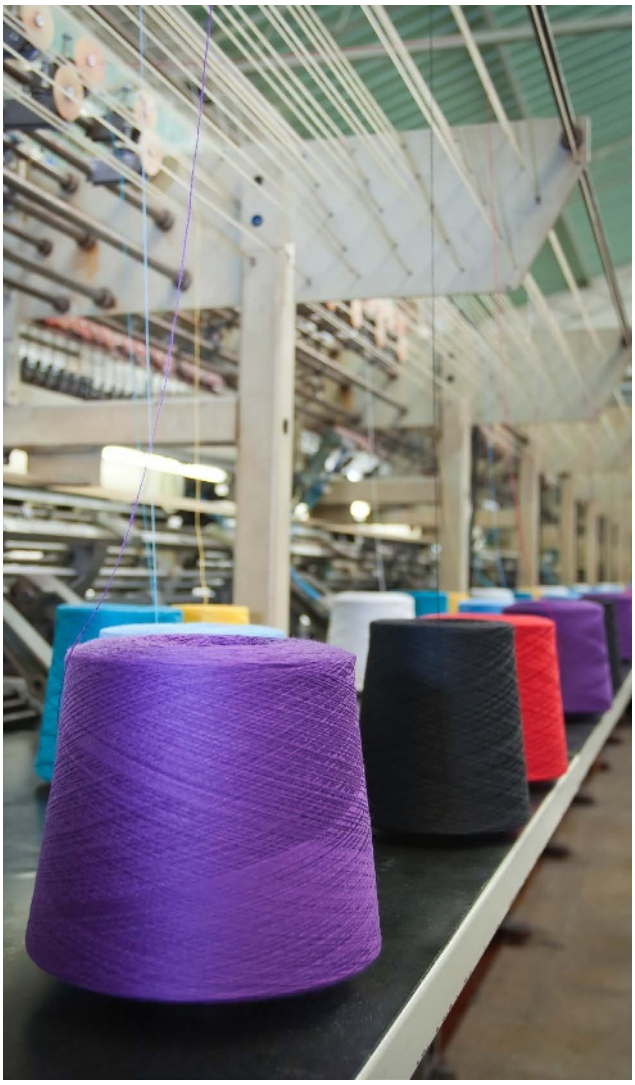

Table 3 – Sources of emissions and removals – BAM equivalence

Topic	PAS 2050:2011 clauses	ISO/TS 14067:2013 clauses	GHG Protocol *Product Standard* sections
1) Emissions and removals	5	6	4,12
2) Scope of GHG emissions and removals	5.1	6.3.1, 6.3.2	6,12.2
3) Time period for inclusion of GHG emissions and removals	5.2	6.3.6	11.2, Appendix B
4) Global warming potential (GWP)	5.3	6.5	10.2, 11.2
5) Aircraft emissions and removals	5.4	6.4.9.8	Not specifically referred to
6) Carbon storage in products	5.5	6.4.9.6	Not specifically referred to
7) Inclusion and treatment of land use change	5.6	6.4.9.4	Appendix B
8) Treatment of soil carbon change in existing systems	5.7	6.4.9.5	Appendix B
9) Offsetting	5.8	6.3.4.1	3.2, Table 3.1, 11.2, 11.3.2
10) Unit of analysis	5.9	6.3.3	6.2

6 System boundary

6.1 Primary requirement

Unless selection of an alternative BAM as provided for in **4.1.2** of this PAS has been made, the requirements of PAS 2050:2011, Clause **6** shall be applied, supplemented by **6.2** of this PAS.

6.2 Supplementary requirements implementing PAS 2395 in respect of the system boundary – inclusion and exclusion of life cycle processes

6.2.1 Establishing the system boundary for a textile product

The cradle-to-grave assessment of a textile product shall include the following activities, where they occur:

a) agriculture, including direct and indirect energy inputs, irrigation, crop protection and nutrient chemicals and pesticides, ginning, retting and degumming;

b) animal husbandry, including breeding, rearing, feeding, waste disposal, health control and shearing;

c) extraction, including mining, drilling and separation of required elements from base material;

d) textile production and yarn preparatory processes, including polymer synthesis and man-made fibre production, carding, drawing, combing, spinning, texturing, weaving, knitting, scouring, bleaching, and dyeing and chemical finishing processes, including water, chemicals and direct or indirect energy used;

e) product manufacture processes, including cutting, assembly/make-up, dyeing, printing or finishing, packaging materials, direct and indirect energy use, chemicals and water use;

NOTE *Emissions from the production of items for the embellishment of textile products (e.g. trims, buttons) may be excluded.*

f) transport, both between and within life cycle stages, e.g. from raw material source to textile production, and between product completion stages and wholesale/retail outlets, and from waste collection to recycling/waste processing (see also note to Table 5);

g) use/reuse phase: laundering or dry-cleaning, repairing/restyling, ironing/pressing, drying, vacuuming and carpet cleaning, and chemical finishing processes, taking into account electricity, detergent/chemical use and wastewater treatment;

h) end-of-life waste management through recycling, including composting of biodegradable materials, or disposal (e.g. through landfill or incineration).

