

Mg Flammability Test at CTC

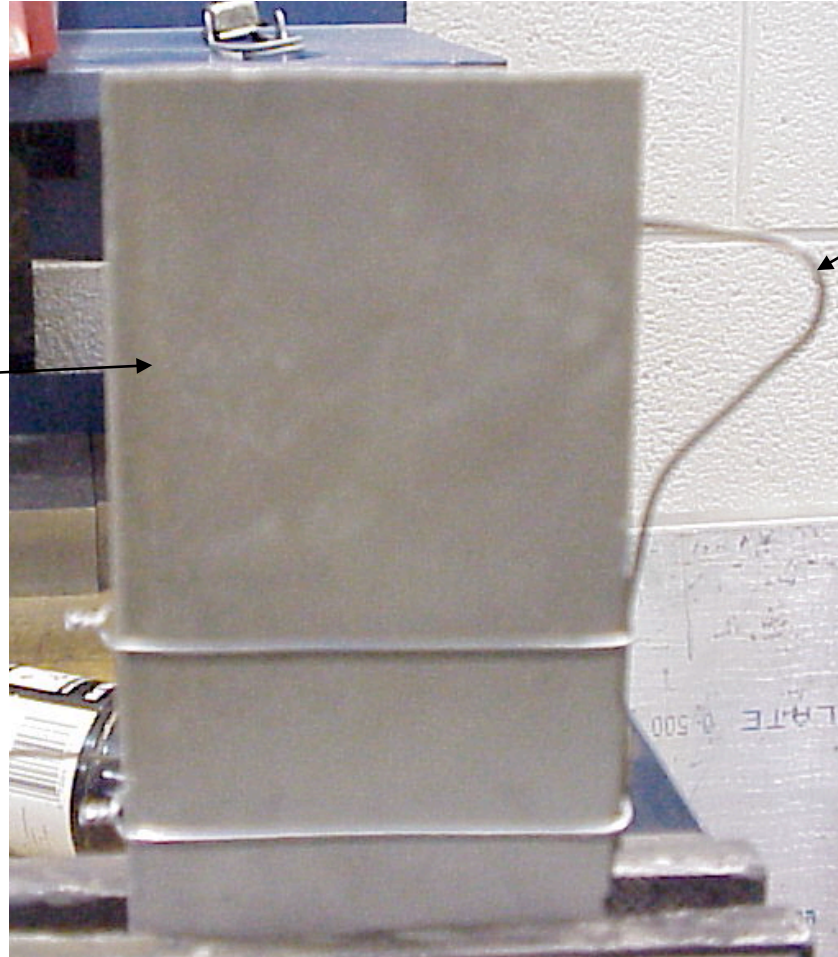
May 23, 2001

Test Procedure

- **Material: AZ91E Commercial Magnesium Alloy Plate (3 in x 6 in x 3/8 in)**
- **Thermocouple (K type) was physically attached the side surface to monitor temperature rise in the plate**
- **Propane torch was used to heat up the plate to 356 °C in the first test. Total heat exposure was 7 minutes.**
- **Oxy-Acetylene torch (a more intense heat source) was also used in the second test on the same plate to heat the plate to 411 °C. Total heat exposure was 3.3 minutes.**

