

**Forest Service Handbook
National Headquarters - Washington Office
Washington, DC**

**Forest Service Handbook 2409.11 – National Forest Log Scaling Handbook
Appendix**

Amendment: 2409.11-2013-1

Effective date: June 26, 2013

Duration: This amendment is effective until superseded or removed.

Approved by: James M. Pena, Associate Deputy Chief, NFS

Date approved: June 7, 2013

Responsible Staff:

Last Change: 2409.11-2006-1 to FSH 2409.1

Superseded Document(s): 2409.11_appendix A-1 thru A-61, Amendment 2409.11-2006-1, October 30, 2006

Digest: Following is an explanation of the changes throughout the directive by section.

Appendix 4 and 5: Revises rounding errors in tables.

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Appendix 1 - Standard Division of Long Logs for Scaling - 20-foot Maximum Scaling Length

Length (feet)	Division of log--segment lengths in feet		
	Bottom	Middle	Top
21-----	11	-----	10
22-----	12	-----	10
23-----	12	-----	11
24-----	12	-----	12
25-----	13	-----	12
26-----	14	-----	12
27-----	14	-----	13
28-----	14	-----	14
29-----	15	-----	14
30-----	16	-----	14
31-----	16	-----	15
32-----	16	-----	16
33-----	17	-----	16
34-----	18	-----	16
35-----	18	-----	17
36-----	18	-----	18
37-----	19	-----	18
38-----	20	-----	18
39-----	20	-----	19
40-----	20	-----	20
41-----	14	14	13
42-----	14	14	14
43-----	15	14	14
44-----	16	14	14
45-----	16	15	14
46-----	16	16	14
47-----	16	16	15
48-----	16	16	16
49-----	17	16	16
50-----	18	16	16

In this table any log length and segment division will be used as the overtrim scaling length for the preceding length.

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Appendix 2 - Scribner Decimal C Log Rule - 4- to 20-foot Logs

[Board-foot volumes in tens—no taper considered]

Diameter (inches)	Log lengths in feet															
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	20
6	0.6	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1	1	1	2	2	2
7	0.6	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1	1	1	2	2	2
8	0.6	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1	1	1	2	2	2
9	0.6	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1	1	1	2	2	2
10	0.6	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1	1	1	2	2	2
11	0.6	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1	1	1	2	2	2
12	0.6	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1	1	1	2	2	2
13	0.6	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1	1	1	2	2	2
14	0.6	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1	1	1	2	2	2
15	0.6	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1	1	1	2	2	2
16	0.6	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1	1	1	2	2	2
17	0.6	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1	1	1	2	2	2
18	0.6	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1	1	1	2	2	2
19	0.6	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1	1	1	2	2	2
20	0.6	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1	1	1	2	2	2
21	0.6	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1	1	1	2	2	2
22	0.6	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1	1	1	2	2	2
23	0.6	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1	1	1	2	2	2
24	0.6	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1	1	1	2	2	2
25	0.6	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1	1	1	2	2	2

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Appendix 2 (continued) Scribner Decimal C Log Rule - 4- to 20-foot Logs

Diameter (Inches)	Log lengths in feet															
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	20
26	12	19	22	24	25	26	31	34	37	41	44	47	50	53	56	62
27	14	21	24	26	27	28	34	38	41	44	48	51	55	58	62	68
28	15	22	25	27	29	30	36	40	44	47	51	54	58	62	65	73
29	16	23	26	28	30	32	38	42	46	49	53	57	61	65	68	76
30	18	25	28	30	32	34	41	45	49	53	57	62	66	70	74	82
31	18	27	30	32	34	36	44	49	53	58	62	67	71	75	80	89
32	18	28	31	33	35	37	46	51	55	60	64	69	74	78	83	93
33	20	29	32	34	36	39	48	54	59	64	69	73	78	83	88	98
34	20	30	33	35	37	40	50	55	60	65	70	75	80	85	90	100
35	22	33	36	38	41	44	55	60	66	71	77	82	88	93	98	109
36	23	35	38	40	43	46	58	63	69	75	81	86	92	98	104	115
37	26	38	41	43	46	49	62	67	73	80	86	90	96	103	109	120
38	27	40	43	45	48	51	64	70	77	84	90	95	101	107	113	123
39	28	42	45	47	50	53	66	72	79	86	92	97	103	109	115	126
40	30	45	48	50	53	56	69	75	82	89	95	101	107	113	119	130
41	32	48	51	53	56	59	72	78	85	92	98	104	110	116	122	133
42	33	50	53	55	58	61	74	80	87	94	100	106	112	118	124	135
43	35	52	55	57	60	63	76	82	89	96	102	108	114	120	126	137
44	37	54	57	59	62	65	78	84	91	98	104	110	116	122	128	139
45	38	56	59	61	64	67	80	86	93	100	106	112	118	124	130	140
46	40	58	61	63	66	69	82	88	95	102	108	114	120	126	132	143
47	41	59	62	64	67	70	84	90	97	104	110	116	122	128	134	145
48	43	62	65	67	70	73	86	92	99	106	112	118	124	130	136	147
49	45	64	67	69	72	75	88	94	101	108	114	120	126	132	138	149
50	47	67	70	72	75	78	91	97	104	110	116	122	128	134	140	151

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Diameter (inches)	Log lengths in feet																
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	20	
51	48	61	73	85	97	110	122	134	146	158	170	183	195	207	219	243	
52	50	63	76	89	101	114	127	139	152	165	177	190	202	215	228	253	
53	52	66	79	92	105	118	132	145	158	171	184	197	210	224	237	263	
54	54	68	82	96	109	123	137	150	164	177	191	205	218	232	246	273	
55	56	71	85	99	113	127	142	156	170	184	198	212	227	241	255	283	
56	59	73	88	103	118	132	147	162	176	191	206	220	235	250	264	294	
57	61	76	91	107	122	137	152	167	183	198	213	228	244	259	274	304	
58	63	79	95	110	126	142	158	174	189	205	221	237	252	268	284	315	
59	65	81	98	114	131	147	163	180	196	212	229	245	261	278	294	327	
60	67	84	101	118	135	152	169	186	203	220	237	253	270	287	304	338	
61	70	87	105	123	140	158	175	193	210	228	245	263	280	298	315	350	
62	72	90	108	127	145	163	181	199	217	235	253	271	289	307	325	362	
63	74	93	112	131	149	168	187	205	224	243	261	280	299	317	336	373	
64	77	96	116	135	154	174	193	213	232	251	270	290	309	329	348	387	
65	79	99	119	139	159	179	199	219	239	259	279	299	319	339	358	398	
66	82	103	123	144	164	185	206	226	247	268	288	309	329	350	370	412	
67	85	106	127	148	170	191	212	233	254	275	297	318	339	360	381	423	
68	87	109	131	153	175	197	219	240	262	284	306	328	350	371	393	437	
69	90	113	135	158	180	203	226	248	271	294	316	339	361	384	406	452	
70	93	116	139	163	186	209	232	256	279	302	325	349	372	395	419	465	
71	96	120	144	167	192	215	240	263	287	311	335	359	383	407	430	478	
72	98	123	148	173	197	222	247	271	296	321	345	370	395	419	444	493	
73	101	127	152	178	203	229	254	280	305	330	356	381	406	432	457	508	
74	104	130	157	183	209	236	261	288	314	340	366	393	418	445	471	523	
75	107	134	161	188	215	242	269	296	323	350	377	404	430	458	484	538	

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Diameter (inches)	Log lengths in feet																
	4		5	6	7	8	9	10	11	12	13	14	15	16	17	18	20
76	110	138	166	194	221	249	277	304	332	360	387	415	443	470	496	553	
77	114	142	171	199	228	256	285	313	341	369	398	426	455	483	511	568	
78	117	146	176	205	234	263	293	322	351	380	410	439	468	497	527	585	
79	120	150	180	211	240	271	301	331	361	391	421	451	481	511	541	602	
80	123	154	185	216	247	278	309	340	371	402	432	464	494	526	556	618	
81	127	158	190	222	254	286	317	349	381	413	444	476	508	540	572	635	
82	130	163	196	228	261	293	326	358	391	424	456	489	521	554	586	652	
83	134	167	201	234	268	301	335	368	401	434	468	501	535	568	601	668	
84	137	171	206	240	275	309	343	378	412	446	481	515	549	584	618	687	
85	140	175	210	246	281	316	351	386	421	456	491	526	561	596	631	702	
86	143	179	215	251	287	323	359	395	431	467	503	539	575	611	646	718	
87	147	184	221	258	295	332	368	405	442	479	516	553	589	626	663	737	
88	150	188	226	264	301	339	377	414	452	490	527	565	603	640	678	753	
89	154	192	231	270	308	347	385	424	462	501	539	578	616	655	693	770	
90	157	196	235	275	315	354	393	433	472	511	551	590	629	669	708	787	
91	161	201	241	282	322	362	402	443	483	523	563	604	644	684	725	806	
92	164	205	246	288	329	370	411	452	493	534	575	616	657	698	740	822	
93	167	209	251	293	335	377	419	461	503	545	587	629	671	713	755	838	
94	171	214	257	300	343	386	428	471	514	557	600	643	686	728	771	857	
95	175	218	262	306	350	394	437	481	526	569	612	656	700	744	788	876	
96	178	223	266	313	357	402	446	491	536	581	625	670	715	759	804	893	
97	182	227	273	319	364	410	455	501	546	592	637	683	728	774	819	910	
98	185	232	278	325	371	418	464	511	557	603	650	696	743	789	836	928	
99	189	236	284	331	379	426	473	521	568	614	663	710	757	805	852	947	
100	193	241	289	338	386	434	482	531	579	627	676	724	772	820	869	966	

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Appendix 2 (continued) Scribner Decimal C Log Rule - 4- to 20-foot Logs

Diameter (Inches)	Log lengths in feet															
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	20
101	196	246	285	344	383	443	492	541	590	639	688	738	787	836	885	983
102	200	251	301	351	401	452	502	552	602	652	702	753	803	853	903	1003
103	204	256	307	358	409	461	512	563	614	665	716	768	819	870	921	1023
104	208	261	313	365	417	470	522	574	626	678	730	783	835	887	939	1043
105	212	266	319	372	425	479	532	585	638	691	744	798	851	904	957	1063
106	216	271	325	379	433	488	542	596	650	704	758	813	867	921	975	1083
107	221	276	331	387	442	497	553	608	663	718	773	829	884	939	995	1105
108	225	281	337	394	450	506	563	619	675	731	788	844	900	956	1013	1125
109	229	286	344	401	459	516	573	631	688	745	803	860	917	975	1032	1147
110	233	291	350	408	467	525	583	642	700	758	817	875	933	992	1050	1167
111	237	297	356	416	475	536	594	654	713	772	832	891	951	1010	1070	1188
112	241	302	362	423	483	544	604	665	725	785	846	906	967	1027	1088	1206
113	245	307	369	431	492	554	615	677	738	800	861	923	984	1046	1107	1230
114	250	313	375	438	501	563	626	688	751	814	876	939	1001	1064	1127	1252
115	254	318	382	446	509	573	637	700	764	828	891	955	1019	1082	1146	1273
116	259	324	389	454	519	584	648	713	778	843	908	973	1037	1102	1167	1297
117	264	330	396	462	528	594	660	726	792	858	924	990	1056	1122	1188	1320
118	268	336	403	470	537	605	672	739	806	873	940	1008	1075	1142	1209	1343
119	273	341	410	478	547	615	683	752	820	888	957	1025	1093	1162	1230	1367
120	278	347	417	487	556	626	695	765	834	904	973	1043	1112	1182	1253	1390

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Appendix 3 - Long Logs, Volume According to Taper, Maximum Scaling Length 20 feet

[Scribner Decimal C rule—board feet in tens]

Top diam. (in.)	22-foot logs (1 10- and 1 12-foot segment)								24-foot logs (2 12-foot segments)							
	Taper in inches (difference between diameters of 2 ends)															
	1-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16	1-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16
6.....	3	3	4	4	5	7	8	10	3	3	4	4	5	7	8	10
7.....	3	4	4	5	7	8	10	12	4	5	5	6	8	9	11	13
8.....	5	5	6	8	9	11	13	14	5	5	6	8	9	11	13	14
9.....	6	7	9	10	12	14	15	17	6	7	9	10	12	14	15	17
10.....	7	9	10	12	14	15	17	19	7	9	10	12	14	15	17	19
11.....	10	11	13	15	16	18	20	22	10	11	13	15	16	18	20	22
12.....	12	14	16	17	19	21	23	26	13	15	17	18	20	22	24	27
13.....	15	17	18	20	22	24	27	29	16	18	19	21	23	25	28	30
14.....	18	19	21	23	25	28	30	32	20	21	23	25	27	30	32	34
15.....	21	23	25	27	30	32	34	37	23	25	27	29	32	34	36	39
16.....	24	26	28	31	33	35	38	40	26	28	30	33	35	37	40	42
17.....	28	30	33	35	37	40	42	46	30	32	35	37	39	42	44	48
18.....	31	34	36	38	41	43	47	50	34	37	39	41	44	46	50	53
19.....	36	38	40	43	45	49	52	56	39	41	43	46	48	52	55	59
20.....	40	42	45	47	51	54	58	61	44	46	49	51	55	58	62	65
21.....	44	47	49	53	56	60	63	65	48	51	53	57	60	64	67	69
22.....	49	51	55	58	62	65	67	70	53	55	59	62	66	69	71	74
23.....	53	57	60	64	67	69	72	76	58	62	65	69	72	74	77	81
24.....	59	62	66	69	71	74	78	80	64	67	71	74	76	79	83	85
25.....	66	70	73	75	78	82	84	88	71	75	78	80	83	87	89	93
26.....	72	75	77	80	84	86	90	91	78	81	83	86	90	92	96	97
27.....	78	80	83	87	89	93	94	100	85	87	90	94	96	100	101	107
28.....	82	85	89	91	95	96	102	105	90	93	97	99	103	104	110	113
29.....	87	91	93	97	98	104	107	115	95	99	101	105	106	112	115	123
30.....	94	96	100	101	107	110	118	121	102	104	108	109	115	118	126	129
31.....	99	103	104	110	113	121	124	128	108	112	113	119	122	130	133	137
32.....	105	106	112	115	123	126	130	136	114	115	121	124	132	135	139	145
33.....	109	115	118	126	129	133	139	144	119	125	128	136	139	143	149	154
34.....	116	119	127	130	134	140	145	151	126	129	137	140	144	150	155	161
35.....	124	132	135	139	145	150	156	160	135	143	146	150	156	161	167	171
36.....	135	138	142	148	153	159	163	169	146	149	153	159	164	170	174	180
37.....	144	148	154	159	165	169	175	178	157	161	167	172	178	182	188	191
38.....	151	157	162	168	172	178	181	186	164	170	175	181	185	191	194	199
39.....	160	165	171	175	181	184	189	194	174	179	185	189	195	198	203	208
40.....	170	176	180	186	189	194	199	205	185	191	195	201	204	209	214	220
41.....	180	184	190	193	198	203	209	214	196	200	206	209	214	219	225	230
42.....	189	195	198	203	208	214	219	224	206	212	215	220	225	231	236	241
43.....	198	201	206	211	217	222	227	233	216	219	224	229	235	240	245	251
44.....	207	212	217	223	228	233	239	245	225	230	235	241	246	251	257	263
45.....	214	219	225	230	235	241	247	253	233	238	244	249	254	260	266	272
46.....	223	229	234	239	245	251	257	263	243	249	254	259	265	271	277	283
47.....	234	239	244	250	256	262	268	274	254	259	264	270	276	282	288	294
48.....	243	248	254	260	266	272	278	284	265	270	276	282	288	294	300	306
49.....	252	258	264	270	276	282	288	295	275	281	287	293	299	305	311	318
50.....	263	269	275	281	287	293	300	306	286	292	298	304	310	316	323	329

Refer to code 17.33 for scaling of butt logs.

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Appendix 3 (continued)

Long Logs, Volume According to Taper, Maximum Scaling Length 20 Feet

[Scribner Decimal C rule—board feet in tens]																
Top diam. (in.)	26-foot logs (1 12- and 1 14-foot segment)								28-foot logs (2 14-foot segments)							
	Taper in inches (difference between diameters of 2 ends)															
	1-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16	1-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16
6.....	3	3	4	5	6	8	9	11	3	3	4	5	6	8	9	11
7.....	4	5	6	7	9	10	12	14	4	5	6	7	9	10	12	14
8.....	5	6	7	9	10	12	14	16	5	6	7	9	10	12	14	16
9.....	7	8	10	11	13	15	17	19	7	8	10	11	13	15	17	19
10.....	8	10	11	13	15	17	19	22	9	11	12	14	16	18	20	23
11.....	11	12	14	16	18	20	23	25	12	13	15	17	19	21	24	26
12.....	14	16	18	20	22	25	27	30	15	17	19	21	23	26	28	31
13.....	17	19	21	23	26	28	31	34	18	20	22	24	27	29	32	35
14.....	21	23	25	28	30	33	36	38	22	24	26	29	31	34	37	39
15.....	25	27	30	32	35	38	40	44	26	28	31	33	36	39	41	45
16.....	28	31	33	36	39	41	45	47	30	33	35	38	41	43	47	49
17.....	33	35	38	41	43	47	49	54	35	37	40	43	45	49	51	56
18.....	37	40	43	45	49	51	56	60	40	43	46	48	52	54	59	63
19.....	42	45	47	51	53	58	62	66	45	48	50	54	56	61	65	69
20.....	48	50	54	56	61	65	69	72	51	53	57	59	64	68	72	75
21.....	52	56	58	63	67	71	74	78	56	60	62	67	71	75	78	80
22.....	58	60	65	69	73	76	78	82	62	64	69	73	77	80	82	86
23.....	63	68	72	76	79	81	85	90	68	73	77	81	84	86	90	95
24.....	70	74	78	81	83	87	92	94	75	79	83	86	88	92	97	99
25.....	78	82	85	87	91	96	98	103	84	88	91	93	97	102	104	109
26.....	85	88	90	94	99	101	106	107	92	95	97	101	106	108	113	114
27.....	92	94	98	103	105	110	111	118	99	101	105	110	112	117	118	125
28.....	97	101	106	108	113	114	121	125	104	108	113	115	120	121	128	132
29.....	103	108	110	115	116	123	127	136	110	115	117	122	123	130	134	143
30.....	111	113	118	119	126	130	139	142	119	121	126	127	134	138	147	150
31.....	117	122	123	130	134	143	146	151	126	131	132	139	143	152	155	160
32.....	124	125	132	136	145	148	153	160	133	134	141	145	154	157	162	169
33.....	129	136	140	149	152	157	164	170	139	146	150	159	162	167	174	180
34.....	137	141	150	153	158	165	171	177	147	151	160	163	168	175	181	187
35.....	147	156	159	164	171	177	183	188	158	167	170	175	182	188	194	199
36.....	159	162	167	174	180	186	191	198	171	174	179	186	192	198	203	210
37.....	170	175	182	188	194	199	206	210	183	188	195	201	207	212	219	223
38.....	178	185	191	197	202	209	213	219	191	198	204	210	215	222	226	232
39.....	189	195	201	206	213	217	223	229	203	209	215	220	227	231	237	243
40.....	201	207	212	219	223	229	235	241	216	222	227	234	238	244	250	256
41.....	212	217	224	228	234	240	246	252	228	233	240	244	250	256	262	268
42.....	223	230	234	240	246	252	258	265	239	246	250	256	262	268	274	281
43.....	234	238	244	250	256	262	269	275	251	255	261	267	273	279	286	292
44.....	244	250	256	262	268	275	281	288	262	268	274	280	286	293	299	306
45.....	253	259	265	271	278	284	291	298	272	278	284	290	297	303	310	317
46.....	264	270	276	283	289	296	303	310	284	290	296	303	309	316	323	330
47.....	275	281	288	294	301	308	315	322	296	302	309	315	322	329	336	343
48.....	287	294	300	307	314	321	328	336	308	315	321	328	335	342	349	357
49.....	299	305	312	319	326	333	341	348	321	327	334	341	348	355	363	370
50.....	310	317	324	331	338	346	353	361	334	341	348	355	362	370	377	385

Refer to code 17.33 for scaling of butt logs.

