

Biomechanical properties of the porcine thoracic aorta: An in-depth analysis of elastic modulus, stress-strain behavior and tissue toughness with regard to anatomical location and loading orientation

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Supporting Information:

Supporting Information

Table S1. Descriptive statistics (mean $\pm$ SD, median, min/max, IQR) for all measured outcomes, by segment and orientation (n = 10 aortas per cell).

Outcome	Segment	Orientation	n	Mean	SD	Median	Min	Max	Q1	Q3
Low-Strain Modulus, Engineering (MPa)	S1	Circumferentiell	10	0.434	0.108	0.399	0.315	0.637	0.349	0.505
	S1	Longitudinal	10	0.383	0.101	0.386	0.203	0.568	0.365	0.426
	S2	Circumferentiell	10	0.593	0.23	0.485	0.378	1.125	0.466	0.681
	S2	Longitudinal	10	0.59	0.399	0.435	0.315	1.395	0.356	0.511
	S3	Circumferentiell	10	0.53	0.115	0.508	0.398	0.755	0.444	0.589
	S3	Longitudinal	10	0.751	0.319	0.689	0.372	1.34	0.496	0.973
	S4	Circumferentiell	10	0.591	0.158	0.627	0.312	0.855	0.471	0.668
	S4	Longitudinal	10	1.023	0.336	1.104	0.468	1.41	0.855	1.232
	S5	Circumferentiell	10	0.608	0.132	0.614	0.412	0.885	0.576	0.646
	S5	Longitudinal	10	1	0.488	0.915	0.302	1.778	0.693	1.339
	S6	Circumferentiell	10	0.786	0.225	0.728	0.505	1.272	0.63	0.914
	S6	Longitudinal	10	0.991	0.349	1.016	0.403	1.465	0.759	1.266
High-Strain Modulus, Engineering (MPa)	S1	Circumferentiell	10	1.73	0.53	1.895	0.905	2.422	1.418	2.128
	S1	Longitudinal	10	0.815	0.149	0.77	0.605	1.1	0.739	0.915
	S2	Circumferentiell	10	2.802	0.531	2.585	2.308	3.89	2.445	3.138
	S2	Longitudinal	10	1.421	0.576	1.242	0.718	2.605	1.155	1.772
	S3	Circumferentiell	10	3.357	0.79	3.425	1.992	4.772	2.869	3.709
	S3	Longitudinal	10	1.209	0.347	1.15	0.653	1.74	0.971	1.454
	S4	Circumferentiell	10	4.125	1.33	4.093	1.865	6.797	3.364	4.705
	S4	Longitudinal	10	1.232	0.531	1.163	0.645	2.01	0.763	1.714
	S5	Circumferentiell	10	5.115	1.193	5.299	3.295	7.055	4.292	5.826
	S5	Longitudinal	10	1.619	0.616	1.702	0.815	2.345	1.003	2.169
	S6	Circumferentiell	10	5.822	1.5	5.686	3.812	7.965	4.739	6.789
	S6	Longitudinal	10	3.588	1.385	3.5	1.77	5.935	2.505	4.412
Toughness, Engineering (MJ/m3)	S1	Circumferentiell	10	1.504	0.411	1.431	1.058	2.49	1.232	1.64
	S1	Longitudinal	10	0.528	0.217	0.49	0.172	0.992	0.419	0.631
	S2	Circumferentiell	10	1.254	0.255	1.171	0.888	1.688	1.097	1.409
	S2	Longitudinal	10	0.489	0.228	0.409	0.23	0.945	0.359	0.586
	S3	Circumferentiell	10	1.222	0.322	1.269	0.812	1.782	0.949	1.433

Outcome	Segment	Orientation	n	Mean	SD	Median	Min	Max	Q1	Q3
Stress at failure, Engineering (MPa)	S3	Longitudinal	10	0.579	0.193	0.569	0.315	0.87	0.411	0.753
	S4	Circumferentiell	10	1.145	0.435	1.163	0.367	1.817	0.917	1.461
	S4	Longitudinal	10	0.581	0.179	0.552	0.335	0.98	0.477	0.648
	S5	Circumferentiell	10	0.967	0.313	0.915	0.5	1.48	0.759	1.119
	S5	Longitudinal	10	0.754	0.26	0.83	0.38	1.212	0.541	0.891
	S6	Circumferentiell	10	0.803	0.307	0.751	0.253	1.32	0.631	1.016
	S6	Longitudinal	10	1.076	0.355	1.025	0.453	1.663	0.89	1.239
	S1	Circumferentiell	10	1.931	0.478	1.889	1.33	3.018	1.666	1.904
	S1	Longitudinal	10	0.809	0.236	0.756	0.42	1.248	0.686	0.934
	S2	Circumferentiell	10	2.268	0.419	2.171	1.735	3.098	1.992	2.36
	S2	Longitudinal	10	1.028	0.373	0.96	0.662	1.877	0.762	1.196
	S3	Circumferentiell	10	2.521	0.43	2.52	1.77	3.152	2.299	2.808
	S3	Longitudinal	10	1.06	0.206	1.067	0.65	1.315	0.94	1.23
	S4	Circumferentiell	10	2.592	0.632	2.527	1.367	3.52	2.384	2.934
	S4	Longitudinal	10	1.09	0.309	1.045	0.65	1.502	0.879	1.343
	S5	Circumferentiell	10	2.575	0.614	2.421	1.88	3.825	2.091	2.932
	S5	Longitudinal	10	1.425	0.391	1.417	0.853	2.065	1.214	1.703
	S6	Circumferentiell	10	2.519	0.709	2.339	1.48	3.783	2.101	2.911
Strain at failure, Engineering (-)	S6	Longitudinal	10	2.438	0.697	2.257	1.643	3.638	2.038	2.618
	S1	Circumferentiell	10	2.153	0.214	2.174	1.79	2.49	2.091	2.292
	S1	Longitudinal	10	1.602	0.218	1.613	1.105	1.962	1.574	1.646
	S2	Circumferentiell	10	1.603	0.129	1.599	1.442	1.762	1.486	1.735
	S2	Longitudinal	10	1.212	0.218	1.281	0.845	1.482	1.069	1.365
	S3	Circumferentiell	10	1.505	0.168	1.556	1.235	1.778	1.411	1.592
	S3	Longitudinal	10	1.293	0.197	1.314	1.02	1.567	1.131	1.458
	S4	Circumferentiell	10	1.331	0.223	1.379	0.935	1.64	1.254	1.468
	S4	Longitudinal	10	1.254	0.168	1.2	1.042	1.48	1.149	1.429
	S5	Circumferentiell	10	1.171	0.124	1.188	0.938	1.377	1.099	1.236
	S5	Longitudinal	10	1.311	0.187	1.329	0.953	1.655	1.206	1.391
	S6	Circumferentiell	10	1.006	0.175	1.018	0.64	1.25	0.948	1.099
	S6	Longitudinal	10	1.294	0.191	1.274	0.917	1.53	1.195	1.448
Low-Strain Modulus, True (MPa)	S1	Circumferentiell	10	0.825	0.209	0.787	0.618	1.327	0.682	0.899
	S1	Longitudinal	10	0.885	0.283	0.884	0.487	1.452	0.747	1.001
	S2	Circumferentiell	10	0.961	0.3	0.893	0.57	1.468	0.787	1.035
	S2	Longitudinal	10	1.099	0.705	0.848	0.497	2.8	0.742	0.991

Outcome	Segment	Orientation	n	Mean	SD	Median	Min	Max	Q1	Q3
High-Strain Modulus, True (MPa)	S3	Circumferentiell	10	0.877	0.187	0.893	0.565	1.155	0.763	1.021
	S3	Longitudinal	10	1.228	0.564	1.149	0.613	2.442	0.816	1.413
	S4	Circumferentiell	10	0.945	0.244	0.841	0.565	1.282	0.787	1.172
	S4	Longitudinal	10	1.537	0.754	1.444	0.552	2.645	0.976	2.013
	S5	Circumferentiell	10	0.996	0.26	1.002	0.69	1.593	0.833	1.048
	S5	Longitudinal	10	1.798	1.046	1.769	0.593	4.022	1.018	1.896
	S6	Circumferentiell	10	1.224	0.317	1.091	0.907	1.83	1.012	1.462
	S6	Longitudinal	10	1.329	0.484	1.278	0.65	2.322	1.119	1.579
	S1	Circumferentiell	10	15.584	4.096	15.172	8.768	22.887	13.348	17.654
	S1	Longitudinal	10	5.679	1.557	5.429	3.15	8.48	4.777	6.288
	S2	Circumferentiell	10	16.439	2.444	15.724	12.85	20.95	14.836	18.234
	S2	Longitudinal	10	7.112	2.972	6.622	4.008	14.463	5.116	7.721
	S3	Circumferentiell	10	18.855	3.38	18.739	12.352	23.668	18.116	20.958
	S3	Longitudinal	10	6.714	1.42	7.09	3.678	8.245	5.936	7.658
	S4	Circumferentiell	10	20.484	5.719	20.005	11.695	28.08	17.149	25.61
	S4	Longitudinal	10	6.523	2.193	6.034	3.803	9.605	4.767	8.436
Toughness, True (MJ/m3)	S5	Circumferentiell	10	21.551	4.314	21.296	16.255	30.823	18.719	23.1
	S5	Longitudinal	10	9.147	2.904	9.096	5.018	14.245	7.847	10.523
	S6	Circumferentiell	10	20.816	6.524	20.181	13.748	36.1	16.185	23.341
	S6	Longitudinal	10	18.204	6.503	16.378	11.265	30.39	14.334	18.139
	S1	Circumferentiell	10	1.504	0.411	1.431	1.058	2.49	1.232	1.64
	S1	Longitudinal	10	0.528	0.217	0.49	0.172	0.992	0.419	0.631
	S2	Circumferentiell	10	1.254	0.255	1.171	0.888	1.688	1.097	1.409
	S2	Longitudinal	10	0.489	0.228	0.409	0.23	0.945	0.359	0.586
	S3	Circumferentiell	10	1.222	0.322	1.269	0.812	1.782	0.949	1.433
	S3	Longitudinal	10	0.579	0.193	0.569	0.315	0.87	0.411	0.753
	S4	Circumferentiell	10	1.145	0.435	1.163	0.367	1.817	0.917	1.461
	S4	Longitudinal	10	0.581	0.179	0.552	0.335	0.98	0.477	0.648
	S5	Circumferentiell	10	0.967	0.313	0.915	0.5	1.48	0.759	1.119
	S5	Longitudinal	10	0.754	0.26	0.83	0.38	1.212	0.541	0.891
	S6	Circumferentiell	10	0.803	0.307	0.751	0.253	1.32	0.631	1.016
	S6	Longitudinal	10	1.076	0.355	1.025	0.453	1.663	0.89	1.239
Stress at failure, True (MPa)	S1	Circumferentiell	10	6.123	1.674	5.981	4.265	10.07	5.081	6.231
	S1	Longitudinal	10	2.145	0.77	1.946	0.872	3.728	1.779	2.461
	S2	Circumferentiell	10	5.952	1.221	5.497	4.35	8.363	5.375	6.057

Outcome	Segment	Orientation	n	Mean	SD	Median	Min	Max	Q1	Q3
Strain at failure, True (-)	S2	Longitudinal	10	2.312	0.979	2.1	1.315	4.615	1.574	2.723
	S3	Circumferentiell	10	6.332	1.218	6.521	4.605	8.338	5.28	7.262
	S3	Longitudinal	10	2.436	0.603	2.289	1.458	3.38	2.075	2.961
	S4	Circumferentiell	10	6.119	1.752	6.043	2.748	8.672	5.161	7.319
	S4	Longitudinal	10	2.453	0.712	2.339	1.425	3.728	2.1	2.801
	S5	Circumferentiell	10	5.647	1.455	5.3	3.645	8.438	4.676	6.604
	S5	Longitudinal	10	3.3	1.016	3.251	1.855	5.037	2.704	3.962
	S6	Circumferentiell	10	5.133	1.759	4.571	2.417	8.555	4.268	6.211
	S6	Longitudinal	10	5.598	1.807	4.992	3.25	8.898	4.668	6.088
	S1	Circumferentiell	10	1.143	0.071	1.153	1.015	1.25	1.126	1.186
	S1	Longitudinal	10	0.952	0.088	0.959	0.74	1.083	0.946	0.971
	S2	Circumferentiell	10	0.953	0.05	0.949	0.89	1.015	0.907	1.004
	S2	Longitudinal	10	0.787	0.101	0.821	0.608	0.907	0.726	0.856
	S3	Circumferentiell	10	0.915	0.068	0.939	0.802	1.018	0.879	0.952
	S3	Longitudinal	10	0.823	0.087	0.834	0.703	0.94	0.753	0.893
	S4	Circumferentiell	10	0.842	0.099	0.864	0.66	0.973	0.813	0.901
	S4	Longitudinal	10	0.809	0.074	0.786	0.715	0.907	0.763	0.886
	S5	Circumferentiell	10	0.772	0.058	0.782	0.66	0.865	0.742	0.804
	S5	Longitudinal	10	0.831	0.081	0.843	0.667	0.973	0.79	0.865
Wall thickness (mm)	S6	Circumferentiell	10	0.692	0.09	0.703	0.495	0.81	0.666	0.742
	S6	Longitudinal	10	0.823	0.085	0.819	0.65	0.925	0.781	0.893
	S1	-	10	2.394	0.331	2.298	2.06	2.93	2.099	2.683
	S2	-	10	2.179	0.362	2.189	1.641	2.791	1.927	2.275
	S3	-	10	1.94	0.318	1.922	1.474	2.36	1.759	2.196
	S4	-	10	1.778	0.367	1.719	1.3	2.509	1.592	2.009
Inner diameter (mm)	S5	-	10	1.585	0.313	1.552	1.139	2.139	1.452	1.725
	S6	-	10	1.397	0.245	1.357	1.064	1.809	1.296	1.498
	S1	-	10	17.9	1.823	18	15.5	22	16.75	18.5
	S2	-	10	15.5	1.155	15.75	13.5	17	14.75	16.375
	S3	-	10	14.15	1.029	14.25	12.5	15.5	13.5	14.875
	S4	-	10	13.25	0.755	13.25	12	14	12.625	14
	S5	-	10	12.4	0.738	12.75	11	13	12	13
	S6	-	10	11.35	0.747	11.75	10.5	12	10.5	12

Table S2. One-way ANOVA results (Segment, Orientation, Position) for all measured outcomes.

