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Description Of Test Methods

B. UL PROCEDURE (V1.2) FOR ELEMENTAL (Pb, Cd, Hg, Cr) ANALYSIS IN POLYMERIC AND RELATED MATERIALS, TECHNIQUE #1, MICROWAVE METHOD BASED ON US EPA 3052 (SAMPLE DIGESTION BY NITRIC ACID, HYDROCHLORIC ACID, AND HYDROGEN PEROXIDE) & ICP or AA SPECTROMETRIC DETECTION: A representative mass (typically ~0.3 g) of cryogenically milled sample (whenever possible) is digested in an acid matrix consisting of nitric, hydrochloric, and hydrogen peroxide (30%). Additional acid matrices may be used according to the type of material being digested. The sample and acid are placed in microwave vessels and heated in a closed vessel microwave system. After cooling, the vessel contents may be filtered, centrifuged, or allowed to settle and then decanted, diluted to volume. After sample digestion, the measurement of lead and cadmium is performed by ICP or AAS instrumental methods.

E. UL PROCEDURE (V1.2) FOR ELEMENTAL (Pb, Cd, Hg, Cr) ANALYSIS IN METAL AND METAL ALLOYS, TECHNIQUE #3, MICROWAVE METHOD BASED ON US EPA 3052 (SAMPLE DIGESTION BY HYDROCHLORIC AND NITRIC ACID) & ICP or AA SPECTROMETRIC DETECTION: An appropriate mass of sample (~0.5 g) is digested in a hydrochloric / nitric acid solution, under elevated temperature and pressure via microwave furnace assistance. After sample digestion, the measurement of elements of interest is performed by ICP or Flame AAS instrumentation.

G. UL PROCEDURE (V1.1) FOR SOLUBLE HEXAVALENT CHROMIUM (Cr^{+6}) ANALYSIS VIA ALKALINE DIGESTION & UV-VIS or IC COLOROMETRIC DETECTION BASED ON US EPA 3060A: An appropriate mass (typically 2 - 3 g) of cryogenically milled sample (whenever possible) undergoes an alkaline digestion to solubilize both water-insoluble and water soluble Cr(VI) compounds. Following careful pH control during the digestion, the Cr(VI) in the digestate undergoes reaction with diphenylcarbazide. The Cr(VI) content of the color complexed solution is then measured via VIS spectrophotometry or by ion chromatography (IC) with VIS detection.

H. UL ANALYSIS GUIDELINE (V1.2) FOR POLYBROMINATED BIPHENYLS AND POLYBROMINATED DIPHENYL ETHERS IN PLASTIC MATERIALS BY SOXHLET EXTRACTION AND GC/MS DETECTION: An appropriate mass (typically 0.1 g) of cryogenically milled plastic sample undergoes a soxhlet extraction with an organic solvent to solubilize the PBDE and PBB compounds. The extract is then analyzed by Gas Chromatography/Mass Spectrometry (GC/MS) and quantitated against calibrated standards.