Electronic Supplementary Material (ESI) for RSC Advances.

In total, 144 mixtures were provided and used in genetic programming modelling. Table A summarizes mixture proportions, curing condition, compressive strength and standard deviation of these data.

Table A. Mixture proportions, curing condition, compressive strength and standard deviation of 144 specimen used for modelling in this paper.

Sample number	Fly ash (wt%)	Sand (wt%)	Na_2SiO_3 (wt%)	KOH (wt%)	NaOH (wt%)	Curing temperature (^oC)	Age of curing (days)	Na2SiO3/NaOH or KOH weight ratio	Liquid/ash ratio	Compressive Strength (MPa)	Standard Deviation
1	30.3	60.6	3.0	-	6.1	60	1	0.5	0.3	3.40	0.22
2	29.4	58.8	3.9	-	7.8	60	1	0.5	0.4	18.84	0.26
3	28.6	57.1	4.8	-	9.5	60	1	0.5	0.5	15.91	0.25
4	27.8	55.6	5.6	-	11.1	60	1	0.5	0.6	12.42	0.19
5	30.3	60.6	4.5	-	4.5	60	1	1	0.3	4.59	0.182
6	29.4	58.8	5.9	-	5.9	60	1	1	0.4	26.95	1.687
7	28.6	57.1	7.1	-	7.1	60	1	1	0.5	22.69	0.604
8	27.8	55.6	8.3	-	8.3	60	1	1	0.6	22.05	0.587
9	30.3	60.6	5.5	-	3.6	60	1	1.5	0.3	3.11	0.353
10	29.4	58.8	7.1	-	4.7	60	1	1.5	0.4	29.95	0.618
11	28.6	57.1	8.6	-	5.7	60	1	1.5	0.5	27.63	0.313
12	27.8	55.6	10.0	-	6.7	60	1	1.5	0.6	22.73	0.958
13	30.3	60.6	6.1	-	3.0	60	1	2	0.3	2.78	0.472
14	29.4	58.8	7.8	-	3.9	60	1	2	0.4	30.68	0.666
15	28.6	57.1	9.5	-	4.8	60	1	2	0.5	24.90	1.209
16	27.8	55.6	11.1	-	5.6	60	1	2	0.6	22.74	0.988
17	30.3	60.6	6.5	-	2.6	60	1	2.5	0.3	1.77	0.344
18	29.4	58.8	8.4	-	3.4	60	1	2.5	0.4	25.47	1.397

19	28.6	57.1	10.2	-	4.1	60	1	2.5	0.5	24.42	0.831
20	27.8	55.6	11.9	-	4.8	60	1	2.5	0.6	22.19	0.196
21	30.3	60.6	6.8	-	2.3	60	1	3	0.3	1.62	0.341
22	29.4	58.8	8.8	-	2.9	60	1	3	0.4	25.13	0.047
23	28.6	57.1	10.7	-	3.6	60	1	3	0.5	20.63	1.338
24	27.8	55.6	12.5	-	4.2	60	1	3	0.6	18.09	0.848
25	30.3	60.6	3.0	-	6.1	60	7	0.5	0.3	4.57	0.63
26	29.4	58.8	3.9	-	7.8	60	7	0.5	0.4	20.87	0.44
27	28.6	57.1	4.8	-	9.5	60	7	0.5	0.5	17.39	1.11
28	27.8	55.6	5.6	-	11.1	60	7	0.5	0.6	13.77	0.70
29	30.3	60.6	4.5	-	4.5	60	7	1	0.3	6.14	0.14
30	29.4	58.8	5.9	-	5.9	60	7	1	0.4	30.49	0.32
31	28.6	57.1	7.1	-	7.1	60	7	1	0.5	23.53	0.92
32	27.8	55.6	8.3	-	8.3	60	7	1	0.6	23.07	1.59
33	30.3	60.6	5.5	-	3.6	60	7	1.5	0.3	3.81	0.30
34	29.4	58.8	7.1	-	4.7	60	7	1.5	0.4	32.48	0.51
35	28.6	57.1	8.6	-	5.7	60	7	1.5	0.5	27.84	0.36
36	27.8	55.6	10.0	-	6.7	60	7	1.5	0.6	23.94	1.00
37	30.3	60.6	6.1	-	3.0	60	7	2	0.3	2.96	0.28
38	29.4	58.8	7.8	-	3.9	60	7	2	0.4	32.62	1.12
39	28.6	57.1	9.5	-	4.8	60	7	2	0.5	27.62	0.33
40	27.8	55.6	11.1	-	5.6	60	7	2	0.6	25.63	1.00
41	30.3	60.6	6.5	-	2.6	60	7	2.5	0.3	2.25	0.20
42	29.4	58.8	8.4	-	3.4	60	7	2.5	0.4	29.99	1.83
43	28.6	57.1	10.2	-	4.1	60	7	2.5	0.5	29.06	1.58
44	27.8	55.6	11.9	-	4.8	60	7	2.5	0.6	23.96	0.49