Forest Service Handbook 2409.11 – National Forest Log Scaling Handbook

Appendix

Amendment: 2409.11-2013-1

Effective date: June 26, 2013

Appendix 3 (continued)

Long Logs, Volume According to Taper, Maximum Scaling Length 20 Feet

[Scribner Decimal C rule—board feet in tens]

Top diam. (in.)	30-foot logs (1 14- and 1 16-foot segment)								32-foot logs (2 16-foot segments)							
	Taper in inches (difference between diameters of 2 ends)															
	1-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16	1-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16
6.....	4	4	5	7	8	9	11	12	5	5	6	8	9	10	12	13
7.....	5	6	8	9	10	12	13	16	6	7	9	10	11	13	14	17
8.....	6	8	9	10	12	13	16	18	7	9	10	11	13	14	17	19
9.....	9	10	11	13	14	17	19	21	10	11	12	14	15	18	20	22
10.....	11	12	14	15	18	20	22	25	13	14	16	17	20	22	24	27
11.....	13	15	16	19	21	23	26	29	15	17	18	21	23	25	28	31
12.....	17	18	21	23	25	28	31	35	18	19	22	24	26	29	32	36
13.....	19	22	24	26	29	32	36	38	21	24	26	28	31	34	38	40
14.....	24	26	28	31	34	38	40	43	25	27	29	32	35	39	41	44
15.....	28	30	33	36	40	42	45	50	30	32	35	38	42	44	47	52
16.....	32	35	38	42	44	47	52	54	34	37	40	44	46	49	54	56
17.....	37	40	44	46	49	54	56	62	39	42	46	48	51	56	58	64
18.....	43	47	49	52	57	59	65	69	45	49	51	54	59	61	67	71
19.....	49	51	54	59	61	67	71	76	52	54	57	62	64	70	74	79
20.....	54	57	62	64	70	74	79	82	58	61	66	68	74	78	83	86
21.....	60	65	67	73	77	82	85	88	63	68	70	76	80	85	88	91
22.....	67	69	75	79	84	87	90	95	71	73	79	83	88	91	94	99
23.....	73	79	83	88	91	94	99	104	78	84	88	93	96	99	104	109
24.....	81	85	90	93	96	101	106	109	86	90	95	98	101	106	111	114
25.....	90	95	98	101	106	111	114	118	96	101	104	107	112	117	120	124
26.....	99	102	105	110	115	118	122	124	105	108	111	116	121	124	128	130
27.....	106	109	114	119	122	126	128	136	113	116	121	126	129	133	135	143
28.....	112	117	122	125	129	131	139	143	119	124	129	132	136	138	146	150
29.....	119	124	127	131	133	141	145	156	127	132	136	139	141	149	153	164
30.....	128	131	135	137	145	149	160	164	137	140	144	146	154	158	169	173
31.....	136	140	142	150	154	165	169	174	145	149	151	159	163	174	178	183
32.....	142	144	152	156	167	171	176	184	152	154	162	166	177	181	186	194
33.....	149	157	161	172	176	181	189	196	158	166	170	181	185	190	198	205
34.....	158	162	173	177	182	190	197	204	168	172	183	187	192	200	207	214
35.....	169	180	184	189	197	204	211	217	180	191	195	200	208	215	222	228
36.....	184	188	193	201	208	215	221	229	195	199	204	212	219	226	232	240
37.....	197	202	210	217	224	230	238	242	210	215	223	230	237	243	251	255
38.....	205	213	220	227	233	241	245	252	219	227	234	241	247	255	259	266
39.....	218	225	232	238	246	250	257	264	232	239	246	252	260	264	271	278
40.....	232	239	245	253	257	264	271	278	247	254	260	268	272	279	286	293
41.....	245	251	259	263	270	277	284	291	261	267	275	279	286	293	300	307
42.....	257	265	269	276	283	290	297	304	274	282	286	293	300	307	314	321
43.....	270	274	281	288	295	302	309	317	288	292	299	306	313	320	327	335
44.....	281	288	295	302	309	316	324	331	300	307	314	321	328	335	343	350
45.....	292	299	306	313	320	328	335	343	311	318	325	332	339	347	354	362
46.....	305	312	319	326	334	341	349	357	325	332	339	346	354	361	369	377
47.....	318	325	332	340	347	355	363	372	339	346	353	361	368	376	384	393
48.....	331	338	346	353	361	369	378	386	353	360	368	375	383	391	400	408
49.....	344	352	359	367	375	384	392	401	367	375	382	390	398	407	415	424
50.....	359	366	374	382	391	399	408	416	382	389	397	405	414	422	431	439

Refer to code 17.33 for scaling of butt logs.

Appendix

Amendment: 2409.11-2013-1

Effective date: June 26, 2013

Appendix 3 (continued)

Long Logs, Volume According to Taper, Maximum Scaling Length 20 Feet

[Scribner Decimal C rule—board feet in tens]

Top diam. (in.)	34-foot logs (1 16- and 1 18-foot segment)								36-foot logs (2 18-foot segments)							
	Taper in inches (difference between diameters of 2 ends)															
	1-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16	1-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16
6	5	5	6	8	10	11	13	15	5	5	6	8	10	11	13	15
7	6	7	9	11	12	14	16	19	6	7	9	11	12	14	16	19
8	7	9	11	12	14	16	19	21	7	9	11	12	14	16	19	21
9	10	12	13	15	17	20	22	25	10	12	13	15	17	20	22	25
10	14	15	17	19	22	24	27	30	14	15	17	19	22	24	27	30
11	16	18	20	23	25	28	31	34	17	19	21	24	26	29	32	35
12	19	21	24	26	29	32	35	39	20	22	25	27	30	33	36	40
13	23	26	28	31	34	37	41	44	24	27	29	32	35	38	42	45
14	27	29	32	35	38	42	45	49	29	31	34	37	40	44	47	51
15	32	35	38	41	45	48	52	56	34	37	40	43	47	50	54	58
16	37	40	43	47	50	54	58	61	39	42	45	49	52	56	60	63
17	42	45	49	52	56	60	63	70	45	48	52	55	59	63	66	73
18	48	52	55	59	63	66	73	77	51	55	58	62	66	69	76	80
19	55	58	62	66	69	76	80	86	58	61	65	69	72	79	83	89
20	62	66	70	73	80	84	90	93	65	69	73	76	83	87	93	96
21	68	72	75	82	86	92	95	98	72	76	79	86	90	96	99	102
22	75	78	85	89	95	98	101	107	80	83	90	94	100	103	106	112
23	83	90	94	100	103	106	112	118	87	94	98	104	107	110	116	122
24	92	96	102	105	108	114	120	123	97	101	107	110	113	119	125	128
25	102	108	111	114	120	126	129	134	108	114	117	120	126	132	135	140
26	112	115	118	124	130	133	138	140	118	121	124	130	136	139	144	146
27	120	123	129	135	138	143	145	153	127	130	136	142	145	150	152	160
28	126	132	138	141	146	148	156	162	133	139	145	148	153	155	163	169
29	135	141	144	149	151	159	165	177	142	148	151	156	158	166	172	184
30	146	149	154	156	164	170	182	186	154	157	162	164	172	178	190	194
31	154	159	161	169	175	187	191	197	163	168	170	178	184	196	200	206
32	162	164	172	178	190	194	200	209	171	173	181	187	199	203	209	218
33	168	176	182	194	198	204	213	221	178	186	192	204	208	214	223	231
34	178	184	196	200	206	215	223	231	188	194	206	210	216	225	233	241
35	192	204	208	214	223	231	239	245	202	214	218	224	233	241	249	255
36	208	212	218	227	235	243	249	258	220	224	230	239	247	255	261	270
37	223	229	238	246	254	260	269	274	236	242	251	259	267	273	282	287
38	233	242	250	258	264	273	278	285	246	255	263	271	277	286	291	298
39	247	255	263	269	278	283	290	298	261	269	277	283	292	297	304	312
40	263	271	277	286	291	298	306	314	278	286	292	301	306	313	321	329
41	278	284	293	298	305	313	321	329	294	300	309	314	321	329	337	345
42	291	300	305	312	320	328	336	345	308	317	322	329	337	345	353	362
43	306	311	318	326	334	342	351	359	323	328	335	343	351	359	368	376
44	319	326	334	342	350	359	367	376	337	344	352	360	368	377	385	394
45	330	338	346	354	363	371	380	389	349	357	365	373	382	390	399	408
46	345	353	361	370	378	387	396	405	364	372	380	389	397	406	415	424
47	360	368	377	385	394	403	412	421	380	388	397	405	414	423	432	441
48	375	384	392	401	410	419	428	437	396	405	413	422	431	440	449	458
49	391	399	408	417	426	435	444	454	413	421	430	439	448	457	466	476
50	406	415	424	433	442	451	461	471	430	439	448	457	466	475	485	495

Refer to code 17.33 for scaling of butt logs.

Appendix

Amendment: 2409.11-2013-1

Effective date: June 26, 2013

Appendix 3 (continued)

Long Logs, Volume According to Taper, Maximum Scaling Length 20 Feet

[Scribner Decimal C rule—board feet in tens]

Top diam. (In.)	38-foot logs (1 18- and 1 20-foot segment)								40-foot logs (2 20-foot segments)							
	Taper in inches (difference between diameters of 2 ends)															
	1-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16	1-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16
6.....	5	5	6	9	10	12	14	16	5	5	6	9	10	12	14	16
7.....	6	7	10	11	13	15	17	21	6	7	10	11	13	15	17	21
8.....	7	10	11	13	15	17	21	23	7	10	11	13	15	17	21	23
9.....	11	12	14	16	18	22	24	27	11	12	14	16	18	22	24	27
10.....	14	16	18	20	24	26	29	33	15	17	19	21	25	27	30	34
11.....	18	20	22	26	28	31	35	38	18	20	22	26	28	31	35	38
12.....	21	23	27	29	32	36	39	44	22	24	28	30	33	37	40	45
13.....	25	29	31	34	38	41	46	49	26	30	32	35	39	42	47	50
14.....	31	33	36	40	43	48	51	55	32	34	37	41	44	49	52	56
15.....	36	39	43	46	51	54	58	63	38	41	45	48	53	56	60	65
16.....	41	45	48	53	56	60	65	68	43	47	50	55	58	62	67	70
17.....	48	51	56	59	63	68	71	78	50	53	58	61	65	70	73	80
18.....	54	59	62	66	71	74	81	86	57	62	65	69	74	77	84	89
19.....	62	65	69	74	77	84	89	95	65	68	72	77	80	87	92	98
20.....	69	73	78	81	88	93	99	104	73	77	82	85	92	97	103	108
21.....	76	81	84	91	96	102	107	110	80	85	88	95	100	106	111	114
22.....	85	88	95	100	106	111	114	120	89	92	99	104	110	115	118	124
23.....	92	99	104	110	115	118	124	131	97	104	109	115	120	123	129	136
24.....	102	107	113	118	121	127	134	137	107	112	118	123	126	132	139	142
25.....	114	120	125	128	134	141	144	150	119	125	130	133	139	146	149	155
26.....	124	129	132	138	145	148	154	156	130	135	138	144	151	154	160	162
27.....	135	138	144	151	154	160	162	171	141	144	150	157	160	166	168	177
28.....	141	147	154	157	163	165	174	180	149	155	162	165	171	173	182	188
29.....	150	157	160	166	168	177	183	197	158	165	168	174	176	185	191	205
30.....	163	166	172	174	183	189	203	207	171	174	180	182	191	197	211	215
31.....	172	178	180	189	195	209	213	220	181	187	189	198	204	218	222	229
32.....	181	183	192	198	212	216	223	233	190	192	201	207	221	225	232	242
33.....	188	197	203	217	221	228	238	247	198	207	213	227	231	238	248	257
34.....	199	205	219	223	230	240	249	258	209	215	229	233	240	250	259	268
35.....	213	227	231	238	248	257	266	272	224	238	242	249	259	268	277	283
36.....	233	237	244	254	263	272	278	289	244	248	255	265	274	283	289	300
37.....	249	256	266	275	284	290	301	306	262	269	279	288	297	303	314	319
38.....	260	270	279	288	294	305	310	318	273	283	292	301	307	318	323	331
39.....	276	285	294	300	311	316	324	333	290	299	308	314	325	330	338	347
40.....	294	303	309	320	325	333	342	351	309	318	324	335	340	348	357	366
41.....	311	317	328	333	341	350	359	368	327	333	344	349	357	366	375	384
42.....	325	336	341	349	358	367	376	385	342	353	358	366	375	384	393	402
43.....	342	347	355	364	373	382	391	400	359	364	372	381	390	399	408	417
44.....	356	364	373	382	391	400	409	419	375	383	392	401	410	419	428	438
45.....	369	378	387	396	405	414	424	434	388	397	406	415	424	433	443	453
46.....	385	394	403	412	421	431	441	451	405	414	423	432	441	451	461	471
47.....	402	411	420	429	439	449	459	469	423	432	441	450	460	470	480	490
48.....	419	428	437	447	457	467	477	488	441	450	459	469	479	489	499	510
49.....	436	445	455	465	475	485	496	506	459	468	478	488	498	508	519	529
50.....	454	464	474	484	494	505	515	526	477	487	497	507	517	528	538	549

Refer to code 17.33 for scaling of butt logs.

Appendix

Amendment: 2409.11-2013-1

Effective date: June 26, 2013

Appendix 3 (continued)

Long Logs, Volume According to Taper, Maximum Scaling Length 20 Feet

[Scribner Decimal C rule—board feet in tens]

Top diam. (in.)	42-foot logs (three 14-foot segments)										44-foot logs (two 14- and one 16-foot segments)									
	Taper in Inches (difference between diameters of 2 ends)																			
	1	2-3	4	5-6	7	8-9	10	11-12	13	14-15	1	2-3	4	5-6	7	8-9	10	11-12	13	14-15
6	5	5	6	7	9	11	13	15	18	20	6	6	7	9	11	12	15	16	20	22
7	6	7	9	10	13	14	17	19	23	25	7	8	11	12	14	16	18	21	25	27
8	8	9	11	13	15	17	21	23	26	29	9	11	13	14	17	18	23	25	28	31
9	11	12	15	16	20	22	25	27	32	34	13	14	16	18	21	24	27	29	34	37
10	14	16	19	21	24	26	30	33	37	40	16	17	21	22	26	28	32	35	40	44
11	19	20	23	25	29	31	36	38	43	46	20	22	24	27	31	33	38	41	47	49
12	23	25	29	31	35	38	42	45	50	52	25	26	31	33	37	40	45	49	53	56
13	28	30	34	36	41	43	48	51	56	60	29	32	36	38	43	46	52	54	60	65
14	34	36	40	43	47	50	56	58	64	66	36	38	42	45	50	54	59	62	69	71
15	40	42	47	49	55	58	62	66	71	76	42	44	49	52	59	61	66	71	76	82
16	46	48	54	57	62	64	71	73	81	85	48	51	57	61	65	68	76	78	87	91
17	54	56	61	64	69	73	78	83	89	93	56	59	65	67	73	78	83	89	95	100
18	61	64	70	72	79	81	88	92	100	103	64	68	73	76	84	86	94	98	107	110
19	69	72	77	81	85	90	98	102	107	109	73	75	81	86	90	96	104	109	114	117
20	78	80	86	88	97	101	107	110	117	121	81	84	91	93	103	107	114	117	125	130
21	85	89	95	100	106	110	118	120	128	133	89	94	100	106	112	117	125	128	137	142
22	95	97	104	108	117	120	126	130	139	141	100	102	110	114	124	127	134	139	148	151
23	103	108	117	121	128	130	138	143	148	153	108	114	123	128	135	138	147	152	158	162
24	115	119	127	130	136	140	148	150	157	158	121	125	134	137	144	149	157	160	166	168
25	128	132	139	141	148	153	157	162	167	174	134	139	146	149	157	162	167	171	177	185
26	140	143	148	152	159	161	170	171	183	187	147	150	156	161	168	171	179	181	194	198
27	150	152	158	163	169	174	180	187	193	202	157	160	167	172	179	183	190	198	204	215
28	157	161	170	172	182	183	192	198	210	213	165	170	179	182	191	193	203	207	223	227
29	167	172	179	184	187	194	203	212	216	221	176	181	189	193	197	205	214	225	230	235
30	181	183	190	191	203	207	217	220	232	239	190	193	199	201	214	218	230	234	246	254
31	190	195	201	208	213	222	232	237	248	254	200	204	211	219	224	235	246	251	263	270
32	202	203	211	215	231	234	243	250	265	271	211	213	222	226	244	248	257	265	281	288
33	209	216	227	236	243	248	264	270	279	284	219	227	238	249	257	262	279	286	296	302
34	224	228	241	244	258	265	274	280	290	297	235	239	254	258	272	280	290	297	308	316
35	239	248	260	265	275	281	292	297	311	315	250	261	274	279	290	297	309	315	330	334
36	261	264	272	279	290	296	308	315	325	331	274	278	286	294	306	313	326	334	344	351
37	276	281	293	299	312	317	330	334	346	352	290	295	308	315	329	335	349	353	366	373
38	289	296	309	315	326	333	343	349	360	366	303	311	325	332	344	352	362	369	381	388
39	308	314	326	331	344	348	359	365	378	384	323	330	343	349	363	367	379	386	400	407
40	327	333	344	351	360	366	379	385	395	402	343	350	362	370	379	386	400	407	418	425
41	345	350	362	366	379	385	395	401	414	420	362	368	381	385	399	406	417	424	437	445
42	361	368	379	385	395	401	413	420	432	439	379	387	398	405	416	423	436	443	457	464
43	380	384	394	400	412	418	431	437	450	457	399	403	414	421	434	441	454	462	475	483
44	395	401	413	419	431	438	450	457	470	477	414	421	434	441	454	461	475	482	496	504
45	411	417	429	435	448	454	467	474	488	495	431	438	451	458	471	479	492	500	515	524
46	429	435	447	454	466	473	487	494	507	515	450	457	470	477	491	498	513	521	536	544
47	447	453	466	472	486	493	506	513	528	535	469	476	489	497	511	519	533	542	557	566
48	465	472	485	492	505	512	526	534	548	556	488	495	510	517	531	539	555	563	579	587
49	485	491	504	511	525	532	547	554	569	577	508	516	529	537	552	561	576	585	600	609
50	504	511	525	532	546	554	568	576	591	599	529	536	551	559	575	583	599	607	623	632

Refer to code 17.33 for scaling of butt logs.

