

# CERTIFICADO DE CONTROLE DA QUALIDADE DO CIMENTO



TIPO/CLASSE: CII-Z 40



FÁBRICA: FBE – FÁBRICA DE ANANINDEUA – PA

MÊS/ANO: ABRIL/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	–
01/04/2026	2.11	10.22	3.70	26.9	33.3	42.8	5159	2.1	0.1	0.5	125	190	30.4
02/04/2026	2.59	10.40	3.58	27.8	34.2	43.5	5200	2.0	0.1	0.5	120	185	30.4
03/04/2026	2.45	10.44	3.14	27.3	33.7	43.2	5299	1.5	0.1	0.5	120	170	30.0
04/04/2026	2.56	10.07	3.11	31.0	36.9	44.3	5221	2.1	0.1	0.5	120	185	30.4
06/04/2026	2.85	10.11	3.48	27.2	34.1	43.2	5171	2.0	0.1	0.5	110	170	30.4
07/04/2026	2.59	10.10	3.67	28.7	35.3	43.5	5159	1.8	0.1	0.5	110	170	30.2
08/04/2026	2.18	10.20	3.56	27.8	33.9	43.3	5171	1.9	0.1	0.5	110	180	30.2
09/04/2026	2.10	10.34	2.31	28.0	35.1	44.1	5113	1.8	0.1	0.5	115	180	30.2
10/04/2026	2.59	10.11	3.40	27.6	33.7	43.1	5152	2.1	0.1	0.5	110	180	30.2
11/04/2026	2.18	10.10	3.40	28.5	34.4	44.1	5203	2.0	0.1	0.5	120	180	30.2
13/04/2026	2.59	10.11	3.14	27.8	34.4	43.4	5012	1.7	0.1	0.5	100	170	30.2
14/04/2026	2.17	10.22	3.40	27.9	34.9	43.8	5171	1.9	0.1	0.5	115	185	30.0
15/04/2026	2.11	10.23	3.58	27.7	34.0	43.8	5200	2.0	0.1	0.5	110	180	30.0
16/04/2026	2.59	10.40	3.56	26.9	33.6	42.9	5614	2.3	0.1	0.5	110	180	30.0
17/04/2026	2.80	10.30	3.10	27.5	33.8	43.1	5471	2.3	0.1	0.5	115	190	30.0
18/04/2026	2.45	10.22	3.40	27.9	34.1	44.0	5548	1.9	0.1	0.5	110	180	30.0
20/04/2026	2.05	11.40	2.59	26.9	33.1	42.8	5404	2.3	0.1	0.5	115	190	30.2
21/04/2026	2.17	10.33	2.78	28.2	34.3	43.9	5877	1.9	0.1	0.5	115	190	30.0
22/04/2026	2.05	11.00	2.55	27.9	34.6	44.5	5320	1.6	0.1	0.5	115	190	30.2
23/04/2026	2.10	13.37	3.08	23.3	34.2	43.9	5796	4.5	0.2	0.5	133	200	29.7
24/04/2026	2.59	15.60	3.40	27.8	34.2	43.7	5362	1.7	0.1	0.5	115	190	30.2
25/04/2026	2.17	10.22	3.24	29.2	34.2	44.2	5355	1.4	0.1	0.5	115	190	30.1
26/04/2026	2.01	10.35	3.45	28.2	34.3	43.6	5310	1.9	0.1	0.5	115	190	30.0
27/04/2026	2.01	10.30	3.08	28.3	34.0	44.0	5320	1.8	0.1	0.5	115	190	30.2
28/04/2026	2.05	10.22	3.48	27.7	33.9	43.2	5320	1.8	0.1	0.5	115	190	30.2
29/04/2026	2.17	10.23	3.33	28.0	34.2	43.5	5558	3.0	0.1	0.5	115	190	30.1
30/04/2026	2.01	10.30	3.08	27.7	34.1	43.9	5507	2.0	0.1	0.5	115	190	30.1
MÉDIA	2.31	10.63	3.24	27.8	34.2	43.6	5333	2.1	0.1	0.5	115	184	30.1
DESVIO PADRÃO	0.27	1.19	0.35	1.2	0.7	0.5	209	0.6	0.0	0.0	6	8	0.2
MÁXIMO	2.85	15.60	3.70	31.0	36.9	44.5	5877	4.5	0.2	0.5	133	200	30.4
MÍNIMO	2.01	10.07	2.31	23.3	33.1	42.8	5012	1.4	0.1	0.5	100	170	29.7

