



Innovative system Acceptance Certificate

Issue date: 22/12/23
Reference number: 4221.01
Valid from: 22/12/23
Innovative System Owner: TopHat Industries Ltd
Unit 3000 Park Avenue
Dove Valley Park, Foston
Derby, DE65 5BT
Innovative System Name: THC with LGS Floor
Generic form: Volumetric timber frame with LGS floor cassette

NHBC Services Ltd has reviewed the following information (the System Manual) related to the Innovative system supplied by the Innovative System Owner:

- TopHat THC LGSF System Manual Rev B dated 15 December 2023

Relying on the information provided by the Innovative System Owner, NHBC Services Ltd considers that the Innovative system can meet NHBC Standards.

Additional requirements must be met in order for a new home to qualify for Buildmark cover. Buildmark cover for new homes will only be issued to Builders or Developers in accordance with the latest version of the NHBC Rules (a copy of which can be found at www.nhbc.co.uk).

This acceptance certificate is valid until such time as it is no longer published or authorised by NHBC. Readers are advised to check the validity and latest issue number of this Certificate by either referring to our website at www.nhbc.co.uk/accepts or contacting NHBC directly.

Issued by:

A handwritten signature in black ink, appearing to read 'Asit', is written over a light blue horizontal line.

Technical Innovation Manager
NHBC Services Ltd



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Description, Scope and Intended Use

The THC System with LGS Floor is a variant of the TopHat THC System. The System comprises factory assembled volumetric units or modules, using timber frames for the majority of the structural elements, with the exception of the ground floor cassette which is fabricated using cold formed galvanised steel joists. The modules are fully fitted out offsite including external rainscreen cladding, breather membrane, sheathing board, thermal insulation, air & vapour control layer, fire protection linings, windows and doors, MEP installations and internal fixtures.

External wall panels have a timber I-stud core with sole and head plates of treated solid timber and glass mineral fibre insulation between studs. The outer face of these panels is covered with sheathing board and breather membrane, while the inner face is covered in an AVCL and a lining of either Rigidur or Fermacell board. The walls are completed with factory-installed cladding which was developed by TopHat and is third-party certified. The rainscreen cladding provides a brick effect on calcium silicate board over a ventilated cavity, and is carried on an aluminium rail framework screwed to the face of the modules.

Separating walls are made up of two panels (each forming the flank wall of a module). These panels comprise solid timber studs and plates with glass mineral fibre insulation between studs and two staggered layers of Rigidur board. When assembled into adjoining houses, the cavity between modules is fully filled with rock mineral insulation. Internal walls are formed of solid timber studs with a layer of Rigidur board each side.

The ground floor comprises galvanised Light Gauge Steel (LGS) joists and rim beams, supplied by LGSF Modular Plant Rooms Ltd (SCI Stage 1 certified). The joists are formed into a cassette with the addition of moisture resistant grade 22mm P5 chipboard, as well as insulation, between and below the joists, AVCL, and a breather membrane.

The intermediate floors are formed from timber I-joists with treated solid timber rim beams, insulation within a 600mm perimeter zone, 22mm P5 floor decking, and 12mm plywood to complete the cassette. The modules also have a ceiling cassette which is similar, but with smaller timber I-joists, a 15mm OSB deck (for access and diaphragm purposes). The underside of the ceiling cassette is lined with one or two layers of 12.5mm Rigidur board (depending on fire resistance requirements). A flat roofed module would utilise the same ceiling cassette but have tapered rigid insulation layered on an AVCL to create a warm roof. A single ply roof membrane is applied to provide waterproofing. Alternatively, a trussed rafter pitched roof can be added to the module on site. In this instance an AVCL would be located behind the ceiling lining.

Modules are delivered to site and assembled on a prepared foundation to create a house. Galvanised steel plate connections to secure modules to substructure and between modules, are made on site. Site works also include: the addition of the roof structure and covering; localised



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completion of the external cladding (referred to as 'Zip-up'); application of fire stopping and internal linings at module interfaces; and drainage and services connections to the mains.

The System can be used on attached houses up to three storeys, as either semi-detached or terraced. The houses are all at least M4 (2) compliant. The System Owner has twelve standard house types, however, these have not been reviewed as this certificate covers the System only. The System is suitable for sites throughout England only, where the peak wind pressure does not exceed 1.0kN/m², and the site is not less than 500m from the coastal shoreline. Sites outside these parameters will require project specific design.

Extent of review for NHBC Warranty on NHBC Registered Sites

NHBC Services Ltd has undertaken a technical review of the System Manual as set out in line with the NHBC Accepts Technical Document for Innovative systems.

The NHBC Accepts Service is intended solely to provide confidence that the Innovative system meets NHBC Standards and is not intended as evidence of performance for any other purpose. Appraisal of the Innovative system against building regulations is not carried out as part of this Service.

Exclusions and Limitations

This Acceptance Certificate is made out solely to the System Owner. To the fullest extent permitted by law, we do not accept or assume responsibility to anyone other than the System Owner arising out of, or in connection with, this Acceptance Certificate.

Exclusions and limitations are set out in the System Manual. Additional considerations in the use of the Innovative system include:

- Detached houses are excluded;
- Steps and staggers are not accommodated;
- Integral factory-bult pitched roofs are not included in the certificate;
- Balconies and top floor setbacks are excluded;

Reference in the System Manual to detailing of associated site work is for guidance only and a project specific design will be required for all these elements of work.



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