

CERTIFICADO DE CONTROLE DA QUALIDADE DO CIMENTO



TIPO/CLASSE: CII-Z 40
FÁBRICA: FBE – FÁBRICA DE ANANINDEUA – PA
MÊS/ANO: AGOSTO/2026



ENSAIOS QUÍMICOS				ENSAIOS FÍSICOS E MECÂNICOS									
ENSAIOS	PERDA AO	RESIDUO	TRIÓXIDO DE	RESISTÊNCIA À COMPRESSÃO			FINURA			EXPANSIB.	TEMPO DE PEGA		CONSIST. NORMAL
	FOGO (PF)	INSOLÚVEL (RI)	ENXOFRE (SO3)	3 DIAS	7 DIAS	28 DIAS	BLAINE	#325	#200	A QUENTE	INÍCIO	FIM	
UNIDADE	(%)	(%)	(%)	(MPa)	(MPa)	(MPa)	(cm²/g)	(%)	(%)	(mm)	(min)	(min)	(%)
LIMITE NORMATIVO (ABNT NBR 16697:2018)	≤ 8,5	≤ 18,5	≤ 4,5	≥ 15,0	≥ 25,0	≥ 40,0	–	–	≤ 10,0	≤ 5	≥ 60	≤ 600	–
01/08/2026	2.33	16.40	3.95	27.4	33.6	43.3	5112	2.0	0.1	0.1	120	190	30.1
03/08/2026	2.31	10.22	3.24	26.9	33.0	42.8	5192	2.3	0.1	0.1	110	180	30.0
04/08/2026	2.09	10.22	3.10	27.5	33.6	43.3	5127	2.1	0.1	0.1	110	180	30.0
05/08/2026	2.39	10.60	3.72	27.1	33.2	42.9	5143	2.1	0.1	0.1	120	190	30.2
06/08/2026	2.59	10.63	3.70	26.9	32.8	42.6	5111	2.3	0.1	0.1	120	190	30.3
07/08/2026	2.29	10.09	3.10	27.3	32.9	42.4	5214	2.4	0.1	0.1	110	180	30.2
08/08/2026	2.10	10.22	3.56	26.8	32.7	41.9	5243	2.4	0.1	0.1	120	190	30.1
09/08/2026	2.11	10.07	3.56	27.1	33.0	43.0	5215	2.2	0.1	0.1	110	180	30.1
10/08/2026	2.30	10.11	3.95	26.9	32.8	41.7	4971	2.4	0.1	0.1	110	180	30.2
11/08/2026	2.69	10.56	3.95	27.6	33.7	43.2	5021	1.8	0.1	0.1	120	190	30.2
12/08/2026	3.03	10.36	3.44	27.7	33.8	43.6	5016	2.0	0.1	0.1	120	190	30.4
13/08/2026	2.18	10.22	3.67	28.0	34.1	44.1	4903	1.7	0.1	0.1	120	190	30.4
14/08/2026	2.36	10.11	3.40	28.1	34.1	44.0	4890	1.8	0.1	0.1	120	190	30.2
15/08/2026	2.01	10.38	3.64	27.7	33.8	43.3	4739	2.0	0.1	0.1	120	190	30.2
17/08/2026	2.93	11.32	4.57	26.8	32.8	42.7	5127	2.6	0.1	0.1	125	190	30.2
18/08/2026	3.07	9.48	3.79	27.8	33.8	43.6	5187	2.0	0.1	0.1	125	190	30.1
19/08/2026	2.37	8.37	3.64	27.9	33.9	43.7	5278	2.0	0.1	0.1	125	190	30.4
20/08/2026	2.92	12.21	3.98	27.8	33.9	43.2	5214	2.1	0.1	0.1	125	190	30.4
21/08/2026	2.77	8.51	3.72	28.2	33.7	43.9	5242	2.0	0.1	0.1	125	190	30.1
22/08/2026	3.03	9.48	3.72	27.8	33.5	43.7	5278	2.0	0.1	0.1	125	190	30.4
24/08/2026	2.93	8.27	3.27	26.9	33.2	43.0	5149	2.2	0.1	0.1	110	180	30.0
25/08/2026	3.20	8.07	3.27	25.9	31.2	41.5	5208	2.5	0.1	0.1	110	180	30.0
26/08/2026	3.07	9.48	3.72	27.5	33.8	43.7	5016	2.0	0.1	0.1	110	180	30.0
27/08/2026	3.20	8.51	3.79	27.2	33.5	43.4	5214	2.1	0.1	0.1	110	180	30.0
28/08/2026	2.59	10.22	3.24	28.1	33.7	43.7	5105	2.0	0.1	0.1	110	180	30.0
29/08/2026	2.59	10.63	3.10	27.3	33.2	43.1	5225	2.2	0.1	0.1	110	180	30.0
MÉDIA	2.59	10.18	3.61	27.4	33.4	43.1	5121	2.1	0.1	0.1	117	186	30.2
DESVIO PADRÃO	0.38	1.59	0.34	0.5	0.6	0.7	133	0.2	0.0	0.0	6	5	0.2
MÁXIMO	3.20	16.40	4.57	28.2	34.1	44.1	5278	2.6	0.1	0.1	125	190	30.4
MÍNIMO	2.01	8.07	3.10	25.9	31.2	41.5	4739	1.7	0.1	0.1	110	180	30.0


