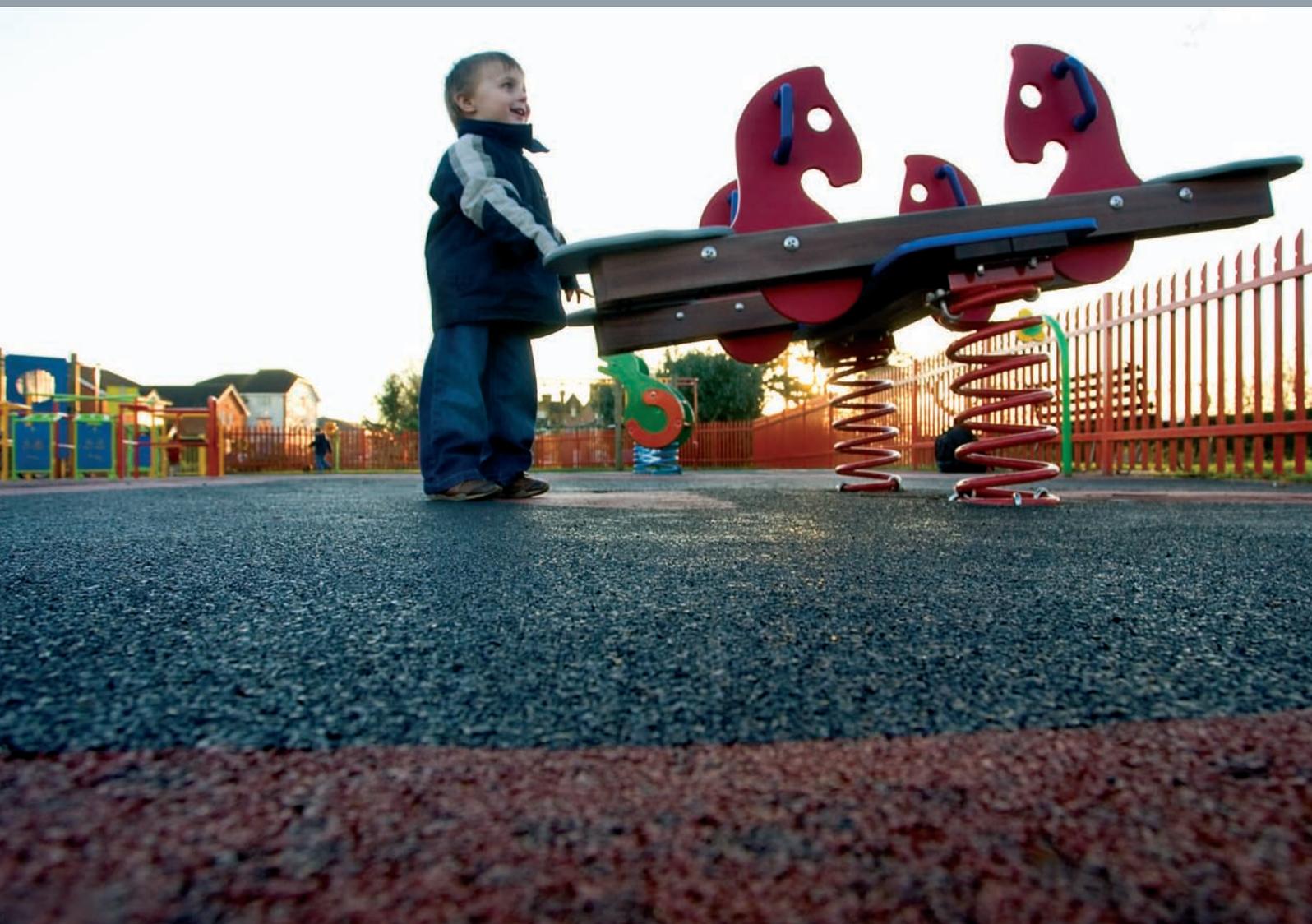


# Tyre-derived rubber materials

End of waste criteria for the production and use of tyre-derived rubber materials



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This Quality Protocol was funded by Defra and the Welsh Assembly Government (WAG) as a business resource efficiency activity. It was developed by the Environment Agency and WRAP (Waste & Resources Action Programme) in consultation with Defra, WAG, industry and other regulatory stakeholders. The Quality Protocol is applicable in both England and Wales. It sets out end of waste criteria for the production and use of tyre-derived rubber materials.

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# Foreword

## Background

Uncertainty over the point at which waste has been fully recovered and ceases to be waste within the meaning of Article 1(1)(a) of the EU Waste Framework Directive (2006/12/EC) has inhibited the development and marketing of materials produced from waste which could be used beneficially without damaging human health and the environment. In some cases, this uncertainty has also inhibited the recovery and recycling of waste and its diversion from landfill.