Material Before Heating

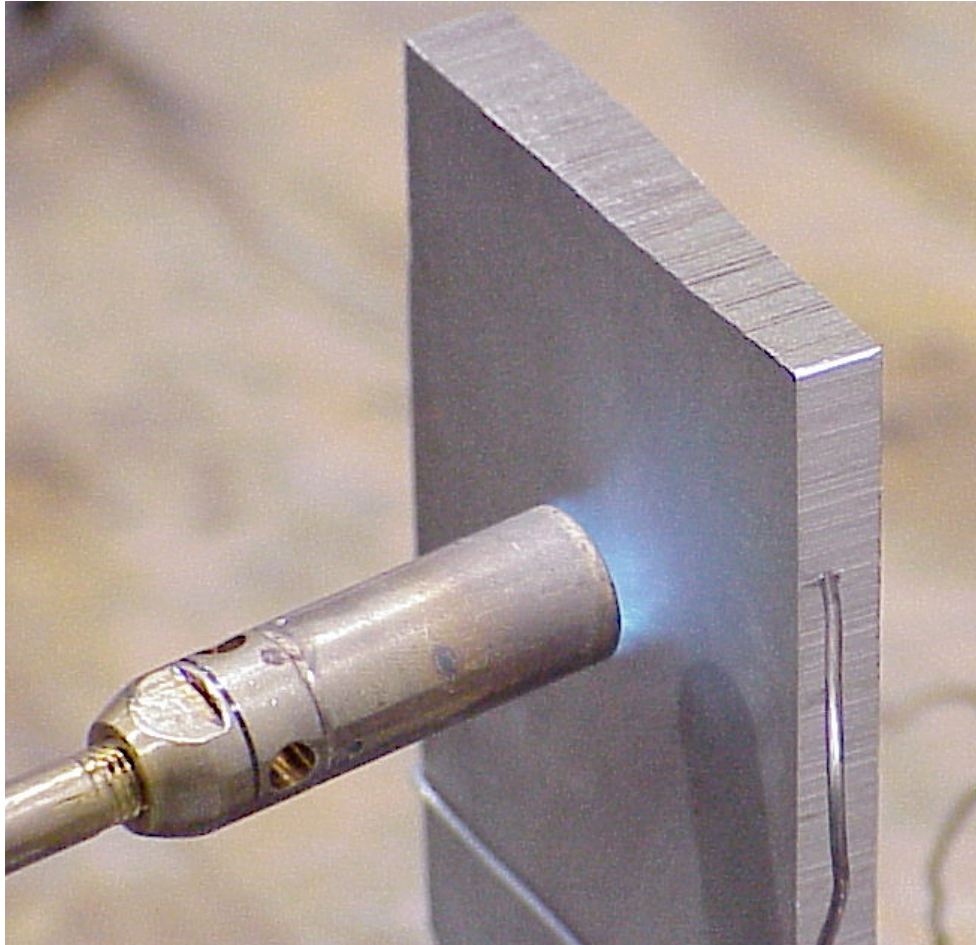
AZ91E Mg



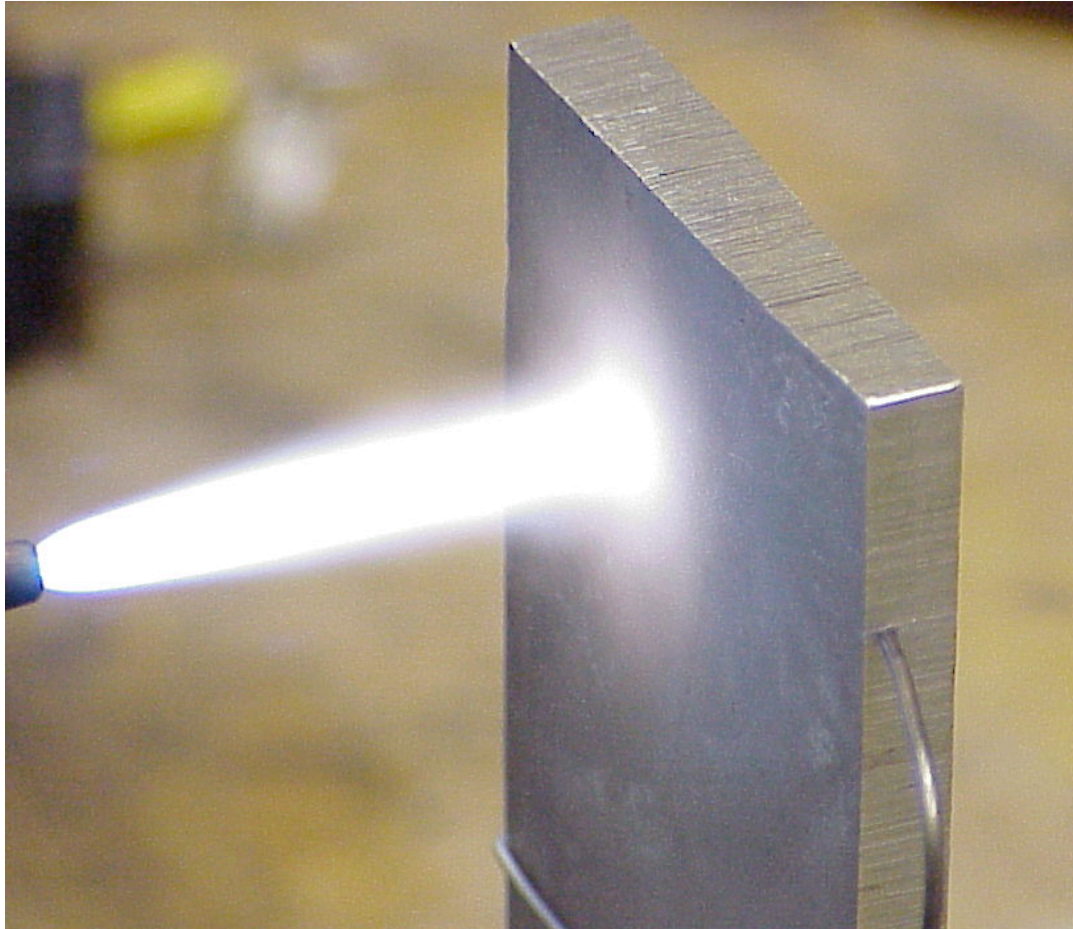