Outcome	Factor	F	df effect	df error	p	Sig.	η^2
Low-Strain Modulus, Engineering (MPa)	Segment	6.391	5	54	<0.001	***	0.372
	Orientierung	5.397	1	18	0.032	*	0.231
	Position	2.659	3	36	0.063	ns	0.181
High-Strain Modulus, Engineering (MPa)	Segment	26.28	5	54	<0.001	***	0.709
	Orientierung	78.859	1	18	<0.001	***	0.814
	Position	2.051	3	36	0.124	ns	0.146
Toughness, Engineering (MJ/m3)	Segment	0.683	5	54	0.638	ns	0.06
	Orientierung	25.067	1	18	<0.001	***	0.582
	Position	0.573	3	36	0.636	ns	0.046
Stress at failure, Engineering (MPa)	Segment	10.384	5	54	<0.001	***	0.49
	Orientierung	43.871	1	18	<0.001	***	0.709
	Position	1.062	3	36	0.377	ns	0.081
Strain at failure, Engineering (-)	Segment	29.345	5	54	<0.001	***	0.731
	Orientierung	6.304	1	18	0.022	*	0.259
	Position	0.56	3	36	0.645	ns	0.045
Low-Strain Modulus, True (MPa)	Segment	2.51	5	54	0.041	*	0.189
	Orientierung	4.975	1	18	0.039	*	0.217
	Position	2.248	3	36	0.099	ns	0.158
High-Strain Modulus, True (MPa)	Segment	10.12	5	54	<0.001	***	0.484
	Orientierung	69.407	1	18	<0.001	***	0.794
	Position	2.061	3	36	0.123	ns	0.147
Toughness, True (MJ/m3)	Segment	0.683	5	54	0.638	ns	0.06
	Orientierung	25.067	1	18	<0.001	***	0.582
	Position	0.573	3	36	0.636	ns	0.046
Stress at failure, True (MPa)	Segment	2.178	5	54	0.070	ns	0.168
	Orientierung	42.301	1	18	<0.001	***	0.701
	Position	0.763	3	36	0.522	ns	0.06
Strain at failure, True (-)	Segment	24.811	5	54	<0.001	***	0.697
	Orientierung	4.281	1	18	0.053	ns	0.192
	Position	0.514	3	36	0.675	ns	0.041
Wall thickness (mm)	Segment	13.036	5	54	<0.001	***	0.547
	Orientierung	0.483	1	18	0.496	ns	0.026
	Position	0.608	3	36	0.614	ns	0.048
Inner diameter (mm)	Segment	44.804	5	54	<0.001	***	0.806

Outcome	Factor	F	df effect	df error	p	Sig.	η^2
	Orientierung	0.464	1	18	0.504	ns	0.025
	Position	0	3	36	1.000	ns	0

Table S3. Full pairwise Tukey HSD post-hoc comparisons (all 66 segment × orientation combinations) for all mechanical outcomes.

Low-Strain Modulus, Engineering (MPa)

Comparison	Mean 1	Mean 2	Difference	p (Tukey adj.)	Sig.
S1 Circumferentiell vs S1 Longitudinal	0.434	0.383	-0.051	1	ns
S1 Circumferentiell vs S2 Circumferentiell	0.434	0.593	0.159	1	ns
S1 Circumferentiell vs S2 Longitudinal	0.434	0.591	0.157	1	ns
S1 Circumferentiell vs S3 Circumferentiell	0.434	0.53	0.096	1	ns
S1 Circumferentiell vs S3 Longitudinal	0.434	0.751	0.317	0.49077	ns
S1 Circumferentiell vs S4 Circumferentiell	0.434	0.591	0.157	1	ns
S1 Circumferentiell vs S4 Longitudinal	0.434	1.023	0.589	0.00012	***
S1 Circumferentiell vs S5 Circumferentiell	0.434	0.608	0.174	0.99999	ns
S1 Circumferentiell vs S5 Longitudinal	0.434	0.999	0.565	0.00031	***
S1 Circumferentiell vs S6 Circumferentiell	0.434	0.786	0.352	0.24743	ns
S1 Circumferentiell vs S6 Longitudinal	0.434	0.991	0.557	0.00042	***
S1 Longitudinal vs S2 Circumferentiell	0.383	0.593	0.21	0.99774	ns
S1 Longitudinal vs S2 Longitudinal	0.383	0.591	0.208	0.99829	ns
S1 Longitudinal vs S3 Circumferentiell	0.383	0.53	0.147	1	ns
S1 Longitudinal vs S3 Longitudinal	0.383	0.751	0.369	0.16986	ns
S1 Longitudinal vs S4 Circumferentiell	0.383	0.591	0.208	0.99824	ns
S1 Longitudinal vs S4 Longitudinal	0.383	1.023	0.641	<0.0001	***
S1 Longitudinal vs S5 Circumferentiell	0.383	0.608	0.225	0.99046	ns
S1 Longitudinal vs S5 Longitudinal	0.383	0.999	0.617	<0.0001	***

Comparison	Mean 1	Mean 2	Difference	p (Tukey adj.)	Sig.
S1 Longitudinal vs S6 Circumferentiell	0.383	0.786	0.404	0.06795	ns
S1 Longitudinal vs S6 Longitudinal	0.383	0.991	0.609	<0.0001	***
S2 Circumferentiell vs S2 Longitudinal	0.593	0.591	-0.002	1	ns
S2 Circumferentiell vs S3 Circumferentiell	0.593	0.53	-0.063	1	ns
S2 Circumferentiell vs S3 Longitudinal	0.593	0.751	0.158	1	ns
S2 Circumferentiell vs S4 Circumferentiell	0.593	0.591	-0.002	1	ns
S2 Circumferentiell vs S4 Longitudinal	0.593	1.023	0.43	0.03194	*
S2 Circumferentiell vs S5 Circumferentiell	0.593	0.608	0.015	1	ns
S2 Circumferentiell vs S5 Longitudinal	0.593	0.999	0.406	0.06339	ns
S2 Circumferentiell vs S6 Circumferentiell	0.593	0.786	0.194	0.99973	ns
S2 Circumferentiell vs S6 Longitudinal	0.593	0.991	0.398	0.08009	ns
S2 Longitudinal vs S3 Circumferentiell	0.591	0.53	-0.06	1	ns
S2 Longitudinal vs S3 Longitudinal	0.591	0.751	0.161	1	ns
S2 Longitudinal vs S4 Circumferentiell	0.591	0.591	0	1	ns
S2 Longitudinal vs S4 Longitudinal	0.591	1.023	0.433	0.02964	*
S2 Longitudinal vs S5 Circumferentiell	0.591	0.608	0.017	1	ns
S2 Longitudinal vs S5 Longitudinal	0.591	0.999	0.409	0.0591	ns
S2 Longitudinal vs S6 Circumferentiell	0.591	0.786	0.196	0.99962	ns
S2 Longitudinal vs S6 Longitudinal	0.591	0.991	0.401	0.07482	ns
S3 Circumferentiell vs S3 Longitudinal	0.53	0.751	0.221	0.99333	ns
S3 Circumferentiell vs S4 Circumferentiell	0.53	0.591	0.061	1	ns
S3 Circumferentiell vs S4 Longitudinal	0.53	1.023	0.493	0.00425	**

Comparison	Mean 1	Mean 2	Difference	p (Tukey adj.)	Sig.
S3 Circumferentiell vs S5 Circumferentiell	0.53	0.608	0.078	1	ns
S3 Circumferentiell vs S5 Longitudinal	0.53	0.999	0.469	0.00938	**
S3 Circumferentiell vs S6 Circumferentiell	0.53	0.786	0.257	0.921	ns
S3 Circumferentiell vs S6 Longitudinal	0.53	0.991	0.461	0.01235	*
S3 Longitudinal vs S4 Circumferentiell	0.751	0.591	-0.161	1	ns
S3 Longitudinal vs S4 Longitudinal	0.751	1.023	0.272	0.84201	ns
S3 Longitudinal vs S5 Circumferentiell	0.751	0.608	-0.143	1	ns
S3 Longitudinal vs S5 Longitudinal	0.751	0.999	0.248	0.94984	ns
S3 Longitudinal vs S6 Circumferentiell	0.751	0.786	0.035	1	ns
S3 Longitudinal vs S6 Longitudinal	0.751	0.991	0.24	0.97079	ns
S4 Circumferentiell vs S4 Longitudinal	0.591	1.023	0.432	0.02986	*
S4 Circumferentiell vs S5 Circumferentiell	0.591	0.608	0.017	1	ns
S4 Circumferentiell vs S5 Longitudinal	0.591	0.999	0.409	0.05952	ns
S4 Circumferentiell vs S6 Circumferentiell	0.591	0.786	0.196	0.99963	ns
S4 Circumferentiell vs S6 Longitudinal	0.591	0.991	0.4	0.07533	ns
S4 Longitudinal vs S5 Circumferentiell	1.023	0.608	-0.415	0.04915	*
S4 Longitudinal vs S5 Longitudinal	1.023	0.999	-0.024	1	ns
S4 Longitudinal vs S6 Circumferentiell	1.023	0.786	-0.237	0.97632	ns
S4 Longitudinal vs S6 Longitudinal	1.023	0.991	-0.032	1	ns
S5 Circumferentiell vs S5 Longitudinal	0.608	0.999	0.392	0.09473	ns
S5 Circumferentiell vs S6 Circumferentiell	0.608	0.786	0.179	0.99997	ns
S5 Circumferentiell vs S6 Longitudinal	0.608	0.991	0.383	0.1183	ns

Comparison	Mean 1	Mean 2	Difference	p (Tukey adj.)	Sig.
S5 Longitudinal vs S6 Circumferentiell	0.999	0.786	-0.213	0.99704	ns
S5 Longitudinal vs S6 Longitudinal	0.999	0.991	-0.008	1	ns
S6 Circumferentiell vs S6 Longitudinal	0.786	0.991	0.204	0.99886	ns

High-Strain Modulus, Engineering (MPa)