Interpretation of EU legislation is ultimately a matter for the Courts and there is now a substantial body of case law on the interpretation of the definition of waste in Article 1(1)(a) of the Waste Framework Directive. Drawing on the principles established in this case law, it is possible to identify the point at which certain wastes cease to be waste and thus when the Waste Framework Directive's waste management controls no longer apply. This identification is the purpose of the Waste Protocols Project.

More specifically, depending on the circumstances of the waste concerned, the project seeks to achieve the following outcomes:

- to produce a Quality Protocol identifying the point at which waste, having been fully recovered, may be regarded as a non-waste product that can be either reused by business or industry, or supplied into other markets, enabling it to be used without the need for waste management controls; and/or
- to produce a statement that confirms to the business community what waste management controls they must comply with.

## What is a Quality Protocol?

A Quality Protocol sets out end of waste criteria for the production and use of a product from a specific waste type. Compliance with these criteria is considered sufficient to ensure that the fully recovered product may be used without undermining the effectiveness of the Waste Framework Directive and therefore without the need for waste management controls.

In addition, a Quality Protocol indicates how compliance may be demonstrated and points to good practice for the use of the fully recovered product. A Quality Protocol further aims to provide increased market confidence in the quality of products made from waste and so encourage greater recovery and recycling.

# 1. Introduction

Definitions are provided in Appendix A for terms that appear in italics when they are first used.

## 1.1 What is this Quality Protocol?

- 1.1.1 This Quality Protocol has been developed by *WRAP (Waste & Resources Action Programme)* and the *Environment Agency* in consultation with industry and other regulatory stakeholders. It is applicable in both England and Wales.
- 1.1.2 The Quality Protocol sets out end of waste criteria for the production and use of *tyre-derived rubber materials* from source-segregated *waste tyres*. If these criteria are met, tyre-derived rubber materials will normally be regarded as having been fully recovered and to have ceased to be waste.
- 1.1.3 *Producers* and *users* are not obliged to comply with the Quality Protocol. If they do not, the tyre-derived rubber materials will normally be considered to be waste and *waste management controls* will apply to their handling, transport and application.
- 1.1.4 Producers of tyre-derived rubber materials should note that this Quality Protocol does not affect the obligation to hold an *environmental permit* and comply with all of its conditions to store and process waste tyres.
- 1.1.5 Producers of tyre-derived rubber materials should also note that by producing a fully recovered product they may be subject to further legal obligations, e.g. the registration of substances under REACH<sup>1</sup>.

## 1.2 The purpose of the Quality Protocol

- 1.2.1 This Quality Protocol has four main purposes:
- clarifying the point at which tyre-derived rubber materials cease to be waste and waste management controls are no longer required;
  - providing users with confidence that the tyre-derived rubber materials they purchase conform to an *approved material standard*;
  - providing users with confidence that the tyre-derived rubber materials are suitable for use in *designated applications* including by conforming with *engineering standards* where required; and
  - protecting human health and the environment (including soil).

In addition, the Quality Protocol describes acceptable good practice for the use of tyre-derived rubber materials (see Appendix D).

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<sup>1</sup> Waste is exempted from REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals) (Regulation (EC) No 1907/2006) as it is covered by separate waste management controls. However, once waste has been fully recovered and ceases to be waste, waste management controls cease to apply and REACH may apply instead at that point. Unless specifically exempted (e.g. because a substance has already been registered), producers may need to register substances recovered from waste and placed back on the market and make available appropriate hazard and safety information, for example a suitable safety data sheet.

### 1.3 Complying with the Quality Protocol

- 1.3.1 Tyre-derived rubber materials will normally be regarded as having ceased to be waste, and therefore no longer subject to waste management controls, provided they:
- require no further processing before use, namely;
    - have been produced using only those input materials specified in Section 2, namely source-segregated waste tyres;
    - meet the requirements of an approved material standard or specification (e.g. PAS 107:2007) (see Section 2);
    - meet the requirements of engineering standards if specified for the specific end use (see Section 2);
    - meet any additional requirements specified by the customer;
    - have been produced using either *ambient* or *cryogenic processing* technologies;
    - have been processed to one of the size categories and in accordance with one of the options in Section 2; and
  - are destined for use in one of the designated applications within the *designated market sectors* listed in Section 4.
- 1.3.2 Producers must demonstrate that these criteria have been met. They will do this in the ways set out in Section 3, including by obtaining *certification* from an *approved certification body* and maintaining records.
- 1.3.3 This Quality Protocol does not apply to whole tyres. It applies to size-reduced tyre-derived rubber materials that are intended for use in *bound* and *unbound* applications.
- 1.3.4 This Quality Protocol will be adopted as a technical regulation under *Technical Standards and Regulations Directive 98/34/EC* as amended. We recognise that there may be codes of practice or standards which apply in *European Economic Area (EEA)* States other than the UK setting out requirements for the production and use of tyre-derived rubber materials. We accept that tyre-derived rubber materials may cease to be waste provided they have been produced in compliance with:
- a relevant standard or code of practice of a national standards body or equivalent body of any EEA State; or
  - any relevant international standard recognised for use in any EEA State; or
  - any relevant technical regulation with mandatory or de facto mandatory application for marketing or use in any EEA State.

