

ASH AND MOISTURE APPLICATIONS FOR PLASTIC AND COMPOSITES

prepASH 340 Series



Burning



Improved Safety



High Temperature



Sample Weighing

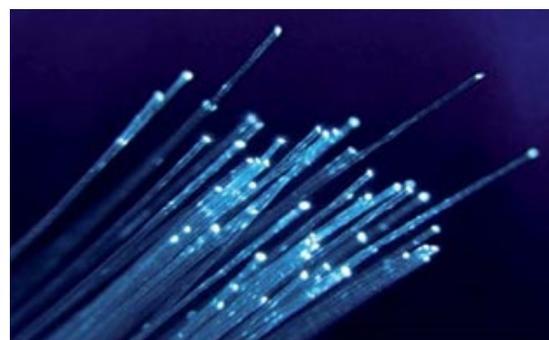


The ash test of plastic samples is used to determine inorganic content. Inorganics have a major influence on the mechanical specification and behaviour of plastics to plastics. The analysis is therefore crucial for quality characteristics. Additional natural products can be added in the production so the nature and quantity are specified and have to be verified as part of Quality Control. On the other hand, components in recycled materials might be unknown and therefore have to be determined additionally. If the moisture content is too high then this is harmful in the processing of plastic granules.

Automation of moisture and ash analysis with the prepASH provides efficiency, quality and security into the laboratory.



Plastic is the common term for a wide range of synthetic or semi synthetic organic amorphous solid materials suitable for the manufacture of industrial products. Plastics are typically polymers of high molecular weight, and may contain other substances to improve performance and/or reduce costs. Polymers are often blended with inorganic fillers, mainly to enhance the mechanical properties of the plastic (e.g. fibreglass) or dyeing (white colour: Titanocid). Plastics can contain small organic molecules (polymer plasticiser, internal lubricants) and Carbon (carbon fibre). An ash test is used to determine the total thermal stable filler content. It cannot identify individual percentages in multi-filled materials without additional test procedures being performed.



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Case Study: Fibreglass

Fibreglass is used as a reinforcing agent for many polymer products. The resulting composite material, correctly known as fibre-reinforced polymer (FRP) or glass-reinforced plastic (GRP), is called “fibreglass” in popular usage. As with many other composite materials, the two materials act together, each overcoming the deficiencies of the other. Whereas plastic resins are strong in compressive loading and relatively weak in tensile strength, the glass fibres are very strong in tension but have no strength against compression. By combining the two materials, GRP becomes a material that resists both compressive and tensile forces well. The two materials may be used uniformly or the glass may be specifically placed in those portions of the structure that will experience tensile loads.

The fibreglass content of the plastic can easily be determined by ashing. The polymer is burned or decomposed at high temperatures whereas the glass resists heat and is measured as the residual ash.

GF20: 20 % fibreglass, GF30: 30% fibreglass

Applications available from Precisa:

- prepASH 008 PP GF Recyclable Materials
- prepASH 3006 PVC
- prepASH 0708 Polyamide 6 filled with talcum powder
- prepASH 0709 Polypropylene filled with talcum powder

- prepASH 0710 Polypropylene filled with glass fibre
- prepASH 0711 Polypropylene filled with calcium carbonate
- prepASH 6001 Rubber compound

prepASH – optimal solution to determine ash in plastics

Reduced time and effort: prepASH is a fully automatic drying and ashing machine. This removes the requirement for multiple weighings, removal of hot material and reduces the time spent as there is no requirement for cooling post analysis in a desiccator. Working in groups of similar samples in a single run increases efficiency and optimises analysis time.

Improved safety and efficiency: No more exposure to extremely hot areas and or open flames. With the prepASH analysis can be performed automatically in time slots where the laboratory is empty or occasionally used such as nighttime runs.

Improve the quality of your results by up to 20%: In the case where ash determination has to be re-analysed because of faulty/undefined results, the automated nature of the prepASH reduces the need for rework of samples.

Detailed analysis reports: Due to the permanent recording of measurements during the entire process and the automatic saving of the final results, all data can be retrieved at any time.

Standard Method with oven	vs.	prepASH
Burning off of crucibles for constant weight before	Dry Matter	Possibility to pre-define a "burning off" crucibles
Tare of crucible one by one		AUTOMATIC PROCEDURE
Addition of sample		Sampling
Weighing + documentation of each crucible		AUTOMATIC + sample addition by operator
Samples in drying oven + START		START PROGRAM
Removing samples from oven + cool down		Results (moisture)
Back weighing samples, calculation (moisture)		Ash
Pre-ashing with rapid incinerator or hot plate		
Samples in muffle furnace for Ash content		
Remove samples + cooling down in desiccator		
Calculation and documentation (ash)		
Back weighing for stable results (repeat?)		