For each of these activities, any inputs of energy and materials and outputs of waste and co-products shall be considered for inclusion within the system boundary of any particular textile product.

Where there is no standard system boundary for textile products, the activities, inputs and outputs that are employed for any particular textile product shall be identified, and a decision taken as to whether they constitute separate or integrated activities for different unit processes.

NOTE *It is accepted that for a), b) and c), primary data can be difficult to obtain and that, in most situations, secondary data will be used for these processes. Attention is drawn to the requirement of PAS 2050:2011,* ***7.3*** *that "Primary activity data shall be collected from those processes owned, operated or controlled by the organization" undertaking the assessment. This supplementary requirement cannot override or modify that requirement.*

6.2.2 Elements of the product system

When setting the system boundary for any given textile product, the input and output flows for each of the different processes listed in Table 4 and Table 5 shall be considered for inclusion, taking account of the materiality rules.

NOTE *Items listed may be excluded under the materiality rules (PAS 2050:2011,* ***6.3****) provided the nature, extent and reason for any such exclusion is unambiguously recorded.*

Table 6 identifies life cycle processes that shall be excluded from an assessment of GHG emissions from textile products.

Table 4 – Processes to be taken into consideration when setting the system boundary for a textile product

Phase	Source type	Source category (not exclusive)	Category subgroups (not exclusive)	Common unit for data collection	Contribution
1) Raw material sourcing	a) Agriculture for plant fibres, or feed for livestock, for animal fibres	Plant input material	Seeds Young plants	kg seeds per hectare Plant pieces per hectare	Medium
		Nitrogen (N) fertilizers	Nitrate Ammonium Other chemical N fertilizers	kg applied per hectare per year	High
		Chemicals for plant protection and nutrients	Herbicides Insecticides Fungicides Sulphate Lime Phosphate	kg applied per hectare per year	Low
		Organic fertilizers	Manure Compost Processed crops Amendments such as biochar	Total mass applied per hectare per year	Medium
		Energy carriers	Fuels from fossil origin Fuels from biogenic origin Electricity Combined heat and power	Any appropriate energy measure that (per year) can be unambiguously linked to GHG emissions of use and production (e.g. kWh per textile product)	High

Table 4 – Processes to be taken into consideration when setting the system boundary for a textile product *(continued)*

Phase	Source type	Source category (not exclusive)	Category subgroups (not exclusive)	Common unit for data collection	Contribution
		Materials used for plant protection	Netting Fencing Polytunnels Plastic film Mulches	kg of utilized material per year (for protection materials with a lifespan of more than one year, the annual impact should be calculated)	Low
		Land use change	Changes in carbon stocks as a result of land use change (particularly deforestation) in the previous 20 years; and non-CO_2 losses related to burning	Tonnes of above and below ground biomass loss per hectare per year (for the 20-year period) Tonnes of biomass burnt per hectare per year kg soil carbon change per hectare per year	Medium
	b) Livestock husbandry [for feed production processes, see a) Agriculture]	Feed processing	Drying, processing of feed crops and fodder Production of feed concentrates	kg plant biomass processed Units of energy used per kg plant material per year	Medium
		Breeding Rearing	Direct deposition of manure and urine on pastures accounts for direct and indirect N_2O emissions	kg N in waste per animal per year	Low
			Enteric fermentation (of ruminants) producing methane	kg CH_4 per animal per year	High

Table 4 – Processes to be taken into consideration when setting the system boundary for a textile product *(continued)*

Phase	Source type	Source category (not exclusive)	Category subgroups (not exclusive)	Common unit for data collection	Contribution
			Manure management for direct and indirect emissions of N_2O and CH_4	kg N_2O per animal per year kg CH_4 per animal per year	Medium
	c) Mining	Underground or deep mines	Energy sources for air supply to mine, e.g.: • tunnelling equipment • cutting machines • hoist mechanisms • conveyors	Any appropriate energy measure that (per year) can be unambiguously linked to GHG emissions of use and production (e.g. kWh per coal)	High
			Methane emission and capture	kg CH_4 per year	High
			Land use change	Tonnes of above and below ground biomass loss per hectare per year (for the 20-year period) Tonnes of biomass burnt per hectare per year kg soil carbon change per hectare per year	Medium

