

HUMBER SPRING / FALL

Heat Loss without Calcium insulation . 1 1/2" thick up to 450°F and 3" thick above 450° F for an ambient temperature of 73.4° (Spring/fall). wind of 1 mph in Btu/ft/hr

Process Temperature (F°)

Pipe Size (Inches)	150	250	350	450	550	650	750	850
2 w/insul.	18.15	44.17	72.96	104.7	95.21	121.1	149.2	179.6
Envirocage	128.6	338	603.9	939.5	1361	1886	2534	3329
3 w/insul.	23.85	58.07	95.97	137.8	120.5	153.3	188.9	227.5
Envirocage	171.7	460.5	834.1	1311	1913	2668	3604	4752
4 w/insul.	28.62	69.73	115.3	165.6	139.6	177.5	218.8	263.5
Envirocage	208.8	567.7	1037	1639	2403	3362	4553	6017
6 w/insul.	40.34	98.41	162.9	234.2	186	236.7	291.8	351.5
Envirocage	286	793.9	1466	2334	3439	4830	6562	8692
8 w/insul.	48.43	118.2	195.8	281.6	219.6	279.4	344.5	415.1
Envirocage	357.8	1006	1869	2686	4411	6207	8444	11200
10 w/insul.	56.6	138.3	229.1	329.6	264.3	336.4	414.8	499.8
Envirocage	433.8	1231	2296	3677	5441	7665	10440	13840
12 w/insul.	65.7	160.6	266.3	383.3	303.5	386.3	476.4	574.2
Envirocage	505.2	1443	2699	4329	6413	9043	12320	16350
14 w/insul.	75.94	185.9	308.5	444.3	338.4	430.7	531.3	640.4
Envirocage	549.9	1575	2950	4736	7020	9902	13490	17920
16 w/insul.	84.91	208	345.3	497.4	378.3	481.7	594.1	716.2
Envirocage	621.3	1787	3353	5387	7991	11280	15380	20430

HUMBER SPRING / FALL

Heat Loss without Calcium insulation . 40mm thick up to 232.2°C and 80mm thick above 232.2°C for an ambient temperature of 23° (Spring/fall). wind of .4 m/s in Heat Loss W/m

Process Temperature (C°)

Pipe Size (Millimeters)	65.5	121.1	176.7	232.2	287.8	343.3	398.9	454.4
50 w/insul.	17.43	42.36	70.01	100.4	91.46	116.3	143.3	172.5
Envirocage	120.2	317.9	570.9	890.8	1294	1796	2418	3179
80 w/insul.	22.89	55.69	92.09	132.2	115.8	147.2	181.5	218.6
Envirocage	161.2	435.2	792.2	1248	1826	2548	3447	4548
100 w/insul.	27.47	66.86	110.6	158.9	134.1	170.5	210.2	253.2
Envirocage	196.7	538.3	987.6	1564	2297	3216	4361	5765
150 w/insul.	23.28	94.37	156.4	227.7	178.7	227.3	280.3	337.7
Envirocage	270.8	755.9	1401	2233	3295	4630	6295	8339
200 w/insul.	46.48	113.4	188	270.3	211	268.4	331	398.8
Envirocage	339.9	960.2	1789	2861	4231	5955	8106	10750
250 w/insul.	54.33	132.7	220	316.5	254	323.2	398.6	480.3
Envirocage	413.1	1177	2201	3526	5222	7358	10020	13290
300 w/insul.	63.07	154.1	255.8	368.1	291.7	371.2	457.9	551.7
Envirocage	482	1381	2588	4154	6158	8682	11830	15710
350 w/insul.	72.89	178.4	296.3	426.7	325.2	413.9	510.6	615.4
Envirocage	525	1509	2831	4545	6741	9509	12960	17210
400 w/insul.	81.51	199.6	331.7	477.8	363.6	462.8	571	688.2
Envirocage	593.9	1713	3218	5172	7676	10830	14780	19620