These must give levels of product performance and protection of human health and the environment which are equivalent to those required in this Quality Protocol.

- 1.3.5 An outline of the main stages and control mechanisms of the Quality Protocol is presented in Figure 1. These are described further in Sections 2 and 3.

### 1.4 When Quality Protocol compliant material may become waste

- 1.4.1 Producers and users of tyre-derived rubber materials should note that, even if the Quality Protocol is complied with, the material will become waste again and subject to waste management controls if it is at any stage:
- disposed of; or
  - stored indefinitely with little prospect of being used.
- 1.4.2 In addition, if Quality Protocol compliant materials are mixed with waste materials the resulting mix will be considered to be a waste and subject to waste management controls. However, if Quality Protocol compliant materials are mixed with other non-waste materials the resulting mix will not, as a result of this, be waste.

## 1.5 Failure to comply with the Quality Protocol

- 1.5.1 Where this Quality Protocol is not complied with, for example the tyre-derived rubber materials do not meet an approved material standard or specification, a specified engineering standard or the producer cannot demonstrate evidence of compliance, the tyre-derived rubber materials will normally be considered to be waste. In such circumstances, the producer or user must comply with the appropriate waste management controls for the transportation, storage and use of the tyre-derived rubber materials and may be committing an offence if they do not do so.
- 1.5.2 Detailed guidance on waste management controls can be obtained from the Environment Agency's National Customer Contact Centre on 08708 506506, from its website (<http://www.environment-agency.gov.uk/subjects/waste/>) or NetRegs (<http://www.netregs.gov.uk/>).

