

Prototype Product Assessment

The BBA has launched a new service for building product manufacturers in the stage of product development where prototypes are available but full production is still some way off.

Full BBA approval may be on any serious building product manufacturer's agenda but this is geared very much at finished products available on the market and to date there has been no interim stage where a product under development may be assessed and a document that should be of use in the marketing of the new products, published.

This new document is called a Prototype Product Assessment (PPA) and is designed to provide independent information to specifiers, building control personnel and contractors considering the use of the product at some time in the future.

Like conventional BBA approval, the PPA process will consider the critical performance areas relevant to the product. These are likely to include Building Regulations compliance, functional capability, application benefits, and limitations in UK, maintenance and production control.

A key difference to the standard BBA assessment will be the use of Failure Modes Effects Analysis (FMEA) and Failure Modes Effects and Criticality (FMECA). These were developed in the aeronautics and other high-tech industries to assess residual risk arising from very new and prototype products used by these industries.


Key FMECA considerations could be probability of failure, its detectability and severity of outcome. Within each of these a judgement is made and a score of 1 to 5 given (1 low and 5 high). Each category score is multiplied with the others and a total score calculated. This enables risk comparisons to be made between the prototype and well-established products familiar to the industry.

The first PPA issued by the BBA is for an anti-flood air brick, known as the Smart Airbrick, marketed by Eco Coverage Technologies. This is a product in the early stages of its life cycle that provides a good solution to a problem in flood-prone areas but has suffered lack of acceptance because no realistic assessment of its performance has been possible to date.

The BBA process investigated the functioning of the Smart Airbrick, checking the leakage risk in different types of floodwater, and its performance as an air brick in normal non-flood situations.

The results of this assessment, including the FMEA and FMECA, are set out in the PPA for the Smart Airbrick, available via the BBA website.

PROTOTYPE PRODUCT ASSESSMENT



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SMART AIRBRICK

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This document is intended to assist specifiers, regulators, contractors and others considering the use of a prototype product⁽¹⁾. In this regard, this document is a precursor to full Agrément approval, which may be granted following experience in use and surveillance of full factory production control procedures.

Generic type of construction product and use

The Smart Airbrick (SAB) is a modular-designed air brick that readily allows passage of air but not water and may replace the standard type of air brick in new build and in retrofit situations where there is risk of flooding. The brick is constructed from durable materials, eg acrylonitrile butadiene styrene (ABS) using UV-stabilised polypropylene, stainless steel, brass and silicone-based minor components. Within the air brick are flood-activated valves that resist water intrusion. The brick operates independently from all other house services and can be installed easily (see Figures 1 and 2).

The SAB is covered by British patent GB 2397592 (26th January 2004).

In addition to restricting the passage of water, the Smart Airbrick will also prevent fast airflows (gusts) under the ground floor, so reducing heat loss from the dwelling.

The Smart Airbrick is available in two forms, although identical in operation:

- for retrofit applications — replaces the standard air brick and fixed into position using appropriately coloured mastic
- for new build applications — fitted in the same way as a standard air brick.

Both types of Smart Airbrick comply with BS 493 : 1995 with a coordinating size of 225 mm by 75 mm (see BS 493 : 1995, Table 1), and provide ventilation under floor voids and in wall cavities. However, this assessment does not cover other applications, eg air supply to combustion appliances.

Basis of this assessment

This document covers:

- factors relating to UK Building Regulations compliance
- performance data in support of functional capability
- FMEA/FMECA⁽²⁾ and risk assessment based upon them
- application benefits
- limitations in use
- maintenance
- production control.

(1) In the context of this assessment, a prototype product is one developed fully at the laboratory stage but needs feedback from site experience to complete the development and complete the manufacturing process.

(2) Failure Modes Effects Analysis (FMEA) and Failure Modes Effects and Criticality (FMECA) were developed in the aeronautics, space, nuclear, chemical and automobile industries to assess residual risks. They can be adapted for making similar judgements about construction and building products (see 'Talon A' entry in the Bibliography).