

Perfect for microplastics (MPs) analysis using Pyrolysis-GC/MS

Ultra ALLOY (UA) MP column kit

This product is a high-resolution column kit consisting of a precolumn (UAMP-1M-1.0F) and a separation column (UA5-30M-0.5F) of different polarities and film thicknesses.

Features of UAMP column kit

1. Improved peak separation with precolumn

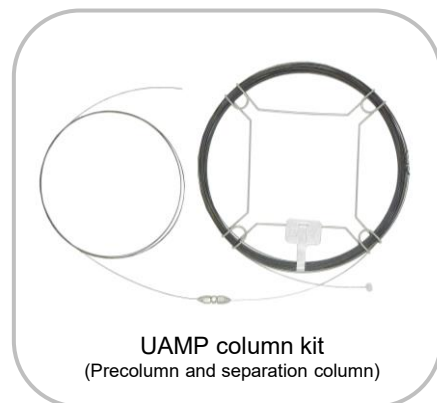
For the 12 commonly used polymers*1, pyrolyzates of each polymer can be analyzed with good separation and peak shape.

2. Precolumn helps reduce column contamination

Periodic replacement of the precolumn maintains the performance of the separation column since high boiling contaminants are retained in the precolumn.

3. Connectivity to a Multi-Functional Splitless Sampler

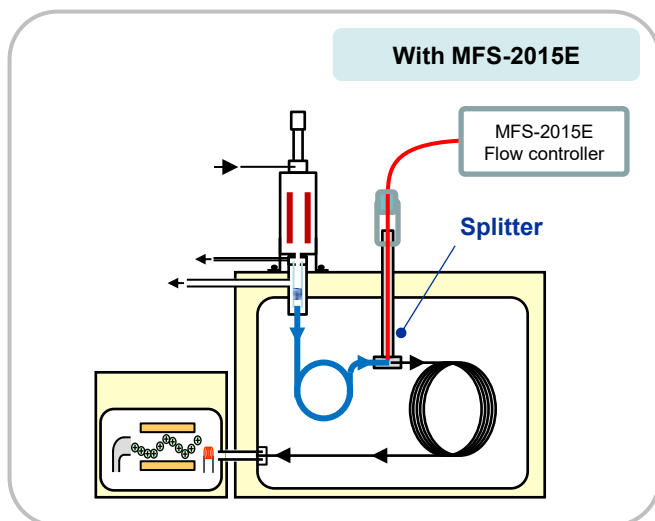
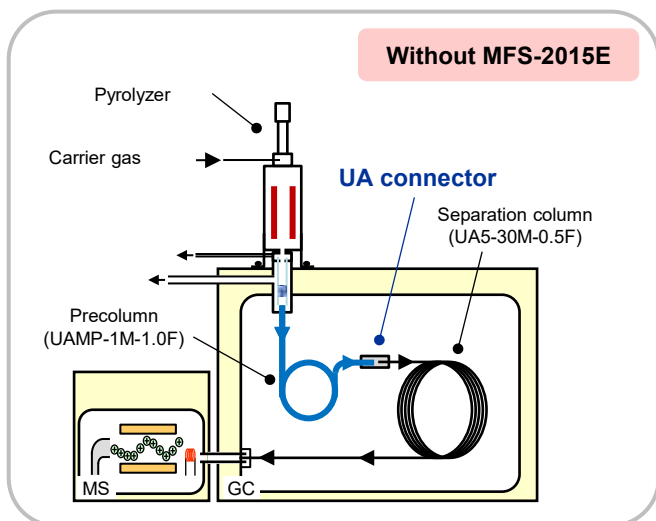
Connecting a Multi-Functional Splitless Sampler (MFS-2015E, Frontier Labs) between the precolumn and separation column allows splitless pyrolysis and backflushing.



*1: Polyethylene (PE) / Polycarbonate (PC) / Acrylonitrile-butadiene-styrene resin (ABS) / Polypropylene (PP) / Poly methyl methacrylate (PMMA) / Styrene diene rubber (SBR) / Polystyrene (PS) / Polyethylene terephthalate (PET) / Polyurethane (PU) / Polyvinyl chloride (PVC) / Nylon 6 (N6) / Nylon 66 (N66)

Connection diagram

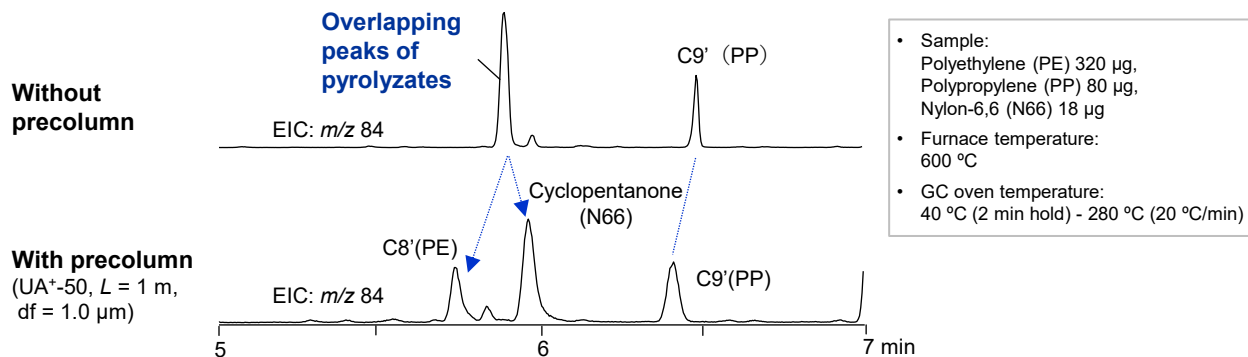
The connection of the UAMP column kit differs depending on whether MFS-2015E is used or not (see figure below). When MFS-2015E is not used, connect both columns using the UA connector. When using the MFS-2015E, a specifically designed splitter is used to connect the precolumn and separation column. The splitter and the UA connector can be easily attached or detached due to the mechanical flexibility, abrasion resistance, and impact resistance of metal capillary columns.



