

L&L KILN MFG INC

BRICK STUDY FOR 2-1/2" VS 3" BRICK FOR JUPITER KILNS

This is an analysis of the different heating characteristics of 2-1/2" brick vs 3" brick

The following table is for Jupiter kilns with 2-1/2" thick brick:

MODEL NUMBER 2-1/2" Brick	INTERIOR DIMENSIONS		CUBIC FEET	K.W	Total Internal Sq Feet	Total Internal Sq Inches	Watts per internal Sq Inch	Total BTU loss/Hr at 1800F	Total BTU loss/Hr at 2000F	Total BTU loss/Hr at 2300F	Total BTU storage/Hr at 1800F	Total BTU storage/Hr at 2000F	Total BTU storage/Hr at 2300F
	DIAM	HIGH											
J18	17 1/2	18	2.6	5.5	10.8	1551.5	3.5	6,723	7,876	9,772	15,698	17,842	21,096
J18X	17 1/2	27	4.0	8.3	14.4	2073.5	4.0	8,985	10,526	13,060	20,980	23,845	28,194
J23	23 3/8	18	4.6	7.0	15.7	2265.2	3.1	9,816	11,499	14,267	22,919	26,049	30,800
J230	23 3/8	27	7.0	10.6	20.5	2951.9	3.6	12,791	14,985	18,593	29,867	33,946	40,137
J236	23 3/8	36	9.3	14.0	25.3	3638.6	3.8	15,767	18,471	22,918	36,815	41,843	49,474
J245	23 3/8	45	11.6	17.6	30.0	4325.3	4.1	18,743	21,957	27,243	43,763	49,740	58,811
J2918	29	18	7.0	9.1	21.0	3022.5	3.0	13,098	15,343	19,038	30,582	34,759	41,098
J2927	29	27	10.5	13.7	26.8	3859.5	3.5	16,725	19,592	24,309	39,051	44,384	52,478
J2936	29	36	14.0	18.2	32.6	4696.5	3.9	20,352	23,841	29,581	47,519	54,010	63,859
J2945	29	45	17.6	22.8	38.4	5533.5	4.1	23,979	28,090	34,853	55,988	63,635	75,240

COLD FACE TEMP AT 1800 DEGF:	299	Deg F with 2-1/2" BRICK
COLD FACE TEMP AT 2000 DEGF:	324	Deg F with 2-1/2" BRICK
COLD FACE TEMP AT 2300 DEGF:	362	Deg F with 2-1/2" BRICK
BTU'S HEAT LOSS PER SQ FT PER HOUR AT 1800 DEGF:	624	WITH 2-1/2" BRICK
BTU'S HEAT LOSS PER SQ FT PER HOUR AT 2000 DEGF:	731	WITH 2-1/2" BRICK
BTU'S HEAT LOSS PER SQ FT PER HOUR AT 2300 DEGF:	907	WITH 2-1/2" BRICK
BTU'S HEAT STORAGE PER SQ FT PER HOUR AT 1800 DEGF:	1457	WITH 2-1/2" BRICK
BTU'S HEAT STORAGE PER SQ FT PER HOUR AT 2000 DEGF:	1656	WITH 2-1/2" BRICK
BTU'S HEAT STORAGE PER SQ FT PER HOUR AT 2300 DEGF:	1958	WITH 2-1/2" BRICK

The following table is for Jupiter kilns with 3" thick brick:

MODEL NUMBER 3" Brick	INTERIOR DIMENSIONS		CUBIC FEET	K.W	Total Internal Sq Feet	Total Internal Sq Inches	Watts per internal Sq Inch	Total BTU loss/Hr at 1800F	Total BTU loss/Hr at 2000F	Total BTU loss/Hr at 2300F	Total BTU storage/Hr at 1800F	Total BTU storage/Hr at 2000F	Total BTU storage/Hr at 2300F
	DIAM	HIGH											
J18-3	16 1/2	18	2.5	5.5	10.5	1515.3	3.6	5,535	6,472	8,029	18,152	20,604	24,382
J18X-3	16 1/2	27	3.7	8.3	14.1	2033.7	4.1	7,429	8,686	10,776	24,362	27,653	32,723
J23-3	22 3/8	18	4.4	7.0	15.4	2212.6	3.2	8,082	9,450	11,724	26,505	30,085	35,601
J230-3	22 3/8	27	6.7	10.6	20.1	2892.1	3.7	10,564	12,352	15,324	34,645	39,325	46,535
J236-3	22 3/8	36	8.9	14.0	24.8	3571.6	3.9	13,046	15,254	18,925	42,785	48,564	57,468
J245-3	22 3/8	45	11.1	17.6	29.5	4251.1	4.1	15,528	18,156	22,525	50,925	57,803	68,401
J2918-3	28	18	6.8	9.1	20.5	2954.4	3.1	10,792	12,618	15,654	35,391	40,172	47,537
J2927-3	28	27	10.2	13.7	26.3	3780.6	3.6	13,810	16,146	20,032	45,288	51,406	60,831
J2936-3	28	36	13.6	18.2	32.0	4606.8	4.0	16,828	19,675	24,410	55,186	62,640	74,125
J2945-3	28	45	17.0	22.8	37.7	5433.0	4.2	19,846	23,203	28,787	65,083	73,874	87,418

