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Temperature Controller System for Gas Gun Targets SCOTT BUCHOLTZ, TED RUPP[1], RUSSELL GEHR, Honeywell FM&T/NM, STEPHEN SHEFFIELD, DAVID ROBBINS, Los Alamos National Laboratory — A temperature controller system capable of heating and cooling gas gun targets over the range -75 $^{\circ}$C to +200 $^{\circ}$C was designed and tested. The system uses cold nitrogen gas from a liquid nitrogen Dewar for cooling and compressed air for heating. Two gas flow heaters control the gas temperature for both heating and cooling. One heater controls the temperature of the target mounting plate and the other the temperature of a copper tubing coil surrounding the target. Each heater is separately adjustable, so the target material will achieve a uniform temperature throughout its volume. A magnetic gauge with integrated thermocouples was developed to measure the internal temperature of the target. Using this system shock experiments, including equation-of-state measurements and shock initiation of high explosives, can be performed over a range of initial temperatures. Successful tests were completed on Teflon samples. This work was supported by the NNSA Enhanced Surveillance Campaign through contract DE-ACO4-01AL66850.

[1]Retired

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