

## **ATI-Composites Canada Inc.**

### **Fire Resistant Mineral Foam Composite**

#### **How they work:**

ATI-Composite Fire Resistant Mineral Foam would be classified as a decahydrate. In simple terms “deca” means ten and “hydrate” refers to chemically bound water. It is generally accepted that drywall (or gypsum board) is a fairly good fire resistant substrate and that 1 sheet of ½ drywall provides a 15-minute thermal barrier fire rating.

Drywall provides fire protection by virtue of its chemistry, which is calcium sulfate dihydrate. Dihydrate refers to two moles of chemically bound water. This chemically bound water must be released from the matrix before the temperature on the cool face can exceed the 140C threshold stipulated in the ASTM-E119 / Can4-S101 fire tests.

The ATI Composite provides substantially more water of hydration (or chemically bound water) than gypsum board. In this example ATI’s decahydrate has 5 times more “water of hydration” than the gypsum board offers.

When the ATI Mineral Foam is heated during a thermo-gravimetric analysis, it loses weight (water) gradually as it is heated from room temperature to 545C. In fact the total weight loss (which is all water of hydration) is clearly 48 percent of its total weight.

The process of releasing this chemically bound water uses very large amounts of heat energy, cooling the substrate and reduces the temperature rise through the material – in effect keeping the cold face below 110 C while the hot face in the typical fire test is heated to 1200C for up to 4 hours. The fire resistance of the panel or assembly is usually directly proportional to the thickness of the panel. Hence two sheets of drywall offers better fire performance than one sheet. 1 inch of ATi Mineral Foam is more effective than 1.5 or 2 inches of drywall.

Recent side-by-side testing, at Warnock Hersey (Intertek) comparing the ATI Mineral foam to Certaineed Fyre Guard Gypsum or Donalco Spray Applied Fire Proofing at identical thickness show that the Mineral Foam out-performs these other materials by up to 400F over a one hour E119 / S101 Fire Test.

These side-by-side test results are available as a pdf bulletin on request.

*Ref; LapTop\work-in-process\ATI-Composites – How They work (1)*