**Table S2.** The significance of differences between the apparent mechanical properties (and also the failure force and the yield and failure strain) for the samples with the same nanofibers orientation was assessed with an unpaired parametric t-test with Welch’s correction.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **F****(N)** | **σY****(MPa)** | **σF****(MPa)** | **εY****(%)** | **εF****(%)** | **E****(MPa)** | **AS****(MPa)** | **LY****(J/mm3)** | **LF****(J/mm3)** |
| RandomMats vs Bundles | \*\*\*\*(<0.0001) | ns(0.1425) | \*\*\*\*(<0.0001) | ns(0.3283) | \*\*\*\*(<0.0001) | ns(0.0863) | \*\*\*\*(<0.0001) | ns(0.1005) | \*\*\*\*(<0.0001) |
| AlignedMats vs Bundles | \*\*\*\*(<0.0001) | \*\*\*\*(<0.0001) | \*\*\*\*(<0.0001) | \*\*\*\*(<0.0001) | \*\*\*\*(<0.0001) | \*\*\*\*(<0.0001) | \*(0.0451) | \*\*\*\*(<0.0001) | \*\*\*\*(<0.0001) |
| AlignedBundles vs HNES | \*(0.028) | \*\*(0.0044) | \*(0.021) | \*\*\*(0.0003) | \*\*(0.0039) | \*\*(0.0041) | \*(0.0498) | \*\*\*(0.0007) | \*(0.0210) |