Forest Service Handbook 2409.11 – National Forest Log Scaling Handbook

Appendix

Amendment: 2409.11-2013-1

Effective date: June 26, 2013

Appendix 3 (continued)

Long Logs, Volume According to Taper, Maximum Scaling Length 20 Feet

[Scribner Decimal C rule—board feet in tens]

Top diam. (in.)	46-foot logs (1 14- and 2 16-foot segments)										48-foot logs (3 16-foot segments)									
	Taper in inches (difference between diameters of 2 ends)																			
	1	2-3	4	5-6	7	8-9	10	11-12	13	14-15	1	2-3	4	5-6	7	8-9	10	11-12	13	14-15
6.....	7	7	8	10	12	13	17	18	22	24	8	8	9	11	13	14	18	19	23	25
7.....	8	9	12	13	16	18	20	23	26	28	9	10	13	14	17	19	21	24	27	29
8.....	10	12	15	16	19	20	24	26	30	33	11	13	16	17	20	21	25	27	31	34
9.....	15	16	18	20	22	25	29	31	35	38	16	17	19	21	23	26	30	32	36	39
10.....	18	19	22	23	28	30	33	36	42	46	20	21	24	25	30	32	35	38	44	48
11.....	21	23	26	29	32	34	40	43	49	51	23	25	28	31	34	38	42	45	51	53
12.....	27	28	32	34	39	42	47	51	55	58	28	29	33	35	40	43	48	52	56	59
13.....	30	33	38	40	45	48	54	56	62	67	32	35	40	42	47	50	56	58	64	69
14.....	38	40	44	47	52	56	61	64	72	74	39	41	45	48	53	57	62	65	73	75
15.....	44	46	51	54	61	63	69	74	80	86	46	48	53	56	63	65	71	76	82	88
16.....	50	53	59	63	68	71	80	82	90	94	52	55	61	65	70	73	82	84	92	96
17.....	58	61	68	70	77	82	86	92	99	104	60	63	70	72	79	84	88	94	101	106
18.....	67	71	77	80	87	89	98	102	112	115	69	73	79	82	89	91	100	104	114	117
19.....	77	79	84	89	94	100	109	114	119	122	80	82	87	92	97	103	112	117	122	125
20.....	84	87	95	97	108	112	119	122	131	136	88	91	99	101	112	116	123	126	135	140
21.....	93	98	105	111	117	122	131	134	143	148	96	101	108	114	120	125	134	137	146	151
22.....	105	107	115	119	130	133	140	145	155	158	109	111	119	123	134	137	144	149	159	162
23.....	113	119	129	134	141	144	154	159	165	169	118	124	134	139	146	149	159	164	170	174
24.....	127	131	140	143	151	156	164	167	174	176	132	136	145	148	156	161	169	172	179	181
25.....	140	145	153	156	164	169	175	179	186	194	146	151	159	162	170	175	181	185	192	200
26.....	164	157	163	168	176	179	188	190	203	207	160	163	169	174	182	185	194	196	209	213
27.....	164	167	175	180	188	192	199	207	214	225	171	174	182	187	195	199	206	214	221	232
28.....	173	178	188	191	200	202	213	217	232	236	180	185	195	198	207	209	220	224	239	243
29.....	185	190	198	202	207	215	223	234	240	245	198	198	206	210	215	223	231	242	248	253
30.....	199	202	209	211	223	227	240	244	257	265	208	211	218	220	232	236	249	253	266	274
31.....	210	214	220	228	234	245	257	262	274	281	219	223	229	237	243	254	266	271	283	290
32.....	220	222	232	236	255	259	268	276	294	301	230	232	242	246	265	269	278	286	304	311
33.....	229	237	249	260	268	273	292	299	310	316	238	246	258	269	277	282	301	308	319	325
34.....	246	250	265	269	285	293	304	311	322	330	256	260	275	279	295	303	314	321	332	340
35.....	261	272	287	292	304	311	323	329	345	349	272	283	298	303	315	322	334	340	356	360
36.....	287	291	300	308	320	327	341	349	360	367	298	302	311	319	331	338	352	360	371	378
37.....	304	309	322	329	344	350	365	369	383	390	317	322	335	342	357	363	378	382	396	403
38.....	317	325	340	347	360	368	379	386	399	406	331	339	354	361	374	382	393	400	413	420
39.....	338	345	359	365	380	384	397	404	419	426	352	359	373	379	394	398	411	418	433	440
40.....	359	366	379	387	397	404	419	426	437	444	374	381	394	402	412	419	434	441	452	459
41.....	379	385	399	403	418	425	436	443	457	465	395	401	415	419	434	441	452	459	473	481
42.....	397	405	417	424	435	442	456	463	478	485	414	422	434	441	452	459	473	480	495	502
43.....	418	422	433	440	454	461	475	483	497	505	436	440	451	458	472	479	493	501	515	523
44.....	433	440	454	461	475	482	497	504	519	527	452	459	473	480	494	501	516	523	538	546
45.....	451	453	472	479	493	501	515	523	538	547	470	477	491	498	512	520	534	542	557	566
46.....	471	478	492	499	514	521	536	544	561	569	491	498	512	519	534	541	556	564	581	589
47.....	491	498	512	520	534	542	558	567	582	591	512	519	533	541	555	563	579	588	603	612
48.....	511	518	533	540	556	564	580	588	605	613	533	540	555	562	578	586	602	610	627	635
49.....	531	539	554	562	577	586	602	611	627	636	554	562	577	585	600	609	625	634	650	659
50.....	554	561	576	584	601	609	626	634	652	661	577	584	599	607	624	632	649	657	675	684

Refer to code 17.33 for scaling of butt logs.

Forest Service Handbook 2409.11 – National Forest Log Scaling Handbook

Appendix

Amendment: 2409.11-2013-1

Effective date: June 26, 2013

Appendix 4 - Deductions for Squared Defects from Solid Board-Foot Contents Based on Formula¹

End dimensions, Inches ²	Deductions for defect length, in feet, of -																
	4	5	6	7	8	9	10	11	12	13	14	15	16 ³	17 ³	18 ³	19 ³	20 ³
2 x 2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
3 x 3	.....	.....	.....	.....	.....	1	1	1	1	1	1	1	1	1	1	1	1
4 x 4	.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 x 5	1	1	1	1	1	2	2	2	2	2	2	2	3	3	3	3	2
6 x 6	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5
7 x 7	1	2	2	2	3	3	3	4	4	4	5	5	5	6	6	6	7
8 x 8	2	2	3	3	3	4	4	5	5	6	6	6	7	7	8	8	9
9 x 9	2	3	3	4	4	5	5	6	6	7	8	8	9	9	10	10	11
10 x 10	3	3	4	5	5	6	7	7	8	9	9	10	11	11	12	13	13
11 x 11	3	4	5	6	6	7	8	9	10	10	11	12	13	14	15	15	16
12 x 12	4	5	6	7	8	9	10	11	12	12	13	14	15	16	17	18	19
13 x 13	5	6	7	8	9	10	11	12	14	15	16	17	18	19	20	21	23
14 x 14	5	7	8	9	10	12	13	14	16	17	18	20	21	22	24	25	26
15 x 15	6	8	9	11	12	14	15	17	18	20	21	23	24	26	27	29	30
16 x 16	7	9	10	12	14	15	17	19	20	22	24	26	27	29	31	32	34

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Appendix

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Effective date: June 26, 2013

Appendix 4 (continued)

Deductions for Squared Defects from Solid Board-foot Contents, Based on Formula¹

End dimensions, inches ²	Deductions for defect length, in feet, of -																
	4	5	6	7	8	9	10	11	12	13	14	15	16 ³	17 ³	18 ³	19 ³	20 ³
17 x 17	8	10	12	13	15	17	19	21	23	25	27	29	31	33	35	37	39
18 x 18	9	11	13	15	17	19	22	24	26	28	30	32	35	37	39	41	43
19 x 19	10	12	14	17	19	22	24	26	29	31	34	36	39	41	43	46	48
20 x 20	11	13	16	19	21	24	27	29	32	35	37	40	43	45	48	51	53
21 x 21	12	15	18	21	24	26	29	32	35	38	41	44	47	50	53	56	59
22 x 22	13	16	19	23	26	29	32	35	39	42	45	48	52	55	58	61	65
23 x 23	14	18	21	25	28	32	35	39	42	46	49	53	56	60	63	67	71
24 x 24	15	19	23	27	31	35	38	42	46	50	54	58	61	65	69	73	77
25 x 25	17	21	25	29	33	38	42	46	50	54	58	63	67	71	75	79	83
26 x 26	18	23	27	32	36	41	45	50	54	59	63	68	72	77	81	86	90
27 x 27	19	24	29	34	39	44	49	53	58	63	68	73	78	83	87	92	97
28 x 28	21	26	31	37	42	47	52	57	63	68	73	78	84	89	94	99	105
29 x 29	22	28	34	39	45	50	56	62	67	73	78	84	90	95	101	107	112
30 x 30	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120

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Appendix

Amendment: 2409.11-2013-1

Effective date: June 26, 2013

Appendix 5 - Deductions for Rectangular Defects, from Solid Board-Foot Contents

End dimen- sions, Inches	Deductions for defect length, in feet, of -																
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
2 x 3	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	1	1	1	1	1	1
4	.....	.....	.....	.....	.....	.....	1	1	1	1	1	1	1	1	1	1	1
5	.....	.....	.....	.....	1	1	1	1	1	1	1	1	1	1	1	1	1
6	.....	.....	.....	1	1	1	1	1	1	1	1	1	1	1	1	2	2
7	.....	.....	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2
3 x 4	.....	.....	.....	1	1	1	1	1	1	1	1	1	1	1	1	2	2
5	.....	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
6	.....	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2
7	1	1	1	1	1	1	1	2	2	2	2	2	2	2	3	3	3
8	1	1	1	1	1	1	1	2	2	2	3	3	3	3	3	3	3
9	1	1	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4
10	1	1	1	1	2	2	2	2	2	3	3	3	3	3	4	4	4
11	1	1	1	2	2	2	2	2	3	3	3	3	4	4	4	4	4
4 x 5	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	3	3
6	1	1	1	1	1	1	2	2	2	2	2	2	3	3	3	3	3
7	1	1	1	1	1	1	2	2	2	2	3	3	3	3	3	4	4
8	1	1	1	1	2	2	2	2	3	3	3	3	3	4	4	4	4
9	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5
10	1	1	2	2	2	2	3	3	3	3	4	4	4	5	5	5	5
11	1	1	2	2	2	3	3	3	4	4	4	4	5	5	5	6	6
12	1	2	2	2	3	3	3	4	4	4	4	5	5	5	6	6	6
13	1	2	2	2	3	3	3	4	4	5	5	5	6	6	6	7	7

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Appendix 5 (continued)

Deductions for Rectangular Defects, From Solid Board-foot Contents

End dimen- sions, Inches	Deductions for defect length, in feet, of -																	
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
5x6	1	1	1	1	2	2	2	2	2	3	3	3	3	3	4	4	4	
	7	1	1	2	2	2	2	3	3	3	3	4	4	4	5	5	5	
	8	1	2	2	2	2	3	3	4	4	4	5	5	5	6	6	6	
	9	1	2	2	2	3	3	4	4	4	5	5	5	6	6	7	7	
	10	1	2	2	3	3	4	4	4	5	5	6	6	6	7	7	7	
	11	1	2	2	3	3	4	4	5	5	6	6	6	7	7	8	8	
	12	2	2	2	3	3	4	4	5	5	6	7	7	7	8	8	9	
	13	2	2	3	3	3	4	4	5	6	6	7	7	7	8	9	9	
	14	2	2	3	3	4	4	5	5	6	7	7	8	8	9	10	10	
	15	2	3	3	4	4	5	5	6	6	7	8	8	9	9	10	11	
	16	2	3	3	4	4	5	5	6	6	7	8	9	9	10	10	11	
	6x7	1	1	2	2	2	3	3	3	3	4	4	4	4	5	5	5	6
		8	1	2	2	2	3	3	4	4	4	4	5	5	5	6	6	6
		9	1	2	2	3	3	4	4	4	5	5	5	6	6	7	7	7
		10	2	2	2	3	3	4	4	5	5	6	6	6	7	7	8	8
		11	2	2	3	3	4	4	5	5	6	6	7	7	7	8	8	9
12		2	2	3	3	4	5	5	6	6	7	7	8	8	9	9	10	
13		2	3	3	4	4	5	6	6	7	7	8	8	9	9	10	10	
14		2	3	3	4	5	6	6	7	8	8	9	9	10	10	11	11	
15		2	3	4	4	5	6	6	7	8	9	9	10	10	11	11	12	
16		3	3	4	4	5	6	6	7	8	9	10	10	11	12	12	13	
17		3	3	4	5	5	6	7	7	8	9	10	10	11	12	13	14	
18		3	4	4	5	6	6	7	8	9	10	11	12	12	13	14	14	
19		3	4	5	5	6	7	8	8	9	10	11	12	13	14	14	15	
20		3	4	5	6	6	7	8	9	10	10	11	12	13	14	15	16	
21		3	4	5	6	7	8	8	9	10	11	12	13	13	14	15	16	
22		4	4	5	6	7	8	9	10	11	11	12	13	14	15	16	17	18

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Appendix 5 (continued)

Deductions for Rectangular Defects, From Solid Board-foot Contents

End dimen- sions, Inches	Deductions for defect length, in feet, of -																	
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
7 x 8	1	2	2	3	3	3	4	4	4	5	5	6	6	6	7	7	7	
	2	2	3	3	3	4	4	5	5	6	6	7	7	7	8	8	8	
	2	2	3	3	4	4	5	5	6	6	7	7	8	8	8	9	9	
	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10	
	2	3	3	4	4	5	6	6	7	7	8	8	9	10	10	11	11	
	2	3	4	4	5	5	6	7	7	8	8	9	10	10	11	12	12	
	2	3	4	4	5	5	6	7	8	8	9	10	10	11	12	12	13	
	3	3	4	5	5	6	7	7	8	8	9	10	11	11	12	13	14	
	3	3	4	5	6	6	7	8	8	9	10	11	12	12	13	14	15	
	3	4	4	5	6	7	7	8	9	10	10	11	12	13	13	14	15	
	3	4	4	5	6	7	8	8	9	10	11	12	13	13	14	15	16	
	3	4	5	6	7	8	8	9	10	11	12	13	14	15	16	17	18	
	4	4	5	6	7	7	8	9	10	11	12	13	14	15	16	17	18	
	4	5	6	7	7	8	9	10	11	12	13	14	15	16	17	18	19	
	4	5	6	7	8	9	10	11	12	13	15	16	17	18	19	20	21	
	8 x 9	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10
		2	3	3	4	4	5	5	6	6	7	7	8	9	9	10	10	11
		2	3	4	4	5	5	6	6	7	8	8	9	9	10	11	11	12
		3	3	4	4	5	6	6	7	8	8	9	10	10	11	12	12	13
		3	3	4	5	6	6	7	8	8	9	10	10	11	12	12	13	14
		3	4	4	5	6	7	7	8	9	10	10	11	12	13	13	14	15
		3	4	5	6	6	7	8	9	10	10	11	12	13	14	15	16	17
		3	4	5	6	7	8	9	9	10	11	12	13	14	15	16	17	18
		4	5	6	7	8	9	10	11	12	12	13	14	15	16	17	18	19
4		5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
4		5	6	7	9	10	11	12	13	14	15	16	17	18	19	20	21	

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Appendix 5 (continued)

Deductions for Rectangular Defects, From Solid Board-foot Contents

End dimen- sions, Inches	Deductions for defect length, in feet, of -																
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
8 x 21	4	6	7	8	9	10	11	12	13	15	16	17	18	19	20	21	22
	5	6	7	8	9	11	12	13	14	15	16	18	19	20	21	22	23
	5	6	7	9	10	11	12	13	15	16	17	18	20	21	22	23	25
	5	6	8	9	10	12	13	14	15	17	18	19	20	22	23	24	26
	5	7	8	9	11	12	13	15	16	17	19	20	21	23	24	25	27
	6	7	8	10	11	12	14	15	17	18	19	21	22	24	25	26	28
	6	7	9	10	12	13	14	16	17	19	20	22	23	24	26	27	29
	6	7	9	10	12	13	15	16	18	19	21	22	24	25	27	28	30
	6	8	9	11	12	14	15	17	19	20	22	23	25	26	28	29	31
	6	8	10	11	13	14	16	18	19	21	22	24	26	27	29	30	32
	9 x 10	2	3	4	4	5	5	6	7	7	8	8	9	10	10	11	11	12
3		3	4	5	5	6	7	7	8	9	9	10	11	11	12	13	13
3		4	4	5	6	6	7	8	9	9	10	11	12	12	13	14	14
3		4	5	5	6	7	8	9	9	10	11	12	13	13	14	15	16
3		4	5	6	7	8	8	9	10	11	12	13	14	15	16	17	17
4		5	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18
4		5	6	7	8	9	10	11	12	12	13	14	15	16	17	18	19
4		5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
4		5	6	8	9	10	11	12	13	14	15	16	17	18	19	21	22
5		6	7	8	9	10	11	13	14	15	16	17	18	19	21	22	23
5		6	7	8	10	11	12	13	14	16	17	18	19	20	22	23	24
5		6	8	9	10	11	13	14	15	16	18	19	20	21	23	24	25
5		7	8	9	11	12	13	15	16	17	18	20	21	22	24	25	26
6		7	8	10	11	12	14	15	17	18	19	21	22	23	25	26	28
6		7	9	10	12	13	14	16	17	19	20	22	23	24	26	27	29

