

1 Introduction

1.1 Context

The use of hydrogen to replace natural gas in the households of the UK has the potential to contribute to the Government's pledges regarding carbon reduction and is one thread of a hydrogen-based economy which seeks to decarbonise the energy sector as it applies to transport, manufacturing, and domestic applications. There is a range of issues that will need to be overcome to secure this ambition. In part this is being addressed by the Hydrogen Skills and Standards for Heat (HSS4H) programme. This proposal outlines Frazer-Nash Consultancy's response to the Invitation to Tender to deliver an evidence project on the suitability of solder and brazing alloys for use in low pressure hydrogen gas installations, such as those that might be found in the household, and in industrial settings where natural gas is currently used.

We believe that we are well placed to conduct this work because:

1. We have extensive experience of applying standards to aging equipment in highly regulated industries (such as nuclear and aerospace) and contribute to the research and development into the authoring of standards and the underlying material and structural models;
2. Our subject matter experts (SMEs) include individuals with expertise in mechanical testing, multidisciplinary experimental programmes, standards, and standards bodies, and the dissemination of knowledge to technical and non-technical audiences; and

3. [REDACTED]
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1.2 Aims and Objectives

Our proposal will deliver an evidence based solution of information that is both reliable and complete, going beyond the minimum and provide a robust data set formed from rigorous and appropriate test programme. To achieve this, we will:

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2. Provide clear unambiguous evidence in accordance with the defined methodology to categorise relevant grades of solder and brazing alloys as either suitable or not suitable for use with low pressure hydrogen. This will lead to a material suitability assessment methodology that reflects the in-service conditions the materials will be subjected to in low pressure domestic and non-domestic hydrogen installations. Additionally, assessment criteria to enable categorisation of material types as suitable or not suitable for use with hydrogen will be defined.

3. Communicate with standards bodies to support writing of sections relating to suitability of materials within hydrogen standards being developed under the HSS4H programme and make information available in a way that will support future standards.

2 Methodology

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