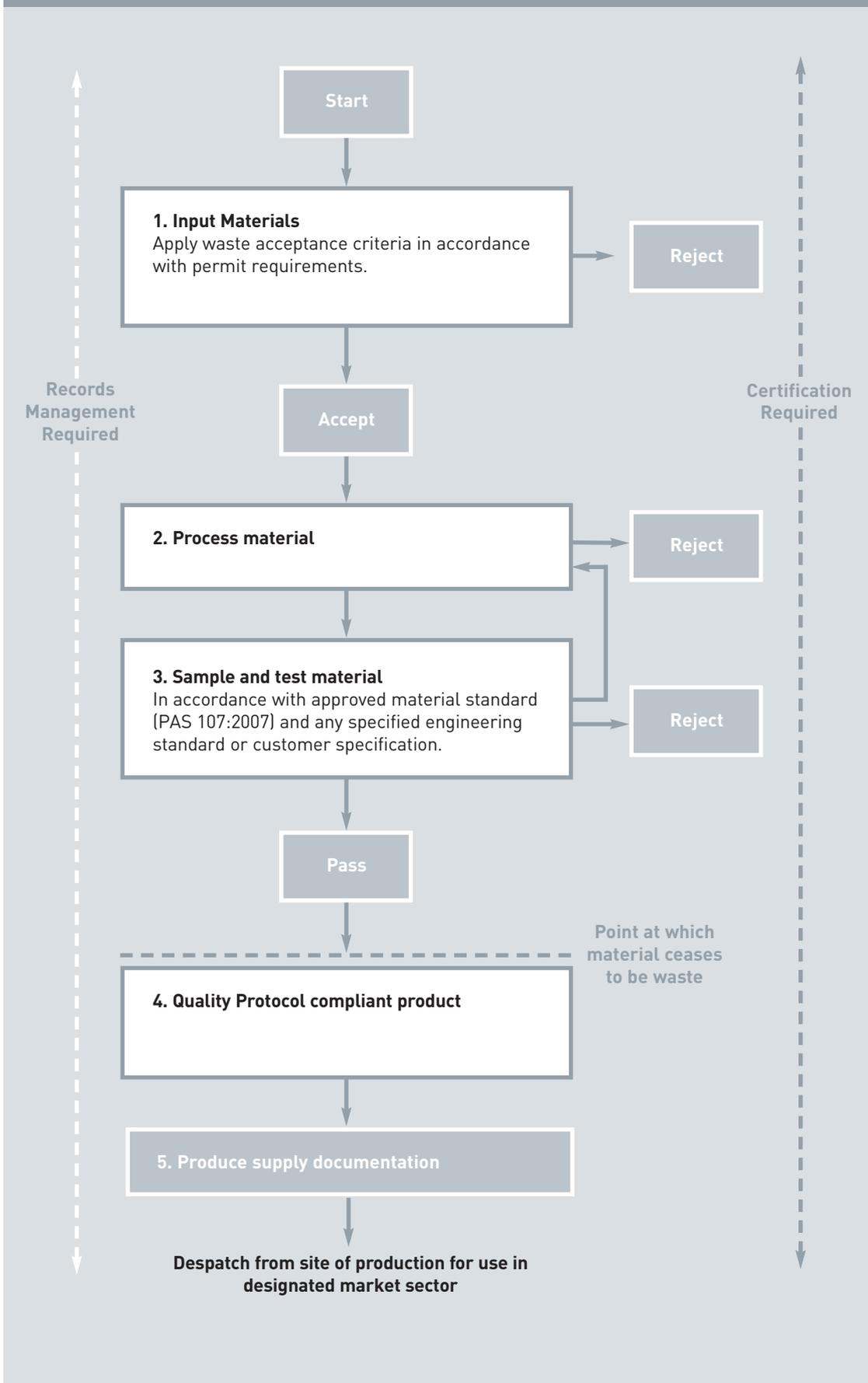
## 1.6 Updating the Quality Protocol

- 1.6.1 We plan to review and update this document every two years from the date of final publication.
- 1.6.2 However, this document may be subject to change before the review dates. Triggers for change could include:
- pollution incidents;
  - a change in the market;
  - a change in legislation or case law;
  - a shift in the chemical composition or physical properties of waste tyres; and
  - more data becoming available on the critical chemical concentrations in waste tyres, such as through REACH analysis undertaken by manufacturers.
- 1.6.3 This Quality Protocol may be withdrawn by the Environment Agency if it becomes apparent that it is generally being misused and/or misapplied.

## 1.7 Importing and exporting Quality Protocol compliant material

- 1.7.1 Producers intending to export Quality Protocol compliant materials should be aware that, although the material may cease to be waste in England and Wales, the country of destination may take a different view. Under the Waste Shipment Regulation (EC/1013/2006), if the competent authority in the country of destination considers the material to be waste, the controls specified in that Regulation will apply to the shipment.
- 1.7.2 Producers intending to import Quality Protocol compliant materials to England and Wales should be aware that if the country of dispatch regards the material as waste the controls set out in the Waste Shipment Regulation will apply to the shipment, even though the material may be regarded as having ceased to be waste in England and Wales.
- 1.7.3 As such it is prudent to check with the competent authority for the country of despatch or destination before importing or exporting tyre-derived rubber materials. A list of the relevant European competent authorities can be found at [http://ec.europa.eu/environment/waste/shipments/pdf/list\\_competent\\_authorities.pdf](http://ec.europa.eu/environment/waste/shipments/pdf/list_competent_authorities.pdf)

Figure 1 Main stages and control mechanisms of the Quality Protocol



## 2. Producing tyre-derived rubber materials from used tyres

### 2.1 Regulating the production process

2.1.1 The process of turning waste tyres into tyre-derived rubber materials is classified as a waste recovery operation and is subject to the waste management controls in the Waste Framework Directive and domestic legislation. This Quality Protocol does not affect the obligation for producers to hold an environmental permit that authorises the storage and processing of waste tyres and to comply with its conditions.

### 2.2 Criteria for producing tyre-derived rubber materials that have ceased to be waste

2.2.1 To comply with this Quality Protocol the tyre-derived rubber material must require no further processing before use. To do this the criteria outlined in Sections 2.3 to 2.5 must be met. In addition, the producer must achieve certification as detailed in Section 3 and the material should be destined for use in one or more of the designated applications in the designated market sectors listed in Section 4.

### 2.3 Input materials

2.3.1 Source-segregated waste tyres classified under *European Waste Catalogue (EWC)* code 16.01.03 end-of-life tyres are the only acceptable input materials. Specifically these are waste tyres that have been removed from road vehicles and off-road vehicles, such as agricultural and earth-moving equipment, but excluding aircraft tyres.

2.3.2 Whilst tyres which contain small amounts of contamination arising from their use or handling, such as earth and stones, or grease and oils are considered to be acceptable inputs, tyres which have been contaminated with foreign matter or contaminants as a result of being fly-tipped or buried are not acceptable inputs.

### 2.4 Processed in accordance with the approved material standard

2.4.1 Tyre-derived rubber materials can be produced in accordance with this Quality Protocol using either ambient or cryogenic processing technologies.

2.4.2 The producer must comply with all the requirements of an approved material standard. Appendix B lists the only approved material standard at the time of publishing this Quality Protocol (PAS 107:2007). Additional material standards may be approved by the Environment Agency for inclusion to this Quality Protocol when it is reviewed.

2.4.3 The tyre-derived rubber materials resulting from the process must have been processed to, and fall within, one of the size categories stated in Table 2 in order to comply with this Quality Protocol.

2.4.4 Producers should be aware that the approved material standard is subject to regular periodic review and should ensure they comply with the latest revision.