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Appendix 5 (continued)

Deductions for Rectangular Defects, From Solid Board-foot Contents

End dimen- sions, Inches	Deductions for defect length, in feet, of -																	
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
9 x 25	6	8	9	11	12	14	15	17	18	20	21	23	24	26	27	29	30	
	26	6	8	9	11	12	14	16	17	19	20	22	23	25	27	28	30	
	27	6	8	10	11	13	15	16	18	19	21	23	24	26	28	29	31	
	28	7	8	10	12	13	15	17	18	20	22	24	25	27	29	30	32	
	29	7	9	10	12	14	16	17	19	21	23	24	26	28	30	31	33	
	30	7	9	11	13	14	16	18	20	22	23	25	27	29	31	32	34	
	10 x 11	3	4	4	5	6	7	7	8	9	10	10	11	12	12	13	14	15
		12	3	4	5	6	7	8	9	10	10	11	12	13	14	14	15	16
		13	3	4	5	6	7	8	9	10	10	11	12	13	14	15	16	17
		14	4	5	6	7	7	8	9	10	11	12	13	14	15	16	17	18
15		4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
16		4	5	6	7	9	10	11	12	13	14	15	16	17	18	19	20	
17		5	6	7	8	9	10	11	12	14	15	16	17	18	19	20	21	
18		5	6	7	8	10	11	12	13	14	16	17	18	19	20	22	23	
19		5	6	8	9	10	11	13	14	15	16	18	19	20	22	23	24	
20		5	7	8	9	11	12	13	15	16	17	19	20	21	23	24	25	
	21	6	7	8	10	11	13	14	15	17	18	20	21	22	24	25	27	
	22	6	7	9	10	12	13	15	16	18	19	21	22	23	25	26	28	
	23	6	8	9	11	12	14	15	17	18	20	21	23	25	26	28	29	
	24	6	8	10	11	13	14	16	18	19	21	22	24	26	27	29	30	
	25	7	8	10	12	13	15	17	18	20	22	23	25	27	28	30	32	
	26	7	9	10	12	14	16	17	19	21	23	24	26	28	29	31	33	
	27	7	9	11	13	14	16	18	20	22	23	25	27	29	31	32	34	
	28	7	9	11	13	15	17	19	21	22	24	26	28	30	32	34	35	
	29	8	10	12	14	15	17	19	21	23	25	27	29	31	33	35	37	
	30	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	

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Appendix 5 (continued)

Deductions for Rectangular Defects, From Solid Board-foot Contents

End dimen- sions, Inches	Deductions for defect length, in feet, of -																18	19	20
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19			
11 x 12	4	4	5	6	7	8	9	10	11	11	12	13	14	15	16	17	18	19	20
13	4	5	6	7	8	9	10	10	11	11	12	13	14	15	16	17	18	19	20
14	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
15	4	6	7	8	9	10	11	12	13	14	15	17	18	19	20	21	22	23	24
16	5	6	7	8	9	11	12	13	14	15	16	18	19	20	21	22	23	24	25
17	5	6	7	9	10	11	12	14	15	16	17	19	20	21	22	24	25	26	27
18	5	7	8	9	11	12	13	15	16	17	18	20	21	22	24	25	26	28	29
19	6	7	8	10	11	13	14	15	17	18	20	21	22	24	25	26	28	29	30
20	6	7	9	10	12	13	15	16	18	19	21	22	23	25	26	28	29	31	32
21	6	8	9	11	12	14	15	17	18	20	22	23	25	26	28	29	31	32	33
22	6	8	10	11	13	15	16	18	19	21	23	24	26	27	29	31	32	33	34
23	7	8	10	12	13	15	17	19	20	22	24	25	27	29	30	32	33	34	35
24	7	9	11	12	14	16	18	19	21	23	25	26	28	29	31	33	34	35	36
25	7	9	11	13	15	17	18	20	22	24	26	28	29	31	32	34	36	38	39
26	8	10	12	14	16	18	20	22	24	26	28	30	32	33	35	37	39	41	42
27	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	43
28	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44
29	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45
30	9	11	13	15	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46
12 x 13	4	5	6	7	8	9	10	11	12	14	15	16	17	18	19	20	21	22	23
14	4	6	7	8	9	10	11	12	13	15	16	17	18	19	20	21	22	23	24
15	5	6	7	8	10	11	12	13	14	16	17	18	19	20	22	23	24	25	26
16	5	6	8	9	10	12	13	14	15	17	18	19	20	22	23	24	25	26	27
17	5	7	8	10	11	12	14	15	16	18	19	20	22	23	24	25	26	27	28
18	6	7	9	10	12	13	14	16	17	19	20	22	23	24	25	26	27	28	29
19	6	8	9	11	12	14	15	17	18	20	21	23	24	25	26	27	28	29	30
20	6	8	10	11	13	14	16	18	19	21	22	24	25	26	27	28	29	30	31

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Appendix 5 (continued)

Deductions for Rectangular Defects, From Solid Board-foot Contents

End dimen- sions, Inches	Deductions for defect length, in feet, of -																
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
12 x 21	7	8	10	12	13	15	17	18	20	22	24	25	27	29	30	32	34
22	7	9	11	12	14	16	18	19	21	23	25	26	28	30	32	33	35
23	7	9	11	13	15	17	18	20	22	24	26	28	29	31	33	35	37
24	8	10	12	13	15	17	19	21	23	25	27	29	31	33	35	36	38
25	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
26	8	10	12	15	17	19	21	23	25	27	29	31	33	35	37	40	42
27	9	11	13	15	17	19	22	24	26	28	30	32	35	37	39	41	43
28	9	11	13	16	18	20	22	25	27	29	31	34	36	38	40	43	45
29	9	12	14	16	19	21	23	26	28	30	32	35	37	39	42	44	46
30	10	12	14	17	19	22	24	26	29	31	34	36	38	41	43	46	48
13 x 14	5	6	7	8	10	11	12	13	15	16	17	18	19	21	22	23	24
15	5	7	8	9	10	12	13	14	16	17	18	20	21	22	23	25	26
16	6	7	8	10	11	12	14	15	17	18	19	21	22	24	25	26	28
17	6	7	9	10	12	13	15	16	18	19	21	22	24	25	27	28	29
18	6	8	9	11	12	14	16	17	19	20	22	23	25	27	28	30	31
19	7	8	10	12	13	15	16	18	20	21	23	25	26	28	30	31	33
20	7	9	10	12	14	16	17	19	21	23	24	26	28	29	31	33	35
21	7	9	11	13	15	16	18	20	22	24	25	27	29	31	33	35	36
22	8	10	11	13	15	17	19	21	23	25	27	29	31	32	34	36	38
23	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
24	8	10	12	15	17	19	21	23	25	27	29	31	33	35	37	40	42
25	9	11	13	15	17	20	22	24	26	28	30	33	35	37	39	41	43
26	9	11	14	16	18	20	23	25	27	29	32	34	36	38	41	43	45
27	9	12	14	16	19	21	23	26	28	30	33	35	37	40	42	44	47
28	10	12	15	17	19	22	24	27	29	32	34	36	39	41	44	46	49
29	10	13	15	18	20	23	25	28	30	33	35	38	40	43	45	48	50
30	10	13	16	18	21	23	26	29	31	34	36	39	42	44	47	49	52

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Appendix 5 (continued)

Deductions for Rectangular Defects, From Solid Board-foot Contents

End dimen- sions, Inches	Deductions for defect length, in feet, of -																
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
14 x 15	6	7	8	10	11	13	14	15	17	18	20	21	22	24	25	27	28
	6	7	9	10	12	13	15	16	18	19	21	22	24	25	27	28	30
	6	8	10	11	13	14	16	17	19	21	22	24	25	27	29	30	32
	7	8	10	12	13	15	17	18	20	22	24	25	27	29	30	32	34
	7	9	11	12	14	16	18	20	21	23	25	27	28	30	32	34	35
	7	9	11	13	15	17	19	21	22	24	26	28	30	32	34	35	37
	8	10	12	14	16	18	20	22	24	25	27	29	31	33	35	37	39
	8	10	12	14	16	18	21	23	25	27	29	31	33	35	37	39	41
	9	11	13	15	17	19	21	24	26	28	30	32	34	36	39	41	43
	9	11	13	16	18	20	22	25	27	29	31	34	36	38	40	43	45
15 x 16	9	12	14	16	19	21	23	26	28	30	33	35	37	40	42	44	47
	10	12	15	17	19	22	24	27	29	32	34	36	39	41	44	46	49
	10	13	15	18	20	23	25	28	30	33	35	38	40	43	45	48	50
	10	13	16	18	21	24	26	29	31	34	37	39	42	44	47	50	52
	11	14	16	19	22	24	27	30	32	35	38	41	43	46	49	51	54
	11	14	17	20	22	25	28	31	34	36	39	42	45	48	50	53	56
	6	8	10	11	13	14	16	18	19	21	22	24	26	27	29	30	32
	7	9	10	12	14	15	17	19	20	22	24	26	27	29	31	32	34
	7	9	11	13	14	16	18	20	22	23	25	27	29	31	32	34	36
	8	10	11	13	15	17	19	21	23	25	27	29	30	32	34	36	38
15 x 16	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
	8	11	13	15	17	19	21	23	25	27	29	32	34	36	38	40	42
	9	11	13	15	18	20	22	24	26	29	31	33	35	37	40	42	44
	9	12	14	16	18	21	23	25	28	30	32	35	37	39	41	44	46
	10	12	14	17	19	22	24	26	29	31	34	36	38	41	43	46	48
	10	13	15	18	20	23	25	28	30	33	35	38	40	43	45	48	50
	6	8	10	11	13	14	16	18	19	21	22	24	26	27	29	30	32
	7	9	10	12	14	15	17	19	20	22	24	26	27	29	31	32	34
	7	9	11	13	14	16	18	20	22	23	25	27	29	31	32	34	36
	8	10	11	13	15	17	19	21	23	25	27	29	30	32	34	36	38

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Deductions for Rectangular Defects, From Solid Board-foot Contents

End dimen- sions, Inches	Deductions for defect length, in feet, of -																
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
14 x 15	6	7	8	10	11	13	14	15	17	18	20	21	22	24	25	27	28
	6	7	9	10	12	13	15	16	18	19	21	22	24	25	27	28	30
	6	8	10	11	13	14	16	17	19	21	22	24	25	27	29	30	32
	7	8	10	12	13	15	17	18	20	22	24	25	27	29	30	32	34
	7	9	11	12	14	16	18	20	21	23	25	27	28	30	32	34	35
	7	9	11	13	15	17	19	21	22	24	26	28	30	32	34	35	37
	8	10	12	14	16	18	20	22	24	25	27	29	31	33	35	37	39
	8	10	12	14	16	18	21	23	25	27	29	31	33	35	37	39	41
	9	11	13	15	17	19	21	24	26	28	30	32	34	36	38	41	43
	9	11	13	16	18	20	22	25	27	29	31	34	36	38	40	43	45
15 x 16	9	12	14	16	19	21	23	26	28	30	33	35	37	40	42	44	47
	10	12	15	17	19	22	24	27	29	32	34	36	39	41	44	46	49
	10	13	15	18	20	23	25	28	30	33	35	38	40	43	45	48	50
	10	13	16	18	21	24	26	29	31	34	37	39	42	44	47	50	52
	11	14	16	19	22	24	27	30	32	35	38	41	43	46	49	51	54
	11	14	17	20	22	25	28	31	34	36	39	42	45	48	50	53	56
	6	8	10	11	13	14	16	18	19	21	22	24	26	27	29	30	32
	7	9	10	12	14	15	17	19	20	22	24	26	27	29	31	32	34
	7	9	11	13	14	16	18	20	22	23	25	27	29	31	32	34	36
	8	10	11	13	15	17	19	21	23	25	27	29	30	32	34	36	38
	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
	8	11	13	15	17	19	21	23	25	27	29	32	34	36	38	40	42
	9	11	13	15	18	20	22	24	26	29	31	33	35	37	40	42	44
	9	12	14	16	18	21	23	25	28	30	32	35	37	39	41	44	46
	10	12	14	17	19	22	24	26	29	31	34	36	38	41	43	46	48
10	13	15	18	20	23	25	28	30	33	35	38	40	43	45	48	50	

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Deductions for Rectangular Defects, From Solid Board-foot Contents

End dimen- sions, Inches	Deductions for defect length, in feet, of -																			
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20			
15 x 26	10	13	16	18	21	23	26	29	31	34	36	39	42	44	47	49	52			
	27	11	14	16	19	22	24	27	30	32	35	38	41	43	46	49	51			
	28	11	14	17	20	22	25	28	31	34	36	39	42	45	48	50	53			
	29	12	15	17	20	23	26	29	32	35	38	41	44	46	49	52	55			
	30	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57			
	60	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57			
16 x 17	7	9	11	13	15	16	18	20	22	24	25	27	29	31	33	34	36			
	18	8	10	12	13	15	17	19	21	23	25	27	29	31	33	35	36			
	19	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	39			
	20	9	11	13	15	17	19	21	23	26	28	30	32	34	36	38	41			
	21	9	11	13	16	18	20	22	25	27	29	31	34	36	38	40	43			
	22	9	12	14	16	19	21	23	26	28	31	33	35	38	40	42	45			
17 x 18	23	10	12	15	17	20	22	25	27	29	32	34	37	39	42	44	47			
	24	10	13	15	18	20	23	26	28	31	33	36	38	41	44	46	49			
	25	11	13	16	19	21	24	27	29	32	35	37	40	43	45	48	51			
	26	11	14	17	19	22	25	28	31	33	36	39	42	44	47	50	53			
	27	12	14	17	20	23	26	29	32	35	37	40	43	46	49	52	55			
	28	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57			
17 x 18	29	12	15	19	22	25	28	31	34	37	40	43	46	49	53	56	59			
	30	13	16	19	22	26	29	32	35	38	42	45	48	51	54	58	61			
	41	8	10	12	14	16	18	20	22	24	27	29	31	33	35	37	39			
	19	9	11	13	15	17	19	22	24	26	28	30	32	34	37	39	41			
	20	9	11	14	16	18	20	23	25	27	29	32	34	36	39	41	43			
	21	10	12	14	17	19	21	24	26	29	31	33	36	38	40	43	45			
17 x 18	22	10	12	15	17	20	22	25	27	30	32	35	37	40	42	45	47			
	23	10	13	16	18	21	23	26	29	31	34	36	39	42	44	47	50			
	24	11	14	16	19	22	24	27	30	33	35	38	41	44	46	49	52			
	54	11	14	16	19	22	24	27	30	33	35	38	41	44	46	49	52			
	54	11	14	16	19	22	24	27	30	33	35	38	41	44	46	49	52			
	54	11	14	16	19	22	24	27	30	33	35	38	41	44	46	49	52			

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Deductions for Rectangular Defects, From Solid Board-foot Contents

End dimen- sions, Inches	Deductions for defect length, in feet, of -																
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
19 x 28	14	18	21	25	28	32	35	39	43	46	50	53	57	60	64	67	71
29	15	18	22	26	29	33	37	40	44	48	51	55	59	62	66	70	73
30	15	19	23	27	30	34	38	42	46	49	53	57	61	65	68	72	76
20 x 21	11	14	17	20	22	25	28	31	34	36	39	42	45	48	50	53	56
22	12	15	18	21	23	26	29	32	35	38	41	44	47	50	53	56	59
23	12	15	18	21	25	28	31	34	37	40	43	46	49	52	55	58	61
24	13	16	19	22	26	29	32	35	38	42	45	48	51	54	58	61	64
25	13	17	20	23	27	30	33	37	40	43	47	50	53	57	60	63	67
26	14	17	21	24	28	31	35	38	42	45	49	52	55	59	62	66	69
27	14	18	22	25	29	32	36	40	43	47	50	54	58	61	65	68	72
28	15	19	22	26	30	34	37	41	45	49	52	56	60	63	67	71	75
29	15	19	23	27	31	35	39	43	46	50	54	58	62	66	70	73	77
30	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80
21 x 22	12	15	18	22	25	28	31	34	37	40	43	46	49	52	55	59	62
23	13	16	19	23	26	29	32	35	39	42	45	48	52	55	58	61	64
24	13	17	20	24	27	30	34	37	40	44	47	50	54	57	60	64	67
25	14	18	21	25	28	32	35	39	42	46	49	53	56	60	63	67	70
26	15	18	22	25	29	33	36	40	44	47	51	55	58	62	66	69	73
27	15	19	23	26	30	34	38	42	45	49	53	57	60	64	68	72	76
28	16	20	24	27	31	35	39	43	47	51	55	59	63	67	71	74	78
29	16	20	24	28	32	37	41	45	49	53	57	61	65	69	73	77	81
30	17	21	25	29	34	38	42	46	50	55	59	63	67	71	76	80	84

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Appendix

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Effective date: June 26, 2013

Appendix 5 (continued)

Deductions for Rectangular Defects, From Solid Board-foot Contents

End dimen- sions, Inches	Deductions for defect length, in feet, of -																
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
22 x 23	13	17	20	24	27	30	34	37	40	44	47	51	54	57	61	64	67
24	14	18	21	25	28	32	35	39	42	46	49	53	56	60	63	67	70
25	15	18	22	26	29	33	37	40	44	48	51	55	59	62	66	70	73
26	15	19	23	27	31	34	38	42	46	50	53	57	61	65	69	72	76
27	16	20	24	28	32	36	40	44	48	51	55	59	63	67	71	75	79
28	16	21	25	29	33	37	41	45	49	53	57	62	66	70	74	78	82
29	17	21	26	30	34	38	43	47	51	55	60	64	68	72	77	81	85
30	18	22	26	31	35	40	44	48	53	57	62	66	70	75	79	84	88
23 x 24	15	18	22	26	29	33	37	40	44	48	52	55	59	63	66	70	74
25	15	19	23	27	31	35	38	42	46	50	54	58	61	65	69	73	77
26	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80
27	17	21	25	29	33	37	41	46	50	54	58	62	66	70	75	79	83
28	17	21	26	30	34	39	43	47	52	56	60	64	69	73	77	82	86
29	18	22	27	31	36	40	44	49	53	58	62	67	71	76	80	84	89
30	18	23	28	32	37	41	46	51	55	60	64	69	74	78	83	87	92
24 x 25	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80
26	17	21	25	29	33	37	42	46	50	54	58	62	67	71	75	79	83
27	17	22	26	30	35	39	43	48	52	56	60	65	69	73	78	82	86
28	18	22	27	31	36	40	45	49	54	58	63	67	72	76	81	85	90
29	19	23	28	32	37	42	46	51	56	60	65	70	74	79	84	88	93
30	19	24	29	34	38	43	48	53	58	62	67	72	77	82	86	91	96