COLD FACE TEMP AT 1800 DEGF:	274	Deg F with 3" BRICK
COLD FACE TEMP AT 2000 DEGF:	297	Deg F with 3" BRICK
COLD FACE TEMP AT 2300 DEGF:	331	Deg F with 3" BRICK
BTU'S HEAT LOSS PER SQ FT PER HOUR AT 1800 DEGF:	526	WITH 3" BRICK
BTU'S HEAT LOSS PER SQ FT PER HOUR AT 2000 DEGF:	615	WITH 3" BRICK
BTU'S HEAT LOSS PER SQ FT PER HOUR AT 2300 DEGF:	763	WITH 3" BRICK
BTU'S HEAT STORAGE PER SQ FT PER HOUR AT 1800 DEGF:	1725	WITH 3" BRICK
BTU'S HEAT STORAGE PER SQ FT PER HOUR AT 2000 DEGF:	1958	WITH 3" BRICK
BTU'S HEAT STORAGE PER SQ FT PER HOUR AT 2300 DEGF:	2317	WITH 3" BRICK

L&L KILN MFG INC

BRICK STUDY FOR 2-1/2" VS 3" BRICK FOR JUPITER KILNS

Because it is very difficult to calculate the heat loss as the kiln is heating up we are making the assumption that the total heat loss is equal to 3 hours at equilibrium.

AT 1800 DEG F

MODEL NUMBER	Heat Loss for 3 hours	Heat Loss for 3 hours	Heat Loss for 3 hours	Heat Storage	Heat Storage	Heat Storage	Net Extra BTUS used	Net Extra KW used
	at 1800F	at 1800F	at 1800F	at 1800F	at 1800F	at 1800F	at 1800F	at 1800F
	2-1/2" brick	3" brick	Difference	2-1/2" brick	3" brick	Difference	with 2-1/2" brick	with 2-1/2" brick
J18	20,170	16,605	3,564	15,698	18,152	2,454	1,110	0.32
J18X	26,956	22,286	4,670	20,980	24,362	3,382	1,287	0.38
J23	29,447	24,246	5,201	22,919	26,505	3,586	1,614	0.47
J230	38,374	31,693	6,681	29,867	34,645	4,778	1,903	0.56
J236	47,301	39,139	8,162	36,815	42,785	5,970	2,193	0.64
J245	56,228	46,585	9,643	43,763	50,925	7,162	2,482	0.73
J2918	39,293	32,375	6,917	30,582	35,391	4,809	2,108	0.62
J2927	50,174	41,429	8,744	39,051	45,288	6,238	2,507	0.73
J2936	61,055	50,483	10,572	47,519	55,186	7,666	2,905	0.85
J2945	71,936	59,537	12,399	55,988	65,083	9,095	3,304	0.97

AT 2000 DEG F

MODEL NUMBER	Heat Loss for 3 hours	Heat Loss for 3 hours	Heat Loss for 3 hours	Heat Storage	Heat Storage	Heat Storage	Net Extra BTUS used	Net Extra KW used
	at 2000F	at 2000F	at 2000F	at 2000F	at 2000F	at 2000F	at 2000F	at 2000F
	2-1/2" brick	3" brick	Difference	2-1/2" brick	3" brick	Difference	with 2-1/2" brick	with 2-1/2" brick
J18	23,628	19,415	4,213	17,842	20,604	2,762	1,452	0.43
J18X	31,578	26,057	5,521	23,845	27,653	3,807	1,713	0.50
J23	34,496	28,349	6,147	26,049	30,085	4,036	2,111	0.62
J230	44,954	37,055	7,899	33,946	39,325	5,378	2,521	0.74
J236	55,412	45,761	9,651	41,843	48,564	6,721	2,930	0.86
J245	65,870	54,467	11,403	49,740	57,803	8,063	3,340	0.98
J2918	46,030	37,853	8,177	34,759	40,172	5,413	2,764	0.81
J2927	58,777	48,439	10,338	44,384	51,406	7,021	3,317	0.97
J2936	71,524	59,025	12,499	54,010	62,640	8,630	3,869	1.13
J2945	84,271	69,610	14,660	63,635	73,874	10,238	4,422	1.30

AT 2300 DEG F

MODEL NUMBER	Heat Loss for 3 hours	Heat Loss for 3 hours	Heat Loss for 3 hours	Heat Storage	Heat Storage	Heat Storage	Net Extra BTUS used	Net Extra KW used
	at 2300F	at 2300F	at 2300F	at 2300F	at 2300F	at 2300F	at 2300F	at 2300F
	2-1/2" brick	3" brick	Difference	2-1/2" brick	3" brick	Difference	with 2-1/2" brick	with 2-1/2" brick
J18	29,317	24,087	5,230	21,096	24,382	3,286	1,944	0.57
J18X	39,181	32,327	6,853	28,194	32,723	4,529	2,324	0.68
J23	42,802	35,171	7,631	30,800	35,601	4,802	2,829	0.83
J230	55,778	45,972	9,805	40,137	46,535	6,398	3,408	1.00
J236	68,754	56,774	11,980	49,474	57,468	7,994	3,986	1.17
J245	81,729	67,575	14,154	58,811	68,401	9,590	4,564	1.34
J2918	57,113	46,963	10,150	41,098	47,537	6,440	3,710	1.09
J2927	72,928	60,096	12,833	52,478	60,831	8,352	4,480	1.31
J2936	88,744	73,229	15,515	63,859	74,125	10,265	5,250	1.54
J2945	104,560	86,362	18,198	75,240	87,418	12,178	6,020	1.76