

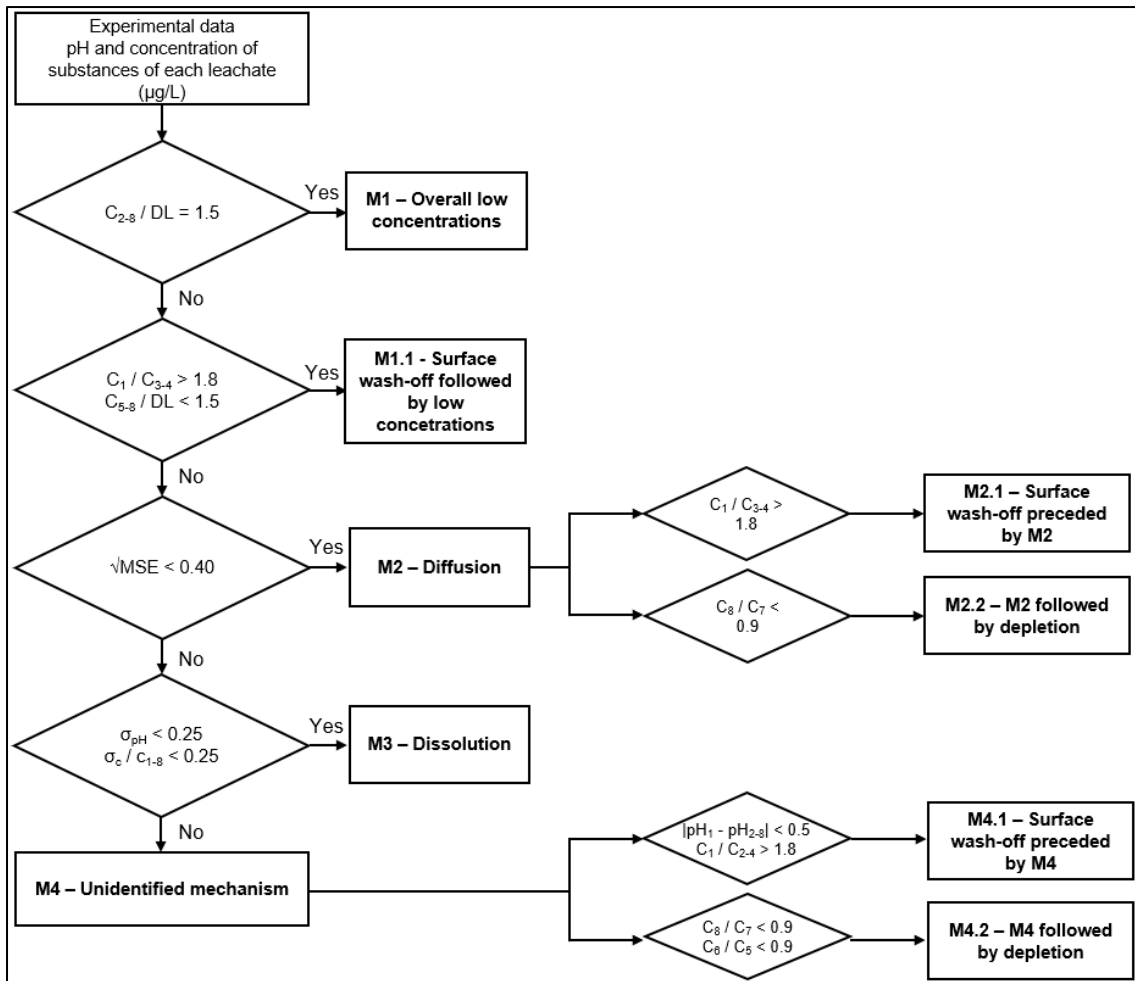


Figure S1. Flowchart adapted from CEN/TS 16637-2 for the hierarchical determination of release mechanisms of substances from monolithic construction materials

Table S1. Release mechanisms, mathematical criteria to be complied as noted in Annex B of CEN/TS 16637-2 and results from the calculations for each asphalt mixture