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Appendix

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Appendix 5 (continued)

Deductions for Rectangular Defects, From Solid Board-foot Contents

End dimen- sions, Inches	Deductions for defect length, in feet, of -																
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
25 x 26	17	22	26	30	35	39	43	48	52	56	61	65	69	74	78	82	87
27	18	23	27	32	36	41	45	50	54	59	63	68	72	77	81	86	90
28	19	23	28	33	37	42	47	51	56	61	65	70	75	79	84	89	93
29	19	24	29	34	39	44	48	53	58	63	68	73	77	82	87	92	97
30	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
26 x 27	19	23	28	33	37	42	47	51	56	61	66	70	75	80	84	89	94
28	19	24	29	34	39	44	49	53	58	63	68	73	78	83	87	92	97
29	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	96	101
30	21	26	31	36	42	47	52	57	62	68	73	78	83	88	94	99	104
27 x 28	20	25	30	35	40	45	50	55	60	66	71	76	81	86	91	96	101
29	21	26	31	37	42	47	52	57	63	68	73	78	84	89	94	99	104
30	22	27	32	38	43	49	54	59	65	70	76	81	86	92	97	103	108
28 x 29	22	27	32	38	43	49	54	60	65	70	76	81	87	92	97	103	108
30	22	28	34	39	45	50	56	62	67	73	78	84	90	95	101	106	112
29 x 30	23	29	35	41	46	52	58	64	70	75	81	87	93	99	104	110	116

Appendix

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Appendix 6 - Deductions for Pitch and Shake Rings, Showing on Both Ends of Logs, with Various Amounts of Ring Taper¹

[Scribner Decimal C rule—board feet in tens]

Inside diameter of ring, small end of log	Ring taper in log											
	1 or 2 inches			3 or 4 inches			5 or 6 inches			7 or 8 inches		
	16 ft.	18 ft.	20 ft.	16 ft.	18 ft.	20 ft.	16 ft.	18 ft.	20 ft.	16 ft.	18 ft.	20 ft.
6.....	5	6	7	7	8	9	9	10	11	11	13	14
7.....	6	7	8	8	9	10	10	12	13	12	14	16
8.....	8	9	10	10	12	13	12	14	16	15	17	20
9.....	9	11	12	11	13	15	14	16	19	17	20	22
10.....	9	11	12	12	14	16	15	18	19	18	21	23
11.....	11	12	15	14	16	18	17	19	22	20	23	26
12.....	13	15	18	16	18	20	19	22	24	23	26	29
13.....	14	16	18	17	20	22	21	24	27	25	28	31
14.....	16	18	20	20	22	25	24	26	29	28	30	34
15.....	17	19	21	21	23	25	25	27	30	29	32	35
16.....	19	21	23	23	25	28	27	30	33	31	35	39
17.....	21	22	25	25	27	30	29	32	36	34	37	42
18.....	22	24	26	26	29	32	31	34	38	35	39	44
19.....	23	26	29	28	31	35	32	36	41	37	42	47
20.....	24	27	30	28	32	36	33	38	42	39	44	48
21.....	26	29	33	31	35	39	37	41	45	42	47	52
22.....	28	31	35	34	37	41	39	43	48	45	49	55
23.....	29	33	36	34	39	43	40	45	50	46	52	58
24.....	32	36	40	38	42	47	44	49	55	50	56	62
25.....	32	35	40	38	42	48	44	49	55	50	56	63
26.....	34	38	43	40	45	50	46	52	58	53	60	66
27.....	35	39	44	41	46	52	48	54	60	54	62	68
28.....	38	43	47	45	51	55	51	58	63	58	67	73
29.....	42	48	52	48	56	60	55	64	70	62	72	80
30.....	43	50	54	50	58	64	57	66	74	65	74	82

¹ Example: A 16-foot log has a ring 10 inches in diameter in the top end and 14 inches in the butt end. Thus with a 4-inch taper, a 10-inch ring diameter, and a 16-foot length, the deduction is 12.

Appendix 6 (continued)

Deductions For Pitch And Shake Rings Showing On Both Ends Of Logs, With Various Amounts Of Ring Taper¹

Instructions for Use of Appendix 6 Pitch and Shake Ring Deduction Table

1. Measure rings at both ends to obtain taper.
2. Refer to table. Use small end ring and proper taper column for deduction.
3. When 2 full rings are over 2 1/2 inches apart, measure diameter of both rings, refer to the proper columns for deductions. Add deductions together.

Supplementary Instructions

For rings showing on one end only, use squared-defect method and replace volume of core.

For logs shorter than 16 feet, use the large end ring and the Coconino scale stick.

When 2 full rings are not more than 2 1/2 inches apart, measure diameter of the outside ring. Add 1 inch. Apply squared-defect method for gross deduction. Reduce this by the scale of a log with a diameter of the inner ring.

When multiple rings occur with no recovery between them, square the overall defect and allow for the scale of any inside log surrounded by rings.

For a full or partial ring 2 1/2 inches or less from the outside at the top end (perimeter ring), deduct as for sap rot.

Appendix 7 - Twelve Common Rots and Fungi in Saw Logs

1. *Fomes pini*

Common name.--Conk rot, red ring rot; sometimes called honeycomb rot, particularly in pine and larch.

Hosts.--Western white, ponderosa lodgepole, white bark, limber pine; Engelmann spruce; western hemlock; sugar pine; mountain hemlock; white, alpine, Shasta red fir; Douglas-fir; western redcedar; western larch.

General form.--Trunk rot rarely acting as butt rot. Generally patchy. Enters through dead branch stubs, rarely through wounds. The rot column is roughly conical in both directions from area of greatest decay in trunk. Often as patchy ring- or crescent-shaped areas not uniformly attacking the heartwood except in very advanced stages.

The rot column may extend from a few feet to entire tree length.

Characteristics.--Heart rot In resinous trees, heart rot or sap rot in trees with little or no resin. Rot In early stages reddish color In split section with small white patches mingled with pitted areas and In advanced stages ring-scaled. Delignifying rot, converting wood to cellulose; white pocket rot.

External signs.--Typical fruiting bodies or conks of fungus on log. Indications at old branch whorls, either by swells or by brownish punky substance, that fruiting bodies have dropped off. Soundings made on trunk to detect punkiness Indicating decay. Punk knots or blind conks.

Fruiting body.--Sometimes called ring-scale fungus, brown shell fungus. Fruiting body Is hoof or shell shape, perennial, hard, woody, upper surface dark brown, rough, hairy when young, with concentric raised zones, substance brown, pores usually large and round, pore layer stratified.

2. *Polyporus schweinitzii*

Common name.--Red-brown butt rot. Stump or ground rot.

Hosts.--Western white, ponderosa, lodgepole, whitebark, limber pine; Douglas-fir; grand, white, alpine, Shasta red fir; western redcedar; Engelmann spruce.

General form.--A uniform circular butt rot; a wound fungus. The rot column Is generally conical from base of tree upward. Uniform, usually not advancing beyond first log. The rot column may extend from roots to 8 to 12 feet up Into first log. Usually not more than 5 or 6 feet upward.

Appendix 7 (continued)

Twelve Common Rots and Fungi in Saw Logs

Characteristics.--Uniform heart rot of butt of tree, also enters roots. Rot in the early stage is light reddish brown; typical stage is reddish brown, pronounced cubical, crumbly, brittle when dry; occasionally with thin resinous crusts of white felt like material (mycelium), odor of turpentine. Carbonizing rot.

External signs.--Typical fruiting bodies of the fungus on the ground near the tree (often partly covered by debris), sometimes found as bracket fungus issuing from injuries at base of the tree (never high up on the trunk). Indications of brown rot in the exposed roots. Soundings on the basal portion of the tree and exposed roots. Indications of typical rot.

Fruiting body.--Sometimes called velvet-top or cowdung fungus. Fruiting body annual, stem short, dark brown, covered with stiff hairs, flesh brown, soft and spongy when fresh, brittle when dry, pores large when young, becoming torn with age. Attached to the roots near the base of the tree or directly on the base of the tree.

3. Echinodontium tinctorium

Common name.--Brown stringy rot; rust-red stringy rot.

Hosts.--Alpine, white, grand fir; western, mountain hemlock. Of economic Importance only on true firs and hemlocks. Shasta red fir; Engelmann spruce.

General form.--A uniform circular trunk rot, entering through branch stubs and wounds. The rot column is roughly conical in both directions from area of greatest decay. Very uniform in occupying most or all of the heartwood. The rot column may extend from a few feet to entire tree length, depending upon the degree of infection.

Characteristics.--Uniform heart rot, confined to given trees almost entirely. Rot in early stages: wood spongy yellow stained; typical stage: soft stringy, often separating along the annual rings, brownish to rusty red in color, knots show deep rusty red color. Sawed surface of cross section pitted, broken, stringy with reddish brown discolorations, often hollow rotted, carbonizing rot; viz, reducing cellulose, producing dark-colored decay.

External signs.--Typical fruiting bodies of the fungus on the tree. Indications at branch whorls either by swells or by deep rust red punk knots that fruiting bodies had dropped off. Large number of dead branch stubs accompanied by pronounced swells of whorls. Deep rusty red color in old branch stubs. Soundings made on trunk.

Appendix 7 (continued)

Twelve Common Rots and Fungi in Saw Logs

Many injuries, such as logging scars, fire scars, frost cracks, blazes, etc., are indications of typical rot.

Fruiting body.--Sometimes called Indian paint fungus, fruiting body perennial, hard and woody, gray or black above with concentric growth zones, substance brick red, lower surface covered with hard sharp spines when mature.

4. Fomes pinicola

Common name.--Brown crumbling rot.

Hosts.--Attacks all the imports conifers, but principally western larch; western, mountain hemlock; alpine, grand fir; Douglas-fir (dead); Shasta red, white fir; especially Sitka spruce and hemlock In Alaska.

General form.--A uniform circular trunk rot; a wound fungus. The rot column is generally uniform and conical. The rot column usually occupies entire heartwood of tree on the portion of the tree infected. Rarely extending beyond the first log length.

Characteristics.--Uniform heart rot found principally in dead, standing, and down timber, occasionally acting as heart rot in living trees by gaining entrance through injuries. In early stages rot is light brown; typical stage, reddish brown, cubical, crumbly and brittle when dry, white feltlike layers of mycelium between cubical patches. Felt patches larger, thicker, and nonresinous as compared to those of velvet-top fungus. Carbonizing rot.

External signs.--Typical "red belt" fruiting bodies of the fungus on the tree. Typical rot at old branch stubs. Soundings made on the trunk. Indications of typical rot.

Fruiting body.--Sometimes called red-margin Fomes; red belt Fomes. Fruiting body, perennial, hard, woody, flat or hoof-shaped, surface smooth, furrowed gray or black with resinous crust, margin white or reddish, substance whitish or wood colored, pores In layers.

5. Polyporus sulphureus

Common name.--Brown cubical rot; reddish-brown heart rot.

Hosts.--Attacks most all of the important conifers but principally ponderosa, western white pine; Douglas-fir; western larch; Shasta red fir; Engelmann spruce; white fir.

General form.--This is a uniform circular butt and trunk rot. A wound fungus.

Appendix 7 (continued)

Twelve Common Rots and Fungi in Saw Logs

The rot column is generally uniform and conical.

The rot column usually occupies the entire heartwood of the tree at point of greatest infection. Usually a butt rot, rarely extending beyond the first log length.

Characteristics.--Uniform heart rot. Rot in early stages light brown, typical stage, dark reddish brown, brittle dry, crumbly, not pronounced cubical, with thick felty mycelial masses in clefts, arranged star-shaped in cross section. Carbonizing rot.

External signs.--Typical fruiting bodies of the fungus on the tree. Soundings made on the trunk. Indications of typical rot.

Fruiting body.--Sometimes called sulfur fungus. Fruiting structure annual, broad, with several parts one above another, smooth, zoned, lemon yellow to orange, white when old, flesh white, crumbly when dry, pores small, sulfur yellow.

6. *Fomes officinalis*

Common name.--Reddish-brown heart rot; brown trunk rot.

Hosts.--Attacks all important conifers but principally western larch; ponderosa, sugar pine; white, Shasta red fir; Douglas-fir; Engelmann spruce.

General form.--Trunk rot. Wound fungus.

The rot column to generally uniform and conical.

The rot column usually occupies the entire heartwood of the tree in advanced stages. Most commonly occupies upper portion of merchantable timber; rarely a typical butt rot.

Characteristics.--Uniform heart rot. Rot in early stages light brown; typical stage, dark reddish brown, brittle dry, crumbly with thin felty mycelial masses in clefts. Carbonizing rot.

External signs.--Typical fruiting bodies of the fungus on the tree, the principal means of distinction between rots of this species and that of sulfur fungus. Soundings made on the trunk. Indications of typical rot.

Fruiting body.--Also known as *Fomes laricis* (chalky quinine fungus). Perennial hoof-shaped, sometimes cylindrical, snow white, substance white soft, bitter to the taste, pores small, white arranged in layers.

Appendix 7 (continued)

Twelve Common Rots and Fungi in Saw Logs

7. *Poria weirii*

Common name.--Yellow laminated rot.

Hosts.--Western redcedar and eastern arborvitae. Douglas-fir.

General form.--Butt rot. Uniform circular rot. Wound fungus.

The rot column is generally uniform and conical.

The rot column may extend from roots to 5 to 8 feet up into first log, often causing hollow butts. Rarely throughout entire pole length in old trees.

Characteristics.--Uniform heart rot. Rot yellow color, decays springwood, separating annual rings. In advanced stages brown, felty, mycelium between layers. Carbonizing rot.

External signs.--Typical fruiting bodies of the fungus on the tree (in the root crotches, often cementing the forest debris about the roots into a punky mass). Soundings at base of tree and exposed root spurs.

Fruiting body.--Sometimes called brown cedar *Poria*. Fruiting structure flat growing, inconspicuous, perennial, stratified, substance brown. Grows in root crotches and underside of down trees and logs.

8. *Fomes annosus*

Common name.--White spongy rot.

Hosts.--Western white, ponderosa, lodgepole, whitebark, limber pine; Engelmann spruce; western, mountain hemlock; Shasta red, alpine, grand, white fir; Douglas-fir; western redcedar; western larch.

General form.--Butt rot. Uniform circular. Pathogenic: can attack the cambium layer.

The rot column is generally conical and uniform, filling heartwood and part or all sapwood.

The rot column may extend from roots to 6 or 8 feet into first log; sometimes much higher in hemlock. Soon producing hollow butts.

Characteristics.--Uniform sap rot and heart rot of butt. Rot in early stages, ranging from lilac to reddish color; typical stage in whitish areas separated by smaller areas of sound wood, not prominently pitted, occasionally with black dots in center of white areas, in last stages annual rings separated; finally wet spongy. Fine felty masses (mycelium) under bark scales. Delignifying rot.

Appendix 7 (continued)

Twelve Common Rots and Fungi in Saw Logs

External signs.--Typical fruiting bodies of the fungus in root crotches usually covered by litter or duff. Resin flow at base of tree and exposed roots. Soundings at base of tree and exposed roots.

Fruiting body.--Sometimes called root Fomes. Fruiting body woody, usually thin and irregular, with a smooth brown crust, perennial; substance white or pale yellowish, pores small stratified and white. Found in the root crotches or under litter, not easily seen.

9. *Pholiota adiposa*

Common name.--Mottled rot; yellow heart rot.

Hosts.--Alpine, grand, white, Shasta red fir; western, mountain hemlock; Engelmann spruce; western white pine. Usually of most importance on the true firs.

General form.--Trunk rot. Uniform circular.

The rot column is generally conical in heartwood.

The rot column may extend from stumps to entire merchantable tree length. Usually confined to the first two log lengths. Sometimes localized in a single log.

Characteristics.--Uniform. Heart rot, principally of trees with little or no resin. Rot in early stages a light yellow stain; typical stage, yellow or honey color, brownish streaks, yellowish to light tan or white felty masses. Running across grain, breaking up in the last stages and separating annual rings, finally becoming hollow rotted. Carbonizing rot.

External signs.--Typical fruiting bodies of the fungus on the tree. Soundings made on the trunk. Indications of typical rot.

Fruiting body.--Sometimes called scaly *Pholiota* or yellow cap fungus. Fruiting body annual, mushroom type, appearing in clusters, yellow on upper surface, sticky when wet, stem yellow, gills yellowish to brown.

10. *Ceratostomella* species

Common name.--Blue stain.

Hosts.--Especially ponderosa, southern yellow, lodgepole, whitebark, limber pine; Engelmann spruce; western hemlock; but all soft and hard woods are affected.

Appendix 7 (continued)

Twelve Common Rots and Fungi in Saw Logs

General form.--Sap stain. Since the bluing fungus does not attack the cell walls except to a negligible extent and feeds only upon the cell contents, blued wood is not weakened. This has been determined by comparative mechanical tests on stained and unstained wood. But high moisture content and warm weather, which promote the development of the bluing fungus, are highly favorable to the development of true wood-destroying fungi. The fact that blued wood may soon show evidences of decay when put in service is due to the true wood-destroying fungi and not to the bluing fungus. Although the strength of blued wood is not impaired by the color, the wood may be objectionable in places where color is a factor.

NOTE: Certain other discolorations of sapwood are produced by fungi belonging to the molds, of which the green mold on fruits or in certain cheeses is an example. Such stains are usually superficial and may be planed off. They are difficult to distinguish by visual inspection from the true blue stain.

Characteristics.--Blue or bluish gray or black color of the sapwood, rarely in the heartwood, color usually most intense in the rays, causing it to appear in streaks in early stages. Due to the character of the wood, conifers are more susceptible than hardwoods. Fruiting body of the bluing fungus not readily seen. When the color is so dense that it is almost black, small bristles with a bulbous base may be seen with a hand lens. The color, depending upon the weather conditions, usually appears very rapidly in trees killed by bark beetles or fire, or in piled logs cut from green trees. Lumber in yards may blue very rapidly if not properly piled or treated. Blue color is due to the reflection to the surface of the wood of the colored mycelium in the wood cells. The wood itself is not stained by the true bluing fungus.

External signs.--"Blued" sapwood. Blued streaks extending from the sap into the heartwood of some logs. Dead and dying trees, killed by bark beetles, fire, or various other agents, are very susceptible to blue stain.

Fruiting body.--Sometimes called Bluing fungus. Fruiting body small, black, with long appendages, can best be seen with hand lens, appears on surface of boards or on wood of logs beneath bark.

11. Polyporus amarus

Common name.--Pocket dry rot.

Hosts.--Incense-cedar.

General form.--Trunk rot. The rot column usually occupies entire heartwood, not common in butt portion.

