

Durabond's EIFS from the Perspective of Fire Safety

General	In 2105 and 2017 two major, international fires engulfed two high rise buildings were the first building represented a new high-rise construction, while the second building was a retrofit. While there was no loss of lives in the first fire, unfortunately, the death toll in the second fire was very high.
Observations	Based on media accounts, it seems that the propagation of the fire in both buildings was primarily caused by the combustible cladding systems used on the exterior walls and the lack or inappropriateness of the fire breaks.
Sprinklered vs Non-sprinklered	The sprinklered, new high-rise building that related to the 2015 fire did not have any death toll and this was attributed to having the building sprinklered throughout. While in the 2017 fire, a combustible, non-fire rated cladding was used on the exterior walls of an unsprinklered building. As the present sources of information are based on media accounts, it is not clear as to the impact of the fire breaks on the propagation of the 2017 fire case. Based on the information in hand, it is fair to say that the combustibility of the cladding system had an impact on the fire performance of that unsprinklered building.
Questions raised	The 2017 fire incident has raised many questions, concerns and doubts with respect to the safety of using combustible claddings on the exterior walls of high-rise buildings, particularly on retrofitted buildings that are, or could be exempt in certain jurisdictions from the new fire protection requirements (sprinklered throughout) that were introduced by the 1995 version of the National Building Code of Canada (NBC). Certainly there are many lessons that could be learned from such tragedies, particularly with respect to the associated fire safety risks.
Safety In General	Safety in general, and fire safety in particular need not be defined by one industry, organization, or group of people. Safety needs to be defined based on the acceptable risks that are set, by a society's standards, needs, as well as, through the codes and its development process. It should not be sufficient to rely on the opinion of one industry member or an industry all together to establish the acceptable level of fire safety.
Canadian Building Codes	<p>Canadians rely on the NBC's development process in establishing the proper mandatory safety levels. Whatever the codes would set as the acceptable level needs to be interpreted as the "Safe Level".</p> <p>An understanding of the relationship between the NBC (Model Code) and the Provincial and Territorial (P/T) Building Codes could shed some clarifications on the confusion out there with respect to fire safety. Provincial and Territorial Building Codes are in fact based on the NBC. However, provinces and territories may add or delete, strengthen or relax the model code's requirements through their process of in acting their provincial and territorial codes to address specific provincial needs with respect to building design and construction. In some cases, there could be certain differences between the national model code and the provincial and territorial building codes.</p> <p>Among the different performance provisions of the NBC, the fire provisions deal with the safety of persons in buildings in the event of fire, as well as the protection of buildings from the effect of fire.</p>
New & Retrofit Construction	While the NBC is applicable to new and retrofit construction, its fire safety and fire protection features are required to be incorporated in a building at the time of its original (new) construction. In a new building construction, the building is required to conform to the most recent sets of requirements of the applicable code. However, in several jurisdictions the building codes are not enforced once a building is occupied unless the building is considered to have alterations or change of usage and occupancy. It is unclear how various local jurisdictions are addressing the retrofit of

facades of existing building buildings, particularly in the case of existing unsprinklered high-rise buildings. It seems that in some jurisdictions, the retrofit of facades has been considered as an alteration while in other jurisdiction it has not.

Consequently we are noticing many older high-rise, unsprinklered buildings being retrofit with new exterior claddings that are considered to be combustible. In many cases the new exterior claddings incorporate insulation to meet new energy requirements.

Ontario Building Code In Ontario specifically, its Ontario Building Code (OBC 2012) does not address the retrofit of existing buildings and does not mandate old building to be sprinklered. The OBC specifically makes reference to the exclusion of sprinkler installation in the retrofitting of existing buildings. As such, we could find existing unsprinklered buildings being retrofitted with combustible claddings that could be considered compliant with the fire safety levels of the OBC but not in conformance with the same intended fire safety levels of the NBC.

Code Requirements Since the adoption of the NBC 1995, up to the current 2015 version, the NBC requires that all new high-rise buildings be sprinklered throughout for the protection of its occupants. According to the NBC, a cladding system needs to be non-combustible for specific occupancies and percentages of unprotected openings in the building's façade. This is intended to ensure the unlikelihood of a fire spread along the façade and across to the neighbouring buildings. However, the limitations for the use of non-combustible cladding is waived for cladding products meeting the requirements of CAN/ULC S 134. This allowance is based on the fact that cladding systems in conformance with ULC S 134 represent a low risk of fire spread. However, the said allowance is still subject to the 3 storey building height if not sprinklered and/or to any height if sprinklered throughout. Accordingly, the retrofitting of existing high-rise buildings constructed prior to 1995 NBC raises some challenges as such buildings were in general not sprinklered as such requirement was not mandatory.

Code Acceptable Solution The NBC's "Acceptable Solution" for the use of combustible cladding is limited to buildings not exceeding 3 storeys in building height if unsprinklered and to any height if sprinklered throughout. The NBC does not provide an "Acceptable Solution" for the retrofit of non-sprinklered buildings other than the use of non-combustible cladding.

Conclusion Based on the logical reading of the NBC 2015, it is clear that combustible cladding needs to be limited to a maximum of 3 storey high unless the building is sprinklered. However, the provincial variation would allow such usage, thus establishing different acceptable fire risks and fire protection features.

An EIFS manufacturer can't on his own, establish the required safety levels, particularly when asked whether the cladding system is "Safe". Safety levels are established by the applicable Codes. A logical reading of the NBC would lead to consider the combustible cladding as "non-safe" from an NBC perspective, and perfectly safe from a provincial perspective.

Definitely, this issue needs to be cleared with the provincial code authorities. For those provinces that has no variations from the NBC, then combustible claddings need to be limited to 3 storey high if not sprinklered, while for provinces with exceptions to the NBC, combustible claddings, on non-sprinklered high-rise need to be considered code compliant. It should be up to the provincial codes authorities to confirm the acceptable fire risks taken while balancing several performance aspects such as energy efficiency, energy requirements, affordable housing, economical costs, etc.

Pending such clarifications, Durabond would align itself with the NBC's safety level requirements through its offering of its non-combustible EIFS, while at the same time, keeps providing combustible EIFS that would be allowed in certain provincial jurisdictions.

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