| Release mechanism and mathematical conditions                 |                           | Control Asphalt Concrete (C-AC) |       |       |       |       | Slag Asphalt Concrete (S-AC) |            |            |       |       | Control Porous Asphalt (C-PA) |       |       |       |    | Slag Porous Asphalt (S-PA) |       |       |       |    |
|---------------------------------------------------------------|---------------------------|---------------------------------|-------|-------|-------|-------|------------------------------|------------|------------|-------|-------|-------------------------------|-------|-------|-------|----|----------------------------|-------|-------|-------|----|
| Mechanism                                                     | Mathematical condition(s) | Cr                              | Mo    | V     | DOC   | pH    | Cr                           | Mo         | V          | DOC   | pH    | Cr                            | Mo    | V     | DOC   | pH | Cr                         | Mo    | V     | DOC   | pH |
| M1 - Overall low concentrations                               | $C_{2-8}/DL < 1.5$        | 2.026                           | 2.356 | 5.165 | 2.129 |       | 15.50<br>7                   | 32.22<br>1 | 272.3<br>6 | 1.671 |       | 1.275                         | 0.815 | 4.639 | 0.400 |    | 42.83                      | 56.31 | 506.3 | 0.357 |    |
| M1.1 - Surface wash-off preceding M1                          | $C_1/C_{3-7} > 1.8$       | 1.762                           | 4.727 | 0.431 | 6.728 |       | 0.400                        | 0.236      | 0.066      | 5.530 |       | -                             | -     | 0.431 | -     |    | 0.426                      | 0.331 | 0.082 | -     |    |
|                                                               | $C_{5-8}/DL < 1.5$        | 1.955                           | 4.123 | 6.183 | 1.225 |       | 21.59<br>6                   | 48.52      | 429.0      | 1.150 |       | -                             | -     | 6.183 | -     |    | 58.87                      | 82.50 | 809.7 | -     |    |
| M2 - Diffusion                                                | $\sqrt{MSE} < 0.40$       | 0.627                           | 0.661 | 0.335 | -     |       | 0.075                        | 0.162      | 0.327      | -     |       | -                             | -     | 0.159 | -     |    | 0.139                      | 0.079 | 0.318 | -     |    |
| M2.1 - Surface wash-off preceding M2                          | $C_1/C_{3-4} > 1.8$       | 1.636                           | 0     | 0.570 | -     |       | 0.790                        | 0.665      | 0.228      | -     |       | -                             | -     | 1.021 | -     |    | 0.827                      | 0.796 | 0.311 | -     |    |
| M2.2 - Depletion after M2                                     | $C_8/C_7 < 0.9$           | 0.982                           | 1.259 | 0.895 | -     |       | 0.980                        | 0.899      | 0.896      | -     |       | -                             | -     | 1.161 | -     |    | 0.940                      | 1.000 | 0.930 | -     |    |
| M3 - Dissolution                                              | $\sigma_{pH} < 0.25$      |                                 |       |       |       | 0.520 |                              |            |            | -     | 0.301 |                               |       |       | -     |    |                            |       |       |       | -  |
|                                                               | $\sigma_c/C_{1-8} < 0.25$ | 0.266                           | 1.080 | -     | -     |       | -                            | -          | -          | -     |       | -                             | -     | -     | -     |    | -                          | -     | -     | -     |    |
| M4.1 - Surface wash-off preceding unidentified mechanism (M4) | $ pH_1 - pH_{2-8}  < 0.5$ |                                 |       |       |       | 0.886 |                              |            |            |       | -     |                               |       |       | -     |    |                            |       |       |       | -  |
|                                                               | $C_1/C_{2-4} > 1.8$       | 1.716                           | 0     | -     | -     |       | -                            | -          | -          | -     |       | -                             | -     | -     | -     |    | -                          | -     | -     | -     |    |
| M4.2 - Depletion after unidentified mechanism (M4)            | $C_8/C_7 < 0.9$           | 0.982                           | 1.259 | -     | -     |       | -                            | -          | -          | -     |       | -                             | -     | -     | -     |    | -                          | -     | -     | -     |    |
|                                                               | $C_6/C_5 < 0.9$           | 0.624                           | 1.216 | -     | -     |       | -                            | -          | -          | -     |       | -                             | -     | -     | -     |    | -                          | -     | -     | -     |    |
| Determined mechanism                                          |                           | M4                              | M4    | M2.2  | M1.1  | -     | M2                           | M2.2       | M2.2       | M1.1  | -     | M1                            | M1    | M2    | M1    | -  | M2                         | M2    | M2    | M1    | -  |

Table S1 (cont). Terms and expressions from the mathematical conditions in Annex B of CEN/TS 16637-2

| Expression            | Meaning                                                                           |
|-----------------------|-----------------------------------------------------------------------------------|
| DL                    | Detection limit                                                                   |
| $C_i$                 | Concentration of a substance in step i of the test                                |
| $C_{i-j}$             | Mean concentration of substance in steps i to j                                   |
| $\sqrt{\text{MSE}^*}$ | Square root of the mean standard error for the calculation of diffusion mechanism |
| $\sigma_{\text{pH}}$  | Standard deviation of pH throughout the test                                      |
| $\sigma_c$            | Standard deviation of concentration of a substance throughout the test            |
| $\text{pH}_i$         | pH value of the leachate on step i                                                |
| $\text{pH}_{i-j}$     | Mean pH value in steps i to j                                                     |

\*Calculation of MSE:

| If $\frac{c_8}{c_7} \geq 0,9$ (no depletion):          | If $\frac{c_8}{c_7} < 0,9$ (depletion):                |
|--------------------------------------------------------|--------------------------------------------------------|
| $c_{2-8} = \frac{\sum_{i=2}^8 c_i}{7},$                | $c_{2-7} = \frac{\sum_{i=2}^7 c_i}{6},$                |
| $SE_2 = \left( \frac{c_2}{c_{2-8}} - 0,467 \right)^2,$ | $SE_2 = \left( \frac{c_2}{c_{2-7}} - 0,545 \right)^2,$ |
| $SE_3 = \left( \frac{c_3}{c_{2-8}} - 0,467 \right)^2,$ | $SE_3 = \left( \frac{c_3}{c_{2-7}} - 0,545 \right)^2,$ |
| $SE_4 = \left( \frac{c_4}{c_{2-8}} - 0,467 \right)^2,$ | $SE_4 = \left( \frac{c_4}{c_{2-7}} - 0,545 \right)^2,$ |
| $SE_5 = \left( \frac{c_5}{c_{2-8}} - 0,933 \right)^2,$ | $SE_5 = \left( \frac{c_5}{c_{2-7}} - 1,091 \right)^2,$ |
| $SE_6 = \left( \frac{c_6}{c_{2-8}} - 0,933 \right)^2,$ | $SE_6 = \left( \frac{c_6}{c_{2-7}} - 1,091 \right)^2,$ |
| $SE_7 = \left( \frac{c_7}{c_{2-8}} - 1,867 \right)^2,$ | $SE_7 = \left( \frac{c_7}{c_{2-7}} - 2,182 \right)^2,$ |
| $SE_8 = \left( \frac{c_8}{c_{2-8}} - 1,867 \right)^2,$ |                                                        |
| $MSE = \frac{\sum_{i=2}^8 SE_i}{7}.$                   | $MSE = \frac{\sum_{i=2}^7 SE_i}{6}.$                   |