Comparison	Mean 1	Mean 2	Difference	p (Tukey adj.)	Sig.
S1 Circumferentiell vs S1 Longitudinal	1.73	0.815	-0.915	0.78112	ns
S1 Circumferentiell vs S2 Circumferentiell	1.73	2.802	1.071	0.39769	ns
S1 Circumferentiell vs S2 Longitudinal	1.73	1.421	-0.309	1	ns
S1 Circumferentiell vs S3 Circumferentiell	1.73	3.357	1.627	0.00338	**
S1 Circumferentiell vs S3 Longitudinal	1.73	1.209	-0.521	1	ns
S1 Circumferentiell vs S4 Circumferentiell	1.73	4.125	2.395	<0.00001	***
S1 Circumferentiell vs S4 Longitudinal	1.73	1.232	-0.498	1	ns
S1 Circumferentiell vs S5 Circumferentiell	1.73	5.115	3.385	<0.00001	***
S1 Circumferentiell vs S5 Longitudinal	1.73	1.619	-0.111	1	ns
S1 Circumferentiell vs S6 Circumferentiell	1.73	5.822	4.092	<0.00001	***
S1 Circumferentiell vs S6 Longitudinal	1.73	3.588	1.858	0.00025	***
S1 Longitudinal vs S2 Circumferentiell	0.815	2.802	1.986	<0.0001	***
S1 Longitudinal vs S2 Longitudinal	0.815	1.421	0.606	0.99991	ns
S1 Longitudinal vs S3 Circumferentiell	0.815	3.357	2.542	<0.00001	***
S1 Longitudinal vs S3 Longitudinal	0.815	1.209	0.394	1	ns
S1 Longitudinal vs S4 Circumferentiell	0.815	4.125	3.31	<0.00001	***
S1 Longitudinal vs S4 Longitudinal	0.815	1.232	0.417	1	ns

Comparison	Mean 1	Mean 2	Difference	p (Tukey adj.)	Sig.
S1 Longitudinal vs S5 Circumferentiell	0.815	5.115	4.3	<0.00001	***
S1 Longitudinal vs S5 Longitudinal	0.815	1.619	0.804	0.95375	ns
S1 Longitudinal vs S6 Circumferentiell	0.815	5.822	5.007	<0.00001	***
S1 Longitudinal vs S6 Longitudinal	0.815	3.588	2.773	<0.00001	***
S2 Circumferentiell vs S2 Longitudinal	2.802	1.421	-1.38	0.03829	*
S2 Circumferentiell vs S3 Circumferentiell	2.802	3.357	0.555	0.99999	ns
S2 Circumferentiell vs S3 Longitudinal	2.802	1.209	-1.593	0.00486	**
S2 Circumferentiell vs S4 Circumferentiell	2.802	4.125	1.323	0.06321	ns
S2 Circumferentiell vs S4 Longitudinal	2.802	1.232	-1.57	0.00614	**
S2 Circumferentiell vs S5 Circumferentiell	2.802	5.115	2.313	<0.00001	***
S2 Circumferentiell vs S5 Longitudinal	2.802	1.619	-1.183	0.19248	ns
S2 Circumferentiell vs S6 Circumferentiell	2.802	5.822	3.021	<0.00001	***
S2 Circumferentiell vs S6 Longitudinal	2.802	3.588	0.787	0.96659	ns
S2 Longitudinal vs S3 Circumferentiell	1.421	3.357	1.936	0.0001	***
S2 Longitudinal vs S3 Longitudinal	1.421	1.209	-0.212	1	ns
S2 Longitudinal vs S4 Circumferentiell	1.421	4.125	2.704	<0.00001	***
S2 Longitudinal vs S4 Longitudinal	1.421	1.232	-0.19	1	ns
S2 Longitudinal vs S5 Circumferentiell	1.421	5.115	3.694	<0.00001	***
S2 Longitudinal vs S5 Longitudinal	1.421	1.619	0.197	1	ns
S2 Longitudinal vs S6 Circumferentiell	1.421	5.822	4.401	<0.00001	***
S2 Longitudinal vs S6 Longitudinal	1.421	3.588	2.167	<0.00001	***
S3 Circumferentiell vs S3 Longitudinal	3.357	1.209	-2.148	<0.0001	***

Comparison	Mean 1	Mean 2	Difference	p (Tukey adj.)	Sig.
S3 Circumferentiell vs S4 Circumferentiell	3.357	4.125	0.768	0.97772	ns
S3 Circumferentiell vs S4 Longitudinal	3.357	1.232	-2.125	<0.0001	***
S3 Circumferentiell vs S5 Circumferentiell	3.357	5.115	1.758	0.0008	***
S3 Circumferentiell vs S5 Longitudinal	3.357	1.619	-1.738	0.001	***
S3 Circumferentiell vs S6 Circumferentiell	3.357	5.822	2.465	<0.00001	***
S3 Circumferentiell vs S6 Longitudinal	3.357	3.588	0.231	1	ns
S3 Longitudinal vs S4 Circumferentiell	1.209	4.125	2.916	<0.00001	***
S3 Longitudinal vs S4 Longitudinal	1.209	1.232	0.023	1	ns
S3 Longitudinal vs S5 Circumferentiell	1.209	5.115	3.906	<0.00001	***
S3 Longitudinal vs S5 Longitudinal	1.209	1.619	0.41	1	ns
S3 Longitudinal vs S6 Circumferentiell	1.209	5.822	4.613	<0.00001	***
S3 Longitudinal vs S6 Longitudinal	1.209	3.588	2.379	<0.00001	***
S4 Circumferentiell vs S4 Longitudinal	4.125	1.232	-2.893	<0.00001	***
S4 Circumferentiell vs S5 Circumferentiell	4.125	5.115	0.99	0.59789	ns
S4 Circumferentiell vs S5 Longitudinal	4.125	1.619	-2.506	<0.00001	***
S4 Circumferentiell vs S6 Circumferentiell	4.125	5.822	1.698	0.00157	**
S4 Circumferentiell vs S6 Longitudinal	4.125	3.588	-0.537	1	ns
S4 Longitudinal vs S5 Circumferentiell	1.232	5.115	3.883	<0.00001	***
S4 Longitudinal vs S5 Longitudinal	1.232	1.619	0.387	1	ns
S4 Longitudinal vs S6 Circumferentiell	1.232	5.822	4.59	<0.00001	***
S4 Longitudinal vs S6 Longitudinal	1.232	3.588	2.357	<0.00001	***
S5 Circumferentiell vs S5 Longitudinal	5.115	1.619	-3.497	<0.00001	***

Comparison	Mean 1	Mean 2	Difference	p (Tukey adj.)	Sig.
S5 Circumferentiell vs S6 Circumferentiell	5.115	5.822	0.707	0.99541	ns
S5 Circumferentiell vs S6 Longitudinal	5.115	3.588	-1.527	0.0095	**
S5 Longitudinal vs S6 Circumferentiell	1.619	5.822	4.204	<0.00001	***
S5 Longitudinal vs S6 Longitudinal	1.619	3.588	1.97	<0.0001	***
S6 Circumferentiell vs S6 Longitudinal	5.822	3.588	-2.234	<0.00001	***

Toughness, Engineering (MJ/m³)

Comparison	Mean 1	Mean 2	Difference	p (Tukey adj.)	Sig.
S1 Circumferentiell vs S1 Longitudinal	1.504	0.528	-0.976	<0.00001	***
S1 Circumferentiell vs S2 Circumferentiell	1.504	1.254	-0.25	0.98555	ns
S1 Circumferentiell vs S2 Longitudinal	1.504	0.489	-1.015	<0.00001	***
S1 Circumferentiell vs S3 Circumferentiell	1.504	1.222	-0.282	0.90647	ns
S1 Circumferentiell vs S3 Longitudinal	1.504	0.579	-0.925	<0.00001	***
S1 Circumferentiell vs S4 Circumferentiell	1.504	1.145	-0.359	0.39008	ns
S1 Circumferentiell vs S4 Longitudinal	1.504	0.582	-0.923	<0.00001	***
S1 Circumferentiell vs S5 Circumferentiell	1.504	0.967	-0.537	0.00417	**
S1 Circumferentiell vs S5 Longitudinal	1.504	0.754	-0.75	<0.00001	***
S1 Circumferentiell vs S6 Circumferentiell	1.504	0.803	-0.701	<0.0001	***
S1 Circumferentiell vs S6 Longitudinal	1.504	1.076	-0.429	0.08869	ns
S1 Longitudinal vs S2 Circumferentiell	0.528	1.254	0.726	<0.00001	***
S1 Longitudinal vs S2 Longitudinal	0.528	0.489	-0.039	1	ns
S1 Longitudinal vs S3 Circumferentiell	0.528	1.222	0.694	<0.0001	***
S1 Longitudinal vs S3 Longitudinal	0.528	0.579	0.051	1	ns

Comparison	Mean 1	Mean 2	Difference	p (Tukey adj.)	Sig.
S1 Longitudinal vs S4 Circumferentiell	0.528	1.145	0.617	0.00028	***
S1 Longitudinal vs S4 Longitudinal	0.528	0.582	0.054	1	ns
S1 Longitudinal vs S5 Circumferentiell	0.528	0.967	0.44	0.06731	ns
S1 Longitudinal vs S5 Longitudinal	0.528	0.754	0.226	0.9983	ns
S1 Longitudinal vs S6 Circumferentiell	0.528	0.803	0.275	0.93351	ns
S1 Longitudinal vs S6 Longitudinal	0.528	1.076	0.548	0.00294	**
S2 Circumferentiell vs S2 Longitudinal	1.254	0.489	-0.765	<0.00001	***
S2 Circumferentiell vs S3 Circumferentiell	1.254	1.222	-0.032	1	ns
S2 Circumferentiell vs S3 Longitudinal	1.254	0.579	-0.675	<0.0001	***
S2 Circumferentiell vs S4 Circumferentiell	1.254	1.145	-0.109	1	ns
S2 Circumferentiell vs S4 Longitudinal	1.254	0.582	-0.672	<0.0001	***
S2 Circumferentiell vs S5 Circumferentiell	1.254	0.967	-0.287	0.88894	ns
S2 Circumferentiell vs S5 Longitudinal	1.254	0.754	-0.5	0.01275	*
S2 Circumferentiell vs S6 Circumferentiell	1.254	0.803	-0.451	0.0503	ns
S2 Circumferentiell vs S6 Longitudinal	1.254	1.076	-0.178	1	ns
S2 Longitudinal vs S3 Circumferentiell	0.489	1.222	0.732	<0.00001	***
S2 Longitudinal vs S3 Longitudinal	0.489	0.579	0.09	1	ns
S2 Longitudinal vs S4 Circumferentiell	0.489	1.145	0.656	<0.0001	***
S2 Longitudinal vs S4 Longitudinal	0.489	0.582	0.092	1	ns
S2 Longitudinal vs S5 Circumferentiell	0.489	0.967	0.478	0.02381	*
S2 Longitudinal vs S5 Longitudinal	0.489	0.754	0.265	0.9624	ns
S2 Longitudinal vs S6 Circumferentiell	0.489	0.803	0.314	0.72332	ns

Comparison	Mean 1	Mean 2	Difference	p (Tukey adj.)	Sig.
S2 Longitudinal vs S6 Longitudinal	0.489	1.076	0.586	0.00082	***
S3 Circumferentiell vs S3 Longitudinal	1.222	0.579	-0.643	0.00011	***
S3 Circumferentiell vs S4 Circumferentiell	1.222	1.145	-0.077	1	ns
S3 Circumferentiell vs S4 Longitudinal	1.222	0.582	-0.64	0.00012	***
S3 Circumferentiell vs S5 Circumferentiell	1.222	0.967	-0.254	0.98078	ns
S3 Circumferentiell vs S5 Longitudinal	1.222	0.754	-0.468	0.03186	*
S3 Circumferentiell vs S6 Circumferentiell	1.222	0.803	-0.419	0.11302	ns
S3 Circumferentiell vs S6 Longitudinal	1.222	1.076	-0.146	1	ns
S3 Longitudinal vs S4 Circumferentiell	0.579	1.145	0.566	0.00162	**
S3 Longitudinal vs S4 Longitudinal	0.579	0.582	0.002	1	ns
S3 Longitudinal vs S5 Circumferentiell	0.579	0.967	0.388	0.22275	ns
S3 Longitudinal vs S5 Longitudinal	0.579	0.754	0.175	1	ns
S3 Longitudinal vs S6 Circumferentiell	0.579	0.803	0.224	0.99863	ns
S3 Longitudinal vs S6 Longitudinal	0.579	1.076	0.496	0.01412	*
S4 Circumferentiell vs S4 Longitudinal	1.145	0.582	-0.564	0.00175	**
S4 Circumferentiell vs S5 Circumferentiell	1.145	0.967	-0.178	1	ns
S4 Circumferentiell vs S5 Longitudinal	1.145	0.754	-0.391	0.2091	ns
S4 Circumferentiell vs S6 Circumferentiell	1.145	0.803	-0.342	0.51199	ns
S4 Circumferentiell vs S6 Longitudinal	1.145	1.076	-0.07	1	ns
S4 Longitudinal vs S5 Circumferentiell	0.582	0.967	0.386	0.23341	ns
S4 Longitudinal vs S5 Longitudinal	0.582	0.754	0.172	1	ns
S4 Longitudinal vs S6 Circumferentiell	0.582	0.803	0.222	0.99893	ns