HUMBER SPRING / FALL

Heat Loss without Calcium insulation . 1 1/2" thick up to 450°F and 3" thick above 450° F for an ambient temperature of 73.4° (Summer). wind of 1 mph in J/ft/hr

Process Temperature (F°)

Pipe Size (Inches)	150	250	350	450	550	650	750	850
2 w/insul.	19149.26	46601.81	76976.87	110464.34	100451.86	127767.26	157414.33	189488.03
Envirocage	135680.18	356608.87	637148.22	991224.97	1435931.01	1989835.33	2673511.53	3512280.93
3 w/insul.	25163.08	61267.09	101253.71	145386.69	127134.23	161740.06	199300.05	2400252.06
Envirocage	181153.08	485853.22	880022.08	1383178.22	2018321.84	2814889.01	3802421.29	5013625.41
4 w/insul.	30195.69	73569.04	121647.93	174717.24	147285.79	187272.41	230846.22	278007.21
Envirocage	220295.66	598955.2	1094092.91	1729236.54	2535299.21	3547097.77	4803669.29	6348271.06
6 w/insul.	42560.95	103828.04	171868.59	247094.08	196240.38	249731.72	307865.29	370852.13
Envirocage	301745.97	827058.28	1546711.87	2462500.36	3628337.07	5095919.76	6923276.5	9170545.47
8 w/insul.	51096.35	124707.6	206579.93	297103.72	231690.26	294782.6	363466.74	437953.68
Envirocage	377498.98	1061386.18	1971899.38	2833880.02	4653851.36	6548731.67	8908891.61	11816625.54
10 w/insul.	59716.16	145914.22	241713.29	347746.4	278851.26	386572.46	437637.16	474564.12
Envirocage	457683.22	1298773.75	2422408.23	3879440.37	5740558.89	8087003.11	11014783.1	14601973
12 w/insul.	69317.16	168808.93	280961.37	404402.9	320209.45	407568.07	502628.6	605813.07
Envirocage	533014.21	1522445.59	2847595.74	4567336.78	6766073.18	9540870.07	12998288.1	17250163.19
14 w/insul.	80120.94	196134.88	325484.73	468761.31	357030.9	454412.55	560551.17	675657.76
Envirocage	580175.21	1661712.96	3112414.76	4996744.51	7406492.08	10447163.05	14232703.45	18906600.87
16 w/insul.	89584.79	219451.61	364310.78	524784.78	399127.62	508220.4	626808.68	755631
Envirocage	655506.2	1885384.8	3537602.27	5683585.87	8430951.31	11901030.01	16226759.01	21655908.12

HUMBER SUMMER								
Heat Loss without Calcium insulation , 1 1/2" thick up to 450°F and 3" thick above 450° F for an ambient temperature of 80° (Summer), wind of 1 mph in Btu/ft/hr								
Process Temperature (F°)								
Pipe Size (Inches)	150	250	350	450	550	650	750	850
2 w/insul.	16.66	42.69	71.49	103.2	94.2	120.1	148.2	178.6
Envirocage	118	326.7	592.1	927.3	1348	1873	2521	3316
3 w/insul.	21.89	56.13	94.05	135.8	119.3	152	187.6	226.3
Envirocage	157.4	444.9	817.7	1294	1896	2650	3585	4734
4 w/insul.	26.27	67.4	113	163.3	138.1	176.1	217.3	262.1
Envirocage	191.3	548.4	1016	1618	2381	3339	4530	5993
6 w/insul.	31.82	95.13	159.7	231	184.1	234.7	289.8	349.6
Envirocage	226.7	766.5	1437	2303	3407	4798	6529	8658
8 w/insul.	44.46	114.3	191.9	277.7	217.3	475.4	342.2	412.8
Envirocage	327.1	970.9	1831	2947	4370	6165	8401	11150
10 w/insul.	51.96	133.7	224.6	325.1	261.6	333.6	342.2	412.8
Envirocage	396.3	1188	2250	3629	5391	7614	10380	13790
12 w/insul.	60.32	155.3	261	378	300.4	383.2	473.3	571.1
Envirocage	461.3	1392	2644	4272	6354	8982	12260	16290
14 w/insul.	69.72	179.7	302.4	438.2	334.8	427.2	527.8	636.9
Envirocage	501.9	1520	2890	4673	6955	9835	13430	17850
16 w/insul.	77.96	201.1	338.5	490.6	374.4	477.8	590.3	712.3
Envirocage	566.8	1724	3284	5316	7917	11200	15300	20350