45	30.3	60.6	6.8	-	2.3	60	7	3	0.3	1.79	0.18
46	29.4	58.8	8.8	-	2.9	60	7	3	0.4	27.47	0.68
47	28.6	57.1	10.7	-	3.6	60	7	3	0.5	23.59	1.81
48	27.8	55.6	12.5	-	4.2	60	7	3	0.6	20.14	0.36
49	30.3	60.6	3.0	-	6.1	25	7	0.5	0.3	0.77	0.03
50	29.4	58.8	3.9	-	7.8	25	7	0.5	0.4	12.84	0.11
51	28.6	57.1	4.8	-	9.5	25	7	0.5	0.5	10.17	1.47
52	27.8	55.6	5.6	-	11.1	25	7	0.5	0.6	8.53	0.63
53	30.3	60.6	4.5	-	4.5	25	7	1	0.3	1.39	0.12
54	29.4	58.8	5.9	-	5.9	25	7	1	0.4	21.33	1.08
55	28.6	57.1	7.1	-	7.1	25	7	1	0.5	15.82	0.75
56	27.8	55.6	8.3	-	8.3	25	7	1	0.6	12.42	0.34
57	30.3	60.6	5.5	-	3.6	25	7	1.5	0.3	1.39	0.28
58	29.4	58.8	7.1	-	4.7	25	7	1.5	0.4	21.78	0.99
59	28.6	57.1	8.6	-	5.7	25	7	1.5	0.5	17.94	3.15
60	27.8	55.6	10.0	-	6.7	25	7	1.5	0.6	14.06	0.97
61	30.3	60.6	6.1	-	3.0	25	7	2	0.3	1.61	0.41
62	29.4	58.8	7.8	-	3.9	25	7	2	0.4	21.98	2.78
63	28.6	57.1	9.5	-	4.8	25	7	2	0.5	20.15	0.31
64	27.8	55.6	11.1	-	5.6	25	7	2	0.6	16.61	0.40
65	30.3	60.6	6.5	-	2.6	25	7	2.5	0.3	1.02	0.23
66	29.4	58.8	8.4	-	3.4	25	7	2.5	0.4	20.39	2.13
67	28.6	57.1	10.2	-	4.1	25	7	2.5	0.5	17.69	0.29
68	27.8	55.6	11.9	-	4.8	25	7	2.5	0.6	14.87	0.42
69	30.3	60.6	6.8	-	2.3	25	7	3	0.3	1.21	0.20
70	29.4	58.8	8.8	-	2.9	25	7	3	0.4	18.50	0.50

71	28.6	57.1	10.7	-	3.6	25	7	3	0.5	16.09	0.88
72	27.8	55.6	12.5	-	4.2	25	7	3	0.6	14.35	0.28
73	30.3	60.6	3.0	6.1	-	60	1	0.5	0.3	1.46	0.10
74	29.4	58.8	3.9	7.8	-	60	1	0.5	0.4	23.59	0.92
75	28.6	57.1	4.8	9.5	-	60	1	0.5	0.5	15.94	1.17
76	27.8	55.6	5.6	11.1	-	60	1	0.5	0.6	14.97	0.46
77	30.3	60.6	4.5	4.5	-	60	1	1	0.3	8.62	0.54
78	29.4	58.8	5.9	5.9	-	60	1	1	0.4	28.97	1.67
79	28.6	57.1	7.1	7.1	-	60	1	1	0.5	20.49	0.76
80	27.8	55.6	8.3	8.3	-	60	1	1	0.6	22.32	0.27
81	30.3	60.6	5.5	3.6	-	60	1	1.5	0.3	2.17	0.22
82	29.4	58.8	7.1	4.7	-	60	1	1.5	0.4	28.78	0.68
83	28.6	57.1	8.6	5.7	-	60	1	1.5	0.5	22.05	0.71
84	27.8	55.6	10.0	6.7	-	60	1	1.5	0.6	21.71	0.92
85	30.3	60.6	6.1	3.0	-	60	1	2	0.3	1.79	0.03
86	29.4	58.8	7.8	3.9	-	60	1	2	0.4	26.11	2.32
87	28.6	57.1	9.5	4.8	-	60	1	2	0.5	22.41	0.34
88	27.8	55.6	11.1	5.6	-	60	1	2	0.6	21.33	0.05
89	30.3	60.6	6.5	2.6	-	60	1	2.5	0.3	0.38	0.02
90	29.4	58.8	8.4	3.4	-	60	1	2.5	0.4	25.31	1.94
91	28.6	57.1	10.2	4.1	-	60	1	2.5	0.5	23.12	1.77
92	27.8	55.6	11.9	4.8	-	60	1	2.5	0.6	21.31	0.41
93	30.3	60.6	6.8	2.3	-	60	1	3	0.3	0.85	0.08
94	29.4	58.8	8.8	2.9	-	60	1	3	0.4	23.53	0.04
95	28.6	57.1	10.7	3.6	-	60	1	3	0.5	19.91	0.41
96	27.8	55.6	12.5	4.2	-	60	1	3	0.6	14.59	0.68

