

Appendix A: Materials



Plate A1: 4.76mm PET material size



Plate A2: 6.35mm PET material size



Plate A3: 9.5mm PET material size

Appendix B: Tools



Plate B1: Compressive Strength Tester type: Engineering laboratory equipment LTD



Plate B2: Compressive Strength Tester specifications



Plate B3: Splitting Strength Tester type: Engineering laboratory equipment LTD



Plate B4: Tight empty 10 cm³ Mold



Plate B5: Tight filled 10 cm³ Mold



Plate B6: loosed filled 10 cm³ Mold

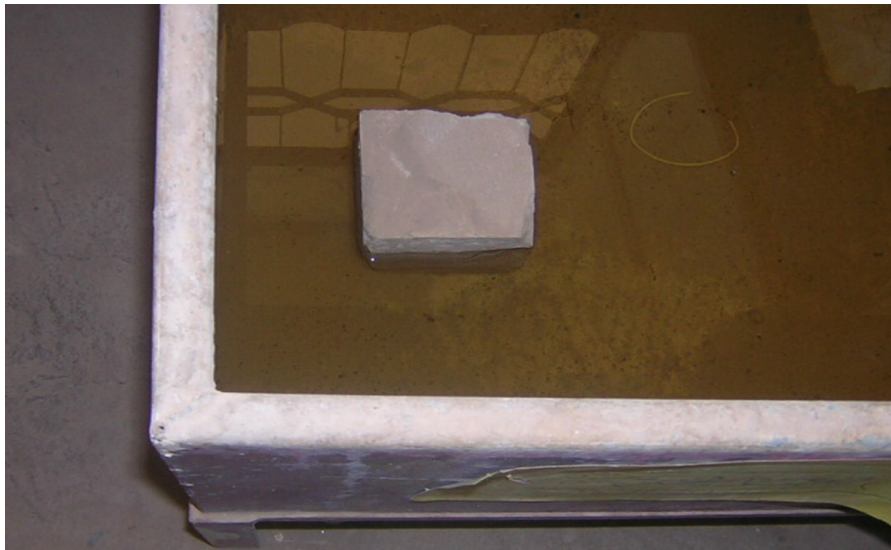


Plate B7: Water Curing Tank



Plate B8: Plastic crushing machine



Plate B9: crushed material collected at the machine box



Plate B10: Crushed material packed and ready to transfer

Appendix C: Experimental Samples



Plate C1: Control Sample Block, S1



Plate C2: Experimental sample Block, S2



Plate C3: Experimental sample Block, S3



Plate C4: Experimental sample Block, S4



Plate C5: Wall plasters Strips (left: test sample, right: control sample)



Plate C6: Wall plaster Strip (test sample)

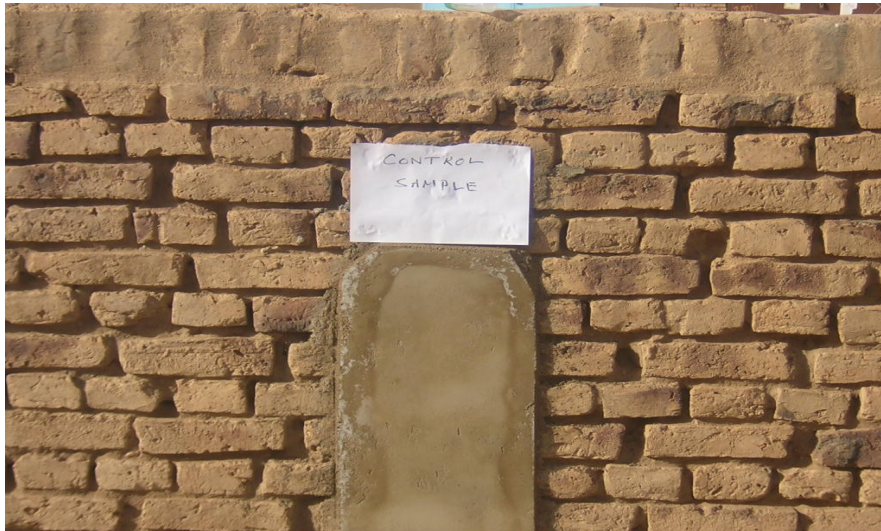


Plate C7: Wall plaster Strip (control sample)



Plate C8: test sample brick after curing



Plate C9: control sample brick after curing



Plate C10: Test sample blocks after curing

Appendix D: Data and Results

Sample	PET%	Size (mm)	Water%	Gum%	Cement (g)	Sand (g)	PET (g)
S1	0	-	10	-	543	1629	0
S2	20	4.76	8	0	543	1303	326
S3	25	4.76	8	0	543	1222	407
S4	27	4.76	8	0	543	1189	440
S5	30	4.76	8	0	543	1140	489
S6	20	4.76	8	0	543	1303	326
S7	20	6.35	8	0	543	1303	326
S8	20	9.5	8	0	543	1303	326
S9	20	4.76	8	0	543	1303	326
S10	20	4.76	10	0	543	1303	326
S11	20	4.76	12	0	543	1303	326
S12	20	4.76	8	1	543	1303	326
S13	20	4.76	8	2	543	1303	326
S14	20	4.76	8	3	543	1303	326