Table 4 – Processes to be taken into consideration when setting the system boundary for a textile product *(continued)*

Phase	Source type	Source category (not exclusive)	Category subgroups (not exclusive)	Common unit for data collection	Contribution
		Surface or opencast	Energy sources to power, e.g.: • draglines (removal of the overburden) • power shovels • bucket wheel excavators • conveyors	Any appropriate energy measure that (per year) can be unambiguously linked to GHG emissions of use and production	High
			Methane emission and capture	kg CH_4 per year	High
			Land use change	Tonnes of above and below ground biomass loss per hectare per year (for the 20-year period) Tonnes of biomass burnt per hectare per year kg soil carbon change per hectare per year	Medium
	d) Oil extraction and refining	Exploration Extraction Pipeline construction	Energy sources for: • drilling • well head operations	Any appropriate energy measure that (per year) can be unambiguously linked to GHG emissions of use and production	High

Table 4 – Processes to be taken into consideration when setting the system boundary for a textile product *(continued)*

Phase	Source type	Source category (not exclusive)	Category subgroups (not exclusive)	Common unit for data collection	Contribution
		Production of the chemical input stream to textile production processes	Energy use attributed to petroleum refining or production of ethene (C_2H_4, ethylene) Bought-in steam Bought-in quench water Bought-in electricity	Any appropriate energy measure that (per year) can be unambiguously linked to GHG emissions of use and production (e.g. kWh per refining product)	Medium
2) Textile production	a) Materials for spinning/ texturing	Air for cleaning Solution additives Preparation agents Lubricants Paraffin Other chemicals Water Packaging: • plastic wrap • pallets	Includes chemicals and water, and packaging material used for yarn processing	kg material per year	Low
	b) Energy use for spinning/ texturing	Fuels Heat Biomass Electricity	Includes all energy used for yarn formation	Any appropriate energy measure that (per year) can be unambiguously linked to GHG emissions of use and production (e.g. kWh per textile product)	High

Table 4 – Processes to be taken into consideration when setting the system boundary for a textile product *(continued)*

Phase	Source type	Source category (not exclusive)	Category subgroups (not exclusive)	Common unit for data collection	Contribution
	c) Raw material for weaving/knitting	Yarns	Input data derived from Table 4, section 1 relevant to the raw material used ***NOTE*** *Avoid double counting, this is not additional input*	kg material per year or m^2 material per year	High
	d) Materials for weaving/knitting	Oils and lubrication: • knit oil • flushing oil Water Packaging: • plastic bags • twist ties	Includes chemicals and water, and packaging material used for fabric formation	kg material per year	Low
	e) Energy use for weaving/ knitting/ felting, etc.	Fuels Heat Biomass Electricity	Includes all energy used for fabric formation	Any appropriate energy measure that (per year) can be unambiguously linked to GHG emissions of use and production (e.g. kWh per textile product)	High
	f) Raw material for finished fabrics	Fabrics	Input data derived from Table 4, section 1 relevant to the raw material used ***NOTE*** *Avoid double counting, this is not additional input*	kg material per year or m^2 material per year	High

Table 4 – Processes to be taken into consideration when setting the system boundary for a textile product *(continued)*

Phase	Source type	Source category (not exclusive)	Category subgroups (not exclusive)	Common unit for data collection	Contribution
	g) Materials for finished fabrics	Resin Catalyst Softener mix: • oil • wax • polyethylene surfactant Water Packaging: • bags • ties	Includes input material data used for the fabric finishing process that follows after the weaving/knitting process	kg material per year	Low
	h) Energy use for finished fabrics	Fuels Heat Biomass Electricity	Includes all energy used for finishing fabrics	Any appropriate energy measure that (per year) can be unambiguously linked to GHG emissions of use and production (e.g. kWh per textile product)	High
	i) Raw material for bleaching	Fabrics	Input data derived from Table 4, section 1 relevant to the raw material used ***NOTE*** *Avoid double counting, this is not additional input*	kg material per year or m^2 material per year	Medium

Table 4 – Processes to be taken into consideration when setting the system boundary for a textile product *(continued)*

