Rapid fixer. The film's dynamic spatial resolution for this experimental setup of >300 lines/cm was measured in a special experiment by successfully recording the image of a Ronchi ruling as a function of time for a camera writing rate of 15 mm/μsec. Time resolution of the camera is a function of camera speed, rotor mirror distortion, spatial resolution, slit width, film characteristics, and ability to read the film record. A good estimate of time resolution is obtained by dividing slit width by camera speed. This estimate gives a time resolution of 0.0033 μsec for a camera writing speed of 15 mm/μsec and a slit width of 0.05 mm. Possible errors in data due to time resolution, spatial resolution, and other such reasons are discussed in Appendix C.

3.6. Explosively Driven Experiments

An explosive shock system in contact with a 25.4-mm-thick iron sample was used to obtain free surface data for driving stress near 250 kbar. The explosive shock system consisted of a plane wave booster in contact with a 2.54-cm-thick pressed ammonium perchlorate (AP) explosive pad. The AP particle diameters were less than 10 μ before pressing to a density of 1.3 gm/cm^3. Faces of the charge were machined to a parallelism better than 0.0038 cm over a 12.7-cm diameter. Faces of the charges were gently hand lapped on a layout table with 600 grit paper to insure a flat surface.

An AP pad was chosen principally because of the 250 kbar stress it induces in iron and the observed improvements in planarity of the shock front, compared to the shock from the plane wave booster alone. For example, arrival of a shock wave at the free surface of a 1.27-cm-thick aluminum plate driven by this explosive system was simultaneous to better than 0.04 μsec over an area with a 5.93-cm diameter. Typical shock wave tilts resulting from this explosive system were 5×10^{-3} rad.

Laboratory methods and target preparations for these experiments were similar to those for plate slap experiments.