

zehnder

always the
best climate

Always the best climate for

PERFORMANCE

Understand how the new EN standards for radiant panels can impact you

What are EN standards?

European Standards (ENs) are documents that have been ratified by one of the three European Standardization Organizations (ESOs), CEN, CENELEC or ETSI; recognised as competent in the area of voluntary technical standardisation as for the EU Regulation 1025/2012.

What are the key industry standards that relate to heating and cooling surfaces (radiant panels)?

The key testing standards are listed below.

EN 14037-1 technical specification and requirements	EN 14240 cooling capacity of closed ceiling	EN 14037-2 thermal output of radiant panels Test method	EN 14037-3 thermal output of radiant panels Rating method and evaluation	EN 14037-4 cooling capacity of radiant panels	EN 14037-5 thermal output of open or closed heated ceiling
--	--	--	---	--	---



What has changed?

Since November 2016, EN 14037-4 cooling capacity of radiant panels and EN 14037-5 thermal output of open or closed heated ceilings, developed by the EMCP (European Manufacturers of Ceiling Panels) have superseded the previous standards. Although the standards remain voluntary rather than mandatory they are recognised across the industry.

How does this impact testing methodology?

Manufacturers would typically have tested radiant panels using the EN 14037-2/3 testing methodologies whether panels were installed as either ceiling panels (free hanging or ceiling sails) or within a ceiling grid or lay-in (termed solely ceiling grid from this point forwards) application. The new standard, EN 14037-5, ensures a separate testing methodology is used for ceiling grid applications.

EN 14037-4 has been implemented by the EMCP to provide a standard for cooling capacity of radiant panels replacing the existing EN 14240 which was developed as part of a 'Ventilation for buildings' methodology. As a note when manufacturers test to EN 14037-2/3 (thermal output – 3 point measuring) the testing to EN 14037-4 (cooling capacity) is carried out directly afterwards as a single point measure.



When should testing to EN 14037-3 and EN 14037-5 be used?

EN 14037-3 is used when ceiling panels are installed, typically in large enclosure applications, when designed as long strips. You can expect higher system temperatures than when compared with ceiling grids. Output results will be based on W/m.

EN 14037-5 is used when radiant panels are installed within ceiling grids, typically where low mounting heights are concerned. You can expect lower system temperatures than when compared with ceiling panels. Output results will be based on W/m².

If the ceiling panel heat output is taken according to EN 14037-3 standard for a grid application, it leads to considerable more output than what the panel can transfer in reality in that application. Hence the requirement for the EN 14037-5 standard.

This article solely concerns itself with thermal output (heating) rather than cooling.

How are outputs for EN 14037-3 (in W/m) and EN 14037-5 (in W/m²) derived?

Firstly, we need to determine what is considered the 'active surface' of both a ceiling panel or ceiling grid to provide the necessary output information.

We need to consider the active surface **in accordance with EN 14240 standard**, that considers the **active length** – i.e the part of the panel where the water carrying pipes are in thermal contact with the radiant panel and the heat exchanger strip between pipe and panel plate (e.g. the aluminium foil) – whichever is longer. The **active width** is derived by multiplying the number of pipes by the spacing between each pipe (shown as calculation $4 \times b$, below).

By adopting the active surface area defined in the EN 14240 standard, it allows for appropriate scaling for heating output to be accounted for. This differs from EN 14037-5 testing standard, which considers the active surface to be the whole module (or panel) area, when installed within a ceiling grid and would not provide the output of the active area.

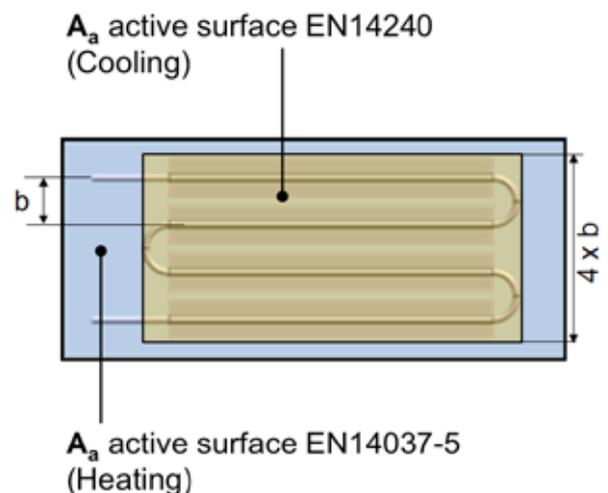
So the active surface is calculated by **active length x active width**.

Calculating heat output using EN 14037-3 is a simple process based on the dimensions of the ceiling panel – for each panel there is a specific heat output in W/m.

What is the fundamental difference between heat outputs expressed to EN 14037-2, and to EN 14037-3 standards?

Outputs stated to EN 14037-3 standard incorporate a factor of 1.1 in relation to EN 14037-2 heat outputs when the flow temperature is $>50^{\circ}\text{C}$.

As detailed in section 5 "Thermal output conversion – Determination of the rated thermal output" of EN 14037-3 guidelines, it is indicated that test booth results understate output from radiant ceiling mounted panels by about 10%.



What do you need to do?

When working with manufacturers ensure they are both working to the new standards and applying the relevant standard to the type of application, either as ceiling panels or ceiling grids. This will ensure that you achieve the stated outputs you are looking to achieve and heat outputs can be compared between manufacturers, on a like for like basis.

Heat outputs derived under EN 14037-5 standard will be lower than for EN 14037-3.

Why would manufacturers opt for stating heat outputs to old standards rather than adopt new standards or not even referencing standards?

The standards themselves are a voluntary technical standardisation so not enforceable. However, adopting them will ensure a consistent approach and provide comparable data across the industry. It will ensure professional standards are maintained, in that a building will achieve its thermal design conditions as a result of all plant and equipment performing as stated in manufacturer's documentation.

If a test standard is not stated it is a fair assumption that outputs are not worth the paper they are written on and should not be accepted without validation.

How can I find out more information with regards to the standards?

All EN documentation can be purchased via www.bsigroup.com.

Contact Information

If you need to speak to someone or have a question to ask us, there are several ways of getting in touch.

Phone

Head Office: 01276 605800

Customer Services: 01276 408404

Technical Services: 01276 408400

Email: enquiries@zehnder.co.uk

Website: www.zehnder.co.uk

© Copyright Zehnder Group UK Ltd 2020

Zehnder Group UK Ltd

Registered office: Concept House,

Watchmoor Point, Camberley

Surrey GU15 3AD

Registered in England No.2296696

The Zehnder logo is written in a bold, red, sans-serif font. The letters are slanted upwards from left to right, giving it a dynamic, forward-leaning appearance.