

Polymers & Plastics-Prep

SAMPLE PREPARATION FOR POLYMERS & PLASTICS LABS

WWW.SPEXSAMPLEPREP.COM/POLYMERS



SPEX SamplePrep is an industry leader in sample preparation products for polymer research and production labs. Our powerful cryogenic grinders provide reliable, reproducible results without cross contamination.

Applications include:

:: ADDITIVE TESTING :: TEMPERATURE SENSITIVE COMPOUNDS :: COMPOSITE MATERIALS :: PACKAGING

FREEZER/MILL® CRYOGENIC GRINDER



 **6875**
FREEZER/MILL®
Single chamber: 0.1-100 grams



Large grinding vials for 1-100g samples

 **6775**
FREEZER/MILL®
Single chamber: 0.1-5 grams



Standard small grinding vials for 0.1 to 5g samples



FREEZER/MILL FEATURES

The **Freezer/Mill®** grinds tough or temperature sensitive samples at cryogenic temperatures. This mill is able to process the toughest samples quickly and effectively that are ungrindable at room temperature.

Product synergy: GCMS, IR, ICP, XRF

Customer types: Polymer production companies, contract testing labs, recycling companies, packing companies, electronic goods manufacturers

Typical samples: Bottles, toys, synthetic fabrics, food & pharma packing, electronics

Typical sample size/format: 0.1-5g in small vials, 5-100g in large vials. Metal free grinding vials (polycarbonate) and polycarbonate free grinding vials (steel) are available. Low chromium (steel end plugs/impactor) are available for RoHS/WEEE.

Applications include: Phthalates & BPA testing, additives testing, contamination testing, leachables testing, metals testing, RoHS/WEEE testing.

Circuit board processed in the Freezer/Mill



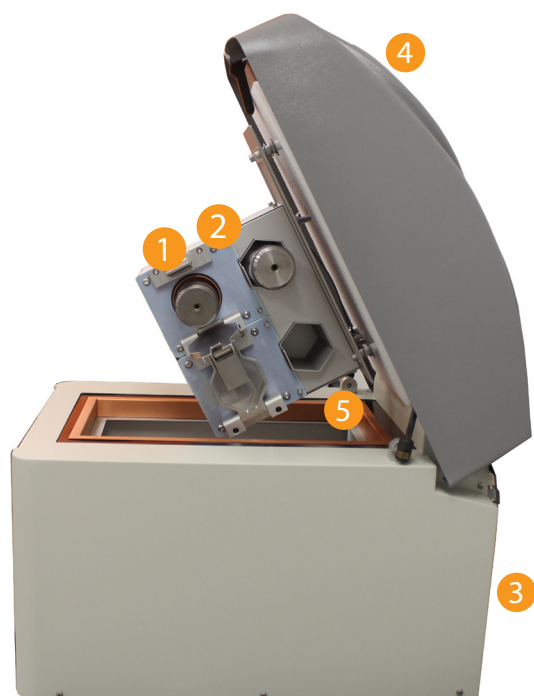
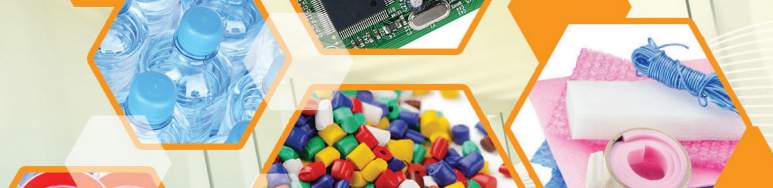
Circuit board before



Circuit board after

SPEX® SamplePrep®

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6875D FREEZER/MILL®

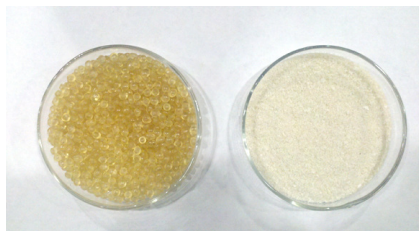
1. Dual grinding chambers processes up to 200 grams* of sample. **Each chamber accepts one large, four small or sixteen microvials.**
2. Dual pre-cooling chambers keeps up to 200 grams* of samples at the appropriate temperature while other samples are grinding.
3. Comes with auto-fill attachment for liquid nitrogen but also has the ability for manual fill.
4. Control panel with touch screen interface stores up to 20 grinding protocols.
5. Safety features include LN sensor and lid interlock. The grinding process will stop if the lid is opened while the mill is running.

*100 grams per large grinding vial, per chamber

PHTHALATES ANALYSIS IN CHILDREN'S TOYS

Phthalates are used as additives in polymers, they cause health problems, especially in children and are banned or restricted in many countries. The US Consumer Product Safety Council (CPSC) has a standard operating procedure for determination of phthalates. The CPSC method recommends grinding samples to a powder using cryogenic methods. The Freezer/Mill is able to efficiently reduced these samples to particle sizes of less than 500 μm without thermal degradation. For further information on how the Freezer/Mill can be used to grind plastics and polymers please visit www.spexsampleprep.com/presentations.

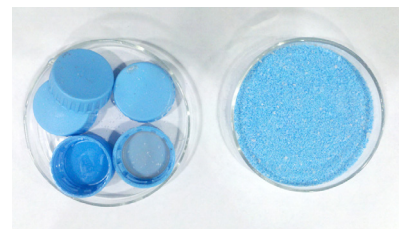
BEFORE AND AFTER SAMPLES



Polymer pellets



Plastic toy



Plastic bottle caps

These samples were ground with the following protocol in the large Freezer/Mill:

Samples are cut to 5 mm pieces (where necessary), 2-3 g of sample is placed in four standard small vials, then placed in the multi-vial adapter in the grinding chamber. 20 minute pre-chill then 5 grinding cycles at 2 minutes each with 2 minutes intercool time. Grinding speed 16 impacts per second.