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a century of  
public safety  
est. 1894

File R18352  
Project 96NK18303

December 6, 1996

REPORT

on

BUILDING UNITS

Under The

CLASSIFICATION PROGRAM

Structural Building Systems Inc.  
Oldsmar, FL

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D E S C R I P T I O N

PRODUCT COVERED:

The product covered by this Report is a building unit consisting of foamed plastic core surfaced on both sides with painted aluminum, forming a roof/ceiling composite panel.

The product was tested with regard to flame propagation and damageability under specified room fire conditions only.

USE:

The product is intended for use as a building material as permitted by authorities having jurisdiction.

T E S T R E C O R D N O. 1EXAMINATION OF MATERIALS:

The materials used in this investigation were produced under the observation of a representative of Underwriters Laboratories Inc., in a ready-to-use form. The composition of the finished materials is of a proprietary nature. Data on the composition is on file at the Laboratories.

The samples consisted of foamed plastic core material, 3 in. thick, at a density of 1.0 lb/ft<sup>2</sup> surfaced on both sides with 0.024 in. thick painted aluminum.

The samples of the foamed plastic were previously investigated and Classified for Surface Burning Characteristics.

TEST PROCEDURE:

The test was conducted in accordance with the UL Standard "Fire Test Of Interior Finish Material, UL 1715" (UBC 26-3).

## TEST ASSEMBLY

Room Configuration

The room test assembly consisted of 8 ft wide by 12 ft long by 8 ft high, with an 8 by 12 ft ceiling with a 2 ft, 6 in. by 8 ft doorway. See ILL. 1.

Wall System

The wall system consisted of 5/8 in. gypsum wallboard mechanically fastened to structural steel angles (nominal 2 in. by 2 in. by 1/8 in.) with vertical support members 4 ft O.C. and horizontal girders at top, bottom and center of each wall.

Ceiling System

The test sample consisted of two 4 ft by 9 ft ceiling panels mechanically fastened to the wall system on the

### Instrumentation

Thermocouples were used to monitor temperature in each corner test at locations shown in ILL. 2. The four thermocouples directly above the ignition source were No. 14 gauge (0.063 in. diameter), Type K (chromel-alumel) thermocouples. The leads of the thermocouples were mounted in ceramic insulators within 1/2 in. diameter black iron pipe, with the bare junction protruding 1 in. beyond the end of the ceramic insulators and 3 in. beyond the end of the iron pipe. The remaining thermocouples used to measure temperatures at various locations in the room geometry were No. 29 gauge (0.11 in. diameter), type (chromel-alumel) thermocouples in inconel shields.

### Supplement Smoke Measurements

In addition to the room temperature instrumentation, a collection hood and exhaust duct was employed to collect the products of combustion for the determination of the smoke release rate. A description of the collection hood and duct instrumentation, including thermocouple, velocity probe, photoelectric cell and light source is provided in App. B of UL 1715.

### Photographic Observations

A video tape recording was taken during the test.

## RESULTS

### Test Observations

<u>Time, min:s</u>	<u>Observations</u>
00:00	Ignition of excelsior.
01:28	First panel nearest crib beginning to warp.
01:50	Second panel beginning to warp.

### Temperature Measurements

The complete temperature profile within the room geometry during the test is found in Appendix A. Temperature graphs of the crib thermocouples, ceiling and doorway thermocouples and the wall end thermocouples are shown in ILLS. 3, 4 and 5.

### Post Test Observations

Extent of damage to the foamed plastic insulation is illustrated in ILL. 7.

### Smoke Release

The total smoke released in  $m^2$  at 5 min was 16.2. At 7-1/2 min and 15 min. The total smoke was 33.3  $m^2$  and 83.4  $m^2$ , respectively. Illustration six provides a plot of the smoke release rate ( $m^2/5$ ) versus time.

C O N C L U S I O N

The following conclusions represent the judgement of Underwriters Laboratories Inc., based on the results of the examination and testing presented in this Report.

FLAME SPREAD RESISTANCE:

During the test the observed surface burning did not extend to the extremities of the test specimen, nor did flames project through the doorway at any time.

RESISTANCE TO DAMAGE:

The combustible damage of the test panels was judged to be within acceptable limits. The extent of damage to the foamed plastic core material diminished proportionally to the distance from the corner.

FOLLOW-UP PROGRAM:

The products covered by this Report are judged to be eligible for Classification and Follow-Up Service. The manufacturer is authorized to use the Laboratories' Classification Marking as shown below on such products which comply with the Follow-Up Procedure and any other applicable requirements of Underwriters Laboratories Inc. Only those products which properly bear the Laboratories' Classification Marking are considered as Classified by Underwriters Laboratories Inc.

