

Table J.1: Connection tests' distribution goodness of fit

Group	Strength	Distribution	Weibull Parameters			Goodness of Fit Test p-value			Decision	Best Fit
			Location	Shape ( $\alpha$ )	Scale ( $\beta$ )	K <sup>2</sup>	K-S	A-D		
			Lognormal Parameters							
			min x	Mean ( $\mu$ )	Shape ( $\sigma$ )					
1	Capacity	Weibull	1614	3.59	640	0.84	1.00	0.98	Accept	Weibull
		Lognormal	0	7.99	0.05	0.84	0.97	0.94	Accept	
	5% Offset	Weibull	965	2.16	231	0.84	0.94	0.92	Accept	
		Lognormal	761	5.99	0.24	0.84	0.97	0.97	Accept	
2	Capacity	Weibull	1665	2.34	1130	0.33	0.57	0.72	Accept	Lognormal
		Lognormal	0	7.87	0.17	0.14	0.65	0.76	Accept	
	5% Offset	Weibull	0	8.76	2163	0.33	0.44	0.45	Accept	
		Lognormal	0	7.60	0.21	0.13	0.14	0.06	Accept	
3	Capacity	Weibull	1333	3.80	845	0.96	0.77	0.82	Accept	Weibull
		Lognormal	0	7.64	0.11	0.21	0.50	0.66	Accept	
	5% Offset	Weibull	377	8.17	724	0.57	0.73	0.79	Accept	
		Lognormal	0	6.96	0.09	0.37	0.37	0.52	Accept	
4	Capacity	Weibull	2467	2.12	925	0.84	0.85	0.93	Accept	Weibull
		Lognormal	0	8.09	0.12	0.70	0.82	0.95	Accept	
	5% Offset	Weibull	804	7.47	1578	0.57	0.60	0.73	Accept	
		Lognormal	0	7.73	0.11	0.18	0.31	0.49	Accept	
5	Capacity	Weibull	2347	1.77	645	0.57	0.84	0.97	Accept	Lognormal
		Lognormal	1568	7.18	0.25	0.84	0.93	0.97	Accept	
	5% Offset	Weibull	0	11.16	2285	0.90	0.88	0.95	Accept	
		Lognormal	0	7.68	0.12	0.84	0.54	0.51	Accept	
6	Capacity	Weibull	1065	2.79	691	0.28	0.93	0.87	Accept	Weibull
		Lognormal	0	7.41	0.15	0.28	0.87	0.84	Accept	
	5% Offset	Weibull	575	4.69	422	0.84	0.98	0.99	Accept	
		Lognormal	0	6.86	0.10	0.77	0.81	0.88	Accept	
7	Capacity	Weibull	1262	2.87	979	0.84	0.91	0.94	Accept	Weibull
		Lognormal	0	7.65	0.16	0.70	0.77	0.92	Accept	
	5% Offset	Weibull	158	4.06	1610	0.84	1.00	0.99	Accept	
		Lognormal	0	7.35	0.30	0.70	0.63	0.67	Accept	
8	Capacity	Weibull	804	4.56	870	0.33	0.79	0.85	Accept	Weibull
		Lognormal	0	7.37	0.13	0.11	0.42	0.62	Accept	
	5% Offset	Weibull	812	2.26	175	0.90	0.96	0.98	Accept	
		Lognormal	238	6.59	0.10	0.96	0.98	0.98	Accept	
9	Capacity	Weibull	1455	3.62	1229	0.63	0.91	0.85	Accept	Weibull
		Lognormal	0	7.84	0.14	0.57	0.72	0.75	Accept	
	5% Offset	Weibull	1062	4.19	968	0.96	0.85	0.96	Accept	
		Lognormal	0	7.56	0.12	0.96	0.89	0.96	Accept	
10	Capacity	Weibull	1199	2.98	634	0.77	0.81	0.73	Accept	Weibull
		Lognormal	0	7.47	0.12	0.57	0.77	0.69	Accept	
	5% Offset	Weibull	665	4.46	356	0.07	0.56	0.70	Accept	
		Lognormal	0	6.89	0.09	0.07	0.31	0.50	Accept	
11	Capacity	Weibull	1113	2.39	1042	0.04	0.26	0.56	Accept**	Weibull
		Lognormal	0	7.60	0.21	0.04	0.24	0.53	Accept**	
	5% Offset	Weibull	703	1.18	520	0.10	0.57	0.48	Accept	
		Lognormal	539	6.32	0.58	0.23	0.80	0.75	Accept	
12	Capacity	Weibull	2786	2.39	999	0.57	0.61	0.67	Accept	Lognormal
		Lognormal	1826	7.50	0.20	0.70	0.79	0.92	Accept	
	5% Offset	Weibull	1416	4.22	1641	0.57	0.86	0.86	Accept	
		Lognormal	0	7.97	0.14	0.84	0.82	0.76	Accept	
13	Capacity	Weibull	413	5.71	2340	0.84	0.98	1.00	Accept	Weibull
		Lognormal	0	7.84	0.18	0.84	0.97	0.89	Accept	
	5% Offset	Weibull	747	2.05	1366	0.46	0.51	0.67	Accept	
		Lognormal	0	7.53	0.34	0.46	0.33	0.60	Accept	
14	Capacity	Weibull	1147	1.45	695	0.77	0.90	0.97	Accept	Lognormal
		Lognormal	858	6.72	0.46	0.90	0.99	0.99	Accept	
	5% Offset	Weibull	427	1.79	780	0.23	0.84	0.92	Accept	
		Lognormal	69	6.89	0.38	0.41	0.91	0.97	Accept	
15	Capacity	Weibull	2801	1.30	561	0.06	0.31	0.59	Accept	Lognormal
		Lognormal	2321	6.84	0.37	0.18	0.60	0.79	Accept	
	5% Offset	Weibull	1621	2.64	1222	0.46	0.81	0.79	Accept	
		Lognormal	0	7.89	0.16	0.46	0.92	0.93	Accept	
16	Capacity	Weibull	1537	2.45	917	0.96	0.34	0.42	Accept	Lognormal
		Lognormal	0	7.75	0.15	0.96	0.40	0.44	Accept	
	5% Offset	Weibull	1420	1.25	385	0.18	0.52	0.74	Accept	
		Lognormal	1246	6.15	0.51	0.18	0.59	0.72	Accept	