**Table 2 – Size categories of tyre-derived rubber materials<sup>2</sup>**

|                              |   |
|------------------------------|---|
| Rough cut shred <sup>a</sup> | Size-reduced rubber to a maximum of 300mm |
| Clean cut shred <sup>b</sup> |   |
| Rough cut chips <sup>a</sup> | Size-reduced rubber to a maximum of 50mm  |
| Clean cut chips <sup>c</sup> |   |
| Granulate <sup>d</sup>       | Size-reduced rubber to a maximum of 10mm  |
| Powder <sup>d</sup>          | Size-reduced rubber to a maximum of 1mm   |
| Fine powder <sup>d</sup>     | Size-reduced rubber to a maximum of 0.5mm |

<sup>a</sup> With exposed wire and textiles; currently the only suitable application of this material is in landfill engineering as replacement aggregate (see designated market sectors)

<sup>b</sup> Containing less than 5% exposed wire and textiles on visual inspection

<sup>c</sup> No exposed wire and containing less than 5% exposed textiles on visual inspection

<sup>d</sup> Free from exposed wire and textiles

## 2.5 Meets the requirements of specified engineering standards

- 2.5.1 The producer should also comply with all the requirements of the specified engineering standard when the intended end use is in either the civil engineering (unbound applications) or landfill engineering market sectors (see Section 4). Appendix C lists engineering standards identified at the time of publishing this Quality Protocol.
- 2.5.2 Producers should be aware that the engineering standards are subject to regular periodic review and should ensure they comply with the latest revisions.

## 2.6 Meets any additional customer specification

- 2.6.1 In addition to the requirements set out in Sections 2.3 to 2.5, a customer may also specify additional requirements for the tyre-derived rubber materials to meet.

<sup>2</sup> Developed from PAS 107:2007 'Table 5 - Characteristics of all size reduced tyre materials'

## 3. Providing evidence of compliance with the Quality Protocol

- 3.1 Producers must be able to demonstrate compliance with the requirements of this Quality Protocol.
- 3.2 Compliance must be demonstrated by obtaining a certificate from an approved certification body and by maintaining records, as described below.
- 3.3 Some of the specified records may already be required as part of the producer's environmental permit conditions. This Quality Protocol does not affect the obligations on producers to comply with environmental permit conditions.

### 3.4 Certification

- 3.4.1 The role of the certification body is outlined in Appendix E.
- 3.4.2 As part of the certification process, the producer must:
  - keep and retain records specified in Section 3.5 for a minimum of four years;
  - make them available to the certification body for certification purposes.

### 3.5 Records management

- 3.5.1 Records must be kept of incoming wastes intended for the purpose of producing tyre-derived rubber materials. In addition to recording the requirements detailed in PAS 107:2007, it must be noted whether the load was accepted.
- 3.5.2 Records of all inspections and testing carried out for compliance with PAS 107:2007 and any specified engineering standards should be retained.
- 3.5.3 Records must be kept of all tyre-derived rubber materials leaving the production site. In addition to recording the requirements detailed in PAS 107:2007, supply documentation must also be kept. This documentation must include the following elements:
  - date of supply;
  - customer's name, contact details and nature of business;
  - producer's name and contact details (including address of processing site);
  - details of the designated application for which the material is destined (see Section 4);
  - quantity supplied by weight/volume;
  - details of certification including certification number; and
  - a copy of the *Quality Statement*.
- 3.5.4 The Quality Statement should contain, as a minimum, the following information:
  - the approved material standard to which the tyre-derived rubber materials comply (PAS 107:2007);
  - the engineering standard to which the tyre-derived rubber materials supplied comply (if required, see Paragraph 2.5.1);
  - a statement that the tyre-derived rubber materials supplied were produced in conformance with this Quality Protocol; and
  - information on good practice relating to the storage and use of the tyre-derived rubber materials supplied.

## 4. Storage and use of tyre-derived rubber materials

### 4.1 Storage of tyre-derived rubber materials

- 4.1.1 Tyre-derived rubber materials produced in accordance with this Quality Protocol, which are therefore regarded as having ceased to be waste, may need to be temporarily stored either in an off site storage facility before delivery to the customer or at the customer's premises. The materials will not be waste at that point so waste management controls will not apply.
- 4.1.2 Producers and users should follow the accepted good practice for the storage of both waste tyres and tyre-derived rubber materials. This good practice guidance is given in Appendix D.
- 4.1.3 If it appears that the material is being stored indefinitely with no certainty of use, the material will revert to being a waste and waste management controls will apply, as specified in Section 1.4.

### 4.2 Designated market sectors

- 4.2.1 To comply with this Quality Protocol, the tyre-derived rubber materials must be destined for use in one of the designated applications (underlined) within the designated market sectors listed below.
- 4.2.2 In some cases, within these designated applications, example final end uses are noted. These example end uses are not intended to be exhaustive and other similar final end uses may be appropriate. The suitability of other similar end uses should be confirmed with your local Environment Agency office.

