TECHNICIAN'S ADVISORY

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PERMEANCE – CAN WALLS DRY THROUGH PLASTERED SURFACES?

IF YOU ARE A WATER DAMAGE TECHNICIAN you will deal with many types of building systems. Often you will be dealing with masonry walls with elevated moisture levels as a result of the incident.

These walls usually have some type of plastered surface and many people think this inhibits the drying process and so has to be removed.

If you've visited many water damaged properties in the UK you will know that it's fairly routine to remove wall plaster, often as a matter of course. This is usually carried out in the belief that this internal demolition will significantly speed the rate of drying.

TRUTH OR FICTION?

Is this belief correct? Can walls dry through plastered surfaces?

Before we consider this question we first need to remind ourselves that this question relates to masonry walls only.

Masonry walls may be defined as –

The building of structures from individual units, which are often laid in and bound together by mortar ... The common materials of masonry construction are brick, building stone (such as marble, granite, travertine, and limestone), cast stone, concrete block ... and cob.

When a wall is affected during a water damage incident water soaks into the material and to 'dry' it needs to find a way out again. This is mainly through the surface of the masonry material. With a cavity wall there are of course two surfaces – both into the room and into the cavity.

Water vapour passing into the room has to pass through surface coatings such as plaster and paint. So it is helpful to understand how easily this might happen – how easily water vapour passes through these materials.

MATERIALS GROUPED ACCORDING TO THEIR PERM RATING

● Vapour impermeable: 0.1 perm or less	
• Polyethylene vapour barrier 0.004 - 0.006"	0.03 perms
• Aluminium foil .0035-0.050" vinyl wallpaper	0.09 perms
● Vapour semi-impermeable: 1.0 perm or less and greater than 0.1 perm	
• Exterior oil based paint three coats	0.3 to 1.0 perm
● Vapour semi-permeable: 10 perms or less and greater than 1.0 perm	
• Orientated strand-board OSB	2 to 5 perms
• Latex paint (primer and sealer)	2 to 6 perms
• Cement block 200 mm	2-3 perms
• Hardwood three-quarter inch two plywood 12 mm	2 to 9 perms
• Brick	3 to 4 perms
• Softwood unfinished	4 perms
• Synthetic topcoat plaster	4 perms
• Traditional stucco 20 mm	4 to 7 perms
● Vapour permeable: greater than 10 perms	
• Lime plaster 25 mm	17 perms
• Gypsum plasterboard paper faced 12 mm	75 perms
• 25 mm air gap	120 perms

TABLE 1

The Technicians' Advisory column is intended to add to a technician's existing knowledge base and offer alternative solutions to specific issues.

It is not intended as a definitive tutorial, nor to imply the recommendation of a particular methodology, since all situations must be assessed individually and any action taken is entirely the responsibility of the technician or organisation involved.

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The rate at which water vapour moves through a material is measured in 'Perms', derived from the word permeance. Here we will consider the metric Perm*.

The metric Perm unit is 1g of moisture per m^2 per day. This means that a material with a metric Perm value of 1 allows 1g of water vapour to move through 1 m^2 of its surface per day.

Materials are grouped according to their Perm rating, as shown in Table 1.

You can see from this data that the perm rating for brick (3-4 perms) and concrete block (2-3 perms) puts them in the semi-vapour permeable range. Latex paint is similar to brick and concrete block with 2-6 perms, while Gypsum at 12mm has 75 perms, making it Vapour Permeable. .

Water vapour will pass through gypsum plaster which has a painted surface at a similar rate to brick or cement blocks. From these figures it is therefore hard to understand why internal gypsum plaster would ever be removed to assist drying.

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The removal of internal plaster should surely require special justification whenever it is proposed and only after alternatives have demonstrably been fully explored.

Interestingly modern domestic buildings have good resilience in the aftermath of flooding – masonry walls with cavities (required since the 1960s) having the ability to release moisture into the cavities, as well as through plastered surfaces. They can, in most cases, be decontaminated and dried without 'hard strip out' of wall plaster.

However, while they may have this built in resilience to flooding incidents, they are not at all resilient to a determined tradesperson with a powered chisel.

**Note there is also a US Perm – 1 metric perm = 1.51735 US perms*