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The Strength of Plastic Bonded Explosives as a Function of Pressure, Strain Rate and Temperature DONALD WIEGAND, BRETT REDDINGIUS, Picatinny Arsenal — Measurements as a function of strain rate and temperature have indicated the importance of the polymer binder in determining the strength of plastic bonded explosives at ambient conditions and low strain rate. Recent measurements of strength as a function of pressure further support this conclusion. As pressure or strain rate are increased or temperature is decreased the strength increases as does the strength of many polymers. In addition, at relatively large values of pressure or strain rate and/or relatively low values of temperature the strength is less sensitive to changes of these quantities. These trends suggest that as the polymer binder becomes stronger with increasing pressure or strain rate or with decreasing temperature, the strength of the explosive component of these composites becomes more important in determining the strength of the composite. Results will be presented for plastic bonded explosives, e.g., LX-14, that demonstrate these trends as a function of pressure, strain rate and temperature.

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