Accept\*\* indicates that one of the goodness of fit tests indicates statistical rejection of null hypothesis.

Table J.2: Embedment tests' goodness of fit

Group	Strength	Distribution	Weibull Parameters			Goodness of Fit Test p-value			Decision	Best Fit
			Location	Shape ( $\alpha$ )	Scale ( $\beta$ )	K <sup>2</sup>	K-S	A-D		
			Lognormal Parameters							
			min x	Mean ( $\mu$ )	Shape ( $\sigma$ )					
1, 3	Capacity	Weibull	3214	4.28	3441	1.00	0.85	0.96	Accept	Weibull
		Lognormal	0	8.74	0.13	0.86	0.63	0.72	Accept	
	5% Offset	Weibull	3059	2.54	2510	0.14	0.68	0.91	Accept	
		Lognormal	0	8.56	0.18	0.14	0.50	0.80	Accept	
6, 8, 10	Capacity	Weibull	3799	2.26	1698	0.34	0.49	0.58	Accept	Lognormal
		Lognormal	0	8.57	0.14	0.43	0.56	0.59	Accept	
	5% Offset	Weibull	2753	1.71	1438	0.47	0.88	0.91	Accept	
		Lognormal	1829	7.64	0.34	0.19	0.93	0.91	Accept	
2, 4, 5	Capacity	Weibull	2298	2.70	2061	0.24	0.50	0.75	Accept	Weibull
		Lognormal	0	8.31	0.18	0.16	0.46	0.75	Accept	
	5% Offset	Weibull	2449	1.94	1547	0.59	0.82	0.81	Accept	
		Lognormal	598	8.05	0.22	0.61	0.93	0.91	Accept	
7, 9	Capacity	Weibull	1058	3.71	2716	0.54	0.68	0.84	Accept	Weibull
		Lognormal	0	8.14	0.22	0.26	0.61	0.58	Accept	
	5% Offset	Weibull	1311	3.37	1849	0.34	0.70	0.59	Accept	
		Lognormal	0	7.98	0.19	0.20	0.68	0.54	Accept	
11, 12, 13	Capacity	Weibull	1437	5.19	3280	0.29	0.51	0.81	Accept	Weibull
		Lognormal	0	8.39	0.16	0.17	0.09	0.18	Accept	
	5% Offset	Weibull	1636	4.53	2978	0.87	0.84	0.92	Accept	
		Lognormal	0	8.37	0.16	0.61	0.47	0.37	Accept	
14, 15, 16	Capacity	Weibull	253	9.19	4741	0.57	0.75	0.94	Accept	Weibull
		Lognormal	0	8.46	0.13	0.31	0.26	0.28	Accept	
	5% Offset	Weibull	1367	6.34	3491	0.63	0.74	0.78	Accept	
		Lognormal	0	8.43	0.13	0.92	0.41	0.54	Accept	

