# **Annex 05- Technical Specification**

## **Spillage Absorption Product Specification**

### **Scope**

* 1. This technical specification is a product specification to cover bulk spreadable products (Type II as defined in BS 7959:2004 Pt 1) for absorbing Diesel (EN 590 Automotive fuels – Diesel – requirements and tests) as well as other hydrocarbons, mineral oils or similar liquids for use on National Highways Strategic Road Network (SRN).

### **Principle**

* 1. The specifications for absorbents that follow specify the requirements for road usage. These specifications are designed to ensure the safety of road users and to limit the dissemination of pollutants into the environment.

### **Product Safety and Packaging**

#### **Safety**

* 1. No sorbents shall be used on roads, which are classified as “dangerous” with respect to European Directive 67/548, Article 2 (2).
  2. A safety data sheet, in accordance with either ISO 11014-1 or European Directive 2001/58/EC shall be available.
  3. No products for use on the highway shall require any additional PPE other than that already generally specified for Highway Operatives (Details provided in Annex A).

#### **Packaging**

* 1. The product will be packaged in a suitable size and weight to meet the requirements of manual handling as defined in HSE INDG143 (rev3).
  2. The product shall be suitably packaged to meet the requirements of the intended operation and environment for use. There should be no requirement for handling devices to move/deploy the material safely in singular package form or any special handling requirements.
  3. The packaging should be suitable to protect the product from the environment as not to affect its performance pre-deployment.
  4. The packaging should allow safe storage/stacking both on the vehicle and its general place of store area on site without any special requirements e.g. packaging inserts/wrapping to support the product.
  5. To allow movement of bulk quantities of product the product to the various sites or respond to an incident, the packaging needs should allow for safe stacking on a standard size 4 way pallet (1000mm x 1200mm) to minimise manual handling during transportation. The safe stacking height should be identified without any wrap but also with wrap. The packaging should ideally allow for interlocked stacking on a pallet.
  6. The packaging ideally should be re-sealable where the entire product may not be required to deal with a spillage.
  7. The packaging shall be such that entire contents can be deposited onto the Highway in one go or in a controlled manner when dealing with either a small spillage or when being deployed for containment purposes.

### **Labeling**

* 1. The packaging as defined in section 3 should be labelled in accordance with the requirements set out below.
  2. Sorbents intended for road usage shall bear labels or imprints, A6 size or larger, in compliance with the requirements and should include the information contained in 4.3 below on each bag in English.
  3. The label should contain the following information:
     1. Intended use areas R indicates: suitable for road purposes;
     2. Friction (F1 or F2) and Sorbency (S1 or S2) classification
     3. Classification as defined in section 5.3: "(Absorbent or Adsorbent) for use on road surfaces and traffic areas";
     4. The nature of the product including a list of essential components;
     5. reference to this Technical Specification;
     6. product name or product brand name;
     7. name of producer or distributor or other official identification;
     8. a code for product traceability for at least 3 years with easily distinguishable numeric year of manufacture;
     9. the contents of the package either in kilograms and in litres, with an indication of bulk density;
     10. sorbency value for hydrocarbons and for water as per this Technical Specification;
     11. conditions for exposure, handling and storage extracted from the safety data sheet as defined in ISO 11014-1 or European Directive 2001/58/EC
     12. statement of the obligations and the risks of using sorbents on roads:
         1. "Use of this product does not remove the risks presented by the original hazard."
         2. "Treat used product with the same precautions."
         3. "Used product should be removed from the road surface and collected, labelled and disposed of in accordance with the Hazardous Waste Regulations."
         4. any other information concerning health and safety in use shall be added to this marking including any relevant website or contact number.

### **Product Performance Requirements**

***General***

* 1. No sorbent product is to be used that require specialised tools/equipment to remove them once applied to the road surface. All contaminated sorbents should be readily removable by shovel and broom, in the case of small spillages or, in the case of larger spillages, by the use of plant such as road sweepers and grab trucks.