*Eric Yueh Nim*

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: MAIO/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	–
04/05/2026	2.31	10.22	3.24	28.1	34.2	43.6	5320	1.8	0.1	0.5	110	180	30.0
05/05/2026	2.59	10.63	3.70	27.7	33.6	42.6	5310	2.3	0.1	0.5	110	180	30.0
06/05/2026	2.11	10.07	3.56	27.3	33.4	42.3	5664	2.6	0.1	0.5	110	180	30.0
07/05/2026	2.39	10.60	3.72	27.4	33.4	42.1	5508	2.6	0.1	0.5	110	180	30.0
08/05/2026	2.69	10.56	3.95	27.3	33.2	41.9	5668	2.7	0.1	0.5	110	180	30.0
09/05/2026	2.18	10.22	3.67	27.5	33.8	43.0	5698	2.7	0.1	0.5	110	180	30.0
11/05/2026	2.01	10.38	3.64	27.2	33.0	41.8	5766	2.6	0.1	0.5	120	185	29.8
12/05/2026	2.66	10.22	3.06	27.9	33.7	42.9	5435	2.4	0.1	0.5	120	185	29.8
13/05/2026	2.05	10.25	3.68	27.2	33.2	40.4	5435	2.5	0.1	0.5	120	185	29.8
14/05/2026	2.29	10.10	3.56	27.3	33.2	41.9	5425	2.4	0.1	0.5	120	185	29.8
15/05/2026	2.45	10.22	3.40	28.0	34.0	43.1	5487	2.1	0.1	0.5	120	185	29.8
16/05/2026	2.39	10.38	3.67	27.5	33.4	42.0	5446	2.1	0.1	0.5	120	185	29.8
18/05/2026	2.34	10.34	3.67	27.5	33.7	42.0	5435	2.3	0.1	0.5	120	185	29.8
19/05/2026	2.10	10.22	3.67	27.5	33.6	42.1	5477	2.3	0.1	0.5	120	185	29.8
20/05/2026	2.30	10.17	3.98	27.7	33.5	43.2	5436	2.4	0.1	0.5	120	185	29.8
21/05/2026	2.59	10.69	3.95	28.1	34.1	43.5	5446	1.7	0.1	0.5	120	185	29.8
22/05/2026	2.59	10.22	3.67	27.6	33.5	42.2	5412	2.2	0.1	0.5	120	185	29.8
23/05/2026	2.59	10.11	3.40	27.5	33.6	43.3	5376	2.1	0.1	0.5	120	185	29.8
25/05/2026	2.30	10.36	3.40	27.1	33.4	43.0	5320	2.3	0.1	0.5	110	180	30.0
26/05/2026	2.10	10.22	3.56	27.5	33.6	43.1	5200	2.0	0.1	0.5	120	170	30.2
27/05/2026	2.30	10.11	3.95	28.0	33.9	43.7	5127	1.9	0.1	0.5	120	170	30.2
28/05/2026	2.29	10.09	3.10	27.7	33.9	43.5	5200	2.0	0.1	0.5	120	170	30.2
29/05/2026	2.09	10.22	3.10	28.9	34.3	44.1	5277	2.5	0.1	0.5	120	170	30.2
30/05/2026	2.33	16.40	3.95	26.9	32.9	42.8	5299	2.4	0.1	0.5	120	170	30.2
<b>MÉDIA</b>	2.34	10.54	3.59	27.6	33.6	42.7	5424	2.3	0.1	0.5	117	180	29.9
<b>DESVIO PADRÃO</b>	0.20	1.26	0.27	0.4	0.4	0.8	160	0.3	0.0	0.0	5	6	0.2
<b>MÁXIMO</b>	2.69	16.40	3.98	28.9	34.3	44.1	5766	2.7	0.1	0.5	120	185	30.2
<b>MÍNIMO</b>	2.01	10.07	3.06	26.9	32.9	40.4	5127	1.7	0.1	0.5	110	170	29.8