Appendix 7 (continued)

Twelve Common Rots and Fungi in Saw Logs

Characteristics.--In early stage, pocket dry rot appears as a faint yellowish-brown discoloration of the heartwood. Later elongated pockets with pointed ends develop, longer than broad, from 1/2 inch to 12 inches. Wood broken down into a dark brown friable residue. Pockets confined to the heartwood of the main trunk or bases of large limbs. Pockets seldom form in exposed heartwood, are sparse near large open wounds.

External signs.--Typical fruiting bodies on the tree, rare. Open borings or shot-hole cups replace conks. Large open fire wounds are indicators of this rot in most locations.

Fruiting body.--Half bell-shaped or somewhat hoof-shaped, 4 to 8 inches wide, buff to tan on top, bright sulfur-yellow underneath, darkens in age to chalky tan, soft and moist when fresh, firm and dry when old.

12. Polyporus anceps

Common name.--Western red rot; red ray rot.

Host.--Ponderosa pine.

General form.--Heart rot. Fungus does not require conspicuous entrance courts such as wounds, fire scars, or dead tops. Enters only through recently dead, bark-covered branches. Requires moisture to sustain attack. The rot column extending to heartwood is invaded longitudinally by a localized infection in the form of a decay column from a knot. Radial and tangential spread is initially slow; may spread through entire tree length but affects mostly logs from middle portion.

Characteristics.--Wood decayed in irregular streaks or pockets. In early stage of decay, heartwood reddish to dark brown. Discolored areas, often fan-shaped, radiate out from the log center, resemble spokes of a wheel or may be isolated anywhere in heartwood. In advanced stage, heartwood is whitish or grayish in color. Rotted wood consists of soft white strands of cellulose intermixed with less rotted wood particles, often wet and soggy, usually in log center, often surrounded by the fanlike areas of an early stage. In longitudinal section, incipient decay often appears as several separate discolored areas. In advanced stage, appears continuous. Decay entering through knots may be concentrated in the pith cavity.

External signs.--Limited. Fruiting bodies rarely formed on trees and then only on dead bark-covered branches. No swollen knots.

Fruiting body.--Fruiting bodies found mostly on decaying dead material in contact with the ground.

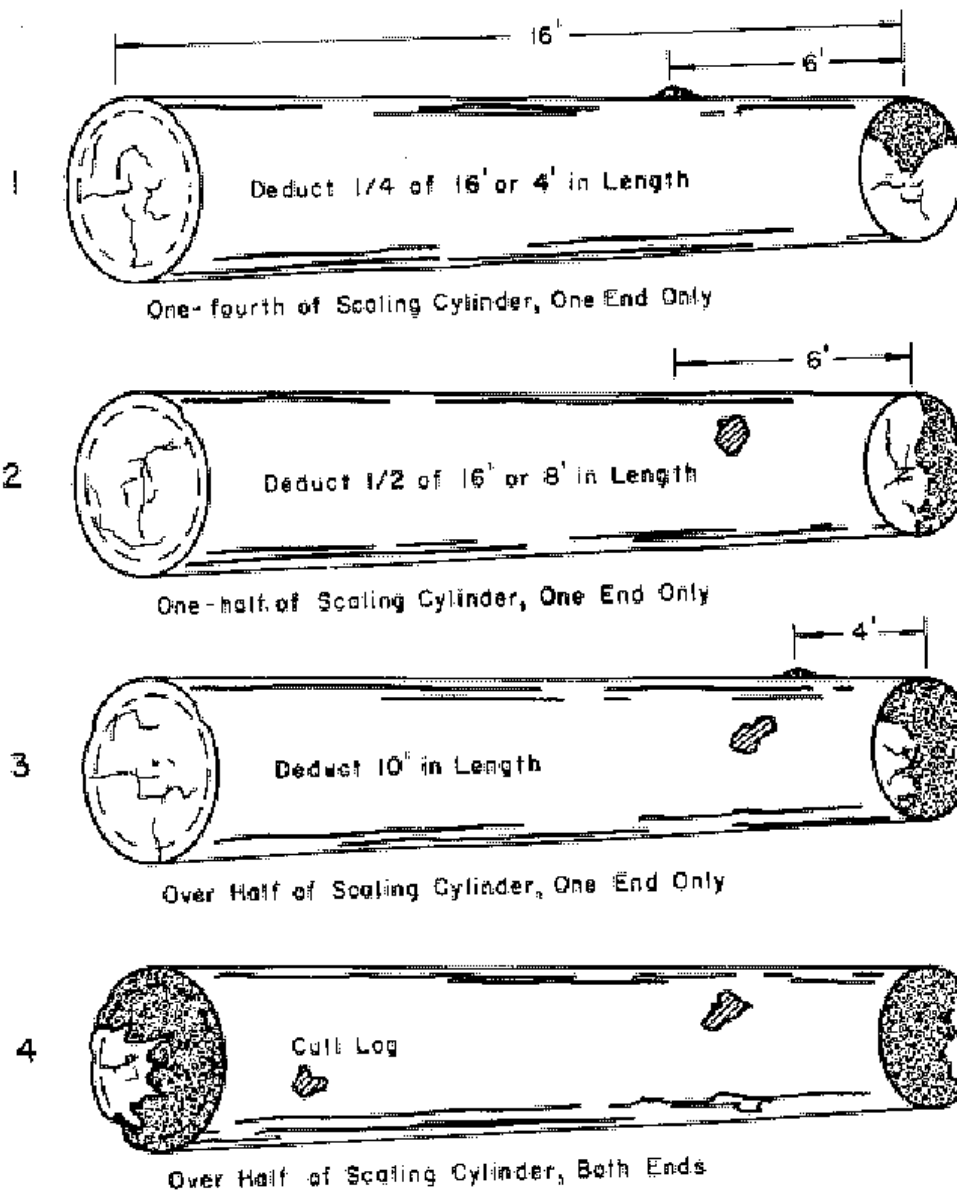
Appendix

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Appendix 7 (continued)

Example of Local Chart Guide for Conk Rot for One Species



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Appendix 7 (continued)

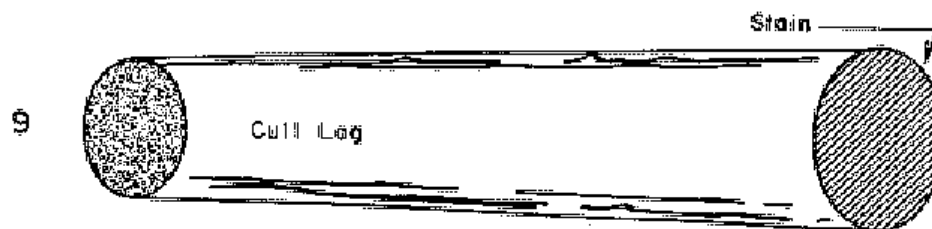
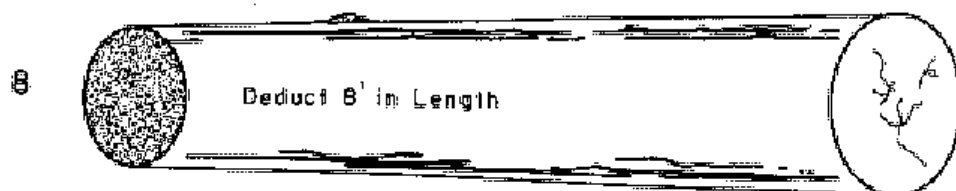
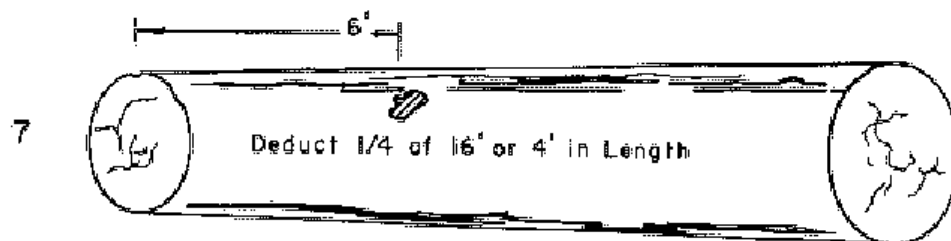
Example of Local Chart Guide for Conk Rot for One Species



Less Than One-half of Both Ends Affected With One Conk Show



One-half of Both, But Opposite, End Affected



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Appendix

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Appendix 8 - International ¼-inch Log Rule¹

Diameter (inches)	Volume (board feet) according to length, in feet—								
	4	5	6	7	8	9	10	11	12
6			5	5	5	5	5	5	10
6	5	5	5	5	10	10	10	10	15
7	5	5	10	10	10	15	15	15	20
8	10	10	10	15	15	20	20	25	25
9	10	15	15	20	20	25	30	30	35
10	15	15	20	25	30	35	35	40	45
11	15	20	25	30	35	40	45	60	55
12	20	25	30	40	45	50	55	65	70
13	25	30	40	45	55	60	70	75	85
14	30	40	45	55	65	70	80	90	100
15	35	45	55	65	75	85	95	105	115
16	40	50	60	75	85	95	110	120	130
17	45	60	70	85	95	110	125	135	150
18	55	65	80	95	110	125	140	155	170
19	60	75	90	105	125	140	155	175	190
20	65	85	100	120	135	155	175	195	210
21	75	95	115	135	155	175	195	215	235
22	80	105	125	145	170	190	215	235	260
23	90	115	140	160	185	210	235	260	285
24	100	125	150	175	205	230	255	285	310
25	110	135	165	195	220	250	280	310	340
26	120	150	180	210	240	275	305	335	370
27	130	160	195	225	260	295	330	365	400
28	140	175	210	245	280	320	355	395	430
29	160	185	225	265	305	345	385	425	465
30	160	200	245	285	325	370	410	455	495
31	170	215	260	305	350	395	440	485	530
32	185	230	280	325	375	420	470	520	570
33	195	245	295	345	400	450	500	555	605
34	210	260	315	370	425	480	535	590	645
35	220	280	335	390	450	510	565	625	685
36	235	295	355	415	475	540	600	665	725
37	250	315	375	440	505	570	635	700	770
38	265	330	400	465	535	605	670	740	810
39	280	350	420	490	565	635	710	785	855
40	295	370	445	520	595	670	750	825	900
41	310	385	465	545	625	705	785	870	950
42	325	405	490	575	655	740	825	910	995
43	340	430	515	600	690	780	870	955	1,045
44	355	450	540	630	725	815	910	1,005	1,095
45	375	470	565	660	755	855	955	1,050	1,150

¹ Values as published by H. H. Chapman, extended by formula: $V = (0.22D^3 - 0.71D) \times .905$ for 4-foot section. Taper allowance: ½ inch per 4 feet lineal.

Forest Service Handbook 2409.11 – National Forest Log Scaling Handbook

Appendix

Amendment: 2409.11-2013-1

Effective date: June 26, 2013

Appendix 8 (continued)
International 1/4-Inch Log Rule

Diameter (Inches)	Volume (board feet) according to length, in feet—							
	13	14	15	16	17	18	19	20
5.....	10	10	10	10	15	15	15	15
6.....	15	15	20	20	20	25	25	25
7.....	20	25	25	30	30	35	35	40
8.....	30	35	35	40	40	45	50	50
9.....	40	45	45	50	55	60	65	70
10.....	60	55	60	66	70	75	80	85
11.....	65	70	75	80	85	95	100	105
12.....	75	85	90	96	105	110	120	125
13.....	90	100	105	115	125	135	140	150
14.....	105	115	125	135	145	155	165	175
15.....	125	135	145	160	170	180	195	205
16.....	145	155	170	180	195	205	220	235
17.....	165	180	190	205	220	235	250	265
18.....	185	200	215	230	250	265	280	300
19.....	205	225	245	260	280	300	315	335
20.....	230	250	270	290	310	330	350	370
21.....	255	280	300	320	345	365	390	410
22.....	285	305	330	355	380	405	430	455
23.....	310	335	360	390	415	445	470	495
24.....	340	370	395	425	465	485	515	545
25.....	370	400	430	460	495	525	560	590
26.....	400	435	470	500	535	570	605	640
27.....	435	470	505	540	580	615	655	690
28.....	470	510	545	585	625	665	705	745
29.....	505	545	590	630	670	715	755	800
30.....	540	585	630	675	720	765	810	860
31.....	580	625	675	720	770	820	870	915
32.....	620	670	720	770	825	875	925	980
33.....	660	715	765	820	875	930	985	1,045
34.....	700	760	815	875	930	990	1,050	1,110
35.....	745	805	865	925	990	1,050	1,115	1,175
36.....	790	855	920	980	1,045	1,115	1,180	1,245
37.....	835	905	970	1,040	1,110	1,175	1,245	1,315
38.....	885	955	1,025	1,095	1,170	1,245	1,315	1,390
39.....	930	1,005	1,080	1,155	1,235	1,310	1,390	1,465
40.....	980	1,060	1,140	1,220	1,300	1,380	1,460	1,540
41.....	1,030	1,115	1,200	1,280	1,365	1,450	1,535	1,620
42.....	1,085	1,170	1,260	1,345	1,435	1,525	1,615	1,705
43.....	1,140	1,230	1,320	1,410	1,505	1,600	1,695	1,785
44.....	1,195	1,290	1,385	1,480	1,580	1,675	1,775	1,870
45.....	1,250	1,350	1,450	1,550	1,650	1,755	1,865	1,960

Forest Service Handbook 2409.11 – National Forest Log Scaling Handbook

Appendix

Amendment: 2409.11-2013-1

Effective date: June 26, 2013

Appendix 8 (continued)
International 1/4-Inch Log Rule

Diameter (inches)	Volume (board feet) according to length, in feet—								
	4	5	6	7	8	9	10	11	12
46.....	390	490	590	690	795	895	995	1,100	1,200
47.....	410	515	620	725	830	935	1,040	1,150	1,255
48.....	430	535	645	755	865	975	1,090	1,200	1,310
49.....	445	560	675	790	905	1,020	1,135	1,250	1,370
50.....	465	585	705	820	940	1,060	1,185	1,305	1,425
51.....	485	610	735	855	980	1,105	1,235	1,360	1,485
52.....	505	635	760	890	1,020	1,150	1,285	1,415	1,545
53.....	525	660	795	925	1,060	1,195	1,335	1,470	1,605
54.....	545	685	825	965	1,100	1,245	1,385	1,530	1,670
55.....	565	710	855	1,000	1,145	1,290	1,440	1,585	1,735
56.....	590	740	890	1,040	1,190	1,340	1,495	1,645	1,800
57.....	610	765	920	1,075	1,230	1,390	1,550	1,705	1,865
58.....	635	795	955	1,115	1,275	1,440	1,605	1,770	1,930
59.....	655	820	990	1,155	1,320	1,490	1,660	1,830	2,000
60.....	680	860	1,025	1,195	1,370	1,545	1,720	1,895	2,070

Diameter (inches)	Volume (board feet) according to length, in feet—							
	13	14	15	16	17	18	19	20
46.....	1,305	1,410	1,515	1,620	1,730	1,835	1,940	2,050
47.....	1,365	1,475	1,585	1,695	1,805	1,915	2,030	2,140
48.....	1,425	1,540	1,655	1,770	1,885	2,000	2,115	2,235
49.....	1,485	1,605	1,725	1,845	1,965	2,085	2,205	2,330
50.....	1,550	1,675	1,795	1,920	2,045	2,175	2,300	2,425
51.....	1,615	1,745	1,870	2,000	2,130	2,265	2,395	2,525
52.....	1,680	1,815	1,945	2,080	2,215	2,355	2,490	2,625
53.....	1,745	1,885	2,025	2,165	2,305	2,445	2,590	2,730
54.....	1,815	1,960	2,100	2,245	2,395	2,540	2,690	2,835
55.....	1,885	2,035	2,185	2,330	2,485	2,640	2,790	2,945
56.....	1,955	2,110	2,265	2,420	2,575	2,735	2,895	3,050
57.....	2,025	2,185	2,345	2,510	2,670	2,835	3,000	3,165
58.....	2,100	2,265	2,430	2,600	2,770	2,935	3,105	3,275
59.....	2,170	2,345	2,515	2,690	2,865	3,040	3,215	3,390
60.....	2,250	2,425	2,605	2,785	2,965	3,145	3,325	3,510

Forest Service Handbook 2409.11 – National Forest Log Scaling Handbook

Appendix

Amendment: 2409.11-2013-1

Effective date: June 26, 2013

Appendix 9 - Forest Service International ¼-inch Decimal Rule

[Board-foot volumes in tens]

Diameter (in.)	Volume according to log length, in feet—																			
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20			
4.....	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1			
5.....	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	2	2			
6.....	0	0	1	1	1	1	1	1	1	1	2	2	2	2	2	2	3			
7.....	1	1	1	1	1	1	2	2	2	2	2	3	3	3	3	4	4			
8.....	1	1	1	1	2	2	2	2	3	3	3	4	4	4	5	5	5			
9.....	1	1	2	2	2	3	3	3	4	4	4	5	5	6	6	6	7			
10.....	1	2	2	2	3	3	4	4	5	5	6	6	6	7	8	8	9			
11.....	2	2	3	3	4	4	5	5	6	6	7	7	8	9	9	10	11			
12.....	2	3	3	4	4	5	6	6	7	8	8	9	10	10	11	12	13			
13.....	3	3	4	5	5	6	7	8	8	9	10	11	12	12	13	14	15			
14.....	3	4	5	5	6	7	8	9	10	11	12	13	14	15	16	17	18			
15.....	4	4	5	6	7	8	9	10	11	12	14	15	16	17	18	19	20			
16.....	4	6	6	7	8	10	11	12	13	14	16	17	18	19	21	22	23			
17.....	5	6	7	8	10	11	12	14	15	16	18	19	21	22	24	25	27			
18.....	5	7	8	10	11	12	14	15	17	18	20	22	23	25	27	28	30			
19.....	6	8	9	11	12	14	16	17	19	21	22	24	26	28	30	32	33			
20.....	7	8	10	12	14	16	17	19	21	23	25	27	29	31	33	35	37			
21.....	7	9	11	13	15	17	19	21	23	26	28	30	32	34	37	39	41			
22.....	8	10	13	15	17	19	21	24	26	28	31	33	35	38	40	43	45			
23.....	9	11	14	16	19	21	24	26	28	31	34	36	39	42	44	47	50			
24.....	10	13	15	18	20	23	26	28	31	34	37	40	42	45	48	51	54			
25.....	11	14	16	19	22	25	28	31	34	37	40	43	46	49	53	56	59			
26.....	12	15	18	21	24	27	30	34	37	40	43	47	50	54	57	60	64			
27.....	13	16	19	23	26	30	33	36	40	43	47	51	54	58	62	65	69			
28.....	14	17	21	25	28	32	36	39	43	47	51	55	58	62	66	70	74			
29.....	15	19	23	26	30	34	38	42	46	50	55	59	63	67	71	76	80			
30.....	16	20	24	28	33	37	41	46	50	54	59	63	67	72	77	81	86			
31.....	17	22	26	30	35	39	44	49	53	58	63	67	72	77	82	87	92			
32.....	18	23	28	33	37	42	47	52	57	62	67	72	77	82	87	93	98			
33.....	20	25	30	35	40	45	50	55	61	66	71	77	82	88	93	99	104			
34.....	21	26	32	37	42	48	53	59	64	70	76	82	87	93	99	105	111			
35.....	22	28	34	39	45	51	57	63	68	74	81	87	93	99	105	111	118			
36.....	23	30	36	42	48	54	60	66	73	79	85	92	98	105	111	118	124			
37.....	25	31	38	44	50	57	64	70	77	84	90	97	104	111	118	125	132			
38.....	26	33	40	47	53	60	67	74	81	88	95	103	110	117	124	132	139			
39.....	28	35	42	49	56	64	71	78	86	93	101	108	116	123	131	139	146			
40.....	29	37	44	52	59	67	75	82	90	98	106	114	122	130	138	146	154			

See note at end of table.