HUMBER SUMMER								
Heat Loss without Calcium insulation , 40mm thick up to 232.2°C and 80mm thick above 232.2°C for an ambient temperature of 26.7° (Summer), wind of .4 m/s in Heat Loss W/m								
Process Temperature (C°)								
Pipe Size (Millimeters)	65.5	121.1	176.7	232.2	287.8	343.3	398.9	454.4
50 w/insul.	15.94	40.93	68.59	99.01	90.49	115.3	142.3	212.4
Envirocage	109.9	307.1	559.6	879	1282	1783	2405	3167
80 w/insul.	20.94	53.81	90.23	130.3	114.6	146	180.3	217.3
Envirocage	147.2	402.3	776.3	1231	1809	2531	3429	4530
100 w/insul.	25.13	64.61	108.4	156.6	132.7	169.1	208.8	251.8
Envirocage	179.5	519.7	967.7	1543	2275	3194	4338	5743
150 w/insul.	35.41	91.2	153.2	221.6	176.8	225.5	278.5	335.9
Envirocage	246.7	729.5	1373	2203	3264	4598	6262	8306
200 w/insul.	42.52	109.6	184.2	266.6	208.8	266.2	328.8	396.6
Envirocage	309.4	926.3	1753	2823	4191	5914	8064	10710
250 w/insul.	49.7	128.2	215.6	312.1	251.3	320	396	477.7
Envirocage	375.7	1135	2156	3479	5173	7307	9971	13240
300 w/insul.	57.7	149	250.6	363	288.6	368.1	454.8	548.7
Envirocage	438.1	1332	2535	4098	6100	8623	11770	15650
350 w/insul.	66.69	172.4	290.4	420.8	321.7	410.5	507.2	612
Envirocage	477.1	1455	2772	4484	6678	9444	12900	17140
400 w/insul.	74.58	192.9	325.1	471.2	359.8	459	567.3	684.5
Envirocage	539	1651	3152	5102	7604	10760	14700	19550

HUMBER SUMMER								
Heat Loss without Calcium insulation , 1 1/2" thick up to 450°F and 3" thick above 450° F for an ambient temperature of 80° (Summer), wind of 1 mph in J/ft/hr								
Process Temperature (F°)								
Pipe Size (Inches)	150	250	350	450	550	650	750	850
2 w/insul.	17577.23	45040.33	75425.94	108881.76	99386.26	126712.2	209112.06	188432.97
Envirocage	124496.59	344686.74	624698.57	9783532.92	1422215.28	1976119.61	2659795.8	3498565.2
3 w/insul.	23095.17	59220.28	99228	143276.58	125868.16	160368.48	197928.47	238759.13
Envirocage	166065.79	469394.34	862719.17	1365242.27	2000385.89	2795898	3782375.23	4994634.4
4 w/insul.	27716.31	71110.76	119221.31	172290.62	145703.21	185795.33	229263.63	276530.13
Envirocage	201832.18	578592.62	168492.41	1707080.36	2512087.98	3522831.49	4779403.01	6322949.72
6 w/insul.	33571.87	100367.46	1516115.26	243717.9	194235.78	247621.6	305755.18	368847.52
Envirocage	239181.16	808700.31	202465.21	2429793.62	4610594.07	5062157.98	6888459.66	9134673.57
8 w/insul.	46907.78	120592.88	202465.21	292989.01	229263.63	501573.55	361040.11	435527.05
Envirocage	345108.76	1024353.72	1931807.26	3109249.59	5687806.1	6504419.33	8863524.21	11763872.75
10 w/insul.	54820.7	141060.96	236965.54	342998.65	276002.61	351966.63	434788.51	524468.26
Envirocage	418118.63	1253406.35	2373875.66	3828797.68	6703824.88	7558420.12	10951479.75	14549220.2
12 w/insul.	63640.96	163850.17	275369.57	398811.11	353232.69	404297.4	499357.93	539239.04
Envirocage	486697.26	1468637.74	2789567.67	4507198.6	6703824.88	9476511.66	12934984.75	17186859.83
14 w/insul.	73558.49	189593.53	319048.88	462325.47	395434.93	450719.86	556858.47	671965.07
Envirocage	529532.53	1603684.89	3049111.41	4930275.99	7337913.45	10376474.31	14169400.1	18832746.96
16 w/insul.	82252.15	212171.73	357136.4	464857.6	395012.91	504105.68	622799.46	751516.28
Envirocage	598005.65	1818916.28	3464803.42	5608676.91	8352877.18	11816625.54	16142354.54	21470386.6