Responsável Técnico
ERIC YUEH NIM
CRQ: 14300278 - Região XV

CERTIFICADO DE CONTROLE DA QUALIDADE DO CIMENTO



TIPO/CLASSE: CII-Z 40
FÁBRICA: FBE – FÁBRICA DE ANANINDEUA – PA
MÊS/ANO: SETEMBRO/2026



ENSAIOS QUÍMICOS				ENSAIOS FÍSICOS E MECÂNICOS									
ENSAIOS	PERDA AO	RESIDUO	TRIÓXIDO DE	RESISTÊNCIA À COMPRESSÃO			FINURA			EXPANSIB.	TEMPO DE PEGA		CONSIST. NORMAL
	FOGO (PF)	INSOLÚVEL (RI)	ENXOFRE (SO3)	3 DIAS	7 DIAS	28 DIAS	BLAINE	#325	#200	A QUENTE	INÍCIO	FIM	
UNIDADE	(%)	(%)	(%)	(MPa)	(MPa)	(MPa)	(cm²/g)	(%)	(%)	(mm)	(min)	(min)	(%)
LIMITE NORMATIVO (ABNT NBR 16697:2018)	≤ 8,5	≤ 18,5	≤ 4,5	≥ 15,0	≥ 25,0	≥ 40,0	–	–	≤ 10,0	≤ 5	≥ 60	≤ 600	–
01/09/2026	2.59	10.09	3.40	26.8	32.8	42.7	5213	2.4	0.1	0.1	110	180	30.0
02/09/2026	2.11	10.09	3.40	28.0	34.1	43.9	5204	2.2	0.1	0.1	110	180	30.0
03/09/2026	2.11	10.63	3.10	27.5	33.7	43.6	5042	2.5	0.1	0.1	110	180	30.0
04/09/2026	2.09	10.63	3.40	27.3	33.3	43.3	5214	2.1	0.1	0.1	110	180	30.0
05/09/2026	2.09	10.39	3.10	26.9	32.9	42.9	5149	2.3	0.1	0.1	110	180	30.0
07/09/2026	2.39	9.83	4.10	26.6	32.8	42.6	5387	2.4	0.1	0.1	115	180	30.2
08/09/2026	2.28	10.26	3.75	26.8	32.9	42.8	5412	2.3	0.1	0.1	115	180	30.2
09/09/2026	2.31	10.63	3.56	27.1	33.1	43.1	5278	2.2	0.1	0.1	115	180	30.2
10/09/2026	2.11	10.63	3.70	27.0	32.9	42.8	5387	2.3	0.1	0.1	115	180	30.2
11/09/2026	3.11	11.09	3.40	26.2	32.6	41.7	5313	2.5	0.1	0.1	115	180	30.2
12/09/2026	2.79	10.73	3.64	26.7	32.9	42.7	5305	2.5	0.1	0.1	115	180	30.2
14/09/2026	2.11	10.09	3.24	26.3	32.6	41.5	5238	2.5	0.1	0.1	120	190	30.4
15/09/2026	2.10	10.25	3.25	27.3	33.3	43.1	5278	2.2	0.1	0.1	120	190	30.4
16/09/2026	2.26	10.63	3.70	26.4	32.7	41.9	5444	2.7	0.1	0.1	120	190	30.4
17/09/2026	2.31	10.32	3.55	26.3	32.6	41.5	5313	2.5	0.1	0.1	120	190	30.4
18/09/2026	2.12	10.15	3.60	27.7	33.7	43.2	5305	2.5	0.1	0.1	120	190	30.4
19/09/2026	2.88	9.88	3.10	27.3	33.5	42.9	5278	2.2	0.1	0.1	120	190	30.4
21/09/2026	2.66	10.22	3.24	27.9	33.8	43.6	5423	2.3	0.1	0.1	110	180	30.0
22/09/2026	3.11	11.05	3.11	26.3	32.6	40.9	5313	2.5	0.1	0.1	110	180	30.0
23/09/2026	2.59	10.58	3.46	27.2	33.5	43.2	5395	2.1	0.1	0.1	110	180	30.0
24/09/2026	2.35	10.58	3.52	27.5	33.7	43.3	5363	2.1	0.1	0.1	110	180	30.0
25/09/2026	2.71	10.54	3.44	27.4	33.7	43.7	5386	2.1	0.1	0.1	110	180	30.0
26/09/2026	2.39	10.32	3.48	27.9	34.0	44.3	5174	2.0	0.1	0.1	110	180	30.0
28/09/2026	2.11	10.63	3.24	27.1	33.4		5313	2.2	0.1	0.1	110	180	30.0
29/09/2026	2.59	10.09	3.40	26.8	32.9		5238	2.3	0.1	0.1	110	180	30.0
30/09/2026	2.11	10.22	3.10	27.3	33.7		5313	2.1	0.1	0.1	110	180	30.0
MÉDIA	2.40	10.41	3.42	27.1	33.2	42.8	5295	2.3	0.1	0.1	113	182	30.1
DESVIO PADRÃO	0.32	0.32	0.24	0.5	0.5	0.8	94	0.2	0.0	0.0	4	4	0.2
MÁXIMO	3.11	11.09	4.10	28.0	34.1	44.3	5444	2.7	0.1	0.1	120	190	30.4
MÍNIMO	2.09	9.83	3.10	26.2	32.6	40.9	5042	2.0	0.1	0.1	110	180	30.0