97	30.3	60.6	3.0	6.1	-	60	7	0.5	0.3	1.79	0.17
98	29.4	58.8	3.9	7.8	-	60	7	0.5	0.4	27.36	0.88
99	28.6	57.1	4.8	9.5	-	60	7	0.5	0.5	17.65	0.23
100	27.8	55.6	5.6	11.1	-	60	7	0.5	0.6	19.45	1.06
101	30.3	60.6	4.5	4.5	-	60	7	1	0.3	12.17	0.54
102	29.4	58.8	5.9	5.9	-	60	7	1	0.4	32.73	0.58
103	28.6	57.1	7.1	7.1	-	60	7	1	0.5	21.50	1.06
104	27.8	55.6	8.3	8.3	-	60	7	1	0.6	23.69	0.71
105	30.3	60.6	5.5	3.6	-	60	7	1.5	0.3	2.27	0.42
106	29.4	58.8	7.1	4.7	-	60	7	1.5	0.4	31.67	0.77
107	28.6	57.1	8.6	5.7	-	60	7	1.5	0.5	23.31	0.53
108	27.8	55.6	10.0	6.7	-	60	7	1.5	0.6	22.62	0.29
109	30.3	60.6	6.1	3.0	-	60	7	2	0.3	2.52	0.19
110	29.4	58.8	7.8	3.9	-	60	7	2	0.4	28.96	0.90
111	28.6	57.1	9.5	4.8	-	60	7	2	0.5	23.95	0.76
112	27.8	55.6	11.1	5.6	-	60	7	2	0.6	21.67	0.10
113	30.3	60.6	6.5	2.6	-	60	7	2.5	0.3	0.49	0.07
114	29.4	58.8	8.4	3.4	-	60	7	2.5	0.4	27.08	0.05
115	28.6	57.1	10.2	4.1	-	60	7	2.5	0.5	24.81	0.37
116	27.8	55.6	11.9	4.8	-	60	7	2.5	0.6	21.84	0.43
117	30.3	60.6	6.8	2.3	-	60	7	3	0.3	0.93	0.12
118	29.4	58.8	8.8	2.9	-	60	7	3	0.4	26.58	1.58
119	28.6	57.1	10.7	3.6	-	60	7	3	0.5	21.93	0.17
120	27.8	55.6	12.5	4.2	-	60	7	3	0.6	16.22	0.14
121	30.3	60.6	3.0	6.1	-	25	7	0.5	0.3	0.26	0.02
122	29.4	58.8	3.9	7.8	-	25	7	0.5	0.4	15.79	0.21

123	28.6	57.1	4.8	9.5	-	25	7	0.5	0.5	10.43	0.56
124	27.8	55.6	5.6	11.1	-	25	7	0.5	0.6	9.50	0.50
125	30.3	60.6	4.5	4.5	-	25	7	1	0.3	2.86	0.28
126	29.4	58.8	5.9	5.9	-	25	7	1	0.4	18.10	1.79
127	28.6	57.1	7.1	7.1	-	25	7	1	0.5	11.07	0.38
128	27.8	55.6	8.3	8.3	-	25	7	1	0.6	11.51	0.52
129	30.3	60.6	5.5	3.6	-	25	7	1.5	0.3	0.88	0.14
130	29.4	58.8	7.1	4.7	-	25	7	1.5	0.4	18.01	2.60
131	28.6	57.1	8.6	5.7	-	25	7	1.5	0.5	12.14	0.12
132	27.8	55.6	10.0	6.7	-	25	7	1.5	0.6	12.28	1.22
133	30.3	60.6	6.1	3.0	-	25	7	2	0.3	1.19	0.19
134	29.4	58.8	7.8	3.9	-	25	7	2	0.4	17.42	2.13
135	28.6	57.1	9.5	4.8	-	25	7	2	0.5	14.85	0.76
136	27.8	55.6	11.1	5.6	-	25	7	2	0.6	14.98	0.98
137	30.3	60.6	6.5	2.6	-	25	7	2.5	0.3	0.20	0.04
138	29.4	58.8	8.4	3.4	-	25	7	2.5	0.4	16.99	2.69
139	28.6	57.1	10.2	4.1	-	25	7	2.5	0.5	18.09	2.38
140	27.8	55.6	11.9	4.8	-	25	7	2.5	0.6	13.42	0.85
141	30.3	60.6	6.8	2.3	-	25	7	3	0.3	0.21	0.04
142	29.4	58.8	8.8	2.9	-	25	7	3	0.4	16.26	0.23
143	28.6	57.1	10.7	3.6	-	25	7	3	0.5	15.81	1.51
144	27.8	55.6	12.5	4.2	-	25	7	3	0.6	10.02	0.62