BUILDING UNITS FOR CEILING CONSTRUCTION  
CLASSIFIED BY  
UNDERWRITERS LABORATORIES INC.  
WITH REGARD TO FLAME PROPAGATION AND  
DAMAGEABILITY UNDER SPECIFIED ROOM FIRE CONDITIONS ONLY

Report by:

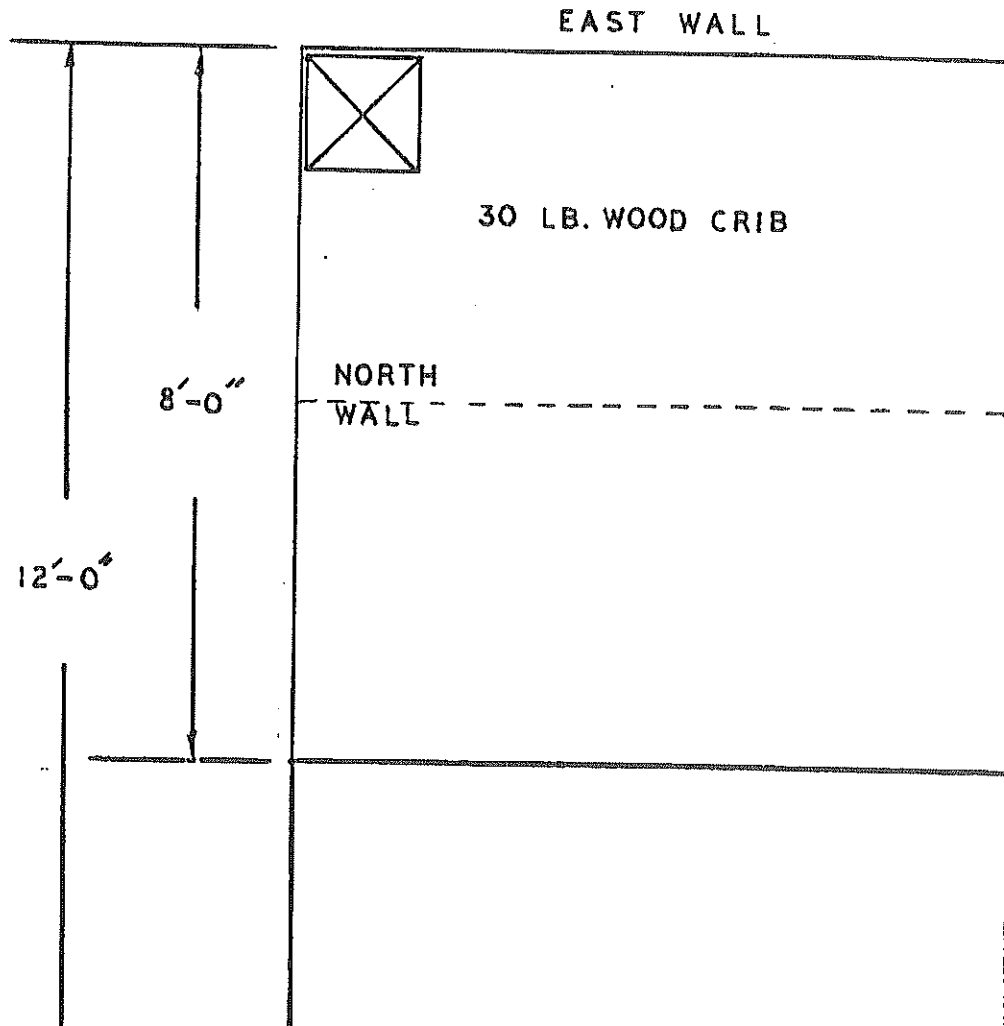
*Joseph G. Marzullo*

Reviewed by:

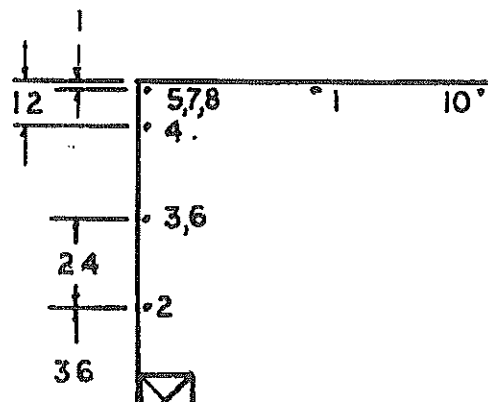
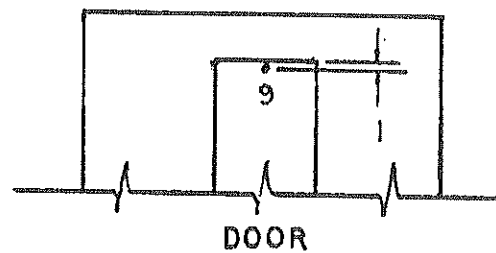
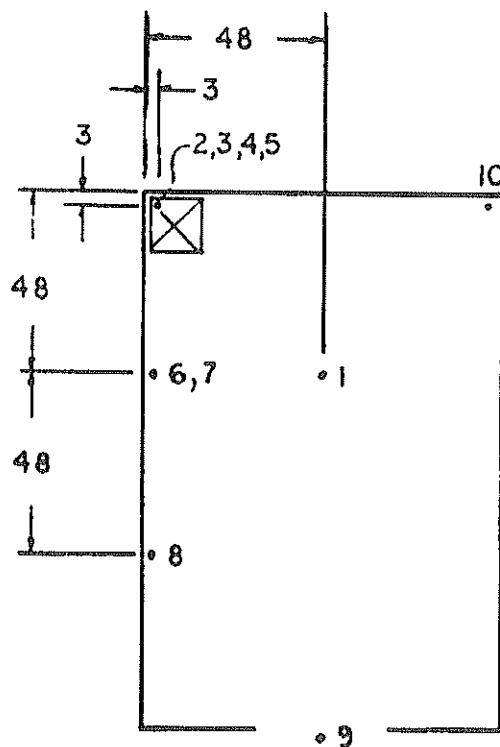
*R. D. Lawman*