#### ■ Civil engineering (unbound applications)

- as a replacement aggregate in construction of road infrastructure, as roadbed stabiliser, slope stabiliser, drainage fill, culverts, drainage channels, bridge abutments and as an additive for rubberised asphalt (refer to Appendix C: engineering standards); or
- as a loose or bound material in surfacing of footpaths, nature trails, cycle paths, bridleways, roads and railways as ballast (refer to Appendix C: engineering standards).

#### ■ Civil engineering (bound applications)

- as a replacement aggregate in the construction and building industry, e.g. use in block fabrication; or
- as a bound rubberised product, e.g. wall and floor boarding, street furniture (e.g. seating and signposts) and railway crossing surface matting.

#### ■ Landfill engineering

- as a replacement aggregate in the construction of landfill sites (e.g. drainage layer) (refer to Appendix C: engineering standards).

#### ■ Sports, recreation and leisure applications

- as unbound material in sports surfacing, e.g. artificial turf, racecourses, equestrian surfaces and running tracks;
- as unbound material in recreation and safety surfacing, e.g. playground surfaces, nature trails, bridleways, cycle trails; or
- as bound material in safety surface matting, anti-vibration matting, impact protection barriers and street furniture.

#### ■ Industrial and consumer applications (bound applications)

- automotive (e.g. new and remoulded tyres, mats and moulded parts);
- street furniture and road surface matting (e.g. level crossings);
- rubber matting (e.g. livestock mats and mattresses);
- ingredients in building products (e.g. rubberised tiles and insulation mats; rubberised adhesives and mastics);
- consumer products (e.g. footwear and stationery); or
- carpet underlay.

4.2.3 The Environment Agency and WRAP are aware of the emerging nature of the market in the UK for tyre-derived rubber materials. The application of the Quality Protocol to new market sectors and applications will be reviewed according to the review schedule detailed in Section 1.6.

#### **4.3 Additional requirements for certain unbound applications**

Where tyre-derived rubber materials are to be used in unbound loose applications in close proximity to aquatic receptors (including rivers, streams, lakes, ponds and groundwater), the good practice stipulated in Appendix D should be adhered to.

## Appendix A: Definitions

In this Quality Protocol, the words and phrases below have the following meanings:

| Term                        | Description  |
|-----------------------------|--|
| Accreditation               | Third-party attestation related to a conformity assessment body conveying formal demonstration of its competence to carry out specific conformity assessment tasks <sup>3</sup> .  |
| Ambient processing          | The process of cutting and grinding whole tyres using a mechanical process at room (ambient) temperatures.   |
| Approved certification body | A third party, independent of the producer, that operates to rules agreed with the Environment Agency and is accredited by the United Kingdom Accreditation Service (UKAS). Provides independent certification that the product meets the approved standard and the requirements of the Quality Protocol. The same organisation may also undertake independent verification.   |
| Approved material standard  | The standard listed in Appendix B (PAS 107:2007) and any other standard approved by the Environment Agency for inclusion in this Quality Protocol.   |
| Bound                       | Size-reduced tyre-derived rubber material is held by another material, for example within a resin matrix.  |
| Certification               | Process of certifying that the independent verification undertaken was valid and proved that the product met the approved standard and the requirements of the Quality Protocol.   |
| Cryogenic processing        | The process of breaking down tyres into rubber crumb at low temperatures using liquid nitrogen.  |
| Designated applications     | Collective term for the final use to which tyre-derived rubber material is put within the designated market sectors.   |
| Designated market sector(s) | The sector(s) listed in Section 4 in which this Quality Protocol enables tyre-derived rubber materials to be used.   |
| Engineering standards       | The standards listed in Appendix C the requirements of which must be met for material destined for end uses in the civil engineering (unbound applications) and landfill engineering market sectors.   |
| Environment Agency          | The Environment Agency is the leading public body for protecting and improving the environment in England and Wales. Its job is to make sure that air, land and water are looked after by everyone in today's society, so that tomorrow's generations inherit a cleaner, healthier world.  |
| Environmental Permit        | <p>Environmental permits issued or exemptions registered under the Environmental Permitting (England and Wales) Regulations 2007, which came into force on 6 April 2008, or a position adopted by the Environment Agency in accordance with its guidance on the regulation of low risk activities.</p> <p>From 6 April 2008, the following automatically became environmental permits:</p> <ul style="list-style-type: none"> <li>■ PPC permits issued under the Pollution Prevention and Control (England and Wales) Regulations 2000 (as amended); and</li> <li>■ Waste Management Licences (WMLs) issued under the Environmental Protection Act 1990 (as amended).</li> </ul> |

<sup>3</sup> EN ISO/IEC 17000: 2004 Conformity assessment. Vocabulary and general principles.

