

Data Set for Design and Testing of a Horizontal Rock Bed for High Temperature Thermal Energy Storage

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Summary of the data set

This describes the data set that was collected for a high temperature thermal energy storage system reported in the paper “Design and Testing of a Horizontal Rock Bed for High Temperature Thermal Energy Storage.”

Data was generally logged at 1 Hz for a number of hours, which depends on the test condition. Data files are either text files that are tab delimited or Excel files. The locations of measurements and thermocouples are described in Figure 1 and Figure 4 in the paper.

A summary of the experiments and data file names is given below. When the data set was used to prepare a figure in the paper, it is described in the notes column.

Cycle	Configuration	Design	T set [degC]	Energy consumption [kWh]	Power [kW]	Duration [h]	Data file	Notes
CH	AO	Standard	640	443	17.7	25	ShoeboxTest_17-12-11_1341	
DIS	AO	Standard	640	12	0.5	22.5	ShoeboxTest_17-12-12_1521	
CH	BITO	Standard	640	424	16.6	25.5	ShoeboxTest_17-12-14_1119	
DIS	BITO	Standard	640	36	1.6	23	ShoeboxTest_17-12-15_1306	
CH	BIBO	Standard	640	424	16.3	26	ShoeboxTest_17-12-18_1119	Figure 6
DIS	TITO	Standard	640	13	0.5	25	ShoeboxTest_17-12-19_1400	
CH	AO	Standard	640	379	16.5	23	ShoeboxTest_17-12-20_1522	
CH	all-BO	Standard	640	440	16.8	26.3	ShoeboxTest_18-01-09_1357	
DIS	all-TO	Standard	640	13	0.5	25	ShoeboxTest_18-01-10_1716	
CH	AO	Standard	640	427	16.4	26	ShoeboxTest_18-01-11_1816	Figure 5, 6, S5
DIS	AO	Standard	640	31	0.5	61	ShoeboxTest_18-01-12_2042	Figure 8
CH	AO	Standard	640	413	16.5	25	ShoeboxTest_18-01-15_0946	
DIS	BITO	Standard	640	13	0.5	25.5	ShoeboxTest_18-01-16_1220	
CH	AO	Standard	640	407	15.7	26	ShoeboxTest_18-01-17_1414	
DIS	TITO	Standard	640	12	0.5	24	ShoeboxTest_18-01-18_1648	Figure 8
CH	AO	Standard	640	424	16.0	26.5	ShoeboxTest_18-01-24_1210	

DIS	all-TO	Standard	640	13	0.5	25.5	ShoeboxTest_18-01-25_1512	Figure 8
CH	AO	Standard	640	426	16.4	26	ShoeboxTest_18-01-29_1022	
DIS	BITO	Standard	640	13	0.5	24.5	ShoeboxTest_18-01-30_1251	Figure 8
CH	AO	Standard	630	444	27.6	16.1	ShoeboxTest_18-02-05_1835	Figure 5, Figure 7, Figure S5
DIS	AO	Standard	-	12	0.5	25.6	ShoeboxTest_18-02-06_1121	Figure 9, Figure 10, Figure S6
CH	BIBO	Standard	630	431	27.0	16.0	ShoeboxTest_18-02-07_1950	Figure 7
DIS	TITO	Standard	-	12	0.5	25.4	ShoeboxTest_18-02-08_1208	Figure 9
CH	AO	lasagna	640	445	17.1	26.0	ShoeboxTestL_18-03-08_1445	
DIS	AO	lasagna	-	-		24.0	ShoeboxTestL_18-03-09_1716	
CH	AO	lasagna	630	383	23.6	16.3	ShoeboxTestL_18-03-12_1845	Figure 7
DIS	AO	lasagna	-	28	1.2	24.0	ShoeboxTestL_18-03-13_1119	Figure 9, Figure 10, Figure S6
CH	top layer	lasagna	630	169	23.6	7.2	ShoeboxTestL_18-03-15_1140	
DIS	top layer	lasagna	-	14	0.6	23	ShoeboxTestL_18-03-15_1900	
CH	bottom layer	lasagna	630	170	24.3	7	ShoeboxTestL_18-03-20_1104	
DIS	bottom layer	lasagna	-	-		15	ShoeboxTestL_18-03-20_1825	
CH	AO	lasagna	640	421	17.5	24	ShoeboxTestL_18-03-22_1501	
CH	AO	lasagna	640	464	17.8	26	ShoeboxTestL_18-04-09_1141	
DIS	AO	lasagna	-	-		24	ShoeboxTestL_18-04-10_1356	
CH	all, slow	lasagna	640	451	17.3	26	ShoeboxTestL_18-04-17_1313	
DIS	all,fast	lasagna	-	-		24	ShoeboxTestL_18-04-18_1543	Figure 8
CH	all,slow	lasagna	640	444	17.1	26	ShoeboxTestL_18-04-24_1412	
DIS	all,slow	lasagna	-	-		3days	ShoeboxTestL_18-04-25_1640	
CH	top,fast	lasagna	630	170	21.3	8	ShoeboxTestL_18-05-03_1005	
DIS	top,fast	lasagna	-		0.0	19	ShoeboxTestL_18-05-03_1827	
CH	all,fast	lasagna	630	351	21.9	16	ShoeboxTestL_18-03-08_1445	Figure 6
DIS	all,fast	lasagna	-			a lot	ShoeboxTestL_18-05-09_0946	
CH	all,slow	lasagna	640	417	15.7	26.5	ShoeboxTestL_18-05-14_1113	Figure 6
DIS	all,fast	lasagna	-		0.0	28	ShoeboxTestL_18-05-15_1405	Figure 8

CH	all,fast	lasagna	630	397	23.4	17	ShoeboxTestL_18-05-22_1652	
DIS	all,fast	lasagna	-		0.0	27	ShoeboxTestL_18-05-23_1003	
CH	all,fast	lasagna	630	411	24.9	16.5	ShoeboxTestL_18-05-24_1800	Figure 7
DIS	all,fast	lasagna	-			a lot	ShoeboxTestL_18-05-25_1046	Figure 9