HUMBER WINTER

Heat Loss without Calcium insulation , 1 1/2" thick up to 450°F and 3" thick above 450° F for an ambient temperature of 20° (Winter), wind of 1 mph in Btu/ft/hr

Process Temperature (F°)

Pipe Size (Inches)	150	250	350	450	550	650	750	850
2 w/insul.	29.82	55.75	84.46	116.1	103.1	128.9	156.9	187.4
Envirocage	212.8	427.6	697.6	1036	1460	1987	3637	3433
3 w/insul.	39.15	73.25	86.7	152.7	130.4	163.1	198.7	237.3
Envirocage	285.5	584	816.7	1447	2053	2811	3749	4899
4 w/insul.	46.95	87.92	111	183.5	151	188.9	230.1	275.8
Envirocage	348.9	721.7	964.7	1810	2579	3542	4736	6202
6 w/insul.	66.12	124	133.4	222.6	201.3	251.8	306.8	366.5
Envirocage	482.2	1013	1201	2195	3692	5089	6825	8958
8 w/insul.	79.36	149	188.4	259.5	237.6	297.3	362.3	432.8
Envirocage	607	1286	1700	2579	4736	6539	8781	15540
10 w/insul.	92.75	174.2	226.4	312.1	285	357.9	436.2	521.1
Envirocage	739.5	1576	2169	3300	5842	8075	10850	14260
12 w/insul.	107.7	202.4	308	365.2	328.3	411	501	598.6
Envirocage	864.3	1849	3135	4065	6885	9525	12810	16850
14 w/insul.	124.4	234.2	356.7	424.7	366	458.2	558.6	667.6
Envirocage	942.3	2020	3427	4786	7536	10430	14030	18460
16 w/insul.	139.1	262.2	399.3	551.2	409.2	512.4	824.7	746.6
Envirocage	1067	2294	3895	5956	8578	11880	15990	21040

HUMBER WINTER

Heat Loss without Calcium insulation , 1 1/2" thick up to 450°F and 3" thick above 450° F for an ambient temperature of 20° (Winter), wind of 1 mph in J/ft/hr

Process Temperature (F°)