Phase	Source type	Source category (not exclusive)	Category subgroups (not exclusive)	Common unit for data collection	Contribution
	j) Materials for bleaching	NaOH for caustic refining H_2O_2 Air Speciality stabilizer Other chemicals Packaging: • plastic bags • twist ties	Includes chemicals, and packaging material used for bleaching process, treated after finishing fabrics	kg material per year	Low
	k) Treated water for bleaching	Treated water Detergents Fabric softeners Complexing agents Water Chemicals used for water treatment	Record and use data for water and chemicals used for bleaching process	kg material per year	Low
	l) Energy use for bleaching	Fuels Heat Biomass Electricity	Includes all energy used for bleaching processes	Any appropriate energy measure that (per year) can be unambiguously linked to GHG emissions of use and production (e.g. kWh per textile product)	High
	m) Raw material for dyeing	Fabrics	Input data derived from Table 4, section 1 relevant to the raw material used ***NOTE*** *Avoid double counting, this is not additional input*	kg material per year or m^2 material per year	Medium

Table 4 – Processes to be taken into consideration when setting the system boundary for a textile product *(continued)*

Phase	Source type	Source category (not exclusive)	Category subgroups (not exclusive)	Common unit for data collection	Contribution
	n) Materials for dyeing	Salt Dyes Chemical specialities Packaging: • plastic bags • twist ties	Includes chemicals, and packaging material used for dyeing process, treated after bleaching and finishing fabrics	kg material per year	Low
	o) Treated water for dyeing	Treated water Detergents Fabric softeners Complexing agents Chemicals used for water treatment	Record and use data for water and chemicals used for dyeing processes	kg material per year	Low
	p) Energy use for dyeing	Fuels Heat Biomass Electricity	Includes all energy used for dyeing processes	Any appropriate energy measure that (per year) can be unambiguously linked to GHG emissions of use and production (e.g. kWh per textile product)	High
	q) Raw material for printing	Fabrics	Input data derived from Table 4, section 1 relevant to the raw material used ***NOTE*** *Avoid double counting, this is not additional input*	kg material per year or m^2 material per year	Low

Table 4 – Processes to be taken into consideration when setting the system boundary for a textile product *(continued)*

Phase	Source type	Source category (not exclusive)	Category subgroups (not exclusive)	Common unit for data collection	Contribution
	r) Materials for printing	Printing: • inks • auxiliary chemicals Packaging: • plastic bags • twist ties	Includes dyes, pigments and other chemicals, and packaging material used for printing process	kg material per year	Low
	s) Energy use for printing	Fuels Heat Biomass Electricity	Includes all energy used for printing processes	Any appropriate energy measure that (per year) can be unambiguously linked to GHG emissions of use and production (e.g. kWh per textile product)	Low
3) Product manufacturing	a) Raw material for cutting/sewing	Fabrics after bleaching/dyeing/ printing	Input data derived from Table 4, section 1 relevant to the raw material used ***NOTE*** *Avoid double counting, this is not additional input*	kg material per year or m^2 material per year	Low

Table 4 – Processes to be taken into consideration when setting the system boundary for a textile product *(continued)*

Phase	Source type	Source category (not exclusive)	Category subgroups (not exclusive)	Common unit for data collection	Contribution
	b) Materials for cutting/sewing (with packaging)	Stitching thread Auxiliary parts: • buttons • zips • tags • collars • cuffs • inner liner Packaging: • plastic bags • papers • cases • boxes	Includes chemicals, and packaging material used for cutting/sewing and packaging process, as final processes	kg material per year	Low
	c) Energy use for cutting/sewing (with packaging)	Fuels Heat Biomass Electricity	Includes all energy used for cutting/sewing process	Any appropriate energy measure that (per year) can be unambiguously linked to GHG emissions of use and production (e.g. kWh per textile product)	Medium
4) Use	a) Energy use	Electricity for: • washing • drying • ironing • dry-cleaning	Includes all the energy used for washing, dry-cleaning and ironing	kWh per one washing kWh per one drying kWh per one ironing kWh per one dry-cleaning	High

Table 4 – Processes to be taken into consideration when setting the system boundary for a textile product *(continued)*

