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TECHNICAL BULLETIN

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Gaps with Gypsum Wallboard Panel Installation

The installation of gypsum wallboard (drywall) to framed walls and ceilings is often used to serve a variety of functions, including aesthetics, shear, and sound and fire resistance. When fire resistance is the primary concern, the allowable gaps in installation are tighter than for non-rated construction. The tests run on fire-rated wall and ceiling assemblies require adherence to the method and the allowable tolerance for the installation of the panels. Allowable variations and interpretations to tested assemblies should be restricted to fire design engineers and authorities.

The IBC (International Building Code) and CBC (California Building Code) require gypsum wallboard to be installed with the board edges and ends in “moderate” contact, per Section 2508.3. Moderate contact is defined as essentially touching each other. It is possible and anticipated that board edges will not be in complete contact with each other the entire length of the gypsum panel. This is due primarily to the fact that there are allowable tolerances set in the manufacturer of gypsum panels by ASTM (American Society of Testing Materials) standard C-36. Perfectly straight/square gypsum panels are not always possible nor should be expected. All panels should be installed essentially touching each other with some small allowable and anticipated gaps along the edges and ends without compromising a fire rating.

FIRE-RATED CONSTRUCTION

UL (Underwriters Laboratory) has an allowable tolerance for electrical boxes through gypsum panels in fire-rated assemblies. The general design information states gypsum board shall be cut as not to create a gap wider than $\frac{1}{8}$ inch around metal electrical boxes for fire-rated partitions rated up to two hours. This language does not apply to the edges and ends of installed gypsum wallboard and should not be used as such. However, it does demonstrate there is an allowable tolerance and perfection is not expected. The challenge for field inspectors is the allowable amount of tolerance without putting the assembly at risk of failure in the event of a fire.

Installing manufactured gypsum panels from the factory with no gaps is not reasonably possible. Gypsum wallboard installed in moderate contact, essentially touching along the edges and ends, should be expected for fire-rated construction. Gaps that are questionable may be pre-filled with an approved material.

Gaps approximately $\frac{1}{8}$ inch and less for one hour and two hour rated partitions, if the face layer joints are staggered a minimum 16 inches from the base layer, can be pre-filled with setting type compound and will not affect the fire rating. Independent test conducted by Wamock Hersey (File # WHI-495-PSV-0977) have successfully demonstrated that gaps up to $\frac{1}{2}$ inch wide filled with a setting type joint compound (20-minute set time) successfully passed a one-hour fire rating. The test was completed per ASTM E 814 (Standard Test Method For Fire Tests of Through -Penetration), and included the hose stream test.

This guide is for static joints only and the setting type joint compound must fill the face layer void completely and be a minimum thickness of the gypsum wallboard.

NON-RATED CONSTRUCTION

Good construction practices dictate that all gypsum wallboard should be installed with edges and ends in moderate contact. However, in non-rated conditions the gaps are not as critical and not as carefully monitored as in rated construction. Small gaps (less than $\frac{1}{8}$ inch) are not required to be pre-filled; gaps $\frac{1}{4}$ to $\frac{3}{8}$ inch wide should be pre-filled with a joint compound and allowed to completely set prior to taping the joint for best performance for final decoration. Wider gaps are recommended to be pre-filled with setting type joint compound.