Table 1

Experiment No.	Cement admixture									Addition ratio of expansive material (parts)	Percent length change (μ)				Compressive strength (N/mm^2)		Remarks
	Mineral composition (parts)						Chemical composition	Braine's specific surface area (cm^2/g)	A/B								
	Free lime	Hydraulic compound									0d	7d	28d	Difference from 7d until 28d	7d	28d	
		Ye'elimite	C4AF	C2S	Total	$CaSO_4$	SrO										
1-1	10	31	5	4	40	50	0.010	3000	2.1	7	0	190	-50	-240	34.2	51.4	Example
1-2	10	32	7	11	50	45	0.010	3000	2.1	7	0	190	-50	-240	34.2	51.4	Example
1-3	20	30	2	3	35	45	0.010	3000	2.1	7	0	245	0	-245	33.9	51.0	Example
1-4	40	20	5	5	30	30	0.010	3000	2.1	7	0	435	300	-135	32.8	50.2	Example
1-5	50	10	5	5	20	30	0.001	3000	2.1	7	0	455	240	-215	32.7	49.2	Example
1-6	50	10	5	5	20	30	0.010	3000	2.1	7	0	452	300	-152	32.7	49.4	Example
1-7	50	10	5	5	20	30	0.500	3000	2.1	7	0	445	330	-115	32.8	49.3	Example
1-8	50	5	0	25	30	20	0.010	3000	2.1	7	0	423	350	-73	32.8	48.7	Example
1-9	60	5	0	5	10	30	0.010	3000	2.1	7	0	522	400	-122	32.3	48.3	Example
1-10	90	1	2	2	5	5	0.010	3000	2.1	7	0	1000	780	-220	29.1	48.4	Example
1-11	95	0	1	1	2	3	0.010	3000	2.1	7	0	1200	900	-300	27.7	48.1	Example
1-12	95	0	2	2	4	1	0.010	3000	2.1	7	0	1271	1000	-271	27.2	48.2	Example
1-13	56	2	2	10	14	30	0.010	3000	2.1	7	0	452	300	-152	32.7	49.2	Example
1-14	100	0	0	0	0	0	0.000	3000	2.1	4	0	449	0	-449	32.7	42.0	Comparative Example
1-15	100	0	0	0	0	0	0.000	3000	2.1	7	0	2005	1000	-1005	21.4	39.3	Comparative Example
1-16	100	0	0	0	0	0	0.010	3000	2.1	4	0	475	100	-375	32.5	34.5	Comparative Example
1-17	100	0	0	0	0	0	0.010	3000	2.1	7	0	2800	1400	-1400	14.1	31.9	Comparative Example
1-18	10	32	7	11	50	45	0.000	3000	2.1	7	0	183	-150	-333	34.2	51.4	Comparative Example
1-19	20	30	2	3	35	45	0.000	3000	2.1	7	0	245	0	-245	33.9	51.0	Comparative Example
1-20	50	10	5	5	20	30	0.000	3000	2.1	7	0	456	140	-316	32.7	47.0	Comparative Example
1-21	70	10	5	5	20	10	0.000	3000	2.1	7	0	1250	250	-1000	27.4	40.8	Comparative Example
1-22	50	10	5	5	20	30	0.000	3000	2.1	7	0	493	170	-323	32.4	47.1	Comparative Example

Table 2

Experiment No.	Cement admixture										Addition ratio of expansive material (parts)	Evaluation								Remarks
	Mineral composition (parts)						Chemical composition		Braine's specific surface area (cm^2/g)	A/B		Flow test		Percent length change (μ)				Compressive strength (N/mm^2)		
	Free lime	Hydraulic compound																		
		Ye'elimite	C4AF	C2S	Total	$CaSO_4$	SrO	ZrO_2				0 min	60 min	0d	7d	28d	Difference from 7d until 28d	7d	28d	
1-6	50	10	5	5	20	30	0.010	0.0000	3000	2.1	7	180	160	0	452	300	-152	32.7	49.4	Example
2-1	50	10	5	5	20	30	0.001	0.0001	3000	2.1	7	185	175	0	450	310	-140	32.1	50.1	Example
2-2	50	10	5	5	20	30	0.010	0.0001	3000	2.1	7	190	185	0	453	335	-118	33.0	50.9	Example
2-3	50	10	5	5	20	30	0.010	0.0500	3000	2.1	7	200	200	0	455	340	-115	32.4	51.2	Example