Phase	Source type	Source category (not exclusive)	Category subgroups (not exclusive)	Common unit for data collection	Contribution
	b) Detergent use	Detergents	Amount of detergent used in a home may be the reference. Fabric conditioner may be added, depending on user scenario	kg material per one washing or litre material per one washing	Medium
	c) Water use	Water	Amount of water used for home washing may be referent input data ***NOTE** The quantity of water can differ between fabric types*	kg water per one washing or litre water per one washing	Low
5) End of life/disposal	a) Reuse	Packaging: • plastic bags • boxes • cases Textile products	Input based on actual occurrence of reuse can be used where evidence of occurrence can be obtained (assumptions should not be made)	Reuse rate of packaging and textile products per year kg material per year	Low
	b) Waste treatment	Textile products Waste packaging: • plastics • papers • metals	Data of waste material for disposal (recycling, landfill, incineration with energy recovery), excluding material identified for reuse	kg material per year waste treatment scenarios	Medium
	c) Wastewater treatment	Water	Includes only treatment of wastewater arising from treatment of waste	kg wastewater per year or litre wastewater per year	Low

***NOTE** The information provided in the Contribution column of Table 4 is intended to provide those undertaking assessment of the GHG emissions from textile products with some guidance as to the life cycle phases that are likely to offer the best opportunities for emission reduction. However, users of this PAS are reminded that assessments undertaken in accordance with PAS 2050:2011 and PAS 2395 are required to take account of the entire life cycle of the product under assessment, subject only to the exceptions otherwise provided for by this PAS.*

Table 5 – Transport factors to be taken into consideration when setting the system boundary for a textile product

Phase	Input category	Category subgroups (not exclusive)	Remark with regard to contribution (in cradle-to-grave assessment) and data collection	Common unit for data collection	Contribution
Transport	Type of transport used, e.g.: • road • rail • air • water	Transport of materials and products within or between life cycle processes included in the cradle-to-gate assessment Transport of textile products to the retailer or other downstream life cycle process, where the entity undertaking the assessment owns, or is financially responsible for, that transport GHG emissions arising from the collection and transfer of waste material for recovery, recycling or reuse	Transport can have a significant contribution to emissions, depending on distance travelled, means of transport and load efficiency employed	See 2050:2011, **8.6**	Medium

NOTE 1 *Transport can occur at almost any stage of the life cycle, both between and within life cycle stages. Care should therefore be exercised to ensure that all relevant transport occurrences are accounted for, for any given assessment.*

NOTE 2 *The information provided in the Contribution column of Table 5 is intended to provide those undertaking assessment of the GHG emissions from textile products with some guidance as to the life cycle phases that are likely to offer the best opportunities for emission reduction. However, users of this PAS are reminded that assessments undertaken in accordance with PAS 2050:2011 and PAS 2395 are required to take account of the entire life cycle of the product under assessment, subject only to the exceptions otherwise provided for by this PAS.*

Table 6 – Inputs to be excluded from an assessment of GHG emissions from textile products

Phase	Input category (e.g. products/ materials/energy)	Category subgroups (on data acquisition level)	Contribution
1) Textile products manufacturing	1) Production and maintenance of machines and other energy-using equipment for the manufacture of the resin, yarn and fabric formation, and wet processing	Except for consumables required to run and maintain these machines and other energy-using equipment	–
	2) Production and maintenance of buildings, roads and pavements, and other surfaces	–	Mostly a low contribution to GHG emissions
2) Use phase	1) Production and maintenance of machines for washing, drying, ironing and dry-cleaning	Except for consumables, to maintain these machines	–
	2) Production and maintenance of buildings, roads and other surfaces	–	Mostly a low contribution to GHG emissions
3) End of life/ disposal	Production and maintenance of machines for waste treatment	Except for consumables, to maintain these machines	–
4) Transport	1) Production and maintenance of vehicles	Except for consumables, to maintain these vehicles	–
	2) Production and maintenance of roads, rails and other surfaces	–	Mostly a low contribution to GHG emissions

6.2.3 Use phase

6.2.3.1 The data for calculating use phase GHG emissions shall be:

a) the lifetime cleaning cycles for the textile product under assessment, based on:
   1) for a textile product supported by a manufacturer's guarantee: the period of that guarantee multiplied by the nearest corresponding cleaning frequency from the list at 2 below (see Note 1);
   2) for a textile product not supported by a manufacturer's guarantee, the estimated lifetime cleaning cycles selected by the entity undertaking or instructing the assessment, from i) to v) below:

i) **continual use**: assumed life of not more than 12 months with likely cleaning frequency of 4 cycles per 1 month and adjustment factor of 20% = lifetime cleaning cycles for assessment: **38**;

ii) **frequent use**: assumed life of not more than 18 months with likely cleaning frequency of 2 cycles per 1 month and adjustment factor of 20% = lifetime cleaning cycles for assessment: **29**;