Connection diagram for UAMP column kit

Improved separation and reduced column contamination by precolumn

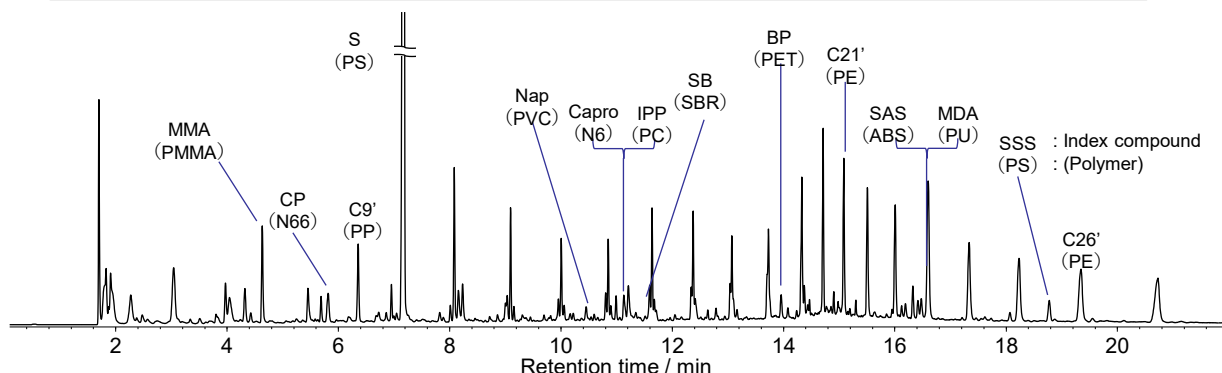
By connecting a precolumn (UAMP-1M-1.0F) to a separation column (UA5-30M-0.5F), peak separation can be achieved (see figure below). High boiling compounds are retained in the precolumn, reducing contamination of the separation column. Also, periodic replacement of the precolumn will extend the life of the separation column.



Pyrolysis GC/MS measurement of MPs standard using UAMP column kit (an example)

The pyrogram of the MPs Calibration Standard (PY1-4940, Frontier Labs), a mixture consisting of 12 types of polymers, obtained by Py-GC/MS using the UAMP column kit are shown below along with major pyrolyzates.

Sample: MPs Calibration Standard 4 mg (PE: 160 μg, PP: 40 μg, PS: 8 μg, ABS: 16 μg, SBR: 16 μg, PMMA: 8 μg, PC: 4 μg, PVC: 40 μg, PU: 4 μg, PET: 16 μg, N6: 5 μg, N66: 18 μg, diluent CaCO₃: 3.8 mg)
Py temp.: 600 °C, GC oven: 40 °C (2 min hold) - 280 °C (20 °C/min, 10 min hold), He: 75 kPa, Split ratio: 1/50



MMA : Methyl methacrylate, CP : Cyclopentanone, C9' : 2,4-Dimethyl-1-heptane, Nap : Naphthalene, IPP : 4-Isopropenylphenol, Capro : ε-Caprolactam, SB : 4-Phenylcyclohexene, BP : Benzophenone, C21' : 1,20-Heneicosadiene, SAS : 2-Phenethyl-4-phenylpent-4-enenitrile, MDA : 4,4'-Methylenedianiline, SSS : Styrene trimer

Specifications

Product name	Product number	Description
UAMP Column Kit	UAMP-K01	UA5-30M-0.5F (1 ea), UA Precolumn 50-1M (2 ea), UA Connector (1 ea), VF Metal Ferrule D (3 ea), Wrench (6/8 mm, 2 ea), 1set
UA Precolumn 50-1M	UAMP-1M-1.0F	50 % Diphenyl 50 % polydimethylsiloxane (PDMS), Deactivated stainless steel, Length 1 m, i.d. 0.25 mm, o.d. 0.47 mm, df. 1.0 μm, 2ea
UA Capillary column UA5-30M-0.5F	UA5-30M-0.5F	5 % Diphenyl 95 % PDMS, Deactivated stainless steel, Length 30 m, i.d. 0.25 mm, o.d. 0.47 mm, df. 0.5 μm, 1ea
UA Connector	UAGU-K02	UA Connector, 1 ea
VF Metal Ferrule D	MS402167	VF Metal Ferrule D, 20 ea