# ROOM-CORNER TEST

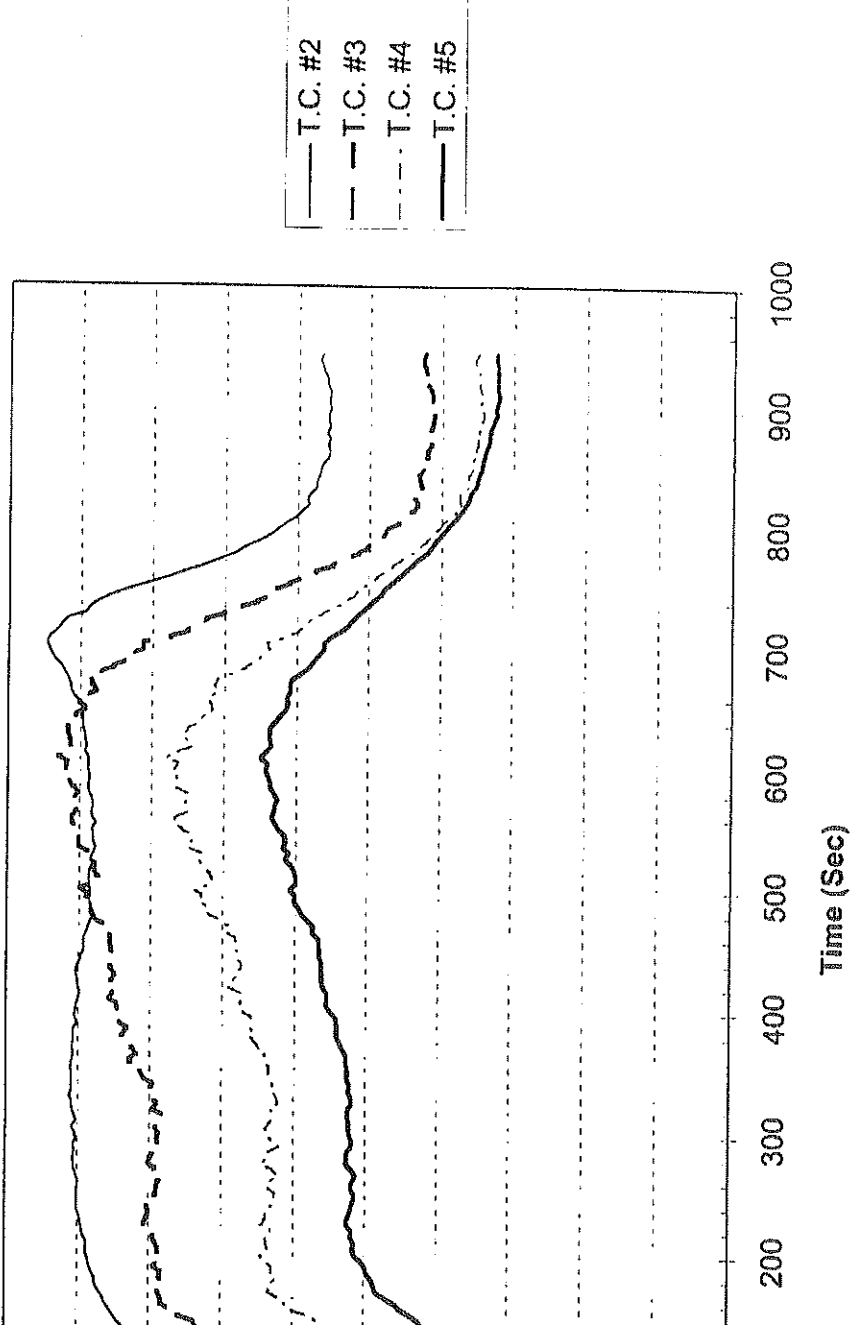


# THERMOCOUPLE LOCATIONS

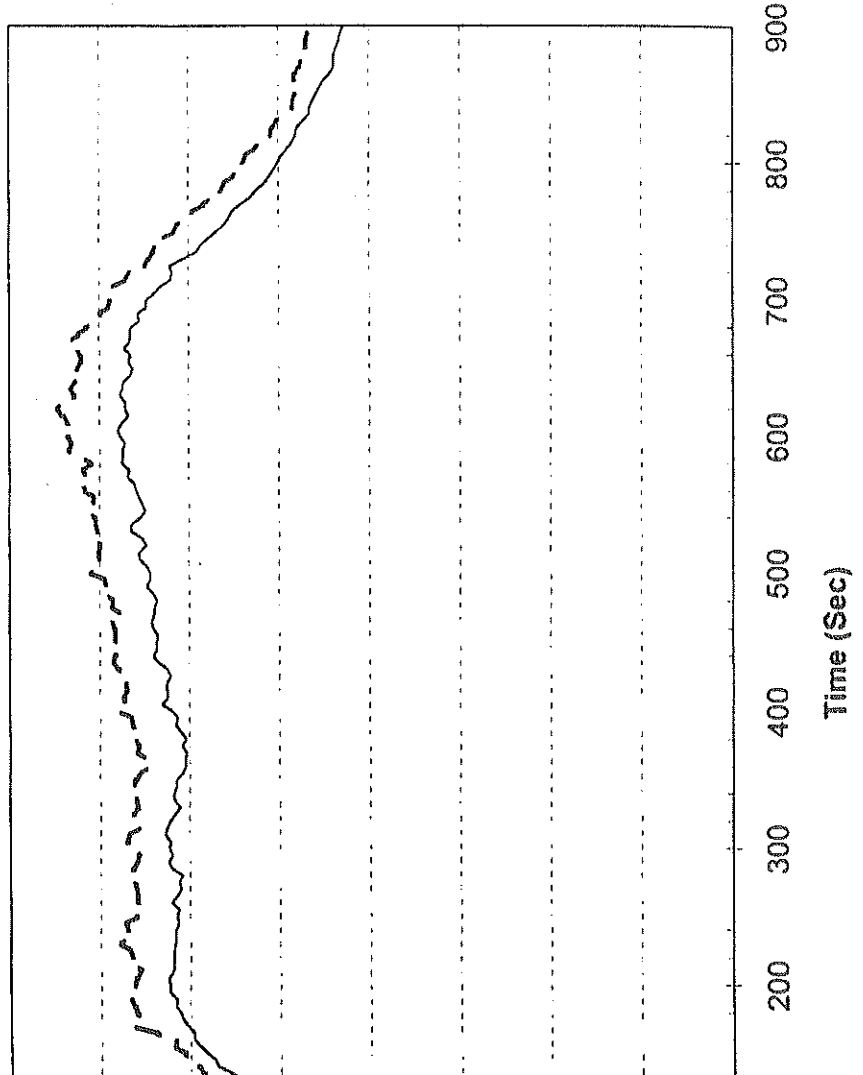




# STRUCTALL BUILDING SYSTEMS CRIB THERMOCOUPLES

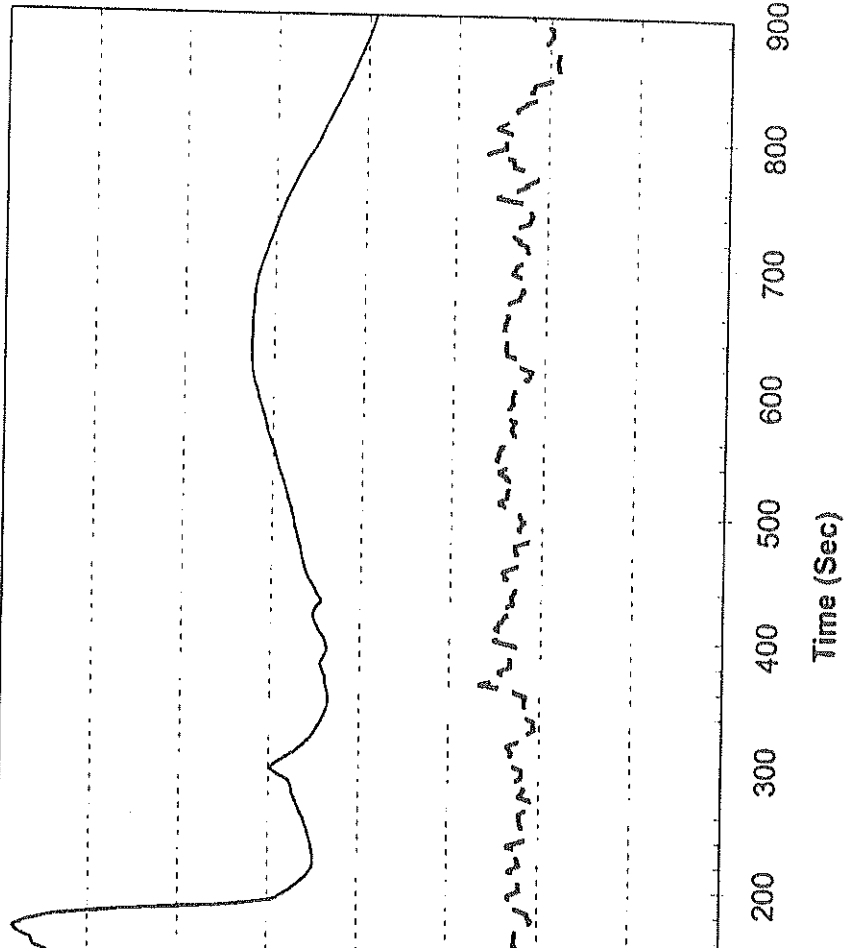


**STRUCTALL BUILDING SYSTEMS  
END OF WALL THERMOCOUPLES**



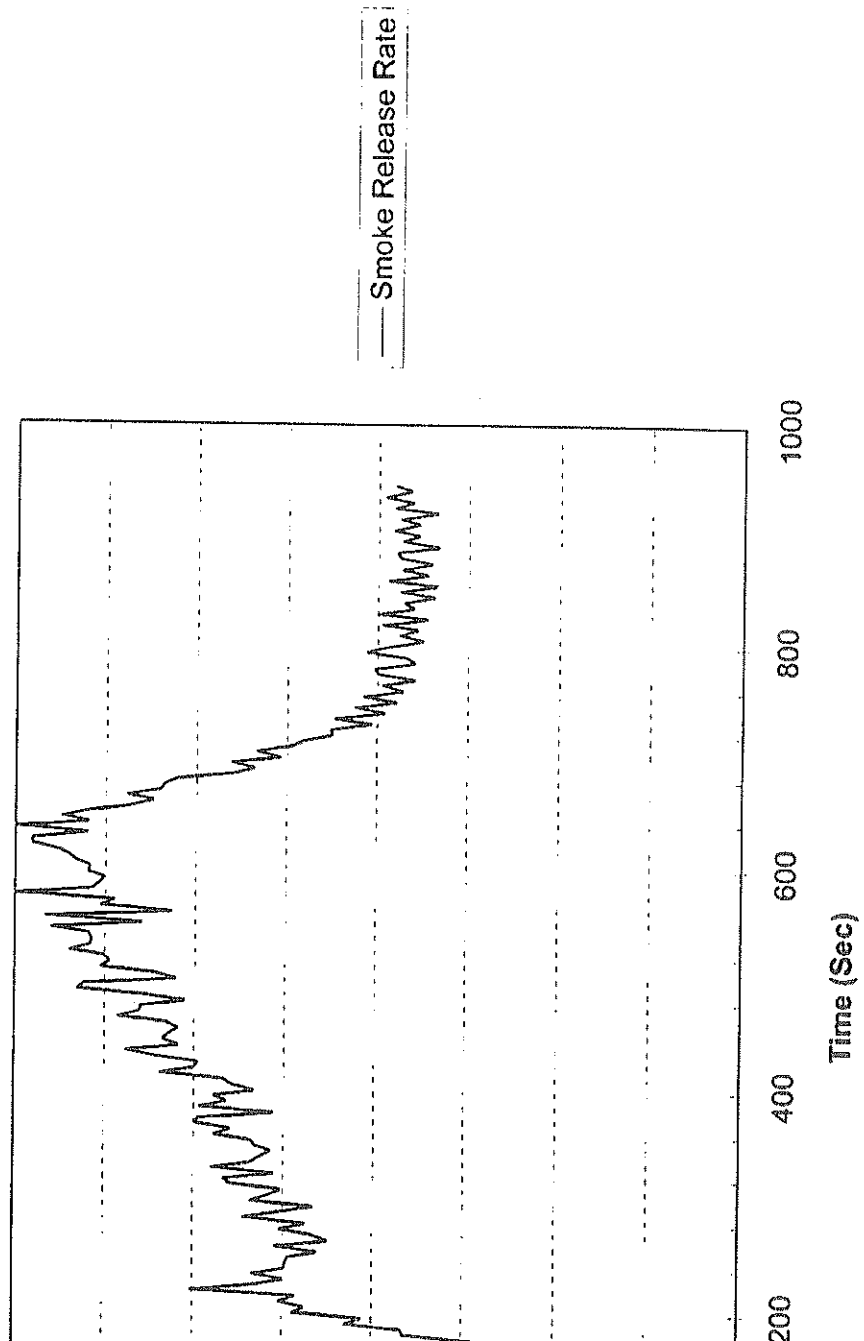
— T.C.#8  
- - T.C.#10

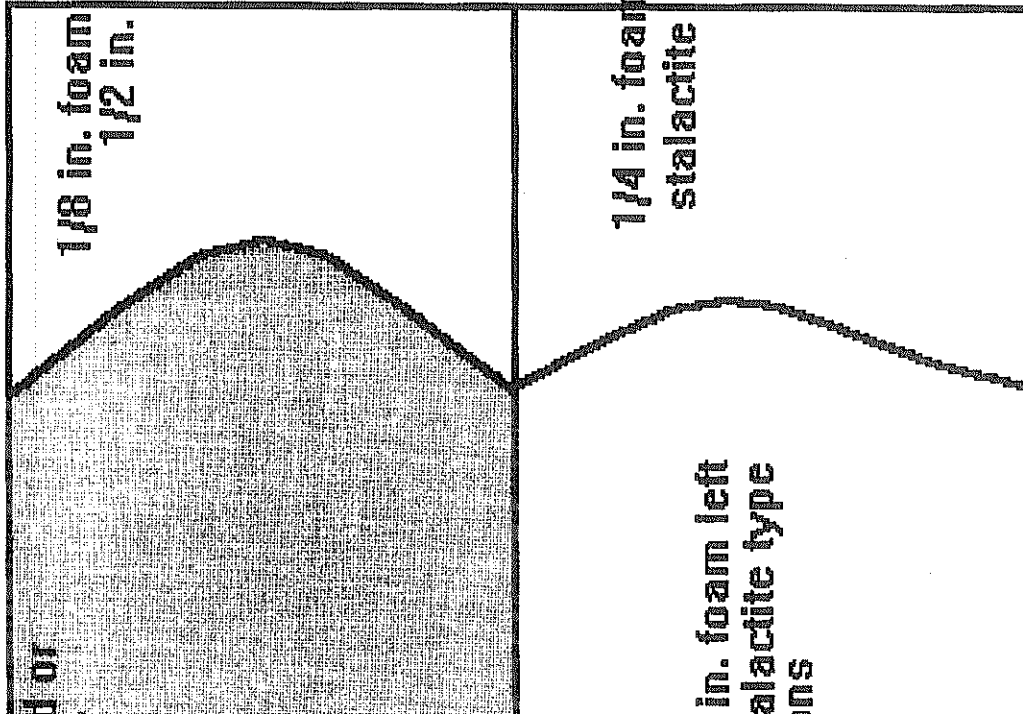
# STRUCTALL BUILDING SYSTEMS CEILING AND DOORWAY THERMOCOUPLES



— T.C. #1 Ceiling  
- - - T.C. #9 Doorway

# STRUCTALL BUILDING SYSTEMS SMOKE RELEASE RATE





1/8 in. foam left with  
1/2 in. stalacite type foam

1/4 in. foam left with 3/4 in.  
stalacite type projections

in. foam left  
stalacite type  
ns

Appendix A  
STRUCTALL BUILDING SYSTEMS  
UL 1715

Time Hr:min:sec	T.C. #1 Ceiling Deg. C	T.C. #2 Deg. C	T.C. #3 Deg. C	T.C. #4 Deg. C	T.C. #5 Deg. C	T.C. #6 Deg. C	T.C. #7 Deg. C	T.C. #8 Deg. C
-00:01:00	20	20	20	20	21	20	20	20
-00:00:55	20	20	20	20	21	20	20	20