Thermocouple



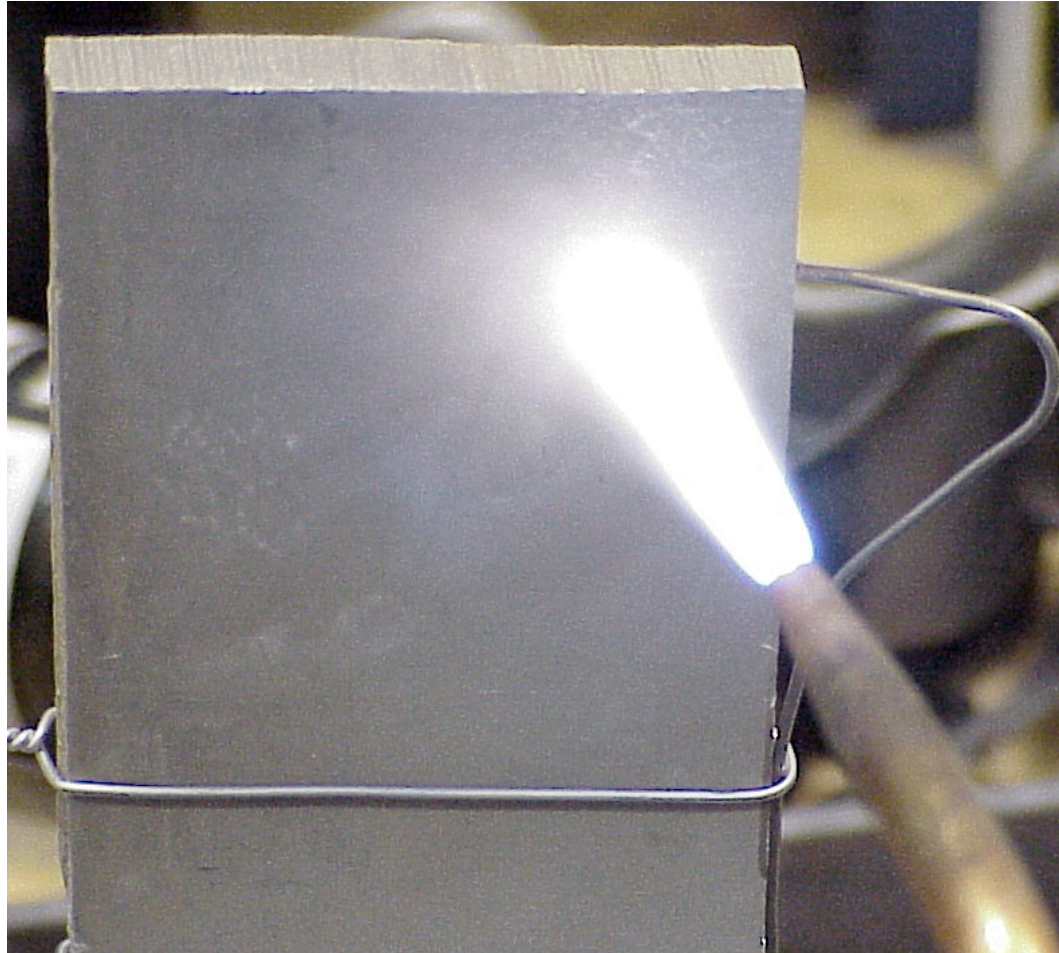
Material During Heating (Test 1)



