

Supplementary material for:

**Surface properties and rising velocities of pristine and weathered
plastic production pellets**

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This supplementary material contains three tables (Tables SM-1 to SM-3) and two figures
(Figures SM-1 and SM-2).

Table SM-1: AFM comparative analysis of the root-mean-square roughness (S_q) and the mean roughness (S_a) for the pristine and the weathered samples.

Samples	Root-mean-square roughness (S_q , nm) ^a	Mean roughness (S_a , nm) ^a
Pristine pellets	73 ± 14	59 ± 11
Weathered pellets	94 ± 35	74 ± 26

^aUncertainty is based on the AFM measurements at seven different locations of the same sample.

Table SM-2: XPS analysis of elemental composition of selected samples

Peak	Pristine milled (salt free)	Pristine (with salt)	Pristine (salt free)	Weathered (with salt)
C 1s	97.7	91.2	98.6	86.0
O 1s	1.3	6.3	1.1	9.9
N 1s	-	0.2	-	0.3
Si 2p	1.0	1.4	-	2.4
Na 1s	-	0.5	<0.1	0.5
Ca 2p	-	0.4	-	0.9
P 2p	-	-	0.2	-

Table SM-3: Binding energies of pellet samples analysed by XPS

Peak	Binding Energy (eV)			
	Pristine milled	Pristine (salt)	Pristine (Salt Free)	Weathered
C 1s	285.0*	285.0*	285.0*	285.0*
O 1s	532.4	532.2	533.0	532.0
N 1s	-	400.0	-	400.2
Si 2p 3/2	102.2	102.2	-	102.4
Ca 2p 3/2	-	347.6	-	347.2
Na 1s	-	1071.4	1071.5	1071.7
P 2p 3/2	-	-	134.7	-

**All binding energies reported relative to hydrocarbon peak in C 1s spectrum, which is fixed at 285.0 eV

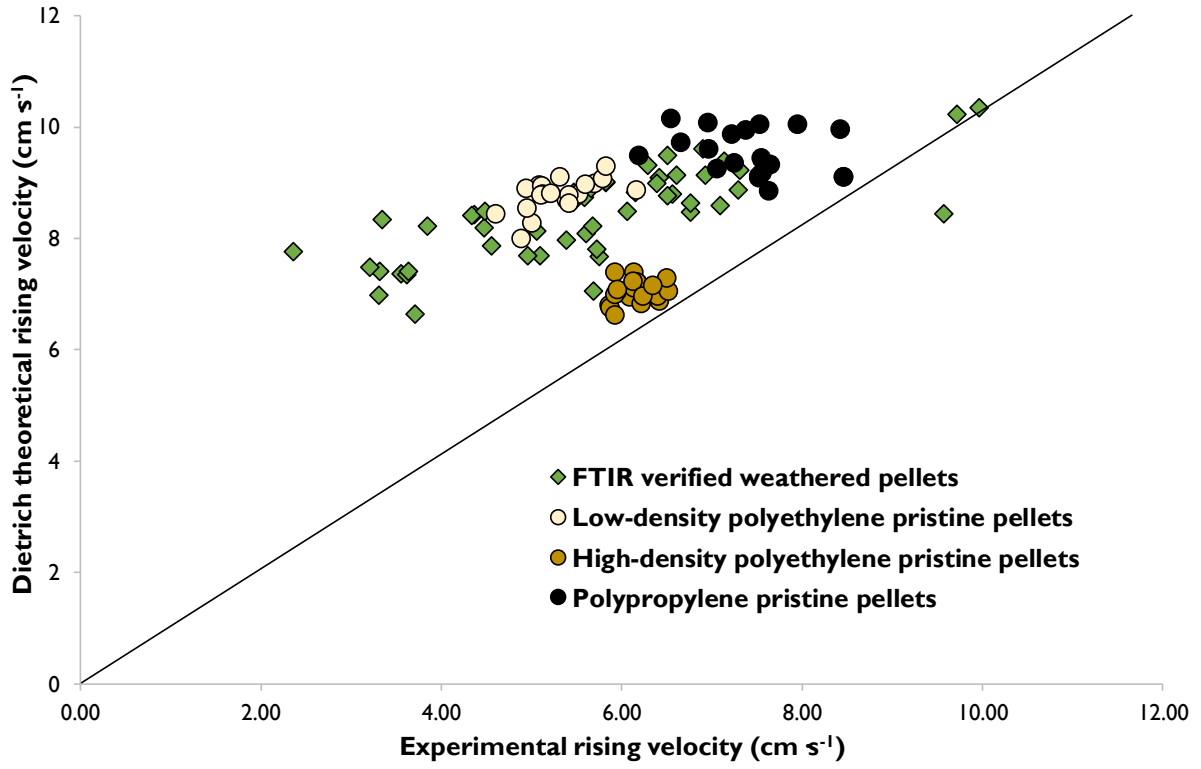


Figure SM-1: Relationships between experimental and Dietrich theoretical rising velocities

Figure SM-2: AFM images of height, amplitude and phase (30 μm x 30 μm) of the pristine pellet (top), pristine-milled sample (middle) and weathered pellet (bottom).

