



**EASTERN MICHIGAN UNIVERSITY**

**MASTER'S THESIS SEMINAR**

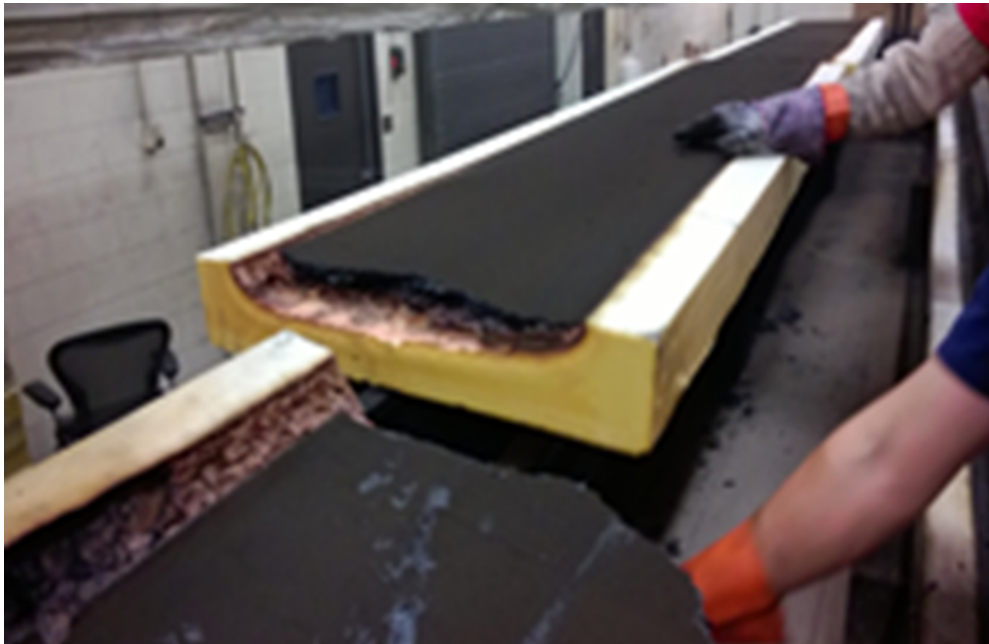
**MONDAY, NOVEMBER 5<sup>TH</sup> AT 4PM**

**ROOM 152 MJSC**

**Reduction of Halogen Flame Retardants in Class I  
Rigid Polyurethane Foam using an Alternative  
Blowing Agent**

by

Denise Robaczewski



Flame retardants are added to different materials and applied as a treatment to materials such as plastics, textiles, foams or wood, to prevent fires from starting, limit the spread of fire, and minimize fire damage. Flame retardants are incorporated in polyurethane foam as additives. However, they are shown to have environmental and health concerns. Polyurethane foams especially rigid foams used as insulation material in commercial buildings, walk-in coolers, and appliances need to meet strict codes and ASTM standards for fire regulations. Material properties usually suffer while utilizing high amounts of flame retardants needed to meet these strict guidelines. Class I foams were created to reduce the level of halogen-based flame retardant along with using an alternative blowing agent while attempting not to diminish the physical properties of the polyurethane.