**Table 1a % Area of Free mica in <63µm sieved sand fines**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Analysis** | **Total analysed** | **Total area of** | **Total area of** | **Total No.** | **Total No.** | **% Area Free** |
| **reference** | **area** | **analysed fines** | **Free mica fines** | **of fines** | **of Free mica** | **mica in total** |
|  | **(sq. µm)** | **(sq. µm)** | **(sq. µm)** |  | **fines** | **fines** |
| TE-1a | 3,000,000 | 473,000 | 94,800 | 6,832 | 400 | 20.04 |
| TE-1c | 636,411 | 155,000 | 25,500 | 2,189 | 197 | 16.45 |
| TE-1e | 636,411 | 162,000 | 33,300 | 2,422 | 160 | 20.56 |
| TE-1f | 357,938 | 83,800 | 17,000 | 1,526 | 127 | 20.29 |
| MEAN |  |  |  |  |  | 19.33 |
| STD DEV |  |  |  |  |  | 1.93 |

**Table 1b % Area of Free mica in <63µm sieved sand fines**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Analysis** | **Total** | **Total area of** | **Total area of** | **Total** | **Total No.** | **% Area Free** | **1SD of %** |
| **reference** | **analysed area** | **analysed fines** | **Free mica fines** | **no. of** | **of Free mica** | **mica in total** | **Free mica** |
|  | **(sq. µm)** | **(sq. µm)** | **(sq. µm)** | **fines** | **fines** | **fines** | **in total fines** |
| OY-1 X1 | 357,938 | 115,000 | 3,710 | 1,570 | 34 | 3.23 |  |
| OY-1 X2 | 357,938 | 118,000 | 2,520 | 1,600 | 31 | 2.14 | 0.77 |
| OY-1 X3 | 357,938 | 148,000 | 3,030 | 2,041 | 31 | 2.05 | 0.66 |
| OY-1 X4 | 229,495 | 84,100 | 847 | 1,587 | 22 | 1.01 | 0.91 |
| OY-1X5 | 116,920 | 47,700 | 617 | 909 | 19 | 1.29 | 0.86 |
| OY-1 X6 | 116,920 | 52,700 | 580 | 1,761 | 24 | 1.10 | 0.85 |
| OY-1 X7 | 116,920 | 40,300 | 966 | 1,389 | 18 | 2.40 | 0.80 |
| OY-1 X8 | 116,920 | 48,700 | 525 | 1,437 | 15 | 1.08 | 0.80 |
| OY-1 X9 | 116,920 | 57,900 | 746 | 1,606 | 16 | 1.29 | 0.76 |
| OY-1 X10 | 116,920 | 45,700 | 521 | 1,336 | 16 | 1.14 | 0.74 |
| OY-1 X11 | 7,850,000 | 1,990,000 | 44,000 | 43,147 | 883 | 2.21 | 0.72 |
| OY-1 X12 | 1,120,000 | 382,000 | 13,000 | 8,530 | 176 | 3.40 | 0.84 |
| OY-1 X13 | 821,000 | 349,000 | 5,990 | 8,883 | 85 | 1.72 | 0.81 |
| MEAN |  |  |  |  |  | 1.85 |  |
| STD DEV |  |  |  |  |  | 0.81 |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |

**Table 1c Sand fines SEM analysis parameters**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Analysis Reference** | **BSE & EDX Image Width x Height µm** | **SEM Magnification** | **Total fields** | **BSE Pixel Dwell µs** | **BSE Frame Time s** | **EDX Pixel Dwell Time µs** | **EDX Live Frame Time min** |
| OY-1 X1 | 691 x 518 | 400 | 1 | 200 | 157 | 5,000 | 16 |
| OY-1 X2 | 691 x 518 | 400 | 1 | 200 | 157 | 5,000 | 16 |
| OY-1 X3 | 691 x 518 | 400 | 1 | 200 | 157 | 5,000 | 16 |
| OY-1 X4 | 553 x 415 | 500 | 1 | 200 | 157 | 5,000 | 16 |
| OY-1 X5 | 395 x 296 | 700 | 1 | 200 | 157 | 5,000 | 16 |
| OY-1 X6 | 395 x 296 | 700 | 1 | 200 | 157 | 5,000 | 16 |
| OY-1 X7 | 395 x 296 | 700 | 1 | 200 | 157 | 5,000 | 16 |
| OY-1 X8 | 395 x 296 | 700 | 1 | 200 | 157 | 5,000 | 16 |
| OY-1 X9 | 395 x 296 | 700 | 1 | 200 | 157 | 5,000 | 16 |
| OY-1 X10 | 395 x 296 | 700 | 1 | 200 | 157 | 5,000 | 16 |
| OY-1 X11 | 395 x 296 | 700 | 55 | 200 | 157 | 5,000 | 16 x 55 |
| OY-1 X12 | 395 x 296 | 700 | 12 | 200 | 157 | 5,000 | 16 x 12 |
| OY-1 X13 | 551 x 413 | 500 | 4 | 200 | 157 | 5,000 | 16 x 4 |
| TE-1a | 2,000 x 1,500 | 138 | 1 | 200 | 157 | 5,000 | 16 |
| TE-1c | 921 x 691 | 300 | 1 | 200 | 157 | 5,000 | 16 |
| TE-1e | 921 x 691 | 300 | 1 | 200 | 157 | 5,000 | 16 |
| TE-1f | 691 x 518 | 400 | 1 | 200 | 157 | 5,000 | 16 |

**Table 2a Area % Free mica in the cement matrix of a hardened concrete block**

**(Ref. AA63210)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Sample ID** |  | **Total image area, µm²** | **Total fines area, µm²** | **Free mica fines area, µm²** | **% Free mica in hardened cement matrix** | **% Free mica among total fines** | **1SD of % Free mica among total fines** |
| 1 |  | 39,790 | 12,106 | 6,168 | 15.70 | 57.22 |  |
| 2 |  | 39,790 | 10,499 | 6,127 | 15.40 | 58.36 | 0.81 |
| 3 |  | 42,364 | 6,448 | 4,869 | 11.49 | 75.51 | 10.25 |
| 4 |  | 42,364 | 8,211 | 5,291 | 12.49 | 64.44 | 8.37 |
| 5 |  | 42,186 | 8,063 | 5,364 | 12.71 | 66.53 | 7.35 |
| 6 |  | 42,364 | 7,262 | 4,815 | 11.37 | 66.30 | 6.62 |
| 7 |  | 42,364 | 13,884 | 6,969 | 16.45 | 50.20 | 8.16 |
| 8 |  | 42,364 | 7,044 | 5,273 | 12.45 | 74.86 | 8.70 |
| 9 |  | 42,364 | 8,916 | 6,111 | 14.42 | 68.54 | 8.27 |
| 10 |  | 42,364 | 10,891 | 6,284 | 14.83 | 57.70 | 8.10 |
| 11 |  | 42,364 | 10,995 | 5,309 | 12.53 | 48.28 | 9.02 |
| 12 |  | 42,364 | 10,810 | 7,367 | 17.39 | 68.15 | 8.76 |
| 13 |  | 42,364 | 9,230 | 7,454 | 17.60 | 80.76 | 9.72 |
| 14 |  | 42,364 | 8,380 | 5,113 | 12.07 | 61.02 | 9.38 |
| MEAN |  |  |  |  | 14.06 | 64.13 |  |
| TD DEV |  |  |  |  | 2.1 | 9.04 |  |