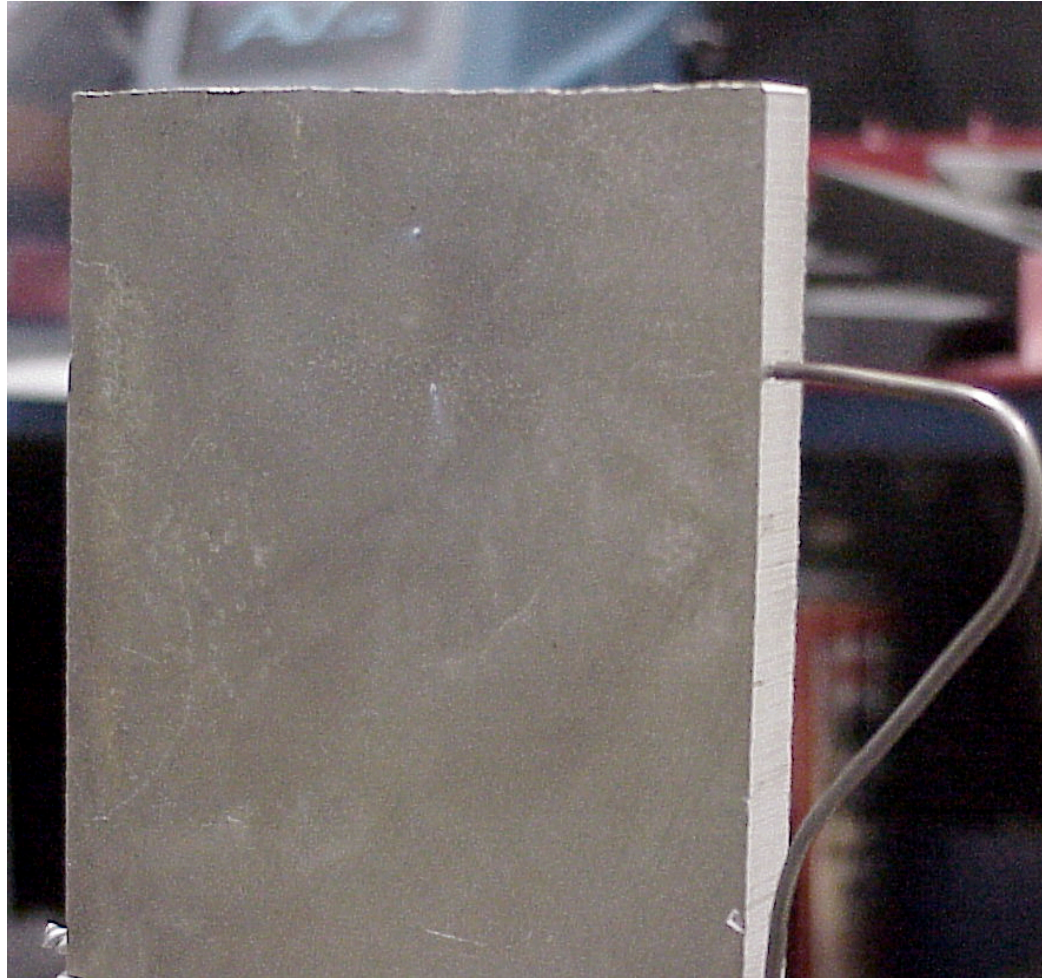
Material During Heating (Test 2)



Material During Heating (Test 2)



Material After Heating (Test 2)



Conclusion

- **Simple torch showed that magnesium can withstand temperatures up to around 400 °C. Above this temperature material is approaching its partial melting temperature and the material will be partially melt without a fire or explosion. This was about to start before the termination of the test #2.**
- **Flammability is a concern for Mg powders, chips and ribbons, particularly for pure magnesium.**
- **Simple test conducted on ~ 3/8 in thick plate. Thinner plate is expected to behave the same way for up to the 400 °C test temperature.**