Comparison	Mean 1	Mean 2	Difference	p (Tukey adj.)	Sig.
S4 Longitudinal vs S6 Longitudinal	0.582	1.076	0.494	0.01508	*
S5 Circumferentiell vs S5 Longitudinal	0.967	0.754	-0.213	0.99959	ns
S5 Circumferentiell vs S6 Circumferentiell	0.967	0.803	-0.164	1	ns
S5 Circumferentiell vs S6 Longitudinal	0.967	1.076	0.108	1	ns
S5 Longitudinal vs S6 Circumferentiell	0.754	0.803	0.049	1	ns
S5 Longitudinal vs S6 Longitudinal	0.754	1.076	0.322	0.66633	ns
S6 Circumferentiell vs S6 Longitudinal	0.803	1.076	0.272	0.94221	ns

Stress at failure, Engineering (MPa)

Comparison	Mean 1	Mean 2	Difference	p (Tukey adj.)	Sig.
S1 Circumferentiell vs S1 Longitudinal	1.931	0.809	-1.121	<0.0001	***
S1 Circumferentiell vs S2 Circumferentiell	1.931	2.268	0.338	0.99979	ns
S1 Circumferentiell vs S2 Longitudinal	1.931	1.028	-0.902	0.00222	**
S1 Circumferentiell vs S3 Circumferentiell	1.931	2.521	0.591	0.3559	ns
S1 Circumferentiell vs S3 Longitudinal	1.931	1.06	-0.87	0.00419	**
S1 Circumferentiell vs S4 Circumferentiell	1.931	2.592	0.661	0.14497	ns
S1 Circumferentiell vs S4 Longitudinal	1.931	1.09	-0.84	0.00739	**
S1 Circumferentiell vs S5 Circumferentiell	1.931	2.575	0.644	0.18393	ns
S1 Circumferentiell vs S5 Longitudinal	1.931	1.425	-0.505	0.74124	ns
S1 Circumferentiell vs S6 Circumferentiell	1.931	2.519	0.589	0.36184	ns
S1 Circumferentiell vs S6 Longitudinal	1.931	2.438	0.507	0.73036	ns
S1 Longitudinal vs S2 Circumferentiell	0.809	2.268	1.459	<0.00001	***
S1 Longitudinal vs S2 Longitudinal	0.809	1.028	0.219	1	ns

Comparison	Mean 1	Mean 2	Difference	p (Tukey adj.)	Sig.
S1 Longitudinal vs S3 Circumferentiell	0.809	2.521	1.712	<0.00001	***
S1 Longitudinal vs S3 Longitudinal	0.809	1.06	0.251	1	ns
S1 Longitudinal vs S4 Circumferentiell	0.809	2.592	1.782	<0.00001	***
S1 Longitudinal vs S4 Longitudinal	0.809	1.09	0.281	1	ns
S1 Longitudinal vs S5 Circumferentiell	0.809	2.575	1.765	<0.00001	***
S1 Longitudinal vs S5 Longitudinal	0.809	1.425	0.616	0.2632	ns
S1 Longitudinal vs S6 Circumferentiell	0.809	2.519	1.71	<0.00001	***
S1 Longitudinal vs S6 Longitudinal	0.809	2.438	1.629	<0.00001	***
S2 Circumferentiell vs S2 Longitudinal	2.268	1.028	-1.24	<0.00001	***
S2 Circumferentiell vs S3 Circumferentiell	2.268	2.521	0.252	1	ns
S2 Circumferentiell vs S3 Longitudinal	2.268	1.06	-1.208	<0.00001	***
S2 Circumferentiell vs S4 Circumferentiell	2.268	2.592	0.323	0.99994	ns
S2 Circumferentiell vs S4 Longitudinal	2.268	1.09	-1.178	<0.00001	***
S2 Circumferentiell vs S5 Circumferentiell	2.268	2.575	0.306	0.99999	ns
S2 Circumferentiell vs S5 Longitudinal	2.268	1.425	-0.843	0.00702	**
S2 Circumferentiell vs S6 Circumferentiell	2.268	2.519	0.251	1	ns
S2 Circumferentiell vs S6 Longitudinal	2.268	2.438	0.169	1	ns
S2 Longitudinal vs S3 Circumferentiell	1.028	2.521	1.493	<0.00001	***
S2 Longitudinal vs S3 Longitudinal	1.028	1.06	0.032	1	ns
S2 Longitudinal vs S4 Circumferentiell	1.028	2.592	1.563	<0.00001	***
S2 Longitudinal vs S4 Longitudinal	1.028	1.09	0.062	1	ns
S2 Longitudinal vs S5 Circumferentiell	1.028	2.575	1.546	<0.00001	***

Comparison	Mean 1	Mean 2	Difference	p (Tukey adj.)	Sig.
S2 Longitudinal vs S5 Longitudinal	1.028	1.425	0.397	0.99032	ns
S2 Longitudinal vs S6 Circumferentiell	1.028	2.519	1.491	<0.00001	***
S2 Longitudinal vs S6 Longitudinal	1.028	2.438	1.41	<0.00001	***
S3 Circumferentiell vs S3 Longitudinal	2.521	1.06	-1.46	<0.00001	***
S3 Circumferentiell vs S4 Circumferentiell	2.521	2.592	0.071	1	ns
S3 Circumferentiell vs S4 Longitudinal	2.521	1.09	-1.431	<0.00001	***
S3 Circumferentiell vs S5 Circumferentiell	2.521	2.575	0.054	1	ns
S3 Circumferentiell vs S5 Longitudinal	2.521	1.425	-1.095	<0.0001	***
S3 Circumferentiell vs S6 Circumferentiell	2.521	2.519	-0.002	1	ns
S3 Circumferentiell vs S6 Longitudinal	2.521	2.438	-0.083	1	ns
S3 Longitudinal vs S4 Circumferentiell	1.06	2.592	1.531	<0.00001	***
S3 Longitudinal vs S4 Longitudinal	1.06	1.09	0.03	1	ns
S3 Longitudinal vs S5 Circumferentiell	1.06	2.575	1.514	<0.00001	***
S3 Longitudinal vs S5 Longitudinal	1.06	1.425	0.365	0.99845	ns
S3 Longitudinal vs S6 Circumferentiell	1.06	2.519	1.459	<0.00001	***
S3 Longitudinal vs S6 Longitudinal	1.06	2.438	1.377	<0.00001	***
S4 Circumferentiell vs S4 Longitudinal	2.592	1.09	-1.502	<0.00001	***
S4 Circumferentiell vs S5 Circumferentiell	2.592	2.575	-0.017	1	ns
S4 Circumferentiell vs S5 Longitudinal	2.592	1.425	-1.166	<0.0001	***
S4 Circumferentiell vs S6 Circumferentiell	2.592	2.519	-0.072	1	ns
S4 Circumferentiell vs S6 Longitudinal	2.592	2.438	-0.154	1	ns
S4 Longitudinal vs S5 Circumferentiell	1.09	2.575	1.484	<0.00001	***

Comparison	Mean 1	Mean 2	Difference	p (Tukey adj.)	Sig.
S4 Longitudinal vs S5 Longitudinal	1.09	1.425	0.335	0.99983	ns
S4 Longitudinal vs S6 Circumferentiell	1.09	2.519	1.429	<0.00001	***
S4 Longitudinal vs S6 Longitudinal	1.09	2.438	1.348	<0.00001	***
S5 Circumferentiell vs S5 Longitudinal	2.575	1.425	-1.149	<0.0001	***
S5 Circumferentiell vs S6 Circumferentiell	2.575	2.519	-0.055	1	ns
S5 Circumferentiell vs S6 Longitudinal	2.575	2.438	-0.137	1	ns
S5 Longitudinal vs S6 Circumferentiell	1.425	2.519	1.094	<0.0001	***
S5 Longitudinal vs S6 Longitudinal	1.425	2.438	1.012	0.00021	***
S6 Circumferentiell vs S6 Longitudinal	2.519	2.438	-0.082	1	ns

Strain at failure, Engineering (-)

Comparison	Mean 1	Mean 2	Difference	p (Tukey adj.)	Sig.
S1 Circumferentiell vs S1 Longitudinal	2.153	1.602	-0.551	<0.00001	***
S1 Circumferentiell vs S2 Circumferentiell	2.153	1.603	-0.549	<0.00001	***
S1 Circumferentiell vs S2 Longitudinal	2.153	1.212	-0.941	<0.00001	***
S1 Circumferentiell vs S3 Circumferentiell	2.153	1.505	-0.648	<0.00001	***
S1 Circumferentiell vs S3 Longitudinal	2.153	1.293	-0.86	<0.00001	***
S1 Circumferentiell vs S4 Circumferentiell	2.153	1.331	-0.821	<0.00001	***
S1 Circumferentiell vs S4 Longitudinal	2.153	1.254	-0.899	<0.00001	***
S1 Circumferentiell vs S5 Circumferentiell	2.153	1.171	-0.982	<0.00001	***
S1 Circumferentiell vs S5 Longitudinal	2.153	1.311	-0.842	<0.00001	***
S1 Circumferentiell vs S6 Circumferentiell	2.153	1.006	-1.147	<0.00001	***
S1 Circumferentiell vs S6 Longitudinal	2.153	1.294	-0.859	<0.00001	***

Comparison	Mean 1	Mean 2	Difference	p (Tukey adj.)	Sig.
S1 Longitudinal vs S2 Circumferentiell	1.602	1.603	0.001	1	ns
S1 Longitudinal vs S2 Longitudinal	1.602	1.212	-0.39	0.00021	***
S1 Longitudinal vs S3 Circumferentiell	1.602	1.505	-0.097	1	ns
S1 Longitudinal vs S3 Longitudinal	1.602	1.293	-0.31	0.01423	*
S1 Longitudinal vs S4 Circumferentiell	1.602	1.331	-0.271	0.07715	ns
S1 Longitudinal vs S4 Longitudinal	1.602	1.254	-0.348	0.00214	**
S1 Longitudinal vs S5 Circumferentiell	1.602	1.171	-0.431	<0.0001	***
S1 Longitudinal vs S5 Longitudinal	1.602	1.311	-0.292	0.03219	*
S1 Longitudinal vs S6 Circumferentiell	1.602	1.006	-0.596	<0.00001	***
S1 Longitudinal vs S6 Longitudinal	1.602	1.294	-0.309	0.01474	*
S2 Circumferentiell vs S2 Longitudinal	1.603	1.212	-0.391	0.0002	***
S2 Circumferentiell vs S3 Circumferentiell	1.603	1.505	-0.098	1	ns
S2 Circumferentiell vs S3 Longitudinal	1.603	1.293	-0.311	0.01342	*
S2 Circumferentiell vs S4 Circumferentiell	1.603	1.331	-0.272	0.07335	ns
S2 Circumferentiell vs S4 Longitudinal	1.603	1.254	-0.349	0.00201	**
S2 Circumferentiell vs S5 Circumferentiell	1.603	1.171	-0.433	<0.0001	***
S2 Circumferentiell vs S5 Longitudinal	1.603	1.311	-0.293	0.03047	*
S2 Circumferentiell vs S6 Circumferentiell	1.603	1.006	-0.597	<0.00001	***
S2 Circumferentiell vs S6 Longitudinal	1.603	1.294	-0.31	0.0139	*
S2 Longitudinal vs S3 Circumferentiell	1.212	1.505	0.293	0.03047	*
S2 Longitudinal vs S3 Longitudinal	1.212	1.293	0.08	1	ns
S2 Longitudinal vs S4 Circumferentiell	1.212	1.331	0.119	0.99999	ns

Comparison	Mean 1	Mean 2	Difference	p (Tukey adj.)	Sig.
S2 Longitudinal vs S4 Longitudinal	1.212	1.254	0.042	1	ns
S2 Longitudinal vs S5 Circumferentiell	1.212	1.171	-0.042	1	ns
S2 Longitudinal vs S5 Longitudinal	1.212	1.311	0.098	1	ns
S2 Longitudinal vs S6 Circumferentiell	1.212	1.006	-0.206	0.60132	ns
S2 Longitudinal vs S6 Longitudinal	1.212	1.294	0.081	1	ns
S3 Circumferentiell vs S3 Longitudinal	1.505	1.293	-0.213	0.5217	ns
S3 Circumferentiell vs S4 Circumferentiell	1.505	1.331	-0.174	0.92183	ns
S3 Circumferentiell vs S4 Longitudinal	1.505	1.254	-0.251	0.16529	ns
S3 Circumferentiell vs S5 Circumferentiell	1.505	1.171	-0.334	0.00423	**
S3 Circumferentiell vs S5 Longitudinal	1.505	1.311	-0.194	0.73857	ns
S3 Circumferentiell vs S6 Circumferentiell	1.505	1.006	-0.499	<0.00001	***
S3 Circumferentiell vs S6 Longitudinal	1.505	1.294	-0.212	0.5308	ns
S3 Longitudinal vs S4 Circumferentiell	1.293	1.331	0.039	1	ns
S3 Longitudinal vs S4 Longitudinal	1.293	1.254	-0.038	1	ns
S3 Longitudinal vs S5 Circumferentiell	1.293	1.171	-0.122	0.99997	ns
S3 Longitudinal vs S5 Longitudinal	1.293	1.311	0.018	1	ns
S3 Longitudinal vs S6 Circumferentiell	1.293	1.006	-0.286	0.04044	*
S3 Longitudinal vs S6 Longitudinal	1.293	1.294	0.001	1	ns
S4 Circumferentiell vs S4 Longitudinal	1.331	1.254	-0.077	1	ns
S4 Circumferentiell vs S5 Circumferentiell	1.331	1.171	-0.161	0.97569	ns
S4 Circumferentiell vs S5 Longitudinal	1.331	1.311	-0.021	1	ns
S4 Circumferentiell vs S6 Circumferentiell	1.331	1.006	-0.325	0.00678	**