-00:00:50	20	20	20	20	21	20	20	20
-00:00:45	20	20	20	20	21	20	20	20
-00:00:40	20	20	20	20	21	20	20	20
-00:00:35	20	20	20	20	20	20	20	20
-00:00:30	20	20	20	20	21	20	20	20
-00:00:25	20	20	20	20	20	20	20	20
-00:00:20	20	20	20	20	20	20	20	20
-00:00:15	20	20	20	20	20	20	20	20
-00:00:10	20	20	20	20	20	19	20	20
-00:00:05	20	20	20	20	20	19	20	20
0:00:00	20	20	20	20	20	19	20	20
0:00:05	20	20	20	20	20	19	20	20
0:00:10	20	20	20	20	20	20	20	20
0:00:15	27	28	37	31	25	20	22	21
0:00:20	55	122	135	81	47	21	23	22
0:00:25	82	252	309	158	82	24	27	30
0:00:30	104	349	418	224	121	27	43	43
0:00:35	118	431	414	232	134	30	60	60
0:00:40	129	469	390	229	141	33	74	71
0:00:45	134	489	380	230	148	35	88	82
0:00:50	142	472	369	231	154	36	98	92
0:00:55	157	460	372	243	165	40	109	100
0:01:00	169	449	377	255	174	44	123	111
0:01:05	177	466	388	265	183	47	130	120
0:01:10	187	488	409	279	192	50	141	130
0:01:15	207	501	432	297	203	53	156	141
0:01:20	228	530	454	321	219	56	171	154
