

**INFORMATION AND GUIDANCE FOR INSTALLERS**

# Heat Pump System Performance Estimate Standard and Tool (MCS 031)

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## WHAT IS MCS 031 AND ITS PURPOSE?

MCS 031 seeks to give consumers a reasonable and impartial assessment of heat pump performance by estimating the annual energy consumption of the proposed heat pump system during a typical year. It is a requirement under MCS that this estimate is provided to the customer at the quoting stage, so they are better able to make an informed decision.

MCS 031 uses an industry-backed, standardised methodology which relies on fixed data points, including the energy usage figures retrieved from a property's EPC. This ensures that customers receive clear and understandable estimates of the proposed system performance, and the methodology means customers can directly compare estimates obtained from different MCS certified installers.

It's important to remember that MCS 031 is **not a design or specification tool to calculate a property's heat load or to size a heat pump**. All heat pump design requirements sit within The Heat Pump Design Standard (MIS 3005-D), where it is mandatory to select a heat pump based on the property's heat load as defined by a heat load calculation in accordance with BS EN 12831-1:2017. After completing the full design, MCS installers must follow section 5.9 'post-design customer information', where the customer is provided with the updated information.

An installer should make the decision as to whether they wish to complete a full heat load calculation to support their quote, however, MCS are aware that not all installers, particularly those from small businesses, have the additional time and resources to carry out a full heat load survey prior to entering a contract. MCS 031 is designed to provide customers with a reasonable expectation of their system performance, whilst not creating a significant time or cost burden on installers.

## WHAT ARE THE MAIN CHANGES THAT HAVE BEEN MADE TO MCS 031 AND WHY?

MCS 031 is now based on estimates of SPF instead of SCOP for the following reasons:

- The new method (based on the SPF) takes **a range of factors** into account when estimating the performance of a heat pump system, whilst the SCOP metric is based solely on the flow temperature taken from the manufacturer's data.
- Recent studies have shown that SCOP significantly overestimates the likely efficiency and takes little account of the emitters being used: whether radiators, underfloor heating or a combination of both.
- Those studies, including the recent Electrification of Heat field trial, have found no or very little correlation between SCOP performance forecasts and actual outcomes. In other words, estimates based on SCOP do not provide useful information about system performance in most situations.

The Heat Pump Working Group therefore agreed to base MCS 031 on the SPF metric because it provides a more reliable and reasonable estimate of heat pump system performance than SCOP. It is also worth noting that utilising the data from an EPC certificate to input the property's energy usage in the calculation is not a new requirement within this update and has existed in previous versions of MCS 031. Whilst MCS appreciates the challenges with EPC data, MCS continues to explore if there is a viable alternative.

## WHAT ARE THE DIFFERENCES BETWEEN COP, SCOP AND SPF?

### Co-Efficient of Performance (COP):

COP is the performance value of a heat pump in a controlled environment when given a fixed input and output temperature. This will be shown as a ratio: 4:1, meaning 4 units of output (flow temperature) is provided by 1 unit of input (kWh of electric). Sometimes also shown as being 400% efficient.

### Seasonal Coefficient of Performance (SCOP):

SCOP is used for measuring heating only efficiency in heat pumps within a controlled environment. It is an evolution of the Coefficient of Performance (COP) which aims to give a truer reflection of day-to-day use of a heat pump for heating over a year. While COP gives efficiency at a set point, SCOP considers that our heating requirements change. SCOP replicates a seasonal heating use (heat pump with fixed heating outputs of 35°C, 55°C and where applicable 65°C), and gives a maximum efficiency rating for the heat pump, with the full system working at an optimum level. SCOP performance is shown as a ratio too.

### Seasonal Performance Factors (SPFs):

SPF is the measurement of the heat pump system (heat pump + heating distribution system) over a year, taking into account the variable air and ground temperatures (in colder temperatures the heat pump will have to work harder and consume more electric) along with the heating system connected to deliver heat like radiators, underfloor, fan assisted radiators etc., (the higher the flow temperature delivered to heat the property, the more energy you will consume). SPF considers the installation location, weather data, and individual heating distribution system to provide a Seasonal Performance Factor of the system for heating along with DHW production efficiency (if applicable). SPF performance is shown as a ratio too.

## HOW WERE THE CHANGES AGREED?

As with all MCS technical standards and tools, MCS ensures that our standards are created and maintained by industry, for industry. This means decisions are made via the MCS Technical Working Groups to ensure they are up to date and align with current industry practices. The working groups make up a wide range of expertise and insight from volunteers across industry, including installers, manufacturers, trade associations, certification bodies, consumer protection representatives and independent consultants. Any proposed changes are then put out for a public consultation to give the wider industry the opportunity to feedback. The feedback from the public consultation on the changes to MCS 031 were supportive which resulted in the changes being implemented.

## WHY IS THE TOOL STILL NOT FUNCTIONING PROPERLY WHEN MY SOFTWARE IS UP TO DATE, AND I'VE ENABLED THE MACROS IN MICROSOFT EXCEL?

This could be a result of your device blocking the macros in another way.

One thing that could be acting as a blocker is from the Trust Centre Settings. If you go to "File > Options > Trust Centre > Trust Centre Settings > Macro Settings > Enable VBA Macros" as well as ticking "Enable Excel 4.0 VBA macros".

Once you have done this, save a copy of the tool to your device and then reopen the tool, this should allow you to run the macros properly.

Other issues that can affect functionality is if you are using the tool in the web version of Excel rather than desktop version. Additionally, if you have other Excel workbooks open at the same time as the MCS 031 tool, the code can be blocked from working.

As the main formula cells in **red** are not locked, you should not make edits to these as they are formula driven. If function is still not working properly, you may need to redownload the tool again to ensure the formulas are correct and have not changed since the original download.

## **ENCOURAGING FEEDBACK**

Despite the recent changes following the formal governance process, MCS are keen to continue to improve their Standards and tools and rely on industry providing feedback and suggestions to our Standards, including MCS 031. This can include an alternative to using EPC data. We encourage you, if you have feedback on MCS 031, to please send this to: [feedback@mcsCertified.com](mailto:feedback@mcsCertified.com) for consideration at the next Heat Pump Working Group meeting.