

PAS 5420:2023

Liquid fuels – Sustainable bioliquid fuels for use in fixed combustion applications for heating, hot water and cooking – Specification



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Published by BSI Standards Limited 2023.

**ISBN** 978 0 539 20345 5

**ICS** 27.190; 13.020.20

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### **Publication history**

First published April 2023

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# Foreword

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Acknowledgement is given to Alan C Black, as the technical author, and the following organizations that were involved in the development of this PAS as members of the Steering Group:

- Argent Energy
- BRE Group
- Crown Oil
- Department for Energy Security and Net Zero (DESNZ)
- Environment Agency
- Neste Corporation
- OFTEC (Oil Firing Technical Association Ltd)
- Salford University
- UKIFDA (UK and Ireland Fuel Distributors Association)

Acknowledgement is also given to the members of a wider review panel who were consulted in the development of this PAS.

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*Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.*

Where words have alternative spellings, the preferred spelling of the *Shorter Oxford English Dictionary* is used (e.g. "organization" rather than "organisation").

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## Section 1: General

# 0 Introduction

PAS 5420 has been developed to provide the liquid fuel firing industry with an environmental sustainability standard. This PAS sets environmental thresholds and limits for bioliquid fuels for fixed combustion purposes to enable the decarbonization of existing off-gas-grid liquid fuel heating and hot water provision in a controlled and sustainable manner.

PAS 5420 is designed to debar environmentally damaging bioliquid fuel feedstocks and processes from the heating and hot water supply chain. The implementation of PAS 5420 limits future fuel feedstocks to waste-derived sources, and creates and maintains a renewable and sustainable alternative to fossil fuels, drastically reducing carbon emissions from domestic heating to support the UK Government's target of achieving net zero carbon emissions target by 2050.

PAS 5420 defines the acceptable (waste source) feedstock greenhouse gas (GHG) emission parameters necessary to achieve and maintain bioliquid fuel carbon equivalent point of use emissions ( $\text{CO}_2\text{e}$ ) which do not exceed those values published within Table 12 of SAP 10.2 [1] and Table 32 of SBEM 2022 [2].

# 1 Scope

This PAS specifies requirements for the provision of sustainable bioliquid fuels for use in district and individual heating, hot water and cooking applications.

PAS 5420 is intended to be applied primarily by the liquid fuel supply chain and their auditors. Accordingly, prior industry knowledge and understanding of this context are necessary for those intending to apply the requirements contained in this document

It applies to bioliquid fuels derived from renewable fuel sources produced from non-virgin (waste) feedstocks that result in carbon equivalent lifecycle emissions not exceeding 0.036 kg CO<sub>2</sub>e per kWh when utilized for fixed combustion purposes.

This PAS covers:

- bioliquid fuel types derived from single or multiple waste sources;
- sustainability factors (e.g. fuel type, composition and provenance, and fuel lifecycle); and
- carbon emissions and primary energy usage from production through to point of use.

**NOTE 1** The PAS aligns with the Renewable Energy Directive (RED II) [3], the Building Research Establishment (BRE) Standard Assessment Procedure (SAP), 10.2, Table 12 [1], and the Department for Levelling Up, Housing and Communities (DLUHC) National Calculation Methodology (NCM, Simplified Building Energy Model (SBEM) for non-domestic buildings 2022, Table 32 [2].

This PAS does not cover:

- liquid fossil fuels or blends containing liquid fossil fuels and bioliquid fuels;
- liquid fuels for transportation;
- technical requirements for the application, composition and specification of liquid fuels;
- fuel efficiency for fixed combustion; and
- fuels subjected to post-production/after-market combustion-enhancing fuel additives.

The PAS is for use by auditors and distributors of bioliquid fuels.

It might also be of interest to producers, importers and blenders of bioliquid fuels, liquid fuel equipment manufacturers, fuel and fuel equipment trade associations, certification/accreditation bodies and governing bodies.

**NOTE 2** Examples of liquid fuels that might be covered by the PAS are paraffinic liquid fuels conforming to BS EN 15940, such as hydrotreated vegetable oils (HVOs), and fatty acid methyl esters (FAMES) conforming to BS EN 14214.

**NOTE 3** The bioliquid fuels described within this standard are not suitable for use in appliances which incorporate vaporizing sleeve burners.