Table J.3: Fracture tests' goodness of fit

Species	Distribution	Weibull Parameters			Goodness of Fit Test p-value			Decision	Best Fit
		Location	Shape ( $\alpha$ )	Scale ( $\beta$ )	K <sup>2</sup>	K-S	A-D		
		Lognormal Parameters							
		min x	Mean ( $\mu$ )	Shape ( $\sigma$ )					
DF	Weibull	240	2.90	145	0.29	0.93	0.97	Accept	Weibull
	Lognormal	0	5.90	0.13	0.29	0.93	0.96	Accept	
SPF	Weibull	234	2.65	135	0.71	0.71	0.88	Accept	Lognormal
	Lognormal	0	5.86	0.14	0.71	0.81	0.93	Accept	

Table J.4: Tension strength perpendicular-to-grain tests' goodness of fit

Species	Distribution	Weibull Parameters			Goodness of Fit Test p-value			Decision	Best Fit
		Location	Shape ( $\alpha$ )	Scale ( $\beta$ )	K <sup>2</sup>	K-S	A-D		
		Lognormal Parameters							
		min x	Mean ( $\mu$ )	Shape ( $\sigma$ )					
DF	Weibull	176	1.51	91	0.57	0.88	0.96	Accept	Lognormal
	Lognormal	125	4.80	0.40	0.77	0.97	0.98	Accept	
SPF	Weibull	0	4.76	310	0.57	0.93	0.88	Accept	Weibull
	Lognormal	0	5.62	0.27	0.18	0.54	0.35	Accept	

Table J.5: Specific gravity goodness of fit

Species	Distribution	Weibull Parameters			Goodness of Fit Test p-value			Decision	Best Fit
		Location	Shape ( $\alpha$ )	Scale ( $\beta$ )	K <sup>2</sup>	K-S	A-D		
		Lognormal Parameters							
		min x	Mean ( $\mu$ )	Shape ( $\sigma$ )					
DF	Weibull	0.34	2.53	0.12	0.44	0.57	0.55	Accept	Lognormal
	Lognormal	0.19	-1.38	0.18	0.93	0.94	0.94	Accept	
SPF	Weibull	0.33	2.66	0.12	0.55	0.64	0.82	Accept	Weibull
	Lognormal	0	-0.81	0.10	0.50	0.51	0.73	Accept	

Table J.6: Moisture content goodness of fit

Species	Distribution	Weibull Parameters			Goodness of Fit Test p-value			Decision	Best Fit
		Location	Shape ( $\alpha$ )	Scale ( $\beta$ )	K <sup>2</sup>	K-S	A-D		
		Lognormal Parameters							
		min x	Mean ( $\mu$ )	Shape ( $\sigma$ )					
DF	Weibull	11.3	3.05	3.18	***	0.05	0.14	Accept**	Lognormal
	Lognormal	2.71	2.43	0.09	0.04	0.14	0.35	Accept**	
SPF	Weibull	10.4	2.99	3.45	0.11	0.73	0.93	Accept	Weibull
	Lognormal	0	2.60	0.08	0.29	0.47	0.91	Accept	

Accept\*\* indicates one of the goodness of fit tests indicates statistical rejection of null hypothesis.

\*\*\* indicates that the p-value is less than 0.01.