iii) **regular use**: assumed life of not more than 30 months with likely cleaning frequency of 1 cycle per 1 month and adjustment factor of 15% = lifetime cleaning cycles for assessment: **26**;

iv) **occasional use**: assumed life of not more than 42 months with likely cleaning frequency of 0.5 cycles per 1 month and adjustment factor of 10% = lifetime cleaning cycles for assessment: **19**;

v) **ongoing use**: assumed life of not more than 60 months with likely cleaning frequency of 1 cycle per 12 months = lifetime cleaning cycles for assessment: **5**;

b) the electricity consumption per single washing or dry-cleaning cycle taking account of machine load to permit allocation to respective product types;

c) the electricity consumption of the standby mode for washing/cleaning equipment used;

d) the water consumption per single laundering or dry-cleaning cycle;

e) the detergent/cleaning chemical consumption per single washing or dry-cleaning cycle;

f) the electricity consumption per average drying cycle;

g) the electricity consumption per single ironing or pressing.

6.2.3.2 The selected basis for the use phase GHG emissions calculation shall be recorded and made known in conjunction with any communication of lifetime GHG emissions assessment outcomes in relation to the textile product under assessment.

NOTE 1 *The specification for a use phase calculation provided in **6.2.3** has been introduced to provide a common basis for assessment that will permit a comparison of reported outcomes between products of a similar nature. The adjustment factor included in the calculation is intended to reflect the likelihood that a given product will not, in fact, remain in use for the whole of its assessed lifetime and that, as a result, the number of lifetime cleaning cycles will not be as high as might otherwise have been assumed. For products supported by a manufacturer's guarantee and products categorized as "ongoing use", the adjustment factor is not considered appropriate and is not applied.*

NOTE 2 *A manufacturer recommended method for washing or cleaning (e.g. washing by machine at a specified temperature for a specified time with a specific amount of detergent) may be used as a basis for determining the use phase GHG emissions of a product. This information could be provided on the product care label, in the maintenance document or in the instructions for use accompanying the product. Where these recommendations include a washing or cleaning frequency, this may be used in place of the relevant frequencies provided in **6.2.3.1**a), with the source of any alternative frequencies used identified in any GHG assessment outcome reporting. Average data available within published Product Category Rules (PCR) for specific product types may also be used for this purpose, and typical life expectancies for different types of textile product may be obtained from published sources, e.g.:*

- *http://www.wrap.org.uk/content/clothing-longevity-measuring-active-use;*
- *http://www.textilerestorations.com/lifeexpectancy.pdf; or*
- *http://www.drycleaningcomplaints.com/Fair%20Claims%20Guide=DIA.pdf (p.23); or*
- *for carpets and other floor coverings: http://www.nahb.org/fileUpload_details.aspx?contentID=99359 (Table 1, p.10).*

*In all cases, the communication requirements at **6.2.3.2** apply.*

6.3 Substitution of an alternative BAM

6.3.1 ISO/TS 14067:2013

Where the methodology provided in ISO/TS 14067:2013 has been selected as the BAM, the PAS 2050:2011 clauses referred to in **6.1** shall be replaced by the equivalent ISO/TS 14067:2013 clauses, identified in Table 7.

6.3.2 GHG Protocol *Product Standard*

Where the methodology provided in the GHG Protocol *Product Standard* has been selected as the BAM, the PAS 2050:2011 clauses referred to in **6.1** shall be replaced by the equivalent GHG Protocol *Product Standard* sections, identified in Table 7.

Table 7 – System boundary – BAM equivalence

Topic	PAS 2050:2011 clauses	ISO/TS 14067:2013 clauses	GHG Protocol *Product Standard* sections
1) System boundary	6	6.3.4	7
2) Establishing the system boundary	6.1	6.3.4.3	7.1, 7.2
3) Cradle-to-gate GHG emission and removals assessment	6.2	6.3.4.2	7.1, 7.2
4) Material contribution and threshold	6.3	6.3.4.4	12.3.3
5) Elements of the product system	6.4	6.3.4.1, 6.4.9	7.2
6) System boundary exclusions	6.5	6.4.5, Table 1	7.2

7 Data

7.1 Primary requirement

Unless selection of an alternative BAM as provided for in **4.1.2** of this PAS has been made, the requirements of PAS 2050:2011, Clause **7** shall be applied without supplement.

7.2 Substitution of an alternative BAM

7.2.1 ISO/TS 14067:2013

Where the methodology provided in ISO/TS 14067:2013 has been selected as the BAM, the PAS 2050:2011 clauses referred to in **7.1** shall be replaced by the equivalent ISO/TS 14067:2013 clauses, identified in Table 8.