**Responsável Técnico**  
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TIPO/CLASSE: CII-Z 40



FÁBRICA: FBE – FÁBRICA DE ANANINDEUA – PA

MÊS/ANO: JUNHO/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	–
01/06/2026	2.10	10.60	3.14	27.3	33.2	43.1	5320	2.1	0.1	0.1	120	170	30.2
02/06/2026	2.11	10.22	3.10	26.9	33.0		5404	2.3	0.1	0.1	120	170	30.2
03/06/2026	2.59	10.11	3.10	27.5	33.3		5362	2.0	0.1	0.1	120	170	30.2
04/06/2026	2.31	10.40	3.22	28.2	33.8		5373	2.1	0.1	0.1	120	170	30.2
05/06/2026	2.09	10.20	3.70	27.6	33.4		5383	2.1	0.1	0.1	120	170	30.2
06/06/2026	2.10	10.11	3.40	27.5	33.3		5383	2.0	0.1	0.1	120	170	30.2
07/06/2026	2.18	10.67	3.49	27.4	33.5		5404	2.3	0.1	0.1	120	190	30.2
08/06/2026	2.01	14.90	3.72	28.2	34.1		5362	2.0	0.1	0.1	120	190	30.2
09/06/2026	2.10	9.50	3.14	26.4	32.8		5373	2.5	0.1	0.1	120	190	30.2
10/06/2026	2.69	10.44	3.68	27.2	33.1		5263	2.3	0.1	0.1	120	190	30.2
11/06/2026	2.30	10.22	3.14	26.6	32.7		5368	2.2	0.1	0.1	120	190	30.2
12/06/2026	2.59	10.11	3.10	27.0	33.0		5341	2.1	0.1	0.1	120	190	30.2
13/06/2026	2.29	10.34	3.06	27.3	33.3		5383	2.0	0.1	0.1	120	190	30.2
14/06/2026	2.30	10.67	3.14	27.4	33.1		5419	2.2	0.1	0.1	120	190	30.2
15/06/2026	2.11	10.10	3.40	27.3	33.2		5383	2.2	0.1	0.1	120	190	30.2
16/06/2026	2.39	10.56	3.72	27.5	33.2		5404	2.1	0.1	0.1	120	190	30.2
17/06/2026	2.18	10.45	3.77	27.9	33.7		5425	2.0	0.1	0.1	120	190	30.2
18/06/2026	2.39	10.69	3.24	27.9	33.7		5298	2.3	0.1	0.1	120	190	30.2
19/06/2026	2.05	10.22	3.95	26.3	32.9		5203	2.0	0.1	0.1	120	190	30.2
20/06/2026	2.17	10.38	3.95	27.2	33.3		5192	2.0	0.1	0.1	120	190	30.2
22/06/2026	2.30	10.56	3.70	27.4	33.1		5278	2.2	0.1	0.1	120	190	30.2
23/06/2026	2.30	10.22	3.95	27.5	33.5		5235	2.0	0.1	0.1	120	190	30.2
24/06/2026	2.29	10.11	3.40	27.4			5320	2.1	0.1	0.1	120	190	30.2
25/06/2026	2.39	10.63	3.10				5238	2.1	0.1	0.1	120	190	30.2
26/06/2026	2.11	10.10	3.67				5235	2.2	0.1	0.1	120	190	30.2
27/06/2026	2.33	10.23	3.40				5198	2.3	0.1	0.1	120	190	30.2
MÉDIA	2.26	10.49	3.44	27.3	33.3	43.1	5329	2.1	0.1	0.1	120	185	30.2
DESVIO PADRÃO	0.18	0.94	0.31	0.5	0.3		75	0.1	0.0	0.0	0	9	0.0
MÁXIMO	2.69	14.90	3.95	28.2	34.1	43.1	5425	2.5	0.1	0.1	120	190	30.2
MÍNIMO	2.01	9.50	3.06	26.3	32.7	43.1	5192	2.0	0.1	0.1	120	170	30.2

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