***Specific performance requirements***

* 1. A number of standard laboratory test procedures have been identified which will quantify desired characteristics of sorbent products destined to be used on the Highway. These tests will also help match the right type of product to a particular operational requirement. This specification only relates to sorbents in the form of loose material (Type II as defined in BS 7959:2004 Pt 1). These tests are to be undertaken in accordance with the requirements set out below and summarised in Table 1.
  2. **Classification** - In order to identify the product type the product must be tested in accordance with ASTM F716-07 Section 11.2.3 to classify it as either as an absorbent or adsorbent.
  3. **Diesel Sorbency** - A measure of diesel sorbency enables the weight of a given sorbent that would be needed to treat a given spillage. This test is described in BS7959:2004 Pt 1 Section 7. The product will be further sub-categorised based on results of test results into one of 2 categories either a class S1 (Sorbent can sorb in excess of its own weight of diesel) or a class S2 (sorbency performance of at least half of its own weight in diesel). The time frames which have been identified within the test 2, 15 and 60 minutes allow for the discrimination of rapid low sorbency materials from progressive high sorbency ones: these characteristics can be matched to operational requirements.
  4. **Release of sorbed diesel** - Once the product is saturated, loss of sorbed diesel in transit and into surrounding materials can be assessed via 2 tests:
     1. ASTM F716-7 Section 11.5 – Provides a measure of the containment efficiency of the contaminated sorbent when in contact with other materials, this provides a measure of potential contamination of the road surface and/or land/watercourse from diesel loss from the contaminated sorbent post-usage.
     2. ASTM F726-06 Section 10 – Provides a measure of how much diesel could be lost from the saturated product if left on the SRN to be trafficked or if exposed to stresses in transit and subsequent storage.
  5. **Water Sorbency –** An informative test to measure the water sorption by weight, relative performance. This test is used to determine any preferential loss of diesel sorbency from exposure to surface water or rain during deployment, or from moisture in storage. High water sorbency is undesirable as it reduces the products ability to sorb diesel.
  6. **Wet Surface Friction –** An informative test to determine the impact to the SRT if the product is left on the SRN, rather than recovered. Any product that meets the requirements of NF P98-190 (Annex A) demonstrates the highest level of residual skidding resistance if left on the road surface. Therefore the product will be classed as F1. In all other cases where the product does not meet the requirement or has been untested it will be classed as F2. An F2 classification indicates that additional measures post-treatment will be required and that the product should not be left on the road surface after use.

## **Table 1 Summary of performance requirements**

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| **Sorbent Property** | **Test Protocol** | **Limits** | **Performance Characteristic** |
| Classification of Sorbent as Absorbent or Adsorbent | ASTM F716-07 section 11.2.3 | Informative: Classification as Absorbent or Adsorbent  As determined by 11.2.3 | A Measure of potential for subsequent contamination from the used sorbent |
| Diesel Sorbency | BS 7959: 2004 Pt 1 Section 7 | Class S1 sorbency >100% by weight (From NF T 90-361)  Class S2 sorbency >50% by weight (From DD CEN TS 15366:2009) | A measure of diesel Sorbency by weight to assess likely weight of product needed to treat any given spillage  **Class S1** – Highest rating as product exceeds sorbency of its own weight  **Class S2** – A product which achieves a sorbency of at least half its own weight |
| Informative: establish the sorbency at  2, 15 & 60 minutes | A discriminator between short-term rapid, and longer term progressive sorbent characteristics |
| Release of Entrained Diesel from Sorbent to Other Products | ASTM F716-07 Section 11.5 | Informative: Maximum Effective Pickup and Maximum Practical Pickup | A measure of the level of sorbency achieved before Transfer of diesel occurs on to adjacent materials |
| ASTM F726-06  Section 10 | Informative: Susceptibility for a contaminated sorbent to lose diesel | A means of establishing the likely loss of entrained diesel from contaminated sorbent. |
| Water Sorbency | ASTM F726-06 Section 9.2.2 | Informative: Susceptibility for a sorbent to pick up water as well as diesel. | A measure of water sorption by weight, relative performance (high water sorbency is undesirable as it reduces the products ability to sorb diesel) |
| Influence of Sorbent on Wet Friction | AFNOR NF P98-190 (Annex A requirement) | Class F1 rating if product achieves  ≥90 % SRT initial Coefficient.  Class F2 rating if product achieves  <90 % SRT initial Coefficient. | **Class F1** – Highest level of Residual Skidding Resistance, if product left on the road surface.  **Class F2** Products should be recovered and not left on the road surface. Classification to apply if product not tested |