0:01:25	244	562	472	339	232	60	185	168
0:01:30	259	586	505	362	246	63	196	184
0:01:35	271	616	539	386	262	67	213	197
0:01:40	292	650	567	416	285	70	223	209
0:01:45	307	690	587	432	301	71	240	223
0:01:50	314	732	629	458	319	76	251	233
0:01:55	334	762	661	482	336	80	264	240



Appendix A  
 STRUCTALL BUILDING SYSTEMS  
 UL 1715

Time Hr:min:sec	T.C. #1 Ceiling Deg. C	T.C. #2 Deg. C	T.C. #3 Deg. C	T.C. #4 Deg. C	T.C. #5 Deg. C	T.C. #6 Deg. C	T.C. #7 Deg. C	T.C. #8 Deg. C
0:02:45	392	865	784	621	472	93	339	298
0:02:50	384	871	788	634	485	94	344	301
0:02:55	369	876	792	634	487	94	344	304
0:03:00	334	876	785	625	491	96	347	305
0:03:05	274	880	784	631	498	96	350	308
0:03:10	247	884	793	630	499	98	352	308
0:03:15	241	885	785	640	506	99	349	312
0:03:20	236	889	789	646	515	99	355	311
0:03:25	232	889	788	637	517	101	359	312
0:03:30	228	888	793	638	515	102	354	310
0:03:35	226	893	795	639	520	103	354	310
0:03:40	225	894	802	632	519	104	351	309