7.2.2 GHG Protocol *Product Standard*

Where the methodology provided in the GHG Protocol *Product Standard* has been selected as the BAM, the PAS 2050:2011 clauses referred to in **7.1** shall be replaced by the equivalent GHG Protocol *Product Standard* sections, identified in Table 8.

Table 8 – Data – BAM equivalence

Topic	PAS 2050:2011 clauses	ISO/TS 14067:2013 clauses	GHG Protocol *Product Standard* sections
1) Data	7	6.3.5	8
2) General	7.1	6.3.5	8.2
3) Data quality rules	7.2	6.3.5	8.2, 8.3
4) Primary activity data	7.3	6.3.5	8.2, 8.3
5) Secondary data	7.4	6.3.5	8.2, 8.3
6) Changes in the life cycle of a product	7.5	6.3.5	14.3 Step 2
7) Variability in emissions and removals associated with the product life cycle	7.6	6.3.5	14.3 Step 4
8) Data sampling	7.7	6.3.5	8.3.3
9) Non-CO_2 emissions data for livestock and soils	7.8	6.4.9.7	Not specifically referred to
10) Emissions data for fuel, electricity and heat	7.9	6.4.9.3	Not specifically referred to
11) Validity of analysis	7.10	6.3.6	Not specifically referred to

8 Allocation of emissions

8.1 Primary requirement

Unless selection of an alternative BAM as provided for in **4.1.2** of this PAS has been made, the requirements of PAS 2050:2011, Clause **8** shall be applied, supplemented by **8.2** of this PAS. Subclause **8.2.1** describes the applied hierarchy of allocation within the GHG assessment of textile products. Subclause **8.2.3** provides a supplementary requirement in relation to the use of recycled material.

8.2 Supplementary requirements implementing PAS 2395 in respect of allocation

8.2.1 Allocation preferences for textile products – allocation to co-products

In relation to **8.1.1** of PAS 2050:2011, the approach towards allocation of emissions to co-products shall be, in order of preference:

a) avoidance: by "dividing the unit processes to be allocated" or "expanding the product system" [PAS 2050:2011, **8.1.1** a) and b)];

b) if the co-products have similar characteristics and/or functionality (e.g. a recoloured or reprinted T-shirt, or clothes with different embellishments), allocation shall be based on mass;

c) if the co-products do not have similar characteristics and/or functionality, allocation shall be based on the economic value of the co-products (economic allocation), and shall be calculated over a period of not less than one year;

d) an exception is animal fibres at the cradle-to-farm-gate stage and accounting for mixed animal species on the farm. For this, a biophysical causal relationship, calculated over a one-year period, shall be used.

***NOTE** Explanation of biophysical causality: the level of feed intake by animals is aligned to both the amount of products (meat, milk and fibre) produced and the level of GHG emissions from enteric fermentation and manure management, the major on-farm sources, emitted. Biophysical allocation according to energy requirements for animal physiological functions of growth, wool production, milk production, reproduction and maintenance is recommended for calculating the GHG emissions to a product (including wool and cashmere fibres). The IPCC (2006) provides a calculation for energy requirements for fibre production based on the energy content of the fibre. In reality, fibre production is determined by protein requirements, and future methodological development using protein-based biophysical causality should be considered.*

8.2.2 Waste combustion with energy recovery

GHG emissions and recovery arising from waste combustion undertaken for energy and/or heat generation shall be allocated in accordance with PAS 2050:2011, **8.2.2**.

8.2.3 Use of recycled material and recycling

As required by PAS 2050:2011, **8.3**, "The method for assessing emissions arising from recycled or recyclable material [in the case of closed-loop recycling, for example, the use of recycled textile products as raw material] shall be as specified in **Annex D**" [**D.3** of PAS 2050:2011 (the closed-loop approximation method or the 0-100 output method)].

In the case of open loop recycling, the impact of the recycled material shall be as specified in **D.2** of PAS 2050:2011 (the recycled content method or the 100-0 method), which allocates the emissions from the material before recovery to the original product system boundary.

***NOTE 1** The closed-loop approximation method is only appropriate when the recycled material input maintains the same inherent properties as the virgin material input.*

***NOTE 2** See requirement for recognition of sequestered atmospheric CO_2 during the disposal phase, in **5.2**.*

8.2.4 Treatment of emissions associated with reuse

The treatment of emissions associated with reuse shall be as for PAS 2050:2011, **8.4**. However, care is necessary in situations where the benefits of reusing clothing are taken into account in an assessment, due to the potential for significant fluctuation in the demand for reused clothing.