### **References**

The following document references have been used to support this specification. The versions have been included and where they have been superseded the latest version shall apply.

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| AFNOR NFP 98-190 | Equipment and products for road maintenance – Sorbents for use on roads - specifications |
| AFNOR NFT 90-361 | Determination of universal sorbent power – September 1997 |
| ASTM F716-07 | Standard test method for Sorbent performance of Absorbents |
| ASTM F726-06 | Standard test method for Sorbent performance of Adsorbents |
| BS 7959: 2004 Pt 1 | Materials used for the control of liquid spillages. |
| EN 590 | Automotive fuels – Diesel - requirements and tests |
| European Directive 67/548 | Classification, packaging and labelling of dangerous substances |
| European Directive 2003/33/EC | Establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of Annex II to Directive 1999/31/EEC |
| European Directive 2001/58/EC | Material Safety Data Sheet - Directive |
| HSE INDG143 (rev 3) | HSE guidance document – ‘Manual Handling for Work’ revision 3 |
| ISO 11014-1 | Safety data sheet for chemical products |
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### **Definitions and Glossary**

For the purposes of this specification the following terms are defined as:

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| **Term** | **Definition** |
| Absorbent | A material which picks up and retains a liquid throughout its molecular structure, causing the material to swell by 50% or more in excess liquid. (The determination of swell ratio as described in ASTM 716-07 section 11.2.3 allows the difference between an absorbent and the other types of sorbent material to be readily distinguished). |
| Adsorbent | A material that is reliant on capillary attraction to hold the liquid on its external surface, and in the void spaces formed by its intrinsic structure. A material is defined as an absorbent if it swells by less than 50% in excess liquid. (The determination of swell ratio as described in ASTM 716-07 section 11.2.3 allows the difference between an absorbent and the other types of sorbent material to be readily distinguished). |
| AFNOR | Association Française de Normalisation (International Organisation for Standardisation) |
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| ASTM | American Society for Testing and Materials ASTM, now ASTM International |
| BS | British Standard |
| BSI | British Standards Institution |
| CEDRE | Centre de documentation, de recherche et d'expérimentations sur les pollutions accidentelles des eaux (Centre of Documentation, Research and Experimentation on Accidental Water Pollution) |
| CEN | Comité Européen de Normalisation (European Committee for Standardisation) |
| Diesel | As defined in EN590 |
| NH | National Highways |
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| HSE | Health and Safety Executive |
| Hydrocarbon | Generic term in some test procedures, for the purposes of this research, diesel fuel as typically used in the UK was the liquid tested. |
| IFSTTAR | l'Institut français des sciences et technologies des transports, de l'aménagement et des réseaux (The French Institute of Science and Technology for Transport, Development and Networks) |
| IMS | (Highways Agency) Incident Management Solutions (Team) |
| ISO | International Standards Organisation |
| ISU | Incident Support Units – National Highways Service Provider |
| Oil | Generic term in some test procedures, for the purposes of this research, diesel fuel as typically used in the UK was the liquid tested. |
| Sorbent | Any material applied to a diesel spill to immobilize it and facilitate physical lift-up of the spilled liquid. (after BS 7959-1:2004) |
| SRN | Strategic Road Network |
| SRT | Skid Resistance Test |
| TO | Traffic Officer |
| TS | A European Technical Specification |