

Dirty ductwork

Paul Gregory explains the importance of handing over new buildings with clean ductwork that meets TR19 standards

■ TO ALLEVIATE CONFUSION AMONG SPECIFIERS OVER THE INTERNAL CLEANLINESS

of newly installed – and existing – ductwork, the HVCA has now published the *TR19 Guide to Good Practice, Internal Cleanliness of Ventilation Systems*, a new all-inclusive guide that provides updated advice on maintaining clean ductwork in existing and new buildings.

In addition to advice on the general cleanliness of ventilation systems, the *TR19* also includes guidelines on pre-commission specialist cleaning to ensure that new ductwork systems remain protected during the installation period and prior to commissioning.

The proper maintenance of building systems is crucial for ensuring the safe, efficient and economic operation of occupied spaces. It has long been recommended that only a specialist cleaning contractor be employed. As far back as 1998, DW/144 – the standard specification for ductwork manufacture and installations – recommended that “it will be in the interests of the designer, both financially and practically, to consider employing a specialist cleaning contractor at the outset of a contract to internally clean newly installed ductwork prior to handover”.

TR19 reiterates this advice, stating that the only way to ensure cleanliness on the final handover of new buildings is to employ a specialist cleaning contractor.

In the past, there have been issues over whose responsibility it is to maintain a suitable working environment to prevent newly installed ductwork from becoming contaminated. It is the responsibility of the specifier to assess the acceptable risk of contamination and to select and state clearly, in the invitation to tender, the level of protection required for the ductwork and the requirement for specialist cleaning.

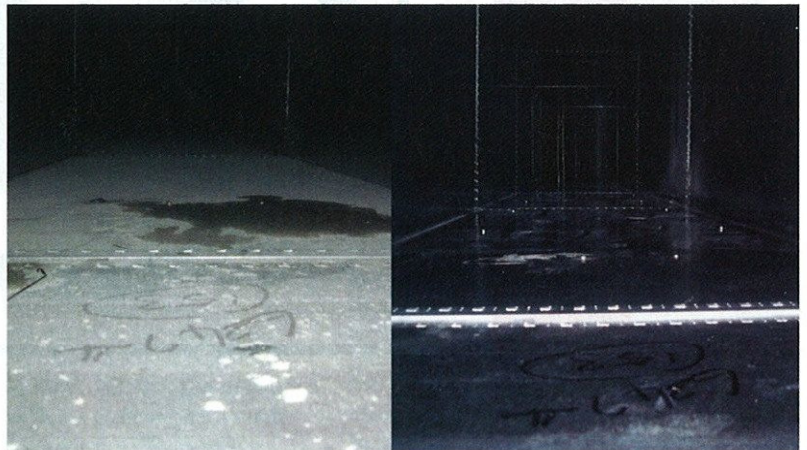
Another common problem in the pre-commission cleaning of new ductwork is that some contractors are using tests specified for measuring ductwork cleanliness in existing buildings to evaluate ductwork cleanliness in new buildings. As a result, new buildings are being handed over with ductwork that does not meet the recommended levels of cleanliness.

It is essential that specifiers are clear on the tests required for pre-commission cleaning of new ductwork and the protection, delivery and installation levels required.

Protection, delivery and installation (PDI) standards

There are three levels of care and protection for maintaining the internal cleanliness of new ductwork prior to commissioning and/or handover – PDI Level 1, 2 and 3 – and it is the responsibility of the main building contractor to provide a dry and clean storage area adjacent to the working area for ductwork and equipment. PDI Level 3 details the requirements for pre-commission specialist cleaning.

Protection of ductwork on a construction site will not guarantee internal cleanliness of the ductwork. Where specific verifiable levels of internal cleanliness are required, it is the responsibility of the designer to specify



A dirty job: ductwork before (left) and after (right) after a thorough clean

a specialist cleaning contractor at the outset of a contract to internally clean newly installed ductwork just prior to commissioning work commencing.

This offers the following benefits:

- The number of cleaning access panels may be determined to suit the method of cleaning to be adopted.
- Clear direction may be given to the ductwork contractor as to the size and location of cleaning access panels required to be installed during the manufacturing process.
- A specialist cleaning operation prior to commissioning would enable the cleaning contractor to verify the practical access requirements for future cleaning operations associated with a regular maintenance programme.
- It would allow the specifier to reduce the need for wipedowns and capping-off.
- The cleanliness of the installation can be confirmed and documented by means of the post-clean verification test procedure.

Verification of cleanliness

Verification must take place immediately after cleaning to avoid post-clean interference. The client should be allowed to witness the testing. The surface should be visibly clean and capable of meeting the level of cleanliness specified. Verification, where specified on general ventilation systems, should be by means of a vacuum test (VT) based on the recommendations of the *TR19*.

A system will be considered acceptably cleaned if a result of no more than $.075\text{g}/\text{m}^2$ is achieved, equivalent to $0.75\text{mg}/100\text{cm}^2$ as per the *TR19*. This applies for specialist pre-commission cleaning of new systems and should not be confused with surface deposit limits, which determine dirtiness levels in existing buildings – commonly $6\text{g}/\text{m}^2$ for extract systems and $1\text{g}/\text{m}^2$ for recirculation systems and supply systems.

Following the tests, a completion report is issued highlighting the type of tests performed, the results, photographic support and future recommendations on maintaining the cleanliness of ductwork.

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