Table 3

Experiment No.	Cement admixture									Addition ratio of expansive material (parts)	Percent length change (× 10^{-6})				Compressive strength (N/mm^2)		Remarks
	Mineral composition (parts)						Chemical composition	Braine's specific surface area (cm^2/g)	A/B		0d	7d	28d	Difference from 7d until 28d	7d	28d	
	Free lime	Hydraulic compound															
		Ye'elimite	C3A	C2S	Total	$CaSO_4$	SrO										
1-1	20	62	10	8	80	0	0.010	3,500	2.1	7	0	240	-10	-250	34.2	51.4	Example
1-2	17	53	12	18	83	0	0.010	3,500	2.1	7	0	243	-10	-253	34.2	51.4	Example
1-3	36	55	4	5	64	0	0.010	3,500	2.1	7	0	288	40	-248	33.9	51.0	Example
1-4	57	29	7	7	43	0	0.010	3,500	2.1	7	0	479	340	-139	32.8	50.2	Example
1-5	71	14	7	7	29	0	0.001	3,500	2.1	7	0	500	280	-220	32.7	49.2	Example
1-6	71	14	7	7	29	0	0.010	3,500	2.1	7	0	501	345	-156	32.7	49.4	Example
1-7	71	14	7	7	29	0	0.500	3,500	2.1	7	0	499	371	-128	32.8	49.3	Example
1-8	63	6	0	31	38	0	0.010	3,500	2.1	7	0	460	390	-70	32.8	48.7	Example
1-9	86	7	0	7	14	0	0.010	3,500	2.1	7	0	574	442	-132	32.3	48.3	Example
1-10	95	1	2	2	5	0	0.010	3,500	2.1	7	0	1,040	820	-220	29.1	48.4	Example
1-11	98	0	1	1	2	0	0.010	3,500	2.1	7	0	1,242	843	-399	27.7	48.1	Example
1-12	90	0	5	5	10	0	0.010	3,500	2.1	7	0	1,400	1,045	-355	27.2	48.2	Example
1-13	80	3	3	14	20	0	0.010	3,500	2.1	7	0	501	341	-160	32.7	49.2	Example
1-14	100	0	0	0	0	0	0.000	3,500	2.1	4	0	500	40	-460	32.7	42.0	Comparative Example
1-15	100	0	0	0	0	0	0.000	3,500	2.1	7	0	2,050	1,042	-1,008	21.4	39.3	Comparative Example
1-16	100	0	0	0	0	0	0.010	3,500	2.1	4	0	510	141	-369	32.5	34.5	Comparative Example
1-17	100	0	0	0	0	0	0.010	3,500	2.1	7	0	2,850	1,442	-1,408	14.1	31.9	Comparative Example
1-18	10	32	7	11	50	45	0.000	3,500	2.1	7	0	220	-111	-333	34.2	51.4	Comparative Example
1-19	20	30	2	3	35	45	0.000	3,500	2.1	7	0	300	41	-259	33.9	51.0	Comparative Example
1-20	50	10	5	5	20	30	0.000	3,500	2.1	7	0	496	181	-315	32.7	47.0	Comparative Example
1-21	70	10	5	5	20	10	0.000	3,500	2.1	7	0	1,300	291	-1,009	27.4	40.8	Comparative Example
1-22	50	10	5	5	20	30	0.000	3,500	2.1	7	0	530	210	-320	32.4	47.1	Comparative Example

Table 4

Experiment No.	Cement admixture									Addition ratio of expansive material (parts)	Evaluation							Remarks
	Mineral composition (parts)					Chemical composition		Braine's specific surface area (cm^2/g)	A/B		Flow test (mm)		Percent length change ($\times 10^{-6}$)			Compressive strength (N/mm^2)		
	Free lime	Hydraulic compound									0 min	60 min	7d	28d	Difference from 7d until 28d	7d	28d	
		Ye'elimite	C3A	C2S	Total	SrO	ZrO_2											
1-12	90	0	5	5	10	0.010	0.0000	3,500	2.1	7	180	160	1400	1045	-355	27.2	48.2	Example
2-1	90	0	5	5	10	0.001	0.0001	3,500	2.1	7	185	175	1402	1066	-336	27.4	49.2	Example
2-2	90	0	5	5	10	0.010	0.0001	3,500	2.1	7	190	185	1398	1090	-308	27.1	48.7	Example
2-3	90	0	5	5	10	0.010	0.0500	3,500	2.1	7	200	200	1401	1101	-300	26.9	49.2	Example