**Table 2b Area % Free mica in the cement matrix of a hardened concrete block**

**(Ref. 31LOCRight)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sample ID** | **Total image area, µm²** | **Total fines area, µm²** | **Free mica fines area, µm²** | **% Free mica in hardened cement matrix** | **% Free mica among total fines** | **1SD of % Free mica among total fines** |
| **A** | 32,200 | 10,500 | 3,310 | 10.28 | 31.52 |  |
| **B** | 32,200 | 7,890 | 3,070 | 9.53 | 38.91 | 5.22 |
| **C** | 32,200 | 9,370 | 3,830 | 11.89 | 40.88 | 4.93 |
| **D** | 32,200 | 8,210 | 2,940 | 9.13 | 35.81 | 4.08 |
| **E** | 32,200 | 11,300 | 3,740 | 11.61 | 33.10 | 3.90 |
| **F** | 32,200 | 8,720 | 2,940 | 9.13 | 33.72 | 3.61 |
| **G** | 32,200 | 13,100 | 2,980 | 9.25 | 22.75 | 5.89 |
| **H** | 32,200 | 11,800 | 3,270 | 10.16 | 27.71 | 5.86 |
| **I** | 32,200 | 13,400 | 3,360 | 10.43 | 25.07 | 6.09 |
| **J** | 32,200 | 11,400 | 2,260 | 7.02 | 19.82 | 6.95 |
| **K** | 32,200 | 9,980 | 2,900 | 9.01 | 29.06 | 6.61 |
| **L** | 32,200 | 12,400 | 3,340 | 10.37 | 26.94 | 6.40 |
| **M** | 66,200 | 20,500 | 5,530 | 8.35 | 26.98 | 6.20 |
| **N** | 32,200 | 9,890 | 2,890 | 8.98 | 29.22 | 5.97 |
| **O** | 32,200 | 7,230 | 2,610 | 8.11 | 36.10 | 5.95 |
| **P** | 32,200 | 12,600 | 3,860 | 11.99 | 30.63 | 5.75 |
| **Q** | 32,200 | 14,100 | 3,750 | 11.65 | 26.60 | 5.65 |
| **R** | 32,200 | 10,800 | 3,460 | 10.75 | 32.04 | 5.50 |
| **S** | 32,200 | 9,910 | 3,740 | 11.61 | 37.74 | 5.60 |
| **T** | 37,200 | 14,000 | 3,760 | 10.11 | 26.86 | 5.52 |
| **U** | 32,200 | 9,500 | 2,800 | 8.70 | 29.47 | 5.39 |
| **V** | 32,200 | 12,000 | 3,000 | 9.32 | 25.00 | 5.39 |
| **MEAN** |  |  |  | 9.88 | 30.27 |  |
| **STD DEV** |  |  |  | 1.34 | 5.39 |  |

**Table 2c** **Area % Free mica in the cement matrix of a hardened concrete block**

**(Ref. 31LOCLeft)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sample ID** | **Total image area, µm²** | **Total fines area, µm²** | **Free mica fines area, µm²** | **% Free mica in hardened cement matrix** | **% Free mica among total fines** | **1SD of % Free mica among total fines** |
| A3 | 63,500 | 27,900 | 6,350 | 10.00 | 22.76 |  |
| B3 | 63,500 | 22,600 | 4,180 | 6.58 | 18.50 | 3.02 |
| C3 | 63,500 | 18,800 | 5,550 | 8.74 | 29.52 | 5.56 |
| D3 | 63,500 | 21,100 | 3,830 | 6.03 | 18.15 | 5.29 |
| E3 | 39,800 | 11,100 | 3,590 | 9.02 | 32.34 | 6.44 |
| F3 | 39,800 | 10,700 | 3,110 | 7.81 | 29.07 | 6.08 |
| G3 | 39,800 | 13,300 | 4,380 | 11.01 | 32.93 | 6.30 |
| H3 | 39,800 | 11,700 | 3,790 | 9.52 | 32.39 | 6.23 |
| I3 | 39,800 | 16,200 | 3,310 | 8.32 | 20.43 | 6.22 |
| J3 | 39,700 | 16,400 | 3,670 | 9.24 | 22.38 | 5.99 |
| K3 | 39,900 | 13,100 | 4,860 | 12.18 | 37.10 | 6.62 |
| L3 | 39,800 | 12,300 | 2,520 | 6.33 | 20.49 | 6.58 |
| M3 | 39,800 | 13,600 | 3,180 | 7.99 | 23.38 | 6.35 |
| N3 | 39,800 | 8,610 | 2,780 | 6.98 | 32.29 | 6.32 |
| O3 | 39,800 | 11,600 | 3,360 | 8.44 | 28.97 | 6.12 |
| P3 | 39,800 | 9,730 | 2,030 | 5.10 | 20.86 | 6.09 |
| Q3 | 39,800 | 11,400 | 3,170 | 7.96 | 27.81 | 5.91 |
| R3 | 40,100 | 13,000 | 2,593 | 6.47 | 19.95 | 5.93 |
| S3 | 40,000 | 17,000 | 4,620 | 11.55 | 27.18 | 5.77 |
| T3 | 39,800 | 12,800 | 4,190 | 10.53 | 32.73 | 5.81 |
| U3 | 39,800 | 12,000 | 4,850 | 12.19 | 40.42 | 6.43 |
| V3 | 39,800 | 11,700 | 3,960 | 9.95 | 33.85 | 6.44 |
| W3 | 39,800 | 13,000 | 2,400 | 6.03 | 18.46 | 6.56 |
| X3 | 39,800 | 10,200 | 1,780 | 4.47 | 17.45 | 6.71 |
| Y3 | 39,800 | 9,580 | 3,860 | 9.70 | 40.29 | 7.11 |
| Z3 | 39,800 | 10,700 | 4,130 | 10.38 | 38.60 | 7.32 |
| AA3 | 39,800 | 14,500 | 3,020 | 7.59 | 20.83 | 7.29 |
| BB3 | 39,800 | 11,900 | 3,460 | 8.69 | 29.08 | 7.16 |
| **MEAN** |  |  |  | 8.53 | 27.44 |  |
| **STD DEV** |  |  |  | 2.02 | 7.16 |  |

