

Notes on (new) friction tests

Date: 15-5-2023

Flow curve for C/PEEK material at 385 degC and 15 kPa (thus 75 N cumulative normal force). Same cutting and lay-up convention as before with original friction tester, now 162 mm long outer plies and 208 mm long central ply. Marked front and topside (which faces towards the inner on the roll). Fronts at the clamps. First outer plies faces downwards, than central ply facings upwards and another outer ply facing upwards. Plies held together with weld spots (4 on each side). Metal foils attached with paperclips.

Material from the edges of the prepreg roll (loc 1 and 6) not used. 5 min waiting/dwell time. Zeroed pull force with dummy specimen clamped at 200 bar at starting position.

103-1	Normal force offset: 80.3 N. 1 mm/min. T ok. Still -2 N on pull force before meas. Settings still on 15 mm slip, thus manually stopped at 10 mm. Changed settings after test. Loc 5. Normal force control on high side (78 N instead of 75 N).
103-2	Normal force offset: 80.1 N. 1 mm/min. T ok. Now 0 N pull force before test. T ok. Loc 4. Normal force control on low side (around 71 N instead of 75 N).
103-3	Normal force offset: 76.2 N. 1 mm/min. T ok. 0 N pull force. Thus previous probably little higher normal force (as offset actually dropped during meas). Loc 3.
103-4	Normal force offset: 74.4 N. 5 mm/min. T ok. Loc 2.
103-5	Normal force offset: 74.4 N. 5 mm/min. T ok. Loc 5. Problem with getting specimen in clamp; pushed against central ply and homing issue. Still tested, looks good.
103-6	Normal force offset: 74.4 N. 5 mm/min. Loc 4. Alignment might not be perfect. High normal pressure. Break after test, heater not shutdown.
103-7	Normal force offset: 73.2 N. 25 mm/min. T ok. Loc 3.
103-8	Normal force offset: 73.2 N. 25 mm/min. T ok. Loc 2.
103-9	Normal force offset: 73.2 N. 25 mm/min. T ok. Loc 5. Alignment might not be perfect. Low force. Low normal force as well.
103-10	Normal force offset: 74.2 N. 125 mm/min. Loc 4. T ok.
103-11	Normal force offset: 74.2 N. 125 mm/min. Loc 3. T ok. High force.
103-12	Normal force offset: 74.2 N. 125 mm/min. Loc 2. T ok. Low force. Various problems with motorcontroller and human errors during last three measurements (alignment, procedure (first clamping then pressure applied) etc) => remeasured at end of series.
103-13	Normal force offset: 74.2 N. 2 mm/min. Loc 5. T ok.
103-14	Normal force offset: 74.2 N. 3 mm/min. Loc 4. T ok.
103-15	Normal force offset: 74.2 N. 10 mm/min. Loc 3. T ok.
103-16	Normal force offset: 74.2 N. 15 mm/min. Loc 2. T ok. Short break.
103-17	Normal force offset: 74.1 N. 40 mm/min. Loc 5. T ok.
103-18	Normal force offset: 74.1 N. 75 mm/min. Loc 4. T ok.
103-19	Normal force offset: 74.1 N. 55 mm/min. Loc 3. T ok. Alignment might not be perfect (slightly hit the clamp).
103-20	Normal force offset: 74.1 N. 200 mm/min. Loc 2.
103-21	Normal force offset: 74.1 N. 125 mm/min. Loc 5.
103-22	Normal force offset: 74.1 N. 125 mm/min. Loc 4.
103-23	Normal force offset: 74.1 N. 125 mm/min. Loc 3.

Date: 10-7-2023

Flow curve with C/LM-PAEK material at 365 degC and 15 kPa (thus 75 N normal force). Normal fore offset with new procedure (using proximity sensor) before each test.

Same specimen lay-up and size. Metal foils attached with paperclips and 5 minute waiting time before each test.

104-1	1 mm/min. Normal offset 92.7 N. Quite increase in pull force during measurement. T ok. Loc 5.
104-2	1 mm/min. Normal offset 91.9 N. T ok (365 degC). Loc 4.
104-3	1 mm/min. Normal offset 91.4 N. T ok (365 degC). Loc 3.
104-4	5 mm/min. Normal offset 92.1 N (after lunch). T ok. Loc 2.
104-5	5 mm/min. Normal offset 92.3 N. T ok. Loc 5.
104-6	5 mm/min. Normal offset 91.8 N. T ok. Loc 4.
104-7	25 mm/min. Normal offset 91.6 N. T ok (365 degC). Loc 3.
104-8	25 mm/min. Normal offset 91.6 N. T ok. Loc 2.
104-9	25 mm/min. Normal offset 91.6 N. Strange curve. T ok. Loc 5.
104-10	25 mm/min. Normal offset 91.6 N. Again measured at 25 mm/min. T ok. Loc 4.

Date: 11-7-2023

104-11	125 mm/min. Normal offset 92.8 N. T ok (365 degC). Loc 3.
104-12	125 mm/min. Normal offset 92.3 N. T ok. Loc 2.
104-13	125 mm/min. Normal offset 92.0 N. Pulled skew; not very reliable. Lower pull force. Loc 5.
104-14	125 mm/min. Normal offset 91.4 N. T ok. Loc 4.
104-15	2 mm/min. Normal offset 91.4 N. T ok. Loc 3.
104-16	3 mm/min. Normal offset 91.2 N. T ok. Loc 2.
104-17	10 mm/min. Normal offset 91.1 N. T ok. Loc 5.
104-18	15 mm/min. Normal offset 91.1 N. T ok. Loc 4.
104-19	40 mm/min. Normal offset 90.6 N. T ok (365 degC). Loc 3.
104-20	55 mm/min. Normal offset 92.7 N. T ok. Loc 2.
104-21	75 mm/min. Normal offset 91.8 N. T ok. Loc 5.
104-22	200 mm/min. Normal offset 91.5 N. T ok (365 degC). Loc 4.

Date: 19-7-2023

Again C/LM-PAEK measurements on 200 mm/min (with same material as measured earlier for flow curve).

104-39	125 mm/min, 365 degC, 15 kPa (75 N). Normal offset 93.8 N. Wrong velocity. Loc 2.
104-40	200 mm/min, 365 degC, 15 kPa (75 N). Normal offset 90.7 N. Material cut at 13-7. Loc 5.
104-41	200 mm/min, 365 degC, 15 kPa (75 N). Loc 3.