

## **Supplementary Material for:**

### **Gradient columns to measure the density of microplastics**

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This supplementary material contains 1 figure and 1 table.

### Gradient column filler

Columns were filled using an automated density gradient column filler (H&D Fitzgerald), which is used extensively in industry to determine the density of solid samples, including microplastics. The current study used a microprocessor-controlled column filler (see photo below), which enables consistent and accurate columns to be built repeatedly and quickly. The current cost of this gradient column filler is £7150 (H&D Fitzgerald, 2024), which additional costs associated with the procurement and calibration of traceable glass floats and the columns themselves.



Photo from H&D Fitzgerald, <https://www.density.co.uk/products/column-fillers/>



**Figure SM 1: photo of sampling location for environmental plastics**

**Table SM 1: details of the 14 density columns used during the study**

Density range (kg m <sup>-3</sup> )	Composition*	Calibration curve	R <sup>2</sup> of calibration curve
800-850	2-P + UPW	$y = 0.1619x + 788.01$	1.00
850-900	2-P + UPW	$y = 0.0008x^3 - 1.9976x^2 + 1775.1x - 526714$	1.00
870-930	2-P + UPW	$y = 0.0008x^3 - 1.9976x^2 + 1775.1x - 526714$	1.00
900-950	2-P + UPW	$y = -5E-08x^4 + 5E-05x^3 - 0.0189x^2 + 3.2275x + 694.89$	1.00
910-970	2-P + UPW	$y = 3E-10x^5 - 3E-07x^4 + 0.0001x^3 - 0.0254x^2 + 2.6421x + 810.55$	1.00
950-998	2-P + UPW	$y = 3E-08x^4 - 3E-05x^3 + 0.0109x^2 - 1.3593x + 964.73$	1.00
998-1050	SC + UPW	$y = 0.1835x + 984.49$	1.00
1050-1100	SC + UPW	$y = 0.1711x + 1035.8$	1.00
1100-1150	SC + UPW	$y = 0.1058x + 1107.5$	1.00
1150-1200	SC + UPW	$y = 0.1428x + 1139.7$	1.00
1200-1250	SB + UPW	$y = 0.1938x + 1187.2$	1.00
1250-1300	SB + UPW	$y = 5.6452x - 7500$	1.00
1300-1350	SB + UPW	$y = 5.8904x - 7563$	1.00
1350-1420	SB + UPW	$y = 0.2392x + 1340.7$	1.00

\*2P + UPW = 2-propanol + ultrapure water

\*SC + UPW = Sodium Chloride + ultrapure water

\*SB + UPW = Sodium Bromide + ultrapure water

## References

H&D Fitzgerald, 2024. World-Class Density Metrologists <https://www.density.co.uk/> (accessed 08.18.24)