Table D1: Test samples recipes for 10 cm³ cubes

sample	S1 KN	S2 KN	S3 KN	S4 KN	S5 KN
1	182	171	166	155	123
2	185	179	170	156	132

3	188	175	168	148	120
Average	185	175	168	153	125
Sd. Dev.	3.0	4.0	2.0	4.36	6.24

Table D2: Compression Test for PET% in cement composition

sample	S1 KN	S2 KN	S3 KN	S4 KN	S5 KN
1	91	86	55	51	44
2	92	82	51	51	42
3	94	81	49	50	39
Average	92.33	83	51.66	50.66	41.66
Sd. Dev.	1.527	2.645	3.05	0.57	2.516

Table D3: splitting Test for PET% in cement composition

sample	S6 KN	S7 KN	S8 KN
1	182	170	166
2	186	170	168
3	185	178	170
Average	184.33	172.66	168
Sd. Dev.	2.081	4.618	2

Table D4: compressive Test for different sizes of PET

sample	S6 KN	S7 KN	S8 KN
1	79	57	44
2	78	55	39
3	69	54	41
Average	75.33	55.33	41.33

Sd. Dev.	5.507	1.527	2.516
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Table D5: splitting Test for different sizes of PET

sample	S9 KN	S10 KN	S11 KN
1	188	175	134
2	186	172	142
3	186	173	136
Average	186.66	173.33	137.33
Sd. Dev.	1.154	1.527	4.163

Table D6: compressive Test for different water amounts

sample	S9 KN	S10 KN	S11 KN
1	88	58	42
2	89	60	39
3	86	62	37
Average	87.66	60	39.33
Sd. Dev.	1.527	2	2.516

Table D7: splitting Test for different water amounts

sample	S12 KN	S13 KN	S14 KN
1	188	199	210

2	186	201	205
3	188	197	206
Average	187.33	199	207
Sd. Dev.	1.154	2	2.645

Table D8: compressive Test for different Gum amounts

sample	S12 KN	S13 KN	S14 KN
1	88	89	105
2	90	94	103
3	91	96	105
Average	89.66	93	104.33
Sd. Dev.	1.527	3.605	1.154

Table D9: splitting Test for different Gum amounts

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
S1	3	185.00	3.00	1.73

Table D10a: Compression strength T- Test for S1

One-Sample Test

	Test Value = 185					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
S1	.000	2	1.000	.00	-7.45	7.45

Table D10b: Compression strength T- Test for S1

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
S2	3	175.00	4.00	2.31

Table D11a: Compression strength T- Test for S2

One-Sample Test

	Test Value = 185					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
S2	-4.330	2	.049	-10.00	-19.94	-6.34E-02

Table D11b: Compression strength T- Test for S2

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
S3	3	168.00	2.00	1.15

Table D12a: Compression strength T- Test for S3

One-Sample Test

	Test Value = 185					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
S3	-14.722	2	.005	-17.00	-21.97	-12.03

Table D12b: Compression strength T- Test for S3

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
S4	3	153.00	4.36	2.52

Table D13a: Compression strength T- Test for S4

One-Sample Test

	Test Value = 185					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
S4	-12.716	2	.006	-32.00	-42.83	-21.17

Table D13b: Compression strength T- Test for S4

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
S5	3	125.00	6.24	3.61

Table D14a: Compression strength T- Test for S5

One-Sample Test

	Test Value = 185					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
S5	-16.641	2	.004	-60.00	-75.51	-44.49

Table D14a: Compression strength T- Test for S5

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
S1	3	92.33	1.53	.88

Table D15a: Splitting strength T- Test for S1

One-Sample Test

	Test Value = 92.33					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
S1	.004	2	.997	3.33E-03	-3.79	3.80

Table D15b: Splitting strength T- Test for S1

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
S2	3	83.00	2.65	1.53

Table D16a: Splitting strength T- Test for S2

One-Sample Test

	Test Value = 92.33					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
S2	-6.108	2	.026	-9.33	-15.90	-2.76

Table D16b: Splitting strength T- Test for S2

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
S3	3	51.67	3.06	1.76

Table D17a: Splitting strength T- Test for S3

One-Sample Test

	Test Value = 92.33					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
S3	-23.054	2	.002	-40.66	-48.25	-33.07

Table D17b: Splitting strength T- Test for S3

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
S4	3	50.67	.58	.33

Table D18a: Splitting strength T- Test for S4

One-Sample Test

	Test Value = 92.33					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
S4	-124.990	2	.000	-41.66	-43.10	-40.23

