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Explosive vessel for coupling dynamic experiments to the X-ray beam at the Advanced Photon Source CHARLES OWENS, NATHANIEL SANCHEZ, Los Alamos National Laboratory, CHRISTIAN SORENSEN, Purdue University, BRIAN JENSEN, Los Alamos National Laboratory — Recent experiments at the Advanced Photon Source have been successful in coupling gun systems to the synchrotron to take advantage of the advanced X-ray diagnostics available including X-ray diffraction and X-ray phase contrast imaging (PCI) to examine matter at extreme conditions. There are many experiments that require explosive loading capabilities, e.g. detonator and initiator dynamics, small angle X-ray scattering (SAXS), ejecta formation, and explosively driven flyer experiments. The current work highlights a new explosive vessel that was designed specifically for use at a synchrotron facility with requirements to confine up to 15 grams of explosives (TNT equivalent), couple the vessel to the X-ray beam line, and reliably position samples remotely. A description of the system and capability will be provided along with the results from qualification testing to bring the system into service (LA-UR-17-21381).

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