| Term   | Description  |
|--|--|
| Environmental Permit<br><i>continued</i>               | Exemptions from the need for a Waste Management Licence, registered under Regulation 18 and Schedule 3 of the Waste Management Licensing Regulations 1994 (as amended) will now come under schedule 3 of the Environmental Permitting (England and Wales) Regulations 2007.  |
| European Economic Area (EEA)                           | The EEA States consist of the members of the EU (Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, The Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the UK) together with Iceland, Liechtenstein, Norway and Switzerland. Although the Channel Islands and the Isle of Man are part of the UK, they are not part of the EU and businesses registered there are subject to different licensing legislation. |
| European Waste Catalogue (EWC)                         | European Waste Catalogue (EWC 2002 and amendments) – comprehensive list of waste codes and descriptions based on waste source and type.  |
| Producer(s)  | The operator(s) undertaking used tyre shredding, crumbing and granulating processes.   |
| Quality Statement                                      | Documentation accompanying each load or consignment of tyre-derived rubber materials supplied.   |
| Technical Standards and Regulations Directive 98/34/EC | Seeks to ensure the transparency of technical regulations and is intended to help avoid the creation of new technical barriers to trade within the European Community.   |
| Tyre-derived rubber materials                          | For the purposes of this document, tyre-derived rubber material is the size-reduced rubber fraction of used tyres meeting the requirements of this Quality Protocol.   |
| Unbound  | Shredded or crumbed material is applied in the form of loose fill.   |
| User(s)  | Individuals or organisations that obtain tyre-derived rubber materials from a producer or third party with the intention of using those materials for a designated application.  |
| Waste management controls                              | Controls under legislation that govern the treatment, handling, containment and storage of waste. For example, in compliance with Article 11 of the Waste Framework Directive the user might need to apply to the Environment Agency for a permit.   |
| Waste tyres  | End-of-life tyres that have been removed from road vehicles and off-road vehicles such as agricultural and earthmoving equipment and accompanied by a waste transfer note or delivery note. Excludes used tyres from aircraft. The chain of custody from the point of arising to processing, including via used tyre collectors or retread manufacturers, must be clearly demonstrated.  |
| WRAP (Waste & Resources Action Programme)              | WRAP helps individuals, businesses and local authorities to reduce waste and recycle more, making better use of resources and helping to tackle climate change.  |

## Appendix B: Approved material standards and specifications to which this Quality Protocol applies

### Ambient processing

British Standards Institution's Publicly Available Specification for the collection, initial storage, production and final storage of size reduced, tyre-derived rubber materials (BSI PAS 107: 2007).

### Cryogenic processing

Cryogenic processing is not currently included in any publicly available standard. However, PAS 107 can still be followed for this type of processing. Therefore in order to ensure the tyre-derived rubber material can be considered to be manufactured in accordance with this Quality Protocol, all sections of PAS 107 must be adhered to except those parts of Section 7.3 (production process) which, by their nature, apply only to ambient processing.

Copies of BSI PAS 107: 2007 documentation can be obtained free from:

- WRAP at <http://www.wrap.org.uk/construction/> or by phoning 0808 100 2040.

## Appendix C: Engineering standards to which this Quality Protocol applies

In the case of material that is destined for use in either the civil engineering (unbound applications) or landfill engineering market sectors, producers of tyre-derived rubber materials should be able to demonstrate compliance with an appropriate engineering standard to ensure that the material is suitable for use in the designated application.

The following standards are considered relevant to applications in the civil engineering (unbound applications) and landfill engineering market sectors listed in Section 4. Producers of tyre-derived rubber materials should note that this list is not intended to be exhaustive and additional relevant standards may exist. Standards may also be published or withdrawn at any time and you must ensure you are using the most up to date version.

### Civil engineering applications of tyre-derived rubber materials

- 1 BS EN 13043:2002 *Aggregates for bituminous mixtures and surface treatments for roads, airfields and other trafficked areas*  
Contains detailed quality requirements to be met by aggregates for use in asphalt and other surface treatments.
- 2 BS EN 13055-2:2004 *Lightweight aggregates part 2: lightweight aggregates for bituminous mixtures and surface treatments and for unbound and bound applications materials*  
Contains detailed quality requirements to be met by lightweight aggregates for use in asphalt and other surface treatments.
- 3 BS EN 13242:2002 *Aggregates for unbound and hydraulically bound materials for use in civil engineering work and road construction*  
Contains detailed quality requirements to be met by aggregates for use in unbound and hydraulically bound materials.
- 4 BS EN 13285:2003 *Unbound mixtures. Specifications*  
Contains detailed quality requirements to be met by unbound aggregate mixtures. Supported by the Quarry Products Association (an information bulletin is available: <http://www.qpa.org/downloads/bulletin06.pdf>).
- 5 BS EN 13450:2002 *Aggregates for railway ballast*  
Specifies the properties of aggregates obtained by processing natural or manufactured materials or recycled crushed unbound aggregates for use in construction of railway track.

### Landfill engineering applications of tyre-derived rubber materials

- 6 *Guidance on the use of tyres for leachate drainage blankets on landfill sites* (Environment Agency, 2008)  
Interim guidance for the design and construction of leachate drainage blankets including characterisation of size reduced materials.