0:03:45	225	896	808	644	526	104	355	309
0:03:50	226	897	803	639	525	103	354	308
0:03:55	226	901	801	639	521	100	353	308
0:04:00	227	901	804	632	519	100	352	308
0:04:05	228	902	793	628	516	98	354	306
0:04:10	229	901	791	626	515	99	353	307
0:04:15	231	901	790	635	520	99	351	306
0:04:20	232	900	788	633	519	99	352	311
0:04:25	234	903	782	620	514	100	349	307
0:04:30	236	906	792	629	518	102	347	305
0:04:35	237	906	801	645	527	103	347	306
0:04:40	237	907	799	638	526	103	341	304
0:04:45	239	905	794	634	526	105	346	310
0:04:50	245	907	787	622	520	104	346	312
0:04:55	250	903	790	631	519	105	350	310
0:05:00	246	905	788	637	523	107	353	312
0:05:05	240	909	793	640	523	108	353	311
0:05:10	235	903	787	633	523	107	346	314
0:05:15	231	906	783	630	525	106	348	313
0:05:20	228	909	795	632	525	108	349	311
0:05:25	225	909	790	623	520	107	352	308
0:05:30	223	912	798	624	521	106	348	305
0:05:35	221	909	799	629	524	103	345	309
0:05:40	219	909	797	629	522	107	352	309