Comparison	Mean 1	Mean 2	Difference	p (Tukey adj.)	Sig.
S4 Circumferentiell vs S6 Longitudinal	1.331	1.294	-0.038	1	ns
S4 Longitudinal vs S5 Circumferentiell	1.254	1.171	-0.084	1	ns
S4 Longitudinal vs S5 Longitudinal	1.254	1.311	0.056	1	ns
S4 Longitudinal vs S6 Circumferentiell	1.254	1.006	-0.248	0.18222	ns
S4 Longitudinal vs S6 Longitudinal	1.254	1.294	0.039	1	ns
S5 Circumferentiell vs S5 Longitudinal	1.171	1.311	0.14	0.99856	ns
S5 Circumferentiell vs S6 Circumferentiell	1.171	1.006	-0.164	0.9654	ns
S5 Circumferentiell vs S6 Longitudinal	1.171	1.294	0.123	0.99996	ns
S5 Longitudinal vs S6 Circumferentiell	1.311	1.006	-0.304	0.01815	*
S5 Longitudinal vs S6 Longitudinal	1.311	1.294	-0.017	1	ns
S6 Circumferentiell vs S6 Longitudinal	1.006	1.294	0.287	0.03916	*

Low-Strain Modulus, True (MPa)

Comparison	Mean 1	Mean 2	Difference	p (Tukey adj.)	Sig.
S1 Circumferentiell vs S1 Longitudinal	0.825	0.885	0.06	1	ns
S1 Circumferentiell vs S2 Circumferentiell	0.825	0.96	0.135	1	ns
S1 Circumferentiell vs S2 Longitudinal	0.825	1.099	0.273	1	ns
S1 Circumferentiell vs S3 Circumferentiell	0.825	0.877	0.052	1	ns
S1 Circumferentiell vs S3 Longitudinal	0.825	1.228	0.403	0.996	ns
S1 Circumferentiell vs S4 Circumferentiell	0.825	0.945	0.119	1	ns
S1 Circumferentiell vs S4 Longitudinal	0.825	1.537	0.712	0.12493	ns
S1 Circumferentiell vs S5 Circumferentiell	0.825	0.996	0.171	1	ns
S1 Circumferentiell vs S5 Longitudinal	0.825	1.798	0.973	0.00161	**

Comparison	Mean 1	Mean 2	Difference	p (Tukey adj.)	Sig.
S1 Circumferentiell vs S6 Circumferentiell	0.825	1.224	0.398	0.99692	ns
S1 Circumferentiell vs S6 Longitudinal	0.825	1.329	0.503	0.85705	ns
S1 Longitudinal vs S2 Circumferentiell	0.885	0.96	0.075	1	ns
S1 Longitudinal vs S2 Longitudinal	0.885	1.099	0.213	1	ns
S1 Longitudinal vs S3 Circumferentiell	0.885	0.877	-0.008	1	ns
S1 Longitudinal vs S3 Longitudinal	0.885	1.228	0.343	0.99994	ns
S1 Longitudinal vs S4 Circumferentiell	0.885	0.945	0.06	1	ns
S1 Longitudinal vs S4 Longitudinal	0.885	1.537	0.652	0.26637	ns
S1 Longitudinal vs S5 Circumferentiell	0.885	0.996	0.111	1	ns
S1 Longitudinal vs S5 Longitudinal	0.885	1.798	0.913	0.00491	**
S1 Longitudinal vs S6 Circumferentiell	0.885	1.224	0.339	0.99996	ns
S1 Longitudinal vs S6 Longitudinal	0.885	1.329	0.444	0.97505	ns
S2 Circumferentiell vs S2 Longitudinal	0.96	1.099	0.138	1	ns
S2 Circumferentiell vs S3 Circumferentiell	0.96	0.877	-0.083	1	ns
S2 Circumferentiell vs S3 Longitudinal	0.96	1.228	0.268	1	ns
S2 Circumferentiell vs S4 Circumferentiell	0.96	0.945	-0.016	1	ns
S2 Circumferentiell vs S4 Longitudinal	0.96	1.537	0.577	0.56104	ns
S2 Circumferentiell vs S5 Circumferentiell	0.96	0.996	0.035	1	ns
S2 Circumferentiell vs S5 Longitudinal	0.96	1.798	0.838	0.01826	*
S2 Circumferentiell vs S6 Circumferentiell	0.96	1.224	0.263	1	ns
S2 Circumferentiell vs S6 Longitudinal	0.96	1.329	0.368	0.99956	ns
S2 Longitudinal vs S3 Circumferentiell	1.099	0.877	-0.221	1	ns

Comparison	Mean 1	Mean 2	Difference	p (Tukey adj.)	Sig.
S2 Longitudinal vs S3 Longitudinal	1.099	1.228	0.13	1	ns
S2 Longitudinal vs S4 Circumferentiell	1.099	0.945	-0.154	1	ns
S2 Longitudinal vs S4 Longitudinal	1.099	1.537	0.438	0.97945	ns
S2 Longitudinal vs S5 Circumferentiell	1.099	0.996	-0.103	1	ns
S2 Longitudinal vs S5 Longitudinal	1.099	1.798	0.7	0.14685	ns
S2 Longitudinal vs S6 Circumferentiell	1.099	1.224	0.125	1	ns
S2 Longitudinal vs S6 Longitudinal	1.099	1.329	0.23	1	ns
S3 Circumferentiell vs S3 Longitudinal	0.877	1.228	0.351	0.99988	ns
S3 Circumferentiell vs S4 Circumferentiell	0.877	0.945	0.068	1	ns
S3 Circumferentiell vs S4 Longitudinal	0.877	1.537	0.66	0.24321	ns
S3 Circumferentiell vs S5 Circumferentiell	0.877	0.996	0.119	1	ns
S3 Circumferentiell vs S5 Longitudinal	0.877	1.798	0.921	0.00426	**
S3 Circumferentiell vs S6 Circumferentiell	0.877	1.224	0.346	0.99992	ns
S3 Circumferentiell vs S6 Longitudinal	0.877	1.329	0.451	0.96685	ns
S3 Longitudinal vs S4 Circumferentiell	1.228	0.945	-0.284	1	ns
S3 Longitudinal vs S4 Longitudinal	1.228	1.537	0.308	1	ns
S3 Longitudinal vs S5 Circumferentiell	1.228	0.996	-0.233	1	ns
S3 Longitudinal vs S5 Longitudinal	1.228	1.798	0.57	0.59116	ns
S3 Longitudinal vs S6 Circumferentiell	1.228	1.224	-0.005	1	ns
S3 Longitudinal vs S6 Longitudinal	1.228	1.329	0.1	1	ns
S4 Circumferentiell vs S4 Longitudinal	0.945	1.537	0.592	0.49171	ns
S4 Circumferentiell vs S5 Circumferentiell	0.945	0.996	0.051	1	ns

Comparison	Mean 1	Mean 2	Difference	p (Tukey adj.)	Sig.
S4 Circumferentiell vs S5 Longitudinal	0.945	1.798	0.853	0.01401	*
S4 Circumferentiell vs S6 Circumferentiell	0.945	1.224	0.279	1	ns
S4 Circumferentiell vs S6 Longitudinal	0.945	1.329	0.384	0.99872	ns
S4 Longitudinal vs S5 Circumferentiell	1.537	0.996	-0.541	0.71699	ns
S4 Longitudinal vs S5 Longitudinal	1.537	1.798	0.261	1	ns
S4 Longitudinal vs S6 Circumferentiell	1.537	1.224	-0.313	1	ns
S4 Longitudinal vs S6 Longitudinal	1.537	1.329	-0.208	1	ns
S5 Circumferentiell vs S5 Longitudinal	0.996	1.798	0.802	0.03258	*
S5 Circumferentiell vs S6 Circumferentiell	0.996	1.224	0.228	1	ns
S5 Circumferentiell vs S6 Longitudinal	0.996	1.329	0.333	0.99998	ns
S5 Longitudinal vs S6 Circumferentiell	1.798	1.224	-0.575	0.56995	ns
S5 Longitudinal vs S6 Longitudinal	1.798	1.329	-0.47	0.93942	ns
S6 Circumferentiell vs S6 Longitudinal	1.224	1.329	0.105	1	ns

High-Strain Modulus, True (MPa)

Comparison	Mean 1	Mean 2	Difference	p (Tukey adj.)	Sig.
S1 Circumferentiell vs S1 Longitudinal	15.584	5.679	-9.905	<0.00001	***
S1 Circumferentiell vs S2 Circumferentiell	15.584	16.439	0.855	1	ns
S1 Circumferentiell vs S2 Longitudinal	15.584	7.112	-8.471	0.00019	***
S1 Circumferentiell vs S3 Circumferentiell	15.584	18.855	3.271	0.99224	ns
S1 Circumferentiell vs S3 Longitudinal	15.584	6.714	-8.87	<0.0001	***
S1 Circumferentiell vs S4 Circumferentiell	15.584	20.484	4.9	0.36386	ns
S1 Circumferentiell vs S4 Longitudinal	15.584	6.523	-9.061	<0.0001	***

Comparison	Mean 1	Mean 2	Difference	p (Tukey adj.)	Sig.
S1 Circumferentiell vs S5 Circumferentiell	15.584	21.551	5.967	0.06312	ns
S1 Circumferentiell vs S5 Longitudinal	15.584	9.147	-6.437	0.02478	*
S1 Circumferentiell vs S6 Circumferentiell	15.584	20.816	5.231	0.22605	ns
S1 Circumferentiell vs S6 Longitudinal	15.584	18.204	2.62	0.99997	ns
S1 Longitudinal vs S2 Circumferentiell	5.679	16.439	10.761	<0.00001	***
S1 Longitudinal vs S2 Longitudinal	5.679	7.112	1.434	1	ns
S1 Longitudinal vs S3 Circumferentiell	5.679	18.855	13.176	<0.00001	***
S1 Longitudinal vs S3 Longitudinal	5.679	6.714	1.036	1	ns
S1 Longitudinal vs S4 Circumferentiell	5.679	20.484	14.805	<0.00001	***
S1 Longitudinal vs S4 Longitudinal	5.679	6.523	0.844	1	ns
S1 Longitudinal vs S5 Circumferentiell	5.679	21.551	15.872	<0.00001	***
S1 Longitudinal vs S5 Longitudinal	5.679	9.147	3.469	0.9769	ns
S1 Longitudinal vs S6 Circumferentiell	5.679	20.816	15.137	<0.00001	***
S1 Longitudinal vs S6 Longitudinal	5.679	18.204	12.526	<0.00001	***
S2 Circumferentiell vs S2 Longitudinal	16.439	7.112	-9.327	<0.0001	***
S2 Circumferentiell vs S3 Circumferentiell	16.439	18.855	2.416	1	ns
S2 Circumferentiell vs S3 Longitudinal	16.439	6.714	-9.725	<0.0001	***
S2 Circumferentiell vs S4 Circumferentiell	16.439	20.484	4.045	0.81892	ns
S2 Circumferentiell vs S4 Longitudinal	16.439	6.523	-9.916	<0.00001	***
S2 Circumferentiell vs S5 Circumferentiell	16.439	21.551	5.112	0.27081	ns
S2 Circumferentiell vs S5 Longitudinal	16.439	9.147	-7.292	0.00374	**
S2 Circumferentiell vs S6 Circumferentiell	16.439	20.816	4.376	0.64791	ns