## Appendix D: Good practice for the storage of tyre-derived rubber materials and use in unbound applications

### Good practice for the storage of tyre-derived rubber materials

Good practice for the storage of tyre-derived rubber materials both on site and at an interim location should be followed; these can be found in Annex B of PAS 107.

Additional good practice for interim storage is as follows:

- Processors should retain ownership of all tyre-derived rubber materials stored at any location other than the site of manufacture until such time as the materials are delivered to the customer at the site for their final use.
- Tyre-derived rubber materials should only be stored at an interim location for a maximum of 12 months.
- A maximum of 5,000 tonnes of tyre-derived rubber material should be stored at an interim location.
- Stockpiles of tyre-derived rubber materials may be at risk from fire and spontaneous heating. Additional detailed fire safety guidance is available from the Health and Safety Executive (HSE)<sup>4</sup> and should be followed. Risk of spontaneous heating can be mitigated by, for example:
  - minimising pile size;
  - controlling moisture levels;
  - managing stock to prevent piles being left for long periods;
  - monitoring sub-surface temperature;
  - turning piles at risk of spontaneous heating;
  - minimising external heating e.g. shading from direct sunshine; and
  - controlling ventilation by enclosure if possible.

### Good practice for all unbound applications of tyre-derived rubber materials in sensitive environments

The following good practice should be followed:

- The good practice outlined in Pollution Prevention Guideline PPG5<sup>5</sup> relating to works within 10 metres of a main river watercourse or flood defence should be followed.
- Tyre-derived rubber materials should not be used in areas with very high pH (e.g. pH 8 or above) or very low pH (e.g. pH 5 or below) as there is greater potential for metal/organic mobilisation.
- Tyre-derived rubber materials should not be used for high load bearing applications as their ability to leach chemicals increases.

<sup>4</sup> <http://www.hse.gov.uk/rubber/spontaneous.htm?ebul=hsegen/03-mar-2008&cr=19%20>

<sup>5</sup> Pollution prevention guideline PPG5 Works and maintenance in or near water. Environment Agency, Scottish Environment Protection Agency (SEPA) and Environment and Heritage Service (Northern Ireland) <http://publications.environment-agency.gov.uk/pdf/PMHO1107BNKG-e-e.pdf>

### **Good practice for unbound, sports, recreation and leisure applications of tyre-derived rubber materials in close proximity to aquatic receptors**

The following good practice should be followed:

- The good practice outlined in Pollution Prevention Guideline PPG5 relating to works within 10 metres of a main river watercourse or flood defence should be followed.
- Steps should be taken to ensure that no pathway exists for surface water run-off directly into watercourses. If this is not possible and/or a potential pathway is found to exist you should:
  - ensure adequate dilution at the receptor (e.g. fast flowing watercourse);
  - contain any potential leachate and treat in the same manner as sewage; and
  - where practical, contain all loose tyre-derived rubber materials using appropriate barrier methods (e.g. lining, kerbing) to prevent free release into the environment.
- Records should be kept and retained (for the minimum timescale specified in Section 3.2) giving the following details:
  - quantities and batch supplied and/or used;
  - application rates of tyre-derived rubber materials;
  - location of sites where tyre-derived rubber materials have been loosely spread; and
  - date of spreading.

### **Good practice for unbound civil engineering (unbound applications) of tyre-derived rubber materials**

The following good practice should be followed:

- The good practice outlined in Pollution Prevention Guideline PPG5 relating to works within 10 metres of a main river watercourse or flood defence should be followed.
- Steps should be taken to ensure that no pathway exists for surface water run-off directly into watercourses. If this is not possible and a potential pathway is found to exist (e.g. use as replacement aggregate in open surface drainage channels) you should:
  - develop suitable containment mechanisms and/or leachate collection systems; and
  - ensure adequate dilution at the receptor (e.g. fast flowing watercourse).

## Appendix E: Role of the certification body

The approved certification body will agree scheme rules with the Environment Agency and obtain *accreditation* on an annual basis from the United Kingdom Accreditation Service (UKAS) to BS EN 45011: 1998 "General requirements for bodies operating certification systems" (or any subsequent amendments).

The certification body must make provision to ensure that:

- the method of certification demonstrates that users have met both its requirements and those of the Quality Protocol;
- compliance with both the standard and the Quality Protocol are certified annually by an approved certification body and accredited by the United Kingdom Accreditation Service (UKAS) to BS EN 45011: 1998 (or any subsequent updates);
- certification verifies source documentation, evidence of site management procedures (including compliance with its quality management system) and laboratory test results;
- the certification body or its authorised contractor carries out at least one site inspection per year to verify on site documentation and to oversee the sampling of at least one batch of tyre-derived rubber materials;
- a public register of certified companies should be published on the internet and made available to the public; and
- certification is overseen by an impartial committee which adjudicates on any matters of non-compliance in line with the requirements of BS EN 45011: 1998.

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