8.3 Substitution of an alternative BAM

8.3.1 ISO/TS 14067:2013

Where the methodology provided in ISO/TS 14067:2013 has been selected as the BAM, the PAS 2050:2011 clauses referred to in **8.1** shall be replaced by the equivalent ISO/TS 14067:2013 clauses, identified in Table 9.

8.3.2 GHG Protocol *Product Standard*

Where the methodology provided in the GHG Protocol *Product Standard* has been selected as the BAM, the PAS 2050:2011 clauses referred to in **8.1** shall be replaced by the equivalent GHG Protocol *Product Standard* sections, identified in Table 9.

Table 9 – Allocation of emissions – BAM equivalence

Topic	PAS 2050:2011 clauses	ISO/TS 14067:2013 clauses	GHG Protocol *Product Standard* sections
1) Allocation of emissions	8	6.4.6	9
2) General requirements	8.1	6.4.6	9.1, 9.2
3) Emissions from waste	8.2	6.3.8	9.2, 9.3.1
4) Use of recycled material and recycling	8.3	6.4.6.3	9.1, 9.2
5) Treatment of emissions associated with reuse	8.4	Not addressed separately (see 6.4.6.3)	Not addressed separately (see 9)
6) Emissions from energy production using CHP	8.5	Not specifically referred to	Not specifically referred to
7) Emissions from transport	8.6	Not addressed separately (see 6.3.4.3, 6.3.8)	9.1

9 Calculation of the GHG emissions of textile products

9.1 Primary requirement

Unless selection of an alternative BAM as provided for in **4.1.2** of this PAS has been made, the requirements of PAS 2050:2011, Clause **9** shall be applied.

9.2 Substitution of an alternative BAM

9.2.1 ISO/TS 14067:2013

Where the methodology provided in ISO/TS 14067:2013 has been selected as the BAM, the PAS 2050:2011 principles incorporated by Clause **9** shall be replaced by the equivalent ISO/TS 14067:2013 clauses, identified in Table 10.

9.2.2 GHG Protocol *Product Standard*

Where the methodology provided in the GHG Protocol *Product Standard* has been selected as the BAM, the PAS 2050:2011 principles incorporated by Clause **9** shall be replaced by the equivalent GHG Protocol *Product Standard* chapter, identified in Table 10.

Table 10 – Calculation of the GHG emissions of textile products – BAM equivalence

Topic	PAS 2050:2011 clauses	ISO/TS 14067:2013 clauses	GHG Protocol *Product Standard* chapter
Calculation of the GHG emissions of products	9	6.0	11.0

10 Claims of conformity

10.1 Primary requirement

Unless selection of an alternative BAM as provided for in **4.1.2** of this PAS has been made, the requirements of PAS 2050:2011, Clause **10** shall be applied.

10.2 Substitution of an alternative BAM

10.2.1 ISO/TS 14067:2013

Where the methodology provided in ISO/TS 14067:2013 has been selected as the BAM, the PAS 2050:2011 clauses referred to in **10.1** shall be replaced by the equivalent ISO/TS 14067:2013 clauses, identified in Table 11.

10.2.2 GHG Protocol Product Standard

Where the methodology provided in the GHG Protocol *Product Standard* has been selected as the BAM, the PAS 2050:2011 clauses referred to in **10.1** shall be replaced by the equivalent GHG Protocol *Product Standard* sections, identified in Table 11.

10.2.3 Reporting/disclosure of results

PAS 2050:2011 does not specify requirements for the reporting or disclosure of results other than in respect of claiming compliance with its provisions for any specific GHG emissions assessment (Clause **10**).

Where an alternative BAM has been used for an assessment in accordance with this PAS, reporting shall be in accordance with the provisions of that BAM.

NOTE *Where it is intended that reporting of an assessment that is using PAS 2050:2011 as its BAM is to be undertaken, it is recommended that guidance be sought from one or other of the alternative BAMs referred to in this PAS.*

Table 11 – Claims of conformity – BAM equivalence

Topic	PAS 2050:2011 clauses on compliance	ISO/TS 14067:2013 clauses on verification	GHG Protocol *Product Standard* sections on assurance
1) General	10.1	No direct equivalent but see Clause 8	12
2) Basis of claim	10.2	No direct equivalent but see Clause 8	12.2
3) Permitted forms of disclosure	10.3	No direct equivalent but see Clause 8	12

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