Forest Service Handbook 2409.11 – National Forest Log Scaling Handbook

Appendix

Amendment: 2409.11-2013-1

Effective date: June 26, 2013

Appendix 9 (continued)

Forest Service International 1/4-inch Decimal Rule

[Board-foot volumes in tens]

Diameter (in.)	Volume according to log length, in feet—																		
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
41.....	31	39	47	55	62	71	79	87	95	103	111	120	128	137	145	154	162		
42.....	32	41	49	57	66	74	83	91	100	108	117	126	135	144	152	161	170		
43.....	34	43	51	60	69	78	87	96	105	114	123	132	141	151	160	169	179		
44.....	36	45	54	63	72	82	91	100	110	119	129	138	148	158	168	177	187		
45.....	37	47	57	66	76	86	95	105	115	125	135	145	155	165	175	186	196		
46.....	39	49	59	69	79	89	100	110	120	131	141	152	162	173	183	194	205		
47.....	41	51	62	72	83	94	104	115	126	137	147	158	169	181	192	203	214		
48.....	43	54	65	76	87	98	109	120	131	143	154	165	177	188	200	212	223		
49.....	45	56	67	79	90	102	114	125	137	149	161	172	184	196	209	221	233		
50.....	47	58	70	82	94	106	118	130	143	155	167	180	192	205	217	230	243		
51.....	49	61	73	85	98	111	123	136	149	161	174	187	200	213	226	239	253		
52.....	50	63	76	89	102	115	128	141	155	168	181	195	208	222	235	249	263		
53.....	53	66	79	93	106	120	133	147	161	175	188	202	216	230	245	258	273		
54.....	55	68	82	96	110	124	139	153	167	181	196	210	225	239	254	269	284		
55.....	57	71	86	100	114	129	144	159	173	188	203	218	233	248	264	279	294		
56.....	59	74	89	104	119	134	149	165	180	195	211	226	242	258	274	289	305		
57.....	61	77	92	108	123	139	155	171	186	203	219	235	251	267	284	300	316		
58.....	63	79	95	112	128	144	160	177	193	210	228	243	260	277	294	311	328		
59.....	66	82	99	116	132	149	166	183	200	217	234	252	269	287	304	322	339		
60.....	68	85	102	120	137	154	172	189	207	225	243	260	278	296	315	333	351		
61.....	70	88	106	124	142	160	178	196	214	233	251	269	288	307	325	344	363		
62.....	73	91	109	128	146	165	184	203	221	240	259	278	297	317	336	356	375		
63.....	75	94	113	132	151	171	190	209	229	248	268	288	307	327	347	367	387		
64.....	77	97	117	136	156	176	196	216	236	256	277	297	317	338	359	379	400		
65.....	80	100	121	141	161	182	202	223	244	265	286	306	327	349	370	391	412		
66.....	82	103	124	145	166	188	209	230	251	273	295	316	337	360	382	403	425		
67.....	85	107	128	150	171	193	215	237	259	281	304	326	348	371	393	416	439		
68.....	88	110	132	154	177	199	222	244	267	290	313	336	359	382	405	429	452		
69.....	90	113	136	159	182	205	229	252	275	299	322	346	370	393	417	441	465		
70.....	93	117	140	164	187	211	235	259	283	308	332	356	380	405	430	454	479		
71.....	96	120	144	169	193	218	242	267	292	317	342	367	392	417	442	468	493		
72.....	99	124	149	174	199	224	249	275	300	326	351	377	402	429	455	481	507		
73.....	101	127	153	179	204	230	256	282	309	335	361	388	414	441	468	495	521		
74.....	104	131	157	184	210	237	264	290	317	344	371	399	426	453	481	508	536		
75.....	107	134	161	189	216	243	271	298	326	354	382	410	438	466	494	522	551		
76.....	110	138	166	194	222	250	278	307	335	363	392	421	449	478	507	537	566		
77.....	113	142	170	199	228	257	286	316	344	373	403	432	461	491	521	551	581		
78.....	116	146	175	204	234	264	293	323	353	383	413	443	474	504	535	565	596		
79.....	119	149	180	210	240	270	301	332	362	393	424	455	486	517	549	580	611		
80.....	122	153	184	215	246	277	309	340	372	403	435	467	499	531	563	595	627		

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Appendix

Amendment: 2409.11-2013-1

Effective date: June 26, 2013

Appendix 9 (continued)

Forest Service International 1/4-inch Decimal Rule

[Board-foot volumes in tens]

Diameter (in.)	Volume according to log length, in feet—																			
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20			
81	125	157	189	221	252	285	317	349	381	414	446	479	511	544	577	610	643			
82	129	161	194	226	259	292	325	358	391	424	457	491	524	558	592	625	659			
83	132	165	199	232	265	299	333	367	400	435	469	503	537	572	606	641	675			
84	135	169	203	238	272	306	341	376	410	445	480	515	550	586	621	657	692			
85	138	173	208	243	278	314	349	385	420	456	492	528	564	600	636	672	709			
86	142	178	213	249	285	321	358	394	430	467	504	540	577	614	651	688	726			
87	145	182	219	255	292	329	366	403	440	478	516	553	591	629	667	705	743			
88	149	186	224	261	299	337	375	413	451	489	528	566	605	643	682	721	760			
89	152	190	229	267	306	345	383	422	461	501	540	579	618	658	698	738	777			
90	155	195	234	273	313	352	392	432	472	512	552	592	633	673	714	755	795			
91	159	199	239	280	320	360	401	442	482	524	565	606	647	688	730	772	813			
92	163	204	245	286	327	369	410	452	493	535	577	619	661	704	746	789	831			
93	166	208	250	292	334	377	419	462	504	547	590	633	676	719	763	806	849			
94	170	213	256	299	342	385	428	472	515	559	603	647	691	735	779	824	868			
95	174	217	261	305	349	393	438	482	526	571	616	661	706	751	796	841	887			
96	177	221	267	312	357	402	447	492	538	583	629	675	721	767	813	859	906			
97	181	227	273	318	364	410	457	503	549	596	642	689	736	783	830	877	925			
98	185	232	278	325	372	419	466	513	561	608	656	704	751	799	848	896	944			
99	189	236	284	332	379	428	476	524	572	621	669	718	767	816	865	914	963			
100	193	241	290	339	387	436	486	535	584	634	683	733	783	833	883	933	983			
101	197	246	296	346	395	445	496	546	596	646	697	748	798	850	901	952	1003			
102	201	251	302	353	403	454	505	557	608	659	711	763	814	867	919	971	1023			
103	205	256	308	360	411	463	516	568	620	673	725	778	831	884	937	990	1043			
104	209	261	314	367	419	473	526	579	632	686	740	793	847	901	955	1010	1064			
105	213	266	320	374	428	482	536	590	644	699	754	809	863	919	974	1029	1085			
106	217	272	326	381	436	491	546	602	657	713	769	824	880	936	993	1049	1105			
107	221	277	333	388	444	501	557	613	670	726	783	840	897	954	1012	1069	1127			
108	225	282	339	396	453	510	567	625	682	740	798	856	914	972	1031	1089	1148			
109	230	287	345	403	461	520	578	637	695	754	813	872	931	991	1050	1110	1169			
110	234	293	352	411	470	529	589	648	708	768	828	888	948	1009	1070	1130	1191			
111	238	298	358	418	479	539	600	660	721	782	843	905	966	1028	1089	1151	1213			
112	243	304	365	426	487	549	611	673	734	797	859	921	983	1046	1109	1172	1236			
113	247	309	372	434	496	559	622	685	748	811	874	938	1001	1066	1129	1193	1257			
114	251	315	378	442	506	569	633	697	761	826	890	955	1019	1084	1149	1215	1280			
115	256	320	385	450	514	579	644	709	775	840	906	972	1037	1104	1170	1236	1302			
116	260	326	392	458	523	589	656	722	788	855	922	989	1056	1123	1190	1258	1325			
117	265	332	399	466	532	600	667	735	802	870	938	1006	1074	1143	1211	1280	1348			
118	270	338	406	474	542	610	679	747	816	885	954	1024	1093	1162	1232	1302	1372			
119	274	343	413	482	551	621	690	760	830	900	971	1041	1111	1182	1253	1324	1395			
120	279	349	420	490	560	631	702	773	844	916	987	1059	1130	1202	1274	1347	1419			

NOTE: International 1/4-inch rule volumes computed electronically to 4 decimals, rounded to nearest tenth board foot. This volume multiplied by 0.905 for 1/4-inch rule volumes, recorded to 1 decimal, rounded to nearest 10 board feet. Volumes that could be influenced by the rounding to a tenth in the 1/4-inch calculations were recalculated, using all decimals. Decimal volumes thus are the same as if all decimals had been used in the calculations.

Volumes are as calculated from the basic equation for the volume of a 4-foot section; i.e., $\text{volume} = 0.22 (D^3) - 0.71 (D)$.

Volumes for sections 8, 12, 16, and 20 feet were obtained by allowing 3/4-inch taper for each 4 feet of length and totaling the volumes for the sections. For other log lengths between 4 and 20 feet, linear interpolation was used.

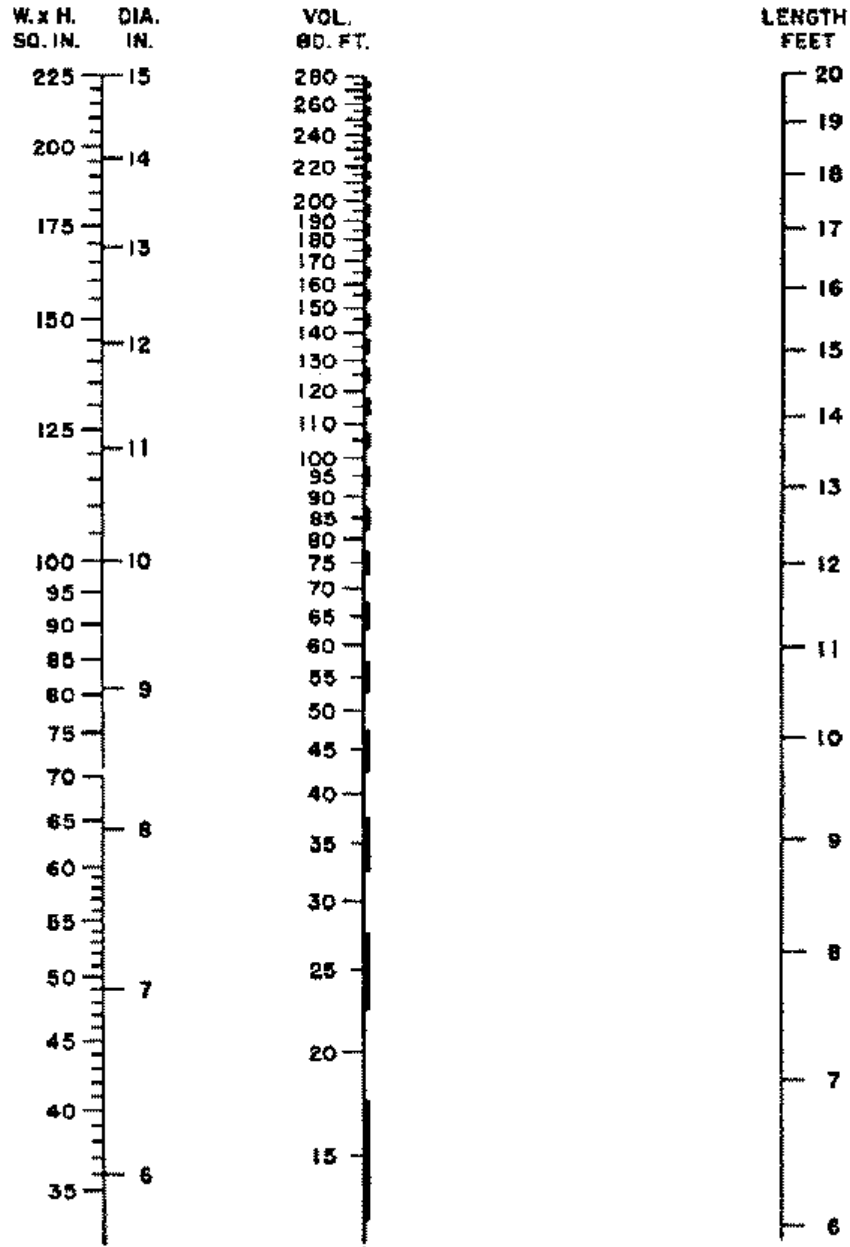
Appendix

Amendment: 2409.11-2013-1

Effective date: June 26, 2013

Appendix 10 - Defect Allowance Chart--International ¼-inch Log Rule

$$\text{Board feet} = \frac{W' \times H' \times L'}{16} \text{ or } \frac{(D')^2 \times L'}{16} \text{ (for Circular Defect)}$$



Appendix

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Effective date: June 26, 2013

Appendix 10 (continued)

Instructions for Use of Defect Allowance Chart

1. Measure width and height of defect in inches. Add 1 inch to each to allow for waste.
2. Multiply width by height.
3. Measure or estimate length of defect.
4. Place straightedge through product of W X H (left line) and length (right line).
5. Read deduction, to nearest 5 board feet, on center line.

For example, if a defect measured 7" by 8" by 10', the deduction would be determined by holding the straightedge through 72 on the left line $(7 + 1) \times (8 + 1)$ and 10 on the right line. The deduction, center line intersection, is 45 board feet.

Shortcut method: Width of defect In inches X height in inches = deduction if defect extends through a 16-foot log. Otherwise take proper proportion, round to *nearest* 5 bd. ft. (or 10 bd. ft. if scaling by Forest Service International 1/4-Inch Decimal rule).

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Appendix

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Effective date: June 26, 2013

Appendix 11 - Defect Allowances - for Optional Use

[Forest Service International ¼-Inch Decimal log rule—
board-feet in tens]

Length (feet)	Squared and defect ¹												
	10	20	30	40	50	60	70	80	90	100	110	120	130
1.....	0	0	0	0	0	0	0	1	1	1	1	1	1
2.....	0	0	0	0	1	1	1	1	1	1	1	1	2
3.....	0	0	1	1	1	1	1	2	2	2	2	2	2
4.....	0	1	1	1	1	1	2	2	2	3	3	3	3
5.....	0	1	1	1	2	2	2	3	3	3	3	4	4
6.....	0	1	1	2	2	2	3	3	3	4	4	5	5
7.....	0	1	1	2	2	3	3	4	4	4	5	5	6
8.....	1	1	2	2	2	3	4	4	5	5	6	6	7
9.....	1	1	2	2	3	3	4	5	5	6	6	7	7
10.....	1	1	2	2	3	4	4	5	6	6	7	7	8
11.....	1	1	2	3	3	4	5	6	6	7	8	8	9
12.....	1	2	2	3	4	4	5	6	7	8	8	9	10
13.....	1	2	2	3	4	5	6	7	7	8	9	10	11
14.....	1	2	3	3	4	5	6	7	8	9	10	10	11
15.....	1	2	3	4	5	6	7	8	8	9	10	11	12
16.....	1	2	3	4	5	6	7	8	9	10	11	12	13

¹ Width (inches) × height (inches), rounded to nearest 10. Round a product ending in 5 to the next higher 10.

Appendix

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Effective date: June 26, 2013

Appendix 11 (continued)

Instructions for Use of Defect Allowance Chart

1. Measure width and height of defect in inches. Add 1 inch to each to allow for waste.
2. Multiply width by height.
3. Measure or estimate length of defect.
4. Place straightedge through product of W X H (left line) and length (right line).
5. Read deduction, to nearest 5 board feet, on center line.

For example, if a defect measured 7" by 8" by 10', the deduction would be determined by holding the straightedge through 72 on the left line $(7 + 1) \times (8 + 1)$ and 10 on the right line. The deduction, center line intersection, is 45 board feet.

Shortcut method: Width of defect in inches X height in inches = deduction if defect extends through a 16-foot log. Otherwise take proper proportion, round to *nearest* 5 bd. ft. (or 10 bd. ft. if scaling by Forest Service International 1/4-Inch Decimal rule).