Comparison	Mean 1	Mean 2	Difference	p (Tukey adj.)	Sig.
S2 Circumferentiell vs S6 Longitudinal	16.439	18.204	1.765	1	ns
S2 Longitudinal vs S3 Circumferentiell	7.112	18.855	11.742	<0.00001	***
S2 Longitudinal vs S3 Longitudinal	7.112	6.714	-0.398	1	ns
S2 Longitudinal vs S4 Circumferentiell	7.112	20.484	13.371	<0.00001	***
S2 Longitudinal vs S4 Longitudinal	7.112	6.523	-0.59	1	ns
S2 Longitudinal vs S5 Circumferentiell	7.112	21.551	14.438	<0.00001	***
S2 Longitudinal vs S5 Longitudinal	7.112	9.147	2.035	1	ns
S2 Longitudinal vs S6 Circumferentiell	7.112	20.816	13.703	<0.00001	***
S2 Longitudinal vs S6 Longitudinal	7.112	18.204	11.092	<0.00001	***
S3 Circumferentiell vs S3 Longitudinal	18.855	6.714	-12.14	<0.00001	***
S3 Circumferentiell vs S4 Circumferentiell	18.855	20.484	1.629	1	ns
S3 Circumferentiell vs S4 Longitudinal	18.855	6.523	-12.332	<0.00001	***
S3 Circumferentiell vs S5 Circumferentiell	18.855	21.551	2.696	0.99994	ns
S3 Circumferentiell vs S5 Longitudinal	18.855	9.147	-9.707	<0.0001	***
S3 Circumferentiell vs S6 Circumferentiell	18.855	20.816	1.961	1	ns
S3 Circumferentiell vs S6 Longitudinal	18.855	18.204	-0.65	1	ns
S3 Longitudinal vs S4 Circumferentiell	6.714	20.484	13.77	<0.00001	***
S3 Longitudinal vs S4 Longitudinal	6.714	6.523	-0.192	1	ns
S3 Longitudinal vs S5 Circumferentiell	6.714	21.551	14.836	<0.00001	***
S3 Longitudinal vs S5 Longitudinal	6.714	9.147	2.433	1	ns
S3 Longitudinal vs S6 Circumferentiell	6.714	20.816	14.101	<0.00001	***
S3 Longitudinal vs S6 Longitudinal	6.714	18.204	11.49	<0.00001	***

Comparison	Mean 1	Mean 2	Difference	p (Tukey adj.)	Sig.
S4 Circumferentiell vs S4 Longitudinal	20.484	6.523	-13.961	<0.00001	***
S4 Circumferentiell vs S5 Circumferentiell	20.484	21.551	1.067	1	ns
S4 Circumferentiell vs S5 Longitudinal	20.484	9.147	-11.336	<0.00001	***
S4 Circumferentiell vs S6 Circumferentiell	20.484	20.816	0.332	1	ns
S4 Circumferentiell vs S6 Longitudinal	20.484	18.204	-2.28	1	ns
S4 Longitudinal vs S5 Circumferentiell	6.523	21.551	15.028	<0.00001	***
S4 Longitudinal vs S5 Longitudinal	6.523	9.147	2.625	0.99997	ns
S4 Longitudinal vs S6 Circumferentiell	6.523	20.816	14.293	<0.00001	***
S4 Longitudinal vs S6 Longitudinal	6.523	18.204	11.681	<0.00001	***
S5 Circumferentiell vs S5 Longitudinal	21.551	9.147	-12.403	<0.00001	***
S5 Circumferentiell vs S6 Circumferentiell	21.551	20.816	-0.735	1	ns
S5 Circumferentiell vs S6 Longitudinal	21.551	18.204	-3.346	0.98788	ns
S5 Longitudinal vs S6 Circumferentiell	9.147	20.816	11.668	<0.00001	***
S5 Longitudinal vs S6 Longitudinal	9.147	18.204	9.057	<0.0001	***
S6 Circumferentiell vs S6 Longitudinal	20.816	18.204	-2.611	0.99998	ns

Toughness, True (MJ/m3)

Comparison	Mean 1	Mean 2	Difference	p (Tukey adj.)	Sig.
S1 Circumferentiell vs S1 Longitudinal	1.504	0.528	-0.976	<0.00001	***
S1 Circumferentiell vs S2 Circumferentiell	1.504	1.254	-0.25	0.98555	ns
S1 Circumferentiell vs S2 Longitudinal	1.504	0.489	-1.015	<0.00001	***
S1 Circumferentiell vs S3 Circumferentiell	1.504	1.222	-0.282	0.90647	ns
S1 Circumferentiell vs S3 Longitudinal	1.504	0.579	-0.925	<0.00001	***

Comparison	Mean 1	Mean 2	Difference	p (Tukey adj.)	Sig.
S1 Circumferentiell vs S4 Circumferentiell	1.504	1.145	-0.359	0.39008	ns
S1 Circumferentiell vs S4 Longitudinal	1.504	0.582	-0.923	<0.00001	***
S1 Circumferentiell vs S5 Circumferentiell	1.504	0.967	-0.537	0.00417	**
S1 Circumferentiell vs S5 Longitudinal	1.504	0.754	-0.75	<0.00001	***
S1 Circumferentiell vs S6 Circumferentiell	1.504	0.803	-0.701	<0.0001	***
S1 Circumferentiell vs S6 Longitudinal	1.504	1.076	-0.429	0.08869	ns
S1 Longitudinal vs S2 Circumferentiell	0.528	1.254	0.726	<0.00001	***
S1 Longitudinal vs S2 Longitudinal	0.528	0.489	-0.039	1	ns
S1 Longitudinal vs S3 Circumferentiell	0.528	1.222	0.694	<0.0001	***
S1 Longitudinal vs S3 Longitudinal	0.528	0.579	0.051	1	ns
S1 Longitudinal vs S4 Circumferentiell	0.528	1.145	0.617	0.00028	***
S1 Longitudinal vs S4 Longitudinal	0.528	0.582	0.054	1	ns
S1 Longitudinal vs S5 Circumferentiell	0.528	0.967	0.44	0.06731	ns
S1 Longitudinal vs S5 Longitudinal	0.528	0.754	0.226	0.9983	ns
S1 Longitudinal vs S6 Circumferentiell	0.528	0.803	0.275	0.93351	ns
S1 Longitudinal vs S6 Longitudinal	0.528	1.076	0.548	0.00294	**
S2 Circumferentiell vs S2 Longitudinal	1.254	0.489	-0.765	<0.00001	***
S2 Circumferentiell vs S3 Circumferentiell	1.254	1.222	-0.032	1	ns
S2 Circumferentiell vs S3 Longitudinal	1.254	0.579	-0.675	<0.0001	***
S2 Circumferentiell vs S4 Circumferentiell	1.254	1.145	-0.109	1	ns
S2 Circumferentiell vs S4 Longitudinal	1.254	0.582	-0.672	<0.0001	***
S2 Circumferentiell vs S5 Circumferentiell	1.254	0.967	-0.287	0.88894	ns

Comparison	Mean 1	Mean 2	Difference	p (Tukey adj.)	Sig.
S2 Circumferentiell vs S5 Longitudinal	1.254	0.754	-0.5	0.01275	*
S2 Circumferentiell vs S6 Circumferentiell	1.254	0.803	-0.451	0.0503	ns
S2 Circumferentiell vs S6 Longitudinal	1.254	1.076	-0.178	1	ns
S2 Longitudinal vs S3 Circumferentiell	0.489	1.222	0.732	<0.00001	***
S2 Longitudinal vs S3 Longitudinal	0.489	0.579	0.09	1	ns
S2 Longitudinal vs S4 Circumferentiell	0.489	1.145	0.656	<0.0001	***
S2 Longitudinal vs S4 Longitudinal	0.489	0.582	0.092	1	ns
S2 Longitudinal vs S5 Circumferentiell	0.489	0.967	0.478	0.02381	*
S2 Longitudinal vs S5 Longitudinal	0.489	0.754	0.265	0.9624	ns
S2 Longitudinal vs S6 Circumferentiell	0.489	0.803	0.314	0.72332	ns
S2 Longitudinal vs S6 Longitudinal	0.489	1.076	0.586	0.00082	***
S3 Circumferentiell vs S3 Longitudinal	1.222	0.579	-0.643	0.00011	***
S3 Circumferentiell vs S4 Circumferentiell	1.222	1.145	-0.077	1	ns
S3 Circumferentiell vs S4 Longitudinal	1.222	0.582	-0.64	0.00012	***
S3 Circumferentiell vs S5 Circumferentiell	1.222	0.967	-0.254	0.98078	ns
S3 Circumferentiell vs S5 Longitudinal	1.222	0.754	-0.468	0.03186	*
S3 Circumferentiell vs S6 Circumferentiell	1.222	0.803	-0.419	0.11302	ns
S3 Circumferentiell vs S6 Longitudinal	1.222	1.076	-0.146	1	ns
S3 Longitudinal vs S4 Circumferentiell	0.579	1.145	0.566	0.00162	**
S3 Longitudinal vs S4 Longitudinal	0.579	0.582	0.002	1	ns
S3 Longitudinal vs S5 Circumferentiell	0.579	0.967	0.388	0.22275	ns
S3 Longitudinal vs S5 Longitudinal	0.579	0.754	0.175	1	ns

Comparison	Mean 1	Mean 2	Difference	p (Tukey adj.)	Sig.
S3 Longitudinal vs S6 Circumferentiell	0.579	0.803	0.224	0.99863	ns
S3 Longitudinal vs S6 Longitudinal	0.579	1.076	0.496	0.01412	*
S4 Circumferentiell vs S4 Longitudinal	1.145	0.582	-0.564	0.00175	**
S4 Circumferentiell vs S5 Circumferentiell	1.145	0.967	-0.178	1	ns
S4 Circumferentiell vs S5 Longitudinal	1.145	0.754	-0.391	0.2091	ns
S4 Circumferentiell vs S6 Circumferentiell	1.145	0.803	-0.342	0.51199	ns
S4 Circumferentiell vs S6 Longitudinal	1.145	1.076	-0.07	1	ns
S4 Longitudinal vs S5 Circumferentiell	0.582	0.967	0.386	0.23341	ns
S4 Longitudinal vs S5 Longitudinal	0.582	0.754	0.172	1	ns
S4 Longitudinal vs S6 Circumferentiell	0.582	0.803	0.222	0.99893	ns
S4 Longitudinal vs S6 Longitudinal	0.582	1.076	0.494	0.01508	*
S5 Circumferentiell vs S5 Longitudinal	0.967	0.754	-0.213	0.99959	ns
S5 Circumferentiell vs S6 Circumferentiell	0.967	0.803	-0.164	1	ns
S5 Circumferentiell vs S6 Longitudinal	0.967	1.076	0.108	1	ns
S5 Longitudinal vs S6 Circumferentiell	0.754	0.803	0.049	1	ns
S5 Longitudinal vs S6 Longitudinal	0.754	1.076	0.322	0.66633	ns
S6 Circumferentiell vs S6 Longitudinal	0.803	1.076	0.272	0.94221	ns

Stress at failure, True (MPa)

Comparison	Mean 1	Mean 2	Difference	p (Tukey adj.)	Sig.
S1 Circumferentiell vs S1 Longitudinal	6.123	2.145	-3.978	<0.00001	***
S1 Circumferentiell vs S2 Circumferentiell	6.123	5.952	-0.172	1	ns
S1 Circumferentiell vs S2 Longitudinal	6.123	2.312	-3.811	<0.00001	***

Comparison	Mean 1	Mean 2	Difference	p (Tukey adj.)	Sig.
S1 Circumferentiell vs S3 Circumferentiell	6.123	6.332	0.209	1	ns
S1 Circumferentiell vs S3 Longitudinal	6.123	2.436	-3.687	<0.00001	***
S1 Circumferentiell vs S4 Circumferentiell	6.123	6.119	-0.004	1	ns
S1 Circumferentiell vs S4 Longitudinal	6.123	2.453	-3.67	<0.00001	***
S1 Circumferentiell vs S5 Circumferentiell	6.123	5.647	-0.476	1	ns
S1 Circumferentiell vs S5 Longitudinal	6.123	3.3	-2.824	0.00011	***
S1 Circumferentiell vs S6 Circumferentiell	6.123	5.133	-0.99	0.99834	ns
S1 Circumferentiell vs S6 Longitudinal	6.123	5.598	-0.525	1	ns
S1 Longitudinal vs S2 Circumferentiell	2.145	5.952	3.806	<0.00001	***
S1 Longitudinal vs S2 Longitudinal	2.145	2.312	0.167	1	ns
S1 Longitudinal vs S3 Circumferentiell	2.145	6.332	4.187	<0.00001	***
S1 Longitudinal vs S3 Longitudinal	2.145	2.436	0.291	1	ns
S1 Longitudinal vs S4 Circumferentiell	2.145	6.119	3.974	<0.00001	***
S1 Longitudinal vs S4 Longitudinal	2.145	2.453	0.308	1	ns
S1 Longitudinal vs S5 Circumferentiell	2.145	5.647	3.502	<0.00001	***
S1 Longitudinal vs S5 Longitudinal	2.145	3.3	1.155	0.9656	ns
S1 Longitudinal vs S6 Circumferentiell	2.145	5.133	2.988	<0.0001	***
S1 Longitudinal vs S6 Longitudinal	2.145	5.598	3.453	<0.00001	***
S2 Circumferentiell vs S2 Longitudinal	5.952	2.312	-3.639	<0.00001	***
S2 Circumferentiell vs S3 Circumferentiell	5.952	6.332	0.381	1	ns
S2 Circumferentiell vs S3 Longitudinal	5.952	2.436	-3.515	<0.00001	***
S2 Circumferentiell vs S4 Circumferentiell	5.952	6.119	0.168	1	ns

