

Concealed explosives in crowded areas—the need for blast-resistant trash receptacles (BRTRs)

Those criminals who target civilian populations with explosive devices have often sought to conceal these devices to reduce the risk to the bomber, and to effect maximum damage to bystanders. Traditional trash receptacles provide ideal concealment for bombs and can augment damage with additional shrapnel and debris added to the blast. After the Madrid train bombings in 2004, the Transportation Security Administration (TSA) directed that transit agencies install bomb resistant receptacles to the extent possible. While there were many products sold as explosive resistant trash receptacles, there were no standards defining performance requirements, nor were there associated test methods to validate performance of these receptacles when exposed to explosive loading.

The Department of Homeland Security (DHS) Science and Technology Directorate (S&T) embarked on a program to develop a suite of standards to meet these needs. S&T expanded upon a preliminary test method used by our Systems Assessment and Validation for Emergency Responders (SAVER) program to conduct an initial assessment on blast resistant trash receptacles (BRTRs), a program not unlike the studies completed by public consumer reports organizations.



Above: Typical trash receptacle that has been damaged by explosives.

Opposite, left: results of BRTR withstanding test explosion.

Opposite, right: successful testing of the BRTR propels the explosion upward helping to decrease the risk to bystanders. (Chris White, NIST)

Testing the resistance of BRTRs

S&T asked the Naval Explosive Ordnance Disposal Technology Division to test 15 different BRTR models from four vendors. They evaluated claims made by each vendor using bare (non-fragmenting) explosive charges and fragmenting pipe bombs. This testing provided valuable input, and helped write the standards developed through ASTM International, (formerly known as the American Society for Testing and Materials).

Standards developed for BRTR

S&T, in partnership with the National Institute of Standards and Technology, and working through ASTM International, has since published three standards:

- ASTM E2639: Standard Test Method for Blast Resistance of Trash Receptacles
- ASTM E2740: Standard Specification for Trash Receptacles Subjected to Blast Resistance Testing
- ASTM E2831: Standard Guide for Deployment of Blast Resistant Trash Receptacles in Crowded Places

This suite of standards defines performance specifications for BRTRs, test methods to determine if the performance specifications are met, and guidance on how to effectively deploy BRTRs to protect the public and reduce collateral damage from the blast effects.

These standards are designed to work together for containers that serve as both collection points for refuse and protection against explosive events. Transit authorities and others can then incorporate trash receptacles into the overall security plan with high confidence in their performance and a higher level of comfort in the threat mitigation potential with the use of BRTRs.