**Table 2d** **Area % Free mica in the cement matrix of a hardened concrete block**

**(Ref. AA68189 external leaf)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sample ID** | **Total image area, µm²** | **Total fines area, µm²** | **Free mica fines area, µm²** | **% Free mica in hardened cement matrix** | **% Free mica among total fines** | **1SD of % Free mica among total fines** |
| B4 | 39,800 | 10,000 | 1,430 | 3.59 | 14.30 |  |
| C4 | 39,800 | 8,880 | 3,090 | 7.76 | 34.80 | 14.49 |
| D4 | 39,800 | 10,800 | 2,080 | 5.23 | 19.26 | 10.69 |
| E4 | 39,800 | 11,000 | 2,340 | 5.88 | 21.27 | 8.76 |
| F4 | 39,800 | 15,500 | 4,030 | 10.13 | 26.00 | 7.76 |
| G4 | 39,800 | 7,480 | 2,050 | 5.15 | 27.41 | 7.16 |
| H4 | 39,300 | 11,500 | 2,190 | 5.57 | 19.04 | 6.78 |
| I4 | 40,100 | 11,500 | 2,140 | 5.34 | 18.61 | 6.48 |
| J4 | 40,100 | 12,300 | 2,500 | 6.23 | 20.33 | 6.11 |
| K4 | 39,900 | 18,400 | 2,820 | 7.07 | 15.33 | 6.17 |
| L4 | 39,500 | 11,300 | 4,030 | 10.20 | 35.66 | 7.22 |
| M4 | 39,500 | 17,400 | 2,520 | 6.38 | 14.48 | 7.30 |
| N4 | 39,800 | 10,600 | 2,680 | 6.73 | 25.28 | 7.04 |
| O4 | 39,900 | 15,400 | 2,260 | 5.66 | 14.68 | 7.08 |
| P4 | 39,500 | 13,400 | 3,610 | 9.14 | 26.94 | 6.94 |
| Q4 | 40,100 | 15,500 | 2,840 | 7.08 | 18.32 | 6.78 |
| R4 | 39,700 | 14,300 | 3,980 | 10.03 | 27.83 | 6.72 |
| S4 | 39,900 | 12,800 | 4,340 | 10.88 | 33.91 | 7.06 |
| T4 | 39,600 | 10,500 | 2,600 | 6.57 | 24.76 | 6.88 |
| U4 | 40,100 | 10,900 | 2,590 | 6.46 | 23.76 | 6.70 |
| V4 | 39,700 | 12,700 | 3,600 | 9.07 | 28.35 | 6.63 |
| W4 | 39,700 | 9,580 | 3,500 | 8.82 | 36.53 | 7.05 |
| **MEAN** |  |  |  | 7.23 | 23.95 |  |
| **STD DEV** |  |  |  | 1.99 | 7.05 |  |