Table D18b: Splitting strength T- Test for S4

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
S5	3	41.67	2.52	1.45

Table D19a: Splitting strength T- Test for S5

One-Sample Test

	Test Value = 92.33					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
S5	-34.869	2	.001	-50.66	-56.91	-44.41

Table D19b: Splitting strength T- Test for S5

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
S6	3	184.33	2.08	1.20

Table D20a: Compression strength T- Test for S6

One-Sample Test

	Test Value = 185					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
S6	-.555	2	.635	-.67	-5.84	4.50

Table D20b: Compression strength T- Test for S6

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
S7	3	172.67	4.62	2.67

Table D21a: Compression strength T- Test for S7

One-Sample Test

	Test Value = 185					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
S7	-4.625	2	.044	-12.33	-23.81	-.86

Table D21b: Compression strength T- Test for S7

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
S8	3	168.00	2.00	1.15

Table D22a: Compression strength T- Test for S8

One-Sample Test

	Test Value = 185					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
S8	-14.722	2	.005	-17.00	-21.97	-12.03

Table D22b: Compression strength T- Test for S8

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
S6	3	75.33	5.51	3.18

Table D23a: Splitting strength T- Test for S6

One-Sample Test

	Test Value = 92.33					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
S6	-5.345	2	.033	-17.00	-30.68	-3.32

Table D23b: Splitting strength T- Test for S6

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
S7	3	55.33	1.53	.88

Table D24a: Splitting strength T- Test for S7

One-Sample Test

	Test Value = 92.33					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
S7	-41.950	2	.001	-37.00	-40.79	-33.20

Table D24b: Splitting strength T- Test for S7

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
S8	3	41.33	2.52	1.45

Table D25a: Splitting strength T- Test for S8

One-Sample Test

	Test Value = 92.33					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
S8	-35.098	2	.001	-51.00	-57.25	-44.75

Table D25b: Splitting strength T- Test for S8

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
S9	3	186.67	1.15	.67

Table D26a: Compression strength T- Test for S9

One-Sample Test

	Test Value = 185					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
S9	2.500	2	.130	1.67	-1.20	4.54

Table D26b: Compression strength T- Test for S9

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
S10	3	173.33	1.53	.88

Table D27a: Compression strength T- Test for S10

One-Sample Test

	Test Value = 185					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
S10	-13.229	2	.006	-11.67	-15.46	-7.87

Table D27b: Compression strength T- Test for S10

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
S11	3	137.33	4.16	2.40

Table D28a: Compression strength T- Test for S11

One-Sample Test

	Test Value = 185					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
S11	-19.831	2	.003	-47.67	-58.01	-37.32

Table D28b: Compression strength T- Test for S11

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
S9	3	87.67	1.53	.88

Table D29a: Splitting strength T- Test for S9

One-Sample Test

	Test Value = 92.33					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
S9	-5.288	2	.034	-4.66	-8.46	-.87

Table D29b: Splitting strength T- Test for S9

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
S10	3	60.00	2.00	1.15

Table D30a: Splitting strength T- Test for S10

One-Sample Test

	Test Value = 92.33					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
S10	-27.999	2	.001	-32.33	-37.30	-27.36

Table D30b: Splitting strength T- Test for S10

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
S11	3	39.33	2.52	1.45

Table D31a: Splitting strength T- Test for S11

One-Sample Test

	Test Value = 92.33					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
S11	-36.475	2	.001	-53.00	-59.25	-46.75

Table D31b: Splitting strength T- Test for S11

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
S12	3	187.33	1.15	.67

Table D32a: Compression strength T- Test for S12

One-Sample Test

	Test Value = 185					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
S12	3.500	2	.073	2.33	-.54	5.20

Table D32b: Compression strength T- Test for S12

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
S13	3	199.00	2.00	1.15

Table D33a: Compression strength T- Test for S13

One-Sample Test

	Test Value = 185					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
S13	12.124	2	.007	14.00	9.03	18.97

Table D33b: Compression strength T- Test for S13

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
S14	3	207.00	2.65	1.53

Table D34a: Compression strength T- Test for S14

One-Sample Test

	Test Value = 185					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
S14	14.402	2	.005	22.00	15.43	28.57

Table D34b: Compression strength T- Test for S14

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
S12	3	89.67	1.53	.88

Table D35a: Splitting strength T- Test for S12

One-Sample Test

	Test Value = 92.33					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
S12	-3.020	2	.094	-2.66	-6.46	1.13

Table D35b: Splitting strength T- Test for S12

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
S13	3	93.00	3.61	2.08

Table D36a: Splitting strength T- Test for S13

One-Sample Test

	Test Value = 92.33					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
S13	.322	2	.778	.67	-8.29	9.63

Table D36b: Splitting strength T- Test for S13

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
S14	3	104.33	1.15	.67

Table D37a: Splitting strength T- Test for S14

One-Sample Test

	Test Value = 92.33					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
S14	18.005	2	.003	12.00	9.13	14.87

Table D37b: Splitting strength T- Test for S14