Appendix

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Effective date: June 26, 2013

Appendix 12 - Standard Converting Factors

Product	Assumed dimensions	Equiv- alent in board feet
Cord, standard.....	4 by 4 by 8 feet.....	500
Cord, long.....	4 by 5 by 8 feet.....	625
Cord, shingle bolts.....	4 by 4 by 8 feet.....	600
Cord, small material (averaging less than 5 inches middle diam- eter in the round).	do.....	333½
Cord, short.....	4 by 3 by 8 feet.....	375
Cord, short, small ma- terial.	do.....	250
Load (small, irregular pieces that can not be ricked).	4 by 4 by 8 feet.....	333½
Tie, standard.....	7 by 9 inches by 8 feet..	35
Do.....	7 by 8 inches by 8 feet..	30
Do.....	6 by 6 inches by 8 feet..	20
Tie, narrow gage.....	7 by 8 inches by 6½ feet..	25
Do.....	6 by 7 inches by 6½ feet..	20
Do.....	6 by 6 inches by 6½ feet..	15
Pole (telephone) or piling..	8 inches by 45 feet.....	200
Do.....	8 inches by 40 feet.....	150
Do.....	8 inches by 35 feet.....	100
Do.....	7 inches by 60 feet.....	280
Do.....	7 inches by 50 feet.....	200
Do.....	7 inches by 40 feet.....	100
Do.....	7 inches by 35 feet.....	80
Do.....	7 inches by 30 feet.....	60
Do.....	7 inches by 25 feet.....	50
Do.....	5 inches by 25 feet.....	30
Cubic foot.....	13.6 inches by 1 foot....	6
Linear foot.....	10 inches by 1 foot.....	3
Linear foot (long piling)...	80 to 125 feet by 6 inches.	5½
Derrick pole.....	7 inches by 30 feet.....	60
Derrick set (11 pieces)...	.....	480
Post, fence.....	6 inches by 7 feet.....	7
Do.....	5 inches by 7 feet.....	5

Appendix

Amendment: 2409.11-2013-1

Effective date: June 26, 2013

Appendix 12 (continued)
Standard Converting Factors

Product	Assumed dimensions	Equiv- alent in board feet
Post, split.....	18 inches circumference by 7 feet.	6
Brace, fence.....	4 inches by 6 feet.....	2
Stake, fence.....	3 inches by 5 feet.....	1
Stay, fence.....	2 inches by 6 feet.....	$\frac{1}{2}$
Rail, fence (split).....	20 inches circumference by 16 feet.	15
Pole, fence.....	4 inches by 20 feet.....	10
Pole (12 pieces).....	4 inches by 16 feet.....	100
Pole, converter.....	4 inches by 20 feet.....	10
Prop.....	6 inches by 10 feet.....	10
Lagging (6 pieces).....	3 inches by 6 feet.....	10

CONVERTING FACTORS

For convenience in preparing statistics, such as reports of timber cut and sold, and for price determinations in sales of products for which prices have not been established by the Chief, it is necessary to convert other products than saw-timber into feet board measure. Regional Foresters will establish converting factors by Forests for these purposes. It is often possible and desirable to establish a converting factor for all standard-gage hewn ties cut on a given Forest based on the size of the average tie; and similar factors are often applicable to groups of sizes of telephone poles, piling, or posts. Standard conversion factors established by Regional Foresters will not be inconsistent with this table, which will be used in the absence of approved local tables.

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Appendix

Amendment: 2409.11-2013-1

Effective date: June 26, 2013

Appendix 13 - Board-foot Contents of Standard Lumber and Timber Sizes

End dimensions (inches)	Volume (board feet) according to length, in feet—							
	10	12	14	16	18	20	22	24
1 by 2-----	1½	2	2½	2¾	3	3½	3¾	4
3-----	2½	3	3½	4	4½	5	5½	6
4-----	3½	4	4¾	5½	6	6¾	7½	8
6-----	4½	5	5¾	6¾	7½	8½	9½	10
8-----	5	6	7	8	9	10	11	12
7-----	5½	7	8½	9½	10½	11½	12½	14
8-----	6¾	8	9½	10¾	12	13½	14¾	16
10-----	8½	10	11¾	13½	15	16¾	18½	20
12-----	10	12	14	16	18	20	22	24
14-----	11¾	14	16½	18¾	21	23½	25¾	28
16-----	13½	16	18¾	21½	24	26¾	29½	32
18-----	15	18	21	24	27	30	33	36
20-----	16¾	20	23½	26¾	30	33½	36¾	40
1½ by 4-----	4½	5	5¾	6¾	7½	8½	9½	10
6-----	6¾	7½	8¾	10	11½	12½	13¾	15
8-----	8½	10	11¾	13½	15	16¾	18½	20
10-----	10	12½	14¾	16¾	18¾	20¾	22½	25
12-----	12½	15	17½	20	22½	25	27½	30
1½ by 4-----	6	6	7	8	9	10	11	12
6-----	7½	9	10½	12	13½	15	16½	18
8-----	10	12	14	16	18	20	22	24
10-----	12½	15	17½	20	22½	25	27½	30
12-----	15	18	21	24	27	30	33	36
2 by 3-----	5	6	7	8	9	10	11	12
4-----	6¾	8	9½	10¾	12	13½	14¾	16
6-----	10	12	14	16	18	20	22	24
8-----	13½	16	18¾	21½	24	26¾	29½	32
10-----	16¾	20	23½	26¾	30	33½	36¾	40
12-----	20	24	28	32	36	40	44	48
14-----	23½	28	32¾	37½	42	46¾	51½	56
16-----	26¾	32	37½	42¾	48	53½	58¾	64
2½ by 12-----	25	30	35	40	45	50	55	60
14-----	29½	35	40¾	46¾	52½	58½	64½	70
16-----	33½	40	46¾	53½	60	66¾	73½	80
3 by 4-----	10	12	14	16	18	20	22	24
6-----	15	18	21	24	27	30	33	36
8-----	20	24	28	32	36	40	44	48
10-----	25	30	35	40	45	50	55	60
12-----	30	36	42	48	54	60	66	72
14-----	35	42	49	56	63	70	77	84
16-----	40	48	56	64	72	80	88	96

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Appendix 13 (continued)

Board-foot Contents of Standard Lumber and Timber Sizes

End dimensions (inches)	Volume (board feet) according to length, in feet—							
	10	12	14	16	18	20	22	24
4 by 4-----	13 $\frac{1}{4}$	16	18 $\frac{3}{4}$	21 $\frac{1}{4}$	24	26 $\frac{3}{4}$	29 $\frac{1}{4}$	32
6-----	20	24	28	32	36	40	44	48
8-----	26 $\frac{3}{4}$	32	37 $\frac{1}{4}$	42 $\frac{3}{4}$	48	53 $\frac{1}{4}$	58 $\frac{3}{4}$	64
10-----	33 $\frac{1}{4}$	40	46 $\frac{3}{4}$	53 $\frac{1}{4}$	60	66 $\frac{3}{4}$	73 $\frac{1}{4}$	80
12-----	40	48	56	64	72	80	88	96
14-----	46 $\frac{3}{4}$	56	66 $\frac{3}{4}$	74 $\frac{3}{4}$	84	93 $\frac{1}{4}$	102 $\frac{3}{4}$	112
5 by 8-----	33 $\frac{1}{4}$	40	46 $\frac{3}{4}$	53 $\frac{1}{4}$	60	66 $\frac{3}{4}$	73 $\frac{1}{4}$	80
6 by 6-----	30	36	42	48	54	60	66	72
8-----	40	48	56	64	72	80	88	96
10-----	50	60	70	80	90	100	110	120
12-----	60	72	84	96	108	120	132	144
14-----	70	84	98	112	126	140	154	168
16-----	80	96	112	128	144	160	176	192
8 by 8-----	53 $\frac{1}{4}$	64	74 $\frac{3}{4}$	85 $\frac{1}{4}$	96	106 $\frac{3}{4}$	117 $\frac{1}{4}$	128
10-----	66 $\frac{3}{4}$	80	93 $\frac{1}{4}$	106 $\frac{3}{4}$	120	133 $\frac{1}{4}$	146 $\frac{3}{4}$	160
12-----	80	96	112	128	144	160	176	192
14-----	93 $\frac{1}{4}$	112	130 $\frac{3}{4}$	149 $\frac{1}{4}$	168	186 $\frac{3}{4}$	205 $\frac{1}{4}$	224
10 by 10-----	83 $\frac{1}{4}$	100	116 $\frac{3}{4}$	133 $\frac{1}{4}$	150	166 $\frac{3}{4}$	183 $\frac{1}{4}$	200
12-----	100	120	140	160	180	200	220	240
14-----	116 $\frac{3}{4}$	140	163 $\frac{1}{4}$	186 $\frac{3}{4}$	210	233 $\frac{1}{4}$	256 $\frac{3}{4}$	280
16-----	133 $\frac{1}{4}$	160	186 $\frac{3}{4}$	213 $\frac{1}{4}$	240	266 $\frac{3}{4}$	293 $\frac{1}{4}$	320
12 by 12-----	120	144	168	192	216	240	264	288
14-----	140	168	196	224	252	280	308	336
16-----	160	192	224	256	288	320	352	384
14 by 14-----	163 $\frac{1}{4}$	196	223 $\frac{3}{4}$	261 $\frac{1}{4}$	294	326 $\frac{3}{4}$	359 $\frac{1}{4}$	392
16-----	186 $\frac{3}{4}$	224	261 $\frac{1}{4}$	293 $\frac{3}{4}$	336	373 $\frac{1}{4}$	410 $\frac{3}{4}$	448
18-----	210	252	294	336	378	420	462	504
16 by 16-----	213 $\frac{1}{4}$	256	298 $\frac{3}{4}$	341 $\frac{1}{4}$	384	426 $\frac{3}{4}$	469 $\frac{1}{4}$	512
18-----	240	288	336	384	432	480	528	576
20-----	266 $\frac{3}{4}$	320	373 $\frac{1}{4}$	426 $\frac{3}{4}$	480	533 $\frac{1}{4}$	586 $\frac{3}{4}$	640
18 by 18-----	270	324	378	432	486	540	594	648
20 by 20-----	333 $\frac{1}{4}$	400	466 $\frac{3}{4}$	533 $\frac{1}{4}$	600	666 $\frac{3}{4}$	733 $\frac{1}{4}$	800
22 by 22-----	403 $\frac{1}{4}$	484	564 $\frac{3}{4}$	645 $\frac{1}{4}$	726	806 $\frac{3}{4}$	887 $\frac{1}{4}$	968
24 by 24-----	480	576	672	768	864	960	1,056	1,152
26 by 26-----	563 $\frac{1}{4}$	676	788 $\frac{3}{4}$	901 $\frac{1}{4}$	1,014	1,126 $\frac{3}{4}$	1,239 $\frac{1}{4}$	1,352
28 by 28-----	653 $\frac{1}{4}$	784	914 $\frac{3}{4}$	1,045 $\frac{1}{4}$	1,176	1,306 $\frac{3}{4}$	1,437 $\frac{1}{4}$	1,568
30 by 30-----	750	900	1,050	1,200	1,350	1,500	1,650	1,800

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Appendix 13 (continued)

Board-foot Contents of Standard Lumber and Timber Sizes

End dimensions (Inches)	Volume (board feet) according to length in feet—					
	28	32	34	36	38	40
8 by 8.....	149 $\frac{1}{4}$	170 $\frac{3}{4}$	181 $\frac{1}{4}$	192	202 $\frac{3}{4}$	213 $\frac{1}{4}$
10.....	186 $\frac{3}{4}$	213 $\frac{1}{4}$	226 $\frac{3}{4}$	240	253 $\frac{1}{4}$	266 $\frac{3}{4}$
12.....	224	256	272	288	304	320
14.....	261 $\frac{1}{4}$	298 $\frac{3}{4}$	317 $\frac{1}{4}$	336	354 $\frac{3}{4}$	373 $\frac{1}{4}$
10 by 10.....	233 $\frac{1}{4}$	266 $\frac{3}{4}$	283 $\frac{1}{4}$	300	316 $\frac{3}{4}$	333 $\frac{1}{4}$
12.....	280	320	340	360	380	400
14.....	326 $\frac{3}{4}$	373 $\frac{1}{4}$	396 $\frac{3}{4}$	420	443 $\frac{1}{4}$	466 $\frac{3}{4}$
16.....	373 $\frac{1}{4}$	426 $\frac{3}{4}$	453 $\frac{1}{4}$	480	506 $\frac{3}{4}$	533 $\frac{1}{4}$
12 by 12.....	336	384	408	432	456	480
14.....	392	448	476	504	532	560
16.....	448	512	544	576	608	640
14 by 14.....	457 $\frac{1}{4}$	522 $\frac{3}{4}$	555 $\frac{1}{4}$	588	620 $\frac{3}{4}$	653 $\frac{1}{4}$
16.....	522 $\frac{3}{4}$	597 $\frac{1}{4}$	634 $\frac{3}{4}$	672	709 $\frac{1}{4}$	746 $\frac{3}{4}$
18.....	588	672	714	756	798	840
16 by 16.....	597 $\frac{1}{4}$	682 $\frac{3}{4}$	725 $\frac{1}{4}$	768	810 $\frac{3}{4}$	853 $\frac{1}{4}$
18.....	672	768	816	864	912	960
20.....	746 $\frac{3}{4}$	853 $\frac{1}{4}$	906 $\frac{3}{4}$	960	1,013 $\frac{1}{4}$	1,066 $\frac{3}{4}$
18 by 18.....	756	864	918	972	1,026	1,080
20 by 20.....	933 $\frac{1}{4}$	1,066 $\frac{3}{4}$	1,133 $\frac{1}{4}$	1,200	1,266 $\frac{3}{4}$	1,333 $\frac{1}{4}$
22 by 22.....	1,129 $\frac{1}{4}$	1,290 $\frac{3}{4}$	1,371 $\frac{1}{4}$	1,452	1,532 $\frac{3}{4}$	1,613 $\frac{1}{4}$
24 by 24.....	1,344	1,636	1,682	1,728	1,824	1,920
26 by 26.....	1,577 $\frac{1}{4}$	1,892 $\frac{3}{4}$	1,915 $\frac{1}{4}$	2,028	2,140 $\frac{3}{4}$	2,253 $\frac{1}{4}$
28 by 28.....	1,829 $\frac{1}{4}$	2,090 $\frac{3}{4}$	2,221 $\frac{1}{4}$	2,352	2,482 $\frac{3}{4}$	2,613 $\frac{1}{4}$
30 by 30.....	2,100	2,400	2,550	2,700	2,850	3,000

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Appendix 14 - Board-foot Contents of Railroad Ties

[To nearest whole board foot, with no deduction for kerf]

End dimensions (inches)	Length (feet)		
	6½ ¹	8 ²	8½
6 by 6.....	20	24	26
6 by 7.....	23	28	30
6 by 8.....	26	32	34
7 by 7.....	27	33	35
7 by 8.....	30	37	40
7 by 9.....	-----	42	45

¹ Narrow gage railroad.² Standard gage railroad.

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Appendix

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Appendix 15 - Factors for Computing Scribner Decimal C Log Volumes

For logs 1' through 20' in length

Revised 7/1/72

	DIA.	FACTOR	DIA.	FACTOR	DIA.	FACTOR	DIA.	FACTOR
	1	0.000	22	20.880	55	141.610	88	376.610
	2	0.143	23	23.510	56	146.912	89	385.135
	3	0.390	24	25.218	57	152.210	90	393.380
	4	0.676	25	28.677	58	157.710	91	402.499
	5	1.070	26	31.249	59	163.288	92	410.834
1' thru 15'	6	1.160*	27	34.220	60	168.990	93	419.166
	7	1.400*	28	36.376	61	174.850	94	428.380
	8	1.501*	29	38.040	62	180.749	95	437.499
	9	2.084*	30	41.060	63	186.623	96	446.565
	10	3.126*	31	44.376	64	193.170	97	455.010
	11	3.749*	32	45.975	65	199.120	98	464.150
16' thru 20'	6	1.249*	33	48.990	66	205.685	99	473.430
	7	1.608*	34	50.000	67	211.810	100	482.490
	8	1.854*	35	54.688	68	218.501	101	491.700
	9	2.410*	36	57.660	69	225.685	102	501.700
	10	3.542*	37	64.319	70	232.499	103	511.700
	11	4.167*	38	66.731	71	239.317	104	521.700
			39	70.000	72	246.615	105	531.700
			40	75.240	73	254.040	106	541.700
			41	79.480	74	261.525	107	552.499
			42	83.910	75	269.040	108	562.501
			43	87.190	76	276.630	109	573.350
			44	92.501	77	284.260	110	583.350
	12	4.900	45	94.990	78	292.501	111	594.150
	13	6.043	46	99.075	79	300.655	112	604.170
	14	7.140	47	103.501	80	308.970	113	615.010
	15	8.880	48	107.970	81	317.360	114	625.890
	16	10.000	49	112.292	82	325.790	115	636.660
	17	11.528	50	116.990	83	334.217	116	648.380
	18	13.290	51	121.650	84	343.290	117	660.000
	19	14.990	52	126.525	85	350.785	118	671.700
	20	17.499	53	131.510	86	359.120	119	683.330
	21	18.990	54	136.510	87	368.380	120	695.011

SPECIAL NOTE: Log diameters 6" - 11" have separate factors for log lengths 1' - 15', and 16'- 20'.

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Appendix 16 - Scribner Decimal C Recorded Lengths and Segment Lengths

Maximum 6"Trim per Segment

Measured Length (Ft. & In.)	Recorded Length (Ft)	Segment Length(s) (Ft)		
		top	2 nd	3rd
8'0" - 8'6"	8	8		
8'7" - 9'6"	9	9		
9'7" - 10'6"	10	10		
10'7" - 11'6"	11	11		
11'7" - 12'6"	12	12		
12'7" - 13'6"	13	13		
13'7" - 14'6"	14	14		
14'7" - 15'6"	15	15		
15'7" - 16'6"	16	16		
16'7" - 17'6"	17	17		
17'7" - 18'6"	18	18		
18'7" - 19'6"	19	19		
19'7" - 20'6"	20	20		
20'7" - 22'0"	21	10	11	
22'1" - 23'0"	22	10	12	
23'1" - 24'0"	23	11	12	
24'1" - 25'0"	24	12	12	
25'1" - 26'0"	25	12	13	
26'1" - 27'0"	26	12	14	
27'1" - 28'0"	27	13	14	
28'1" - 29'0"	28	14	14	
29'1" - 30'0"	29	14	15	
30'1" - 31'0"	30	14	16	
31'1" - 32'0"	31	15	16	
32'1" - 33'0"	32	16	16	
33'1" - 34'0"	33	16	17	
34'1" - 35'0"	34	16	18	
35'1" - 36'0"	35	17	18	
36'1" - 37'0"	36	18	18	
37'1" - 38'0"	37	18	19	
38'1" - 39'0"	38	18	20	
39'1" - 40'0"	39	19	20	
40'1" - 41'0"	40	20	20	
41'1" - 42'6"	41	13	14	14
42'7" - 43'6"	42	14	14	14

Appendix

Amendment: 2409.11-2013-1

Effective date: June 26, 2013

Appendix 16 (continued)**Scribner Decimal C Recorded Lengths and Segments**

Measured Length (Ft. & In.)	Recorded Length (Ft)	Segment Length(s) (Ft)		
		top	2 nd	3rd
43'7" - 44'6"	43	14	14	15
44'7" - 45'6"	44	14	14	16
45'7" - 46'6"	45	14	15	16
46'7" - 47'6"	46	14	16	16
47'7" - 48'6"	47	15	16	16
48'7" - 49'6"	48	16	16	16
49'7" - 50'6"	49	16	16	17
50'7" - 51'6"	50	16	16	18
51'7" - 52'6"	51	16	17	18
52'7" - 53'6"	52	16	18	18
53'7" - 54'6"	53	17	18	18
54'7" - 55'6"	54	18	18	18
55'7" - 56'6"	55	18	18	19
56'7" - 57'6"	56	18	18	20
57'7" - 58'6"	57	18	19	20
58'7" - 59'6"	58	18	20	20
59'7" - 60'6"	59	19	20	20
60'7" - 61'6"	60	20	20	20