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## Steel Stud Thickness in Non-Loadbearing Fire-rated Assemblies

Steel studs have been used for years throughout the construction industry as an integral part of non-loadbearing fire-rated wall assemblies. There are a number of accredited third party listed wall assemblies using generic steel studs. Appendix D and Part 9 of the BC Building Code also include steel stud framing members as a component of fire-rated assemblies.

The confusion arises when comparing actual thickness of the standard steel stud products in the market and the minimum required thickness indicated in the accredited third party listings or Appendix D of the BC Building Code. For example, the majority of the ULC listed wall assemblies specify minimum steel stud thickness of 0.5 mm. Appendix D requires that the steel studs used are not less than 0.5 mm thick. The cUL listed assemblies identify steel stud thickness as 25 MSG (Manufacturers' Standard Gauge). On the other hand, a large number of light frame steel studs in the market are 26 gauge. To add to this confusion, there are number of thickness terms used by steel stud manufacturers: "nominal thickness," "base steel thickness," "coated thickness," "design thickness," "minimum thickness."

To clarify this confusion, the Canadian Sheet Steel Building Institute (CSSBI) was consulted and their *Sheet Steel Facts 10* issued in April 2009 was referenced. CSSBI indicated that the 0.455 mm is the minimum base steel thickness for the standard non-loadbearing lightweight steel stud, which is equal to 0.0179 in. Furthermore, based on the CSA-S136-2007 ("North American Specification for the Design of Cold-Formed Steel Structural Members") steel framing gauge No. 25 represents a minimum base steel thickness of 0.455 mm (0.0179 in). It appears that during the conversion from imperial to metric system, steel stud design base metal thickness of 0.478 mm (gauge No. 25) is used and then a galvanizing process increases the thickness to slightly less than 0.5 mm

In other words, the nominal value of 0.5 mm in the ULC listings can be interpreted to include studs with a 0.455 mm base metal thickness.

Note that there are a number of new products being developed that have unique profiles that can provide the same structural strength as a standard non-loadbearing steel stud (0.455 mm), but with a thinner material. If the base metal thickness is less than 0.455 mm, it is recommended that the fire performance of the fire-rated non-loadbearing wall assembly incorporating these types of steel studs be confirmed by third-party testing, or evaluated by a Professional Engineer.

For compliance with the BC Building Code, Authorities Having Jurisdiction have the authority to review such submissions.