Comparison	Mean 1	Mean 2	Difference	p (Tukey adj.)	Sig.
S2 Circumferentiell vs S4 Longitudinal	5.952	2.453	-3.498	<0.00001	***
S2 Circumferentiell vs S5 Circumferentiell	5.952	5.647	-0.304	1	ns
S2 Circumferentiell vs S5 Longitudinal	5.952	3.3	-2.652	0.00044	***
S2 Circumferentiell vs S6 Circumferentiell	5.952	5.133	-0.818	0.99999	ns
S2 Circumferentiell vs S6 Longitudinal	5.952	5.598	-0.353	1	ns
S2 Longitudinal vs S3 Circumferentiell	2.312	6.332	4.02	<0.00001	***
S2 Longitudinal vs S3 Longitudinal	2.312	2.436	0.124	1	ns
S2 Longitudinal vs S4 Circumferentiell	2.312	6.119	3.807	<0.00001	***
S2 Longitudinal vs S4 Longitudinal	2.312	2.453	0.141	1	ns
S2 Longitudinal vs S5 Circumferentiell	2.312	5.647	3.336	<0.00001	***
S2 Longitudinal vs S5 Longitudinal	2.312	3.3	0.988	0.99844	ns
S2 Longitudinal vs S6 Circumferentiell	2.312	5.133	2.821	0.00011	***
S2 Longitudinal vs S6 Longitudinal	2.312	5.598	3.286	<0.00001	***
S3 Circumferentiell vs S3 Longitudinal	6.332	2.436	-3.896	<0.00001	***
S3 Circumferentiell vs S4 Circumferentiell	6.332	6.119	-0.213	1	ns
S3 Circumferentiell vs S4 Longitudinal	6.332	2.453	-3.879	<0.00001	***
S3 Circumferentiell vs S5 Circumferentiell	6.332	5.647	-0.685	1	ns
S3 Circumferentiell vs S5 Longitudinal	6.332	3.3	-3.033	<0.0001	***
S3 Circumferentiell vs S6 Circumferentiell	6.332	5.133	-1.199	0.93945	ns
S3 Circumferentiell vs S6 Longitudinal	6.332	5.598	-0.734	1	ns
S3 Longitudinal vs S4 Circumferentiell	2.436	6.119	3.683	<0.00001	***
S3 Longitudinal vs S4 Longitudinal	2.436	2.453	0.017	1	ns

Comparison	Mean 1	Mean 2	Difference	p (Tukey adj.)	Sig.
S3 Longitudinal vs S5 Circumferentiell	2.436	5.647	3.211	<0.00001	***
S3 Longitudinal vs S5 Longitudinal	2.436	3.3	0.864	0.99996	ns
S3 Longitudinal vs S6 Circumferentiell	2.436	5.133	2.697	0.0003	***
S3 Longitudinal vs S6 Longitudinal	2.436	5.598	3.162	<0.0001	***
S4 Circumferentiell vs S4 Longitudinal	6.119	2.453	-3.666	<0.00001	***
S4 Circumferentiell vs S5 Circumferentiell	6.119	5.647	-0.472	1	ns
S4 Circumferentiell vs S5 Longitudinal	6.119	3.3	-2.819	0.00011	***
S4 Circumferentiell vs S6 Circumferentiell	6.119	5.133	-0.986	0.99851	ns
S4 Circumferentiell vs S6 Longitudinal	6.119	5.598	-0.521	1	ns
S4 Longitudinal vs S5 Circumferentiell	2.453	5.647	3.195	<0.00001	***
S4 Longitudinal vs S5 Longitudinal	2.453	3.3	0.847	0.99998	ns
S4 Longitudinal vs S6 Circumferentiell	2.453	5.133	2.68	0.00035	***
S4 Longitudinal vs S6 Longitudinal	2.453	5.598	3.145	<0.0001	***
S5 Circumferentiell vs S5 Longitudinal	5.647	3.3	-2.348	0.00436	**
S5 Circumferentiell vs S6 Circumferentiell	5.647	5.133	-0.514	1	ns
S5 Circumferentiell vs S6 Longitudinal	5.647	5.598	-0.049	1	ns
S5 Longitudinal vs S6 Circumferentiell	3.3	5.133	1.834	0.11416	ns
S5 Longitudinal vs S6 Longitudinal	3.3	5.598	2.298	0.00618	**
S6 Circumferentiell vs S6 Longitudinal	5.133	5.598	0.465	1	ns

Strain at failure, True (-)

Comparison	Mean 1	Mean 2	Difference	p (Tukey adj.)	Sig.
S1 Circumferentiell vs S1 Longitudinal	1.143	0.952	-0.192	<0.0001	***

Comparison	Mean 1	Mean 2	Difference	p (Tukey adj.)	Sig.
S1 Circumferentiell vs S2 Circumferentiell	1.143	0.953	-0.19	<0.0001	***
S1 Circumferentiell vs S2 Longitudinal	1.143	0.787	-0.356	<0.00001	***
S1 Circumferentiell vs S3 Circumferentiell	1.143	0.916	-0.227	<0.00001	***
S1 Circumferentiell vs S3 Longitudinal	1.143	0.823	-0.321	<0.00001	***
S1 Circumferentiell vs S4 Circumferentiell	1.143	0.842	-0.301	<0.00001	***
S1 Circumferentiell vs S4 Longitudinal	1.143	0.809	-0.334	<0.00001	***
S1 Circumferentiell vs S5 Circumferentiell	1.143	0.772	-0.371	<0.00001	***
S1 Circumferentiell vs S5 Longitudinal	1.143	0.831	-0.312	<0.00001	***
S1 Circumferentiell vs S6 Circumferentiell	1.143	0.692	-0.451	<0.00001	***
S1 Circumferentiell vs S6 Longitudinal	1.143	0.823	-0.32	<0.00001	***
S1 Longitudinal vs S2 Circumferentiell	0.952	0.953	0.001	1	ns
S1 Longitudinal vs S2 Longitudinal	0.952	0.787	-0.165	0.00033	***
S1 Longitudinal vs S3 Circumferentiell	0.952	0.916	-0.036	1	ns
S1 Longitudinal vs S3 Longitudinal	0.952	0.823	-0.129	0.02271	*
S1 Longitudinal vs S4 Circumferentiell	0.952	0.842	-0.11	0.1434	ns
S1 Longitudinal vs S4 Longitudinal	0.952	0.809	-0.142	0.00527	**
S1 Longitudinal vs S5 Circumferentiell	0.952	0.772	-0.179	<0.0001	***
S1 Longitudinal vs S5 Longitudinal	0.952	0.831	-0.12	0.05362	ns
S1 Longitudinal vs S6 Circumferentiell	0.952	0.692	-0.26	<0.00001	***
S1 Longitudinal vs S6 Longitudinal	0.952	0.823	-0.128	0.02456	*
S2 Circumferentiell vs S2 Longitudinal	0.953	0.787	-0.166	0.00028	***
S2 Circumferentiell vs S3 Circumferentiell	0.953	0.916	-0.037	1	ns

Comparison	Mean 1	Mean 2	Difference	p (Tukey adj.)	Sig.
S2 Circumferentiell vs S3 Longitudinal	0.953	0.823	-0.13	0.0199	*
S2 Circumferentiell vs S4 Circumferentiell	0.953	0.842	-0.111	0.12877	ns
S2 Circumferentiell vs S4 Longitudinal	0.953	0.809	-0.144	0.00456	**
S2 Circumferentiell vs S5 Circumferentiell	0.953	0.772	-0.181	<0.0001	***
S2 Circumferentiell vs S5 Longitudinal	0.953	0.831	-0.122	0.04745	*
S2 Circumferentiell vs S6 Circumferentiell	0.953	0.692	-0.261	<0.00001	***
S2 Circumferentiell vs S6 Longitudinal	0.953	0.823	-0.129	0.02154	*
S2 Longitudinal vs S3 Circumferentiell	0.787	0.916	0.129	0.02331	*
S2 Longitudinal vs S3 Longitudinal	0.787	0.823	0.036	1	ns
S2 Longitudinal vs S4 Circumferentiell	0.787	0.842	0.055	0.99987	ns
S2 Longitudinal vs S4 Longitudinal	0.787	0.809	0.022	1	ns
S2 Longitudinal vs S5 Circumferentiell	0.787	0.772	-0.015	1	ns
S2 Longitudinal vs S5 Longitudinal	0.787	0.831	0.044	1	ns
S2 Longitudinal vs S6 Circumferentiell	0.787	0.692	-0.095	0.43495	ns
S2 Longitudinal vs S6 Longitudinal	0.787	0.823	0.037	1	ns
S3 Circumferentiell vs S3 Longitudinal	0.916	0.823	-0.093	0.48214	ns
S3 Circumferentiell vs S4 Circumferentiell	0.916	0.842	-0.074	0.93634	ns
S3 Circumferentiell vs S4 Longitudinal	0.916	0.809	-0.106	0.19172	ns
S3 Circumferentiell vs S5 Circumferentiell	0.916	0.772	-0.144	0.00456	**
S3 Circumferentiell vs S5 Longitudinal	0.916	0.831	-0.085	0.72061	ns
S3 Circumferentiell vs S6 Circumferentiell	0.916	0.692	-0.224	<0.00001	***
S3 Circumferentiell vs S6 Longitudinal	0.916	0.823	-0.092	0.5029	ns

Comparison	Mean 1	Mean 2	Difference	p (Tukey adj.)	Sig.
S3 Longitudinal vs S4 Circumferentiell	0.823	0.842	0.019	1	ns
S3 Longitudinal vs S4 Longitudinal	0.823	0.809	-0.013	1	ns
S3 Longitudinal vs S5 Circumferentiell	0.823	0.772	-0.05	0.99999	ns
S3 Longitudinal vs S5 Longitudinal	0.823	0.831	0.009	1	ns
S3 Longitudinal vs S6 Circumferentiell	0.823	0.692	-0.13	0.01938	*
S3 Longitudinal vs S6 Longitudinal	0.823	0.823	0.001	1	ns
S4 Circumferentiell vs S4 Longitudinal	0.842	0.809	-0.033	1	ns
S4 Circumferentiell vs S5 Circumferentiell	0.842	0.772	-0.07	0.97275	ns
S4 Circumferentiell vs S5 Longitudinal	0.842	0.831	-0.011	1	ns
S4 Circumferentiell vs S6 Circumferentiell	0.842	0.692	-0.15	0.00217	**
S4 Circumferentiell vs S6 Longitudinal	0.842	0.823	-0.018	1	ns
S4 Longitudinal vs S5 Circumferentiell	0.809	0.772	-0.037	1	ns
S4 Longitudinal vs S5 Longitudinal	0.809	0.831	0.022	1	ns
S4 Longitudinal vs S6 Circumferentiell	0.809	0.692	-0.117	0.07315	ns
S4 Longitudinal vs S6 Longitudinal	0.809	0.823	0.014	1	ns
S5 Circumferentiell vs S5 Longitudinal	0.772	0.831	0.059	0.99917	ns
S5 Circumferentiell vs S6 Circumferentiell	0.772	0.692	-0.08	0.83064	ns
S5 Circumferentiell vs S6 Longitudinal	0.772	0.823	0.051	0.99999	ns
S5 Longitudinal vs S6 Circumferentiell	0.831	0.692	-0.139	0.00764	**
S5 Longitudinal vs S6 Longitudinal	0.831	0.823	-0.008	1	ns
S6 Circumferentiell vs S6 Longitudinal	0.692	0.823	0.131	0.0179	*

Figures S1–S6. True stress/strain equivalents of Fig. 4–9.