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CERTIFICADO DE CONTROLE DA QUALIDADE DO CIMENTO



TIPO/CLASSE: CII-Z 40
FÁBRICA: FBE – FÁBRICA DE ANANINDEUA – PA
MÊS/ANO: OUTUBRO/2026



ENSAIOS QUÍMICOS				ENSAIOS FÍSICOS E MECÂNICOS									
ENSAIOS	PERDA AO	RESIDUO	TRIÓXIDO DE	RESISTÊNCIA À COMPRESSÃO			FINURA			EXPANSIB.	TEMPO DE PEGA		CONSIST. NORMAL
	FOGO (PF)	INSOLÚVEL (RI)	ENXOFRE (SO3)	3 DIAS	7 DIAS	28 DIAS	BLAINE	#325	#200	A QUENTE	INÍCIO	FIM	
UNIDADE	(%)	(%)	(%)	(MPa)	(MPa)	(MPa)	(cm²/g)	(%)	(%)	(mm)	(min)	(min)	(%)
LIMITE NORMATIVO (ABNT NBR 16697:2018)	≤ 8,5	≤ 18,5	≤ 4,5	≥ 15,0	≥ 25,0	≥ 40,0	–	–	≤ 10,0	≤ 5	≥ 60	≤ 600	–
01/10/2026	2.59	10.63	3.56	27.8	33.8		5238	2.1	0.1	0.1	115	180	30.0
02/10/2026	2.59	10.63	3.56	27.3	33.6		5337	1.8	0.1	0.1	115	180	30.0
03/10/2026	2.31	10.22	3.70	28.0	33.9		5354	1.9	0.1	0.1	115	180	30.0
05/10/2026	2.59	10.22	3.40	27.9	34.0		5338	2.2	0.1	0.1	120	190	30.2
06/10/2026	2.59	10.22	3.10	27.1	33.4		5313	2.0	0.1	0.1	120	190	30.2
07/10/2026	2.59	10.63	3.10	27.7	33.7		5134	2.1	0.1	0.1	120	190	30.2
08/10/2026	2.26	10.22	3.56	28.1	33.9		5182	1.9	0.1	0.1	120	190	30.2
09/10/2026	2.59	10.63	3.10	27.0	32.7		5215	1.9	0.1	0.1	120	190	30.2
10/10/2026	2.09	10.22	3.56	27.2	33.1		5188	2.2	0.1	0.1	120	190	30.2
12/10/2026	2.11	10.63	3.40	27.9	34.1		5085	2.0	0.1	0.1	120	190	30.2
13/10/2026	2.09	10.09	3.24	27.5	33.7		5113	2.1	0.1	0.1	120	190	30.2
14/10/2026	2.09	10.09	3.24	26.8	32.8		5137	2.3	0.1	0.1	120	190	30.2
15/10/2026	2.59	10.63	3.10	28.2	35.4		5085	1.8	0.1	0.1	120	190	30.2
16/10/2026	2.11	10.22	3.40	27.3	34.0		5215	2.2	0.1	0.1	120	190	30.2
17/10/2026	2.09	10.09	3.24	27.2			5145	1.9	0.1	0.1	120	190	30.2
MÉDIA	2.35	10.36	3.35	27.5	33.7		5205	2.0	0.1	0.1	119	188	30.2
DESVIO PADRÃO	0.24	0.24	0.21	0.4	0.7		93	0.2	0.0	0.0	2	4	0.1
MÁXIMO	2.59	10.63	3.70	28.2	35.4		5354	2.3	0.1	0.1	120	190	30.2
MÍNIMO	2.09	10.09	3.10	26.8	32.7		5085	1.8	0.1	0.1	115	180	30.0


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