Pipe Size (Inches)	150	250	350	450	550	650	750	850
2 w/insul.	31461.76	58819.36	89110.01	122491.98	108776.25	135996.69	165538.26	197717.46
Envirocage	224515.88	451141.88	736006.96	1093037.86	1540381.54	2096395.97	3837238.13	3622006.74
3 w/insul.	41305.43	77282.84	91473.34	161107.02	137579.28	172079.6	209639.59	250364.75
Envirocage	301218.44	616152.61	861664.11	1526665.81	2166029.66	2965762	3955404.39	5168718.62
4 w/insul.	49534.87	92760.51	117111.19	193602.74	159313.43	199300.05	242768.35	290984.4
Envirocage	364943.81	761433.8	1017812.38	1909651.09	2720989.04	3737007.83	4996744.51	6543456.39
6 w/insul.	69760.29	130826.92	140744.45	234855.43	212382.74	265663.06	323691.13	386677.96
Envirocage	508747.93	1068771.57	1267122.07	2315847.59	3895266.2	5369179.23	7200756.19	9451190.32
8 w/insul.	83729.23	157203.32	198772.52	273786.99	250681.27	313668.1	382246.73	456628.17
Envirocage	640418.9	1356801.82	1793594.94	2720989.04	4996744.51	6899010.22	9264445.44	16395567.95
10 w/insul.	97856.43	183790.72	238864.64	329282.93	300690.91	377604.48	460215.36	549789.6
Envirocage	780213.8	1662768.02	228841.61	3481684.31	6163636.29	8519576	11447356	15045096.45
12 w/insul.	113629.51	213543.3	2288416.14	385306.39	346374.83	433627.95	528582.98	631556.43
Envirocage	911884.77	1950798.27	324957.2	4288802.04	7264059.54	10049406.99	13515265.47	17777691.11
14 w/insul.	131248.94	247094.08	3307600.09	448082.22	386150.44	483426.59	589354.19	704355.28
Envirocage	994179.12	2131212.82	376338.42	5049497.31	7950900.9	11004232.54	14802433.61	19476331.03
16 w/insul.	146758.26	276635.64	421283.8	581546.78	431728.85	540188.59	870104.56	787704.69
Envirocage	1125744.59	2420298.12	4109442.54	6283912.65	9050269.1	12534063.52	16870343.08	22198375.13

HUMBER WINTER

Heat Loss without Calcium insulation , 1 1/2" thick up to 450°F and 3" thick above 450° F for an ambient temperature of 20° (Winter), wind of 1 mph in J/ft/hr

Process Temperature (F°)

Pipe Size (Inches)	150	250	350	450	550	650	750	850
2 w/insul.	31461.76	58819.36	89110.01	122491.98	108776.25	135996.69	165538.26	197717.46
Envirocage	224515.88	451141.88	736006.96	1093037.86	1540381.54	2096395.97	3837238.13	3622006.74
3 w/insul.	41305.43	77282.84	91473.34	161107.02	137579.28	172079.6	209639.59	250364.75
Envirocage	301218.44	616152.61	861664.11	1526665.81	2166029.66	2965762	3955404.39	5168718.62
4 w/insul.	49534.87	92760.51	117111.19	193602.74	159313.43	199300.05	242768.35	290984.4
Envirocage	364943.81	761433.8	1017812.38	1909651.09	2720989.04	3737007.83	4996744.51	6543456.39
6 w/insul.	69760.29	130826.92	140744.45	234855.43	212382.74	265663.06	323691.13	386677.96
Envirocage	508747.93	1068771.57	1267122.07	2315847.59	3895266.2	5369179.23	7200756.19	9451190.32
8 w/insul.	83729.23	157203.32	198772.52	273786.99	250681.27	313668.1	382246.73	456628.17
Envirocage	640418.9	1356801.82	1793594.94	2720989.04	4996744.51	6899010.22	9264445.44	16395567.95
10 w/insul.	97856.43	183790.72	238864.64	329282.93	300690.91	377604.48	460215.36	549789.6
Envirocage	780213.8	1662768.02	228841.61	3481684.31	6163636.29	8519576	11447356	15045096.45
12 w/insul.	113629.51	213543.3	2288416.14	385306.39	346374.83	433627.95	528582.98	631556.43
Envirocage	911884.77	1950798.27	324957.2	4288802.04	7264059.54	10049406.99	13515265.47	17777691.11
14 w/insul.	131248.94	247094.08	3307600.09	448082.22	386150.44	483426.59	589354.19	704355.28
Envirocage	994179.12	2131212.82	376338.42	5049497.31	7950900.9	11004232.54	14802433.61	19476331.03
16 w/insul.	146758.26	276635.64	421283.8	581546.78	431728.85	540188.59	870104.56	787704.69
Envirocage	1125744.59	2420298.12	4109442.54	6283912.65	9050269.1	12534063.52	16870343.08	22198375.13