Figure S1

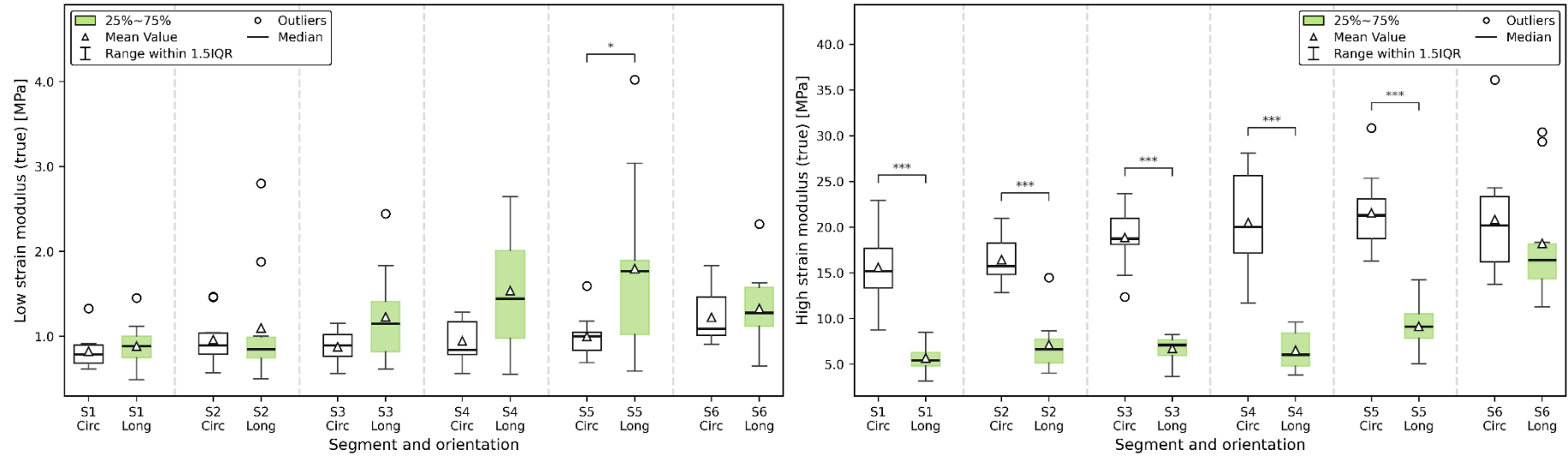
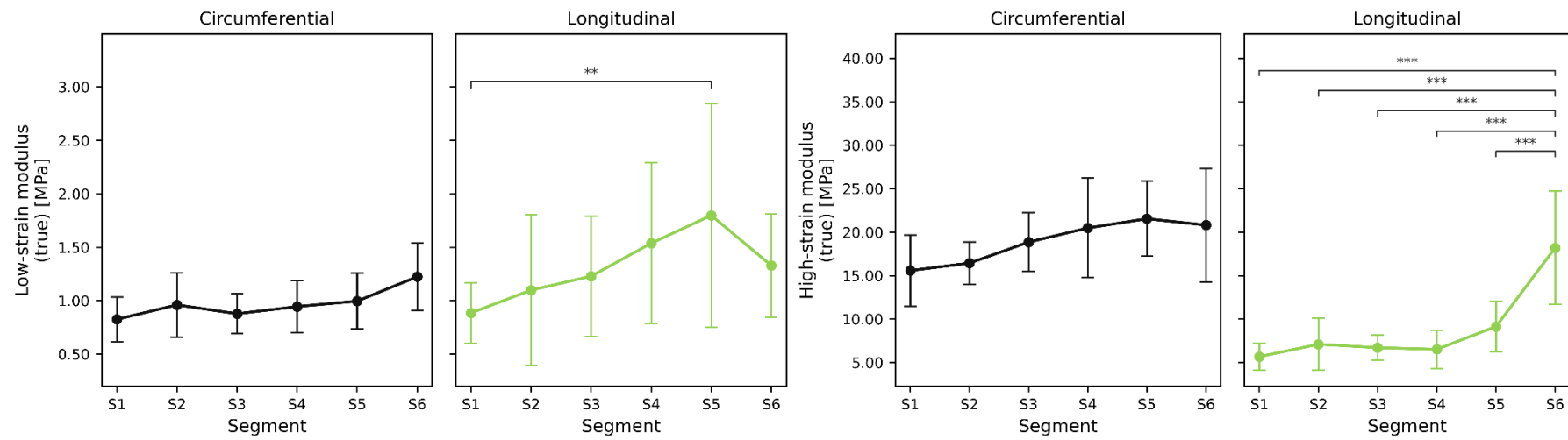


Figure S1: Low- and high-strain modulus (True) — boxplots by segment and orientation (mirrors Fig. 4).

Figure S2



Figure

S2: Low- and high-strain modulus (True) — regional trend line plots by orientation (mirrors Fig. 5).

Figure S3

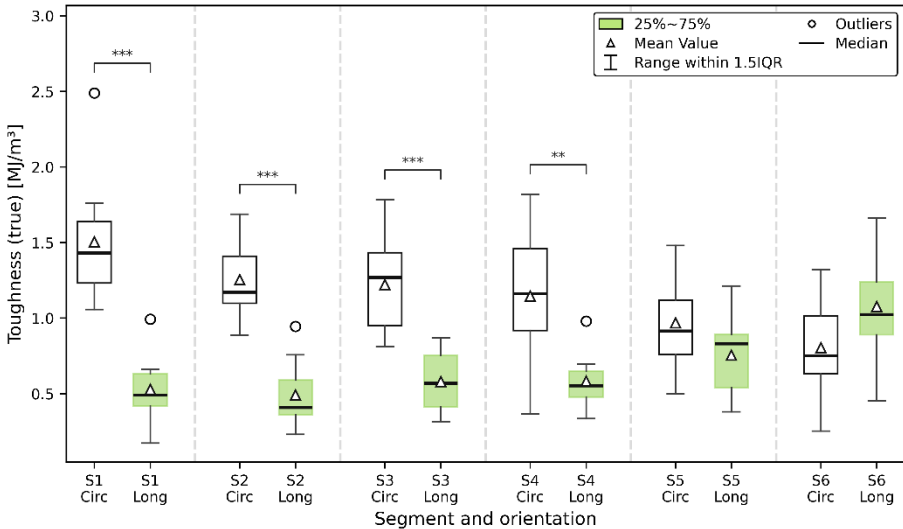


Figure S3: Tissue toughness (True) — boxplots by segment and orientation (mirrors Fig. 6).

Figure S4

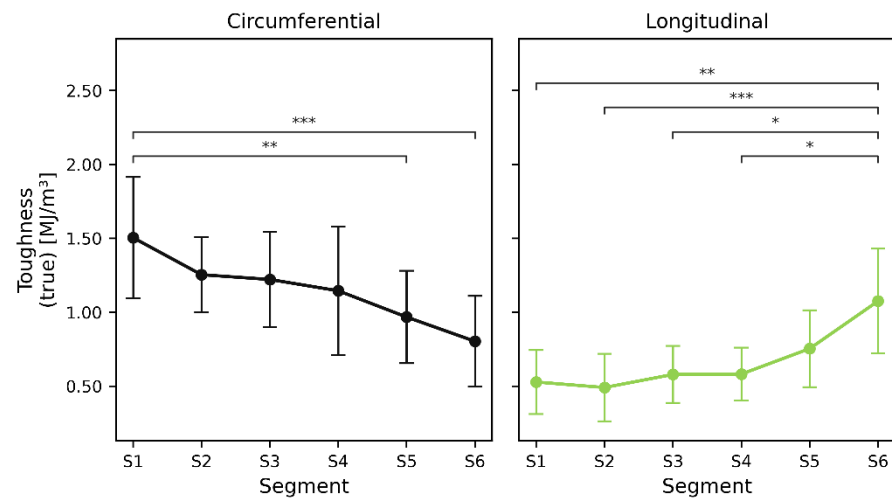


Figure S4: Tissue toughness (True) — regional trend line plots by orientation (mirrors Fig. 7).

Figure S5

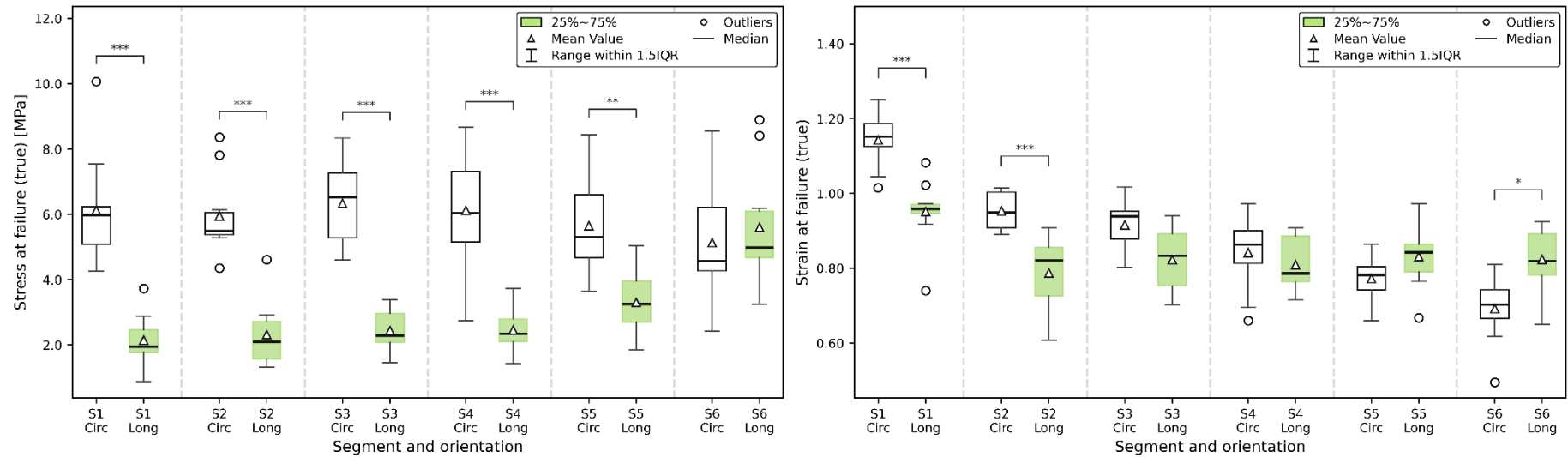


Figure S5: Stress and strain at failure (True) — boxplots by segment and orientation (mirrors Fig. 8).

Figure S6

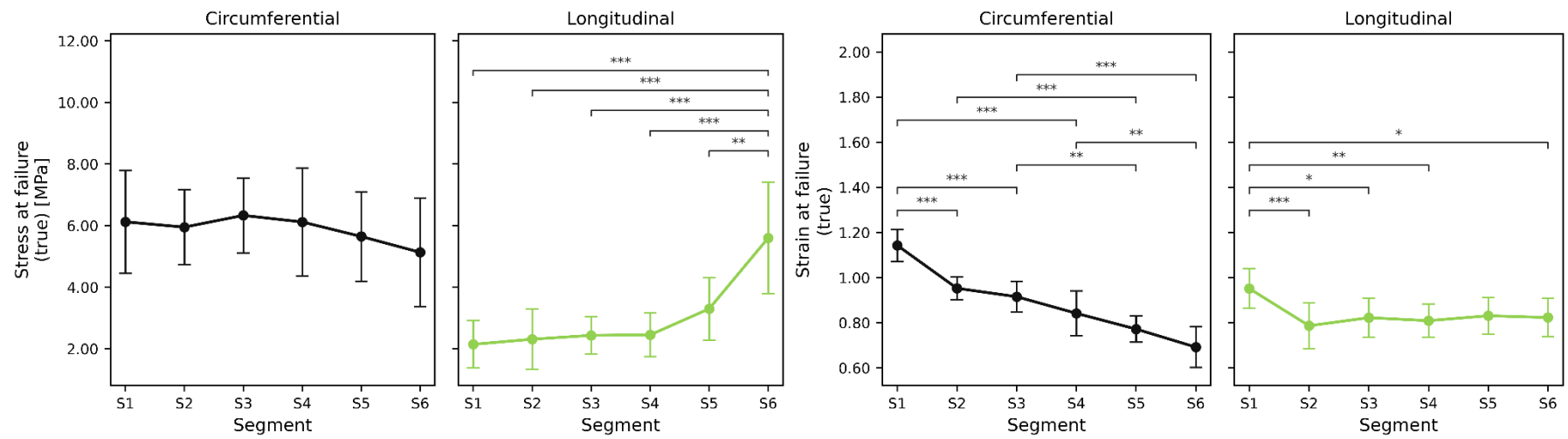


Figure S6: Stress and strain at failure (True) — regional trend line plots by orientation (mirrors Fig. 9).