Appendix A  
 STRUCTALL BUILDING SYSTEMS  
 UL 1715

Time Hr:min:sec	T.C. #1 Ceiling Deg. C	T.C. #2 Deg. C	T.C. #3 Deg. C	T.C. #4 Deg. C	T.C. #5 Deg. C	T.C. #6 Deg. C	T.C. #7 Deg. C	T.C. #8 Deg. C
0:06:30	219	901	841	661	541	114	341	308
0:06:35	219	906	844	660	543	114	334	307
0:06:40	220	904	845	670	550	111	340	309
0:06:45	222	903	847	677	557	111	345	316
0:06:50	224	900	857	672	555	114	343	312
0:06:55	226	899	851	676	555	116	343	313
0:07:00	226	902	858	690	561	116	342	313
0:07:05	225	902	855	687	562	116	347	311
0:07:10	221	904	849	680	563	116	357	312
0:07:15	224	904	856	675	563	114	353	317
0:07:20	226	899	857	673	563	115	363	320
0:07:25	228	898	855	680	565	115	359	318
0:07:30	230	893	854	680	566	118	360	318
0:07:35	231	893	857	680	567	119	367	318
0:07:40	232	893	856	682	567	122	365	320
0:07:45	233	890	865	693	576	124	358	321
0:07:50	234	887	867	693	574	125	363	320
0:07:55	235	883	877	706	584	123	364	320
0:08:00	235	883	883	721	591	125	358	318
0:08:05	236	883	884	719	595	126	365	320
0:08:10	237	886	892	733	602	127	361	324
0:08:15	238	885	889	729	600	128	359	322
0:08:20	239	885	899	739	609	130	370	322
0:08:25	240	887	871	715	599	128	367	324
0:08:30	241	887	874	716	599	127	377	328
0:08:35	242	886	881	720	602	129	371	328
0:08:40	243	883	879	727	606	130	369	324
0:08:45	244	885	892	736	615	130	383	326
0:08:50	245	880	890	731	609	133	380	333
0:08:55	246	878	901	749	618	134	380	332
0:09:00	247	881	902	744	615	135	375	327
0:09:05	248	881	902	744	616	135	388	325
0:09:10	249	883	907	757	625	135	381	326
0:09:15	250	878	911	769	629	137	381	328
0:09:20	252	883	912	767	634	136	379	330
0:09:25	253	884	905	751	630	136	378	330

Appendix A  
STRUCTALL BUILDING SYSTEMS  
UL 1715

Time Hr:min:sec	T.C. #1 Ceiling Deg. C	T.C. #2 Deg. C	T.C. #3 Deg. C	T.C. #4 Deg. C	T.C. #5 Deg. C	T.C. #6 Deg. C	T.C. #7 Deg. C	T.C. #8 Deg. C
0:10:15	262	894	925	765	643	146	389	334
0:10:20	262	890	914	743	635	145	390	336
0:10:25	263	894	915	752	637	141	386	335
0:10:30	263	894	918	755	637	138	387	339
0:10:35	263	897	918	749	637	140	388	337
0:10:40	263	897	908	733	629	141	387	337
0:10:45	262	897	906	728	623	141	384	333
0:10:50	262	897	894	717	615	141	381	332
0:10:55	262	899	903	719	612	141	378	334
0:11:00	262	909	893	723	614	140	374	332
0:11:05	262	913	878	708	609	140	380	337
0:11:10	262	914	884	715	610	140	377	333
0:11:15	261	917	885	709	607	139	372	333
0:11:20	261	922	872	691	594	137	367	333
0:11:25	260	926	854	670	584	139	370	328
0:11:30	260	935	838	659	577	137	360	329
0:11:35	259	941	830	648	570	138	356	324
0:11:40	258	945	813	638	563	137	354	324
0:11:45	256	947	813	642	563	135	352	320
0:11:50	255	943	775	617	553	132	349	316
0:11:55	254	932	750	599	539	125	335	310
0:12:00	253	927	740	588	529	122	331	309
0:12:05	251	919	725	581	522	123	330	311
0:12:10	250	893	701	566	513	119	326	303
0:12:15	249	888	678	547	504	117	317	296
0:12:20	247	873	655	535	494	113	313	293
0:12:25	246	856	638	521	484	112	313	290
0:12:30	245	833	629	515	479	110	307	285
0:12:35	243	805	611	502	469	108	298	280
0:12:40	241	778	592	489	459	106	297	278
0:12:45	240	755	575	479	450	104	293	276
0:12:50	238	730	551	467	441	103	291	271
0:12:55	236	707	537	454	432	104	290	266
0:13:00	234	687	516	440	421	103	284	263
0:13:05	232	674	503	430	414	101	278	258
0:13:10	230	654	494	421	408	97	270	255

Appendix A  
STRUCTALL BUILDING SYSTEMS  
UL 1715

Time Hr:min:sec	T.C. #1 Ceiling Deg. C	T.C. #2 Deg. C	T.C. #3 Deg. C	T.C. #4 Deg. C	T.C. #5 Deg. C	T.C. #6 Deg. C	T.C. #7 Deg. C	T.C. #8 Deg. C
0:14:00	213	574	431	364	350	96	243	233
0:14:05	211	570	433	363	348	96	242	231
0:14:10	210	569	425	357	345	94	240	229
0:14:15	208	566	424	358	343	91	238	227
0:14:20	207	558	422	355	341	88	235	225
0:14:25	205	557	421	355	339	85	234	222
0:14:30	204	560	415	351	336	86	229	219
0:14:35	202	556	418	351	334	86	229	219
0:14:40	201	561	418	350	333	85	226	219
0:14:45	199	556	415	347	332	83	226	218
0:14:50	198	558	413	345	328	82	228	216
0:14:55	197	558	411	341	324	81	228	216
0:15:00	196	556	413	345	325	80	223	214

