with the plate at zero pressure. Impact causes a shock wave to travel into the target plate and a stopping shock is sent back into the flyer plate as required by the continuity conditions. In the pressure versus particle velocity plane, the state attained in the target plate is defined by the intersection of its Hugoniot curve with the reflected Hugoniot curve for the flyer plate through the point $U_p = U_t$. Assuming identical materials for both the flying plate and the target plate, the particle velocity in the target after impact would be from symmetry one half the terminal velocity of the flying plate. Denser flying plates at the same velocity deliver more momentum to the target giving rise to higher transmitted pressures.

The duration of the pressure pulse in the target depends primarily on the thickness of the flying plate and its sound speed and shock velocity. As an example, the pressure pulse obtained from a 0.16 cm thick stainless steel flying plate is about 1/2 μsec long. A thicker stainless plate increases the time proportionately. This time, called catch-up, represents one round trip through the flying plate plus the time needed for the second transmitted shock wave to overtake the original input wave in the sample. Hence, it is necessary to make the desired velocity measurements before catch-up occurs. If measurements are not accomplished before catch-up, there results a lower measured velocity because the original shock wave is attenuated from the rear by the second wave. A wide range of pressures are possible by choosing various explosives, flying plate densities, thicknesses of the flying plate, and air gap distances. For example, about 1.1 Mbar were achieved in a 0.32 cm thick 2024 dural plate using 15.24 cm thick PBX-9404, a 0.16 cm thick stainless steel plate,