Appendix A  
STRUCTALL BUILDING SYSTEMS  
UL 1715

Time	T.C.#9 Doorway Deg. C	T.C.#10 Deg. C
-00:01:00	20	20
-00:00:55	20	20
-00:00:50	20	20
-00:00:45	20	20
-00:00:40	21	21
-00:00:35	21	21
-00:00:30	21	20
-00:00:25	20	20
-00:00:20	20	20
-00:00:15	20	20
-00:00:10	20	20
-00:00:05	20	20
0:00:00	20	20
0:00:05	20	20
0:00:10	20	20
0:00:15	20	21
0:00:20	21	34
0:00:25	23	50
0:00:30	29	75
0:00:35	31	89
0:00:40	34	97
0:00:45	38	103
0:00:50	40	110
0:00:55	43	120
0:01:00	43	129
0:01:05	47	136
0:01:10	48	145
0:01:15	51	160
0:01:20	58	169
0:01:25	59	184
0:01:30	64	196
0:01:35	80	208
0:01:40	81	222
0:01:45	84	235
0:01:50	88	246
0:01:55	95	260

Appendix A  
STRUCTALL BUILDING SYSTEMS  
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Time Hr:min:sec	T.C.#9 Doorway Deg. C	T.C.#10 Deg. C
0:02:45	112	319
0:02:50	108	331
0:02:55	104	328
0:03:00	106	330
0:03:05	112	331
0:03:10	116	333
0:03:15	116	333
0:03:20	110	331
0:03:25	111	331
0:03:30	114	328
0:03:35	115	332
0:03:40	110	332
0:03:45	112	334
0:03:50	110	339
0:03:55	117	334
0:04:00	108	335
0:04:05	111	336
0:04:10	109	330
0:04:15	110	331
0:04:20	110	329
0:04:25	106	329
0:04:30	103	330
0:04:35	111	331
0:04:40	108	333
0:04:45	115	332
0:04:50	110	330
0:04:55	110	329
0:05:00	115	333
0:05:05	116	335
0:05:10	115	334
0:05:15	117	329
0:05:20	112	332
0:05:25	108	332
0:05:30	103	329
0:05:35	104	330
0:05:40	108	331
0:05:45	103	329



Appendix A  
STRUCTALL BUILDING SYSTEMS  
UL 1715

Time Hr:min:sec	T.C.#9	T.C.#10
	Doorway Deg. C	Doorway Deg. C
0:06:30	114	332
0:06:35	114	333
0:06:40	125	339
0:06:45	119	336
0:06:50	124	337
0:06:55	122	335
0:07:00	119	336
0:07:05	123	337
0:07:10	115	339
0:07:15	116	343
0:07:20	114	342
0:07:25	117	340
0:07:30	120	342
0:07:35	121	342
0:07:40	114	342
0:07:45	112	343
0:07:50	114	338
0:07:55	115	343
0:08:00	107	343
0:08:05	109	347
0:08:10	113	346
0:08:15	110	347
0:08:20	113	355
0:08:25	119	349
0:08:30	123	351
0:08:35	120	350
0:08:40	119	350
0:08:45	116	354
0:08:50	120	351
0:08:55	124	352
0:09:00	118	352
0:09:05	125	356
0:09:10	124	354
0:09:15	123	353
0:09:20	120	358
0:09:25	116	359

Appendix A  
STRUCTALL BUILDING SYSTEMS  
UL 1715

Time	T.C.#9	T.C.#10
Hr:min:sec	Doorway Deg. C	Deg. C
0:10:15	107	371
0:10:20	113	374
0:10:25	112	372
0:10:30	121	364
0:10:35	121	366
0:10:40	121	364
0:10:45	124	362
0:10:50	122	363
0:10:55	122	360
0:11:00	120	360
0:11:05	123	363
0:11:10	120	366
0:11:15	115	362
0:11:20	113	358
0:11:25	113	350
0:11:30	113	349
0:11:35	118	345
0:11:40	116	344
0:11:45	112	342
0:11:50	110	342
0:11:55	111	336
0:12:00	115	333
0:12:05	119	325
0:12:10	118	323
0:12:15	110	320
0:12:20	108	319
0:12:25	110	314
0:12:30	112	309
0:12:35	127	306
0:12:40	117	299
0:12:45	111	297
0:12:50	106	292
0:12:55	110	287
0:13:00	119	283
0:13:05	119	280
0:13:10	133	276

Appendix A  
STRUCTALL BUILDING SYSTEMS  
UL 1715

Time	T.C.#9	T.C.#10
Hr:min:sec	Doorway Deg. C	Deg. C
0:14:00	110	242
0:14:05	108	242
0:14:10	99	241
0:14:15	95	241
0:14:20	95	241
0:14:25	96	241
0:14:30	95	238
0:14:35	97	237
0:14:40	101	236
0:14:45	99	235
0:14:50	99	235
0:14:55	105	233
0:15:00	109	234