4. Test results

4.1 Conventional Charpy parameters (*KV*, *LE*, *SFA*)

Conventional test results for CVN, SCVN and RHS specimens are provided in Tables 3 to 7.

Table 3 - Charpy test results for CVN specimens.

4340 – Low energy					4340 – High energy					T200 – Super-high energy[**]				
Specimen id	**T (°C)**	***KV* (J)**	***LE* (mm)**	***SFA* (%)**	**Specimen id**	**T (°C)**	***KV* (J)**	***LE* (mm)**	***SFA* (%)**	**Specimen id**	**T (°C)**	***KV* (J)**	***LE* (mm)**	***SFA* (%)**
1435	-198	6.02	0.129	2	468	-198	12.27	0.152	6	825	-198	35.13	0.230	26
1542	-150	7.09	0.112	2	298	-150	24.61	0.149	9	714	-150	41.96	0.463	32
1875	-121	8.53	0.121	3	296	-120	27.44	0.136	18	147	-120	74.29	0.598	54
1730	-90	9.52	0.110	4	467	-90	64.04	0.639	72	61	-90	117.50	1.068	68
1527	-60	16.67	0.108	8	292	-60	96.89	1.309	100	874	-60	144.84	1.535	88
1590	-30	18.77	0.120	15	300	-30	106.24	1.427	100	624	-30	144.39	1.605	80
1516	21	21.65	0.163	31	294	21	107.82	1.320	100	101	21	169.53	1.799	100
1937	50	23.28	0.198	42	469	50	120.44	1.535	100	1109	21	175.22	1.996	100
1500	100	28.23	0.218	100	299	100	125.83	1.561	100	442	21	186.37	1.911	100
1640	150	30.06	0.236	100						686	21	187.22	2.087	100
2743	200	34.67	0.218	100						963	21	178.11	1.957	100
1563	300	34.89	0.257	100						204	50	166.03	1.876	100
										49	100	177.79	1.964	100

Table 4 - Charpy test results for 3/4-size specimens.

4340 – Low energy					4340 – High energy					T200 – Super-high energy				
Specimen id	**T (°C)**	***KV* (J)**	***LE* (mm)**	***SFA* (%)**	**Specimen id**	**T (°C)**	***KV* (J)**	***LE* (mm)**	***SFA* (%)**	**Specimen id**	**T (°C)**	***KV* (J)**	***LE* (mm)**	***SFA* (%)**
2992	-198	4.13	0.152	3	714	-198	13.20	0.106	7	776	-198	23.28	0.137	29
2795	-150	4.13	0.116	4	715	-150	17.51	0.180	10	916	-150	30.84	0.277	41
2575	-121	6.48	0.051	4	754	-120	20.23	0.237	21	162	-120	49.84	0.526	59
2759	-90	8.68	0.094	7	720	-100	33.29	0.589	*36*[††]	1459	-90	98.85	1.495	64
1504	-60	12.05	0.099	14	718	-90	56.57	0.523	84	1093	-60	105.98	1.821	70
2912	-30	11.97	0.098	18	712	-60	71.12	1.124	100	531	-30	125.32	1.804	81
2780	21	15.21	0.117	44	717	-30	78.40	1.794	100	201	21	135.76	1.858	100
1596	50	18.83	0.121	57	781	21	79.84	1.372	100	329	50	144.97	2.217	100
2801	100	21.32	0.181	100	713	50	87.16	1.915	100	387	100	138.44	2.158	100
2757	150	25.02	0.268	100										
2812	200	23.76	0.308	100										
2944	300	30.99	0.336	100										
2788	300	27.67	0.304	100										

[**]For this material, 5 tests were available at 21 °C (room temperature) from the latest indirect verification of the machine.

[††]For this test, it was not possible to estimate the value of *SFA* through optical measurements. The reported value is therefore the average of the estimations obtained from the instrumented test records.

Table 5 - Charpy test results for 1/2-size specimens.

4340 – Low energy					4340 – High energy					T200 – Super-high energy				
Specimen id	**T (°C)**	***KV* (J)**	***LE* (mm)**	***SFA* (%)**	**Specimen id**	**T (°C)**	***KV* (J)**	***LE* (mm)**	***SFA* (%)**	**Specimen id**	**T (°C)**	***KV* (J)**	***LE* (mm)**	***SFA* (%)**
48	-198	3.00	0.063	3	5-10	-198	10.82	0.113	11	74	-198	17.05	0.120	41
21	-150	2.93	0.086	3	5-6	-150	10.97	0.121	13	446	-150	23.98	0.397	59
20	-123	4.36	0.091	4	5-5	-120	14.73	0.359	33	376	-120	42.20	0.763	77
2	-90	5.12	0.060	9	72	-100	21.55	0.547	*36*[‡‡]	50	-90	55.75	1.177	100
97	-60	7.70	0.087	19	5-4	-90	40.19	1.081	100	929	-60	65.08	1.656	100
50	-30	7.85	0.059	28	5-3	-60	45.06	0.962	100	558	-30	71.79	1.522	100
586	21	10.90	0.067	60	5-2	-30	45.79	1.249	100	687	21	80.01	1.588	100
7	50	13.58	0.170	74	5-72	21	47.90	1.371	100	418	50	81.68	1.823	100
11	100	14.81	0.267	100	5-9	50	51.97	1.214	100	1088	100	85.47	2.013	100
2890	150	16.91	0.240	100										
1141	200	18.46	0.247	100										
63	300	18.36	0.272	100										

Table 6 - Charpy test results for 1/4-size specimens. NOTE: results highlighted in yellow were obtained from specimens most likely altered by the machining process (see the text for further details).

4340 – Low energy					4340 – High energy					T200 – Super-high energy				
Specimen id	**T (°C)**	***KV* (J)**	***LE* (mm)**	***SFA* (%)**	**Specimen id**	**T (°C)**	***KV* (J)**	***LE* (mm)**	***SFA* (%)**	**Specimen id**	**T (°C)**	***KV* (J)**	***LE* (mm)**	***SFA*[§] (%)**
5-15	-198	1.20	0.075	6	5-3	-198	5.57	0.144	11	132	-198	12.35	0.271	*60*
5-1	-150	2.33	0.087	7	5-5	-150	5.87	0.215	27	375	-150	14.50	0.491	*65*
5-2	-123	3.61	0.056	8	SS3_4	-135	0.75	0.000	0	535	-123	17.67	0.725	*57*
5-3	-90	3.61	0.088	17	SS3_3	-130	1.35	0.000	0	257	-90	18.37	0.968	*71*
5-4	-60	3.76	0.030	28	5-6	-120	13.43	0.503	93	28	-60	23.68	0.714	*87*
25-2	-30	4.44	0.060	81	5-7	-90	15.81	0.949	100	1285	-30	20.40	1.117	*79*
5-12	21	6.86	0.100	58	5-8	-60	18.30	0.575	100	414	21	21.18	1.175	*100*
5-5	50	8.00	0.132	100	5-2	-30	17.76	n/a	100	153	50	22.42	1.204	n/a[§§]
5-6	100	8.30	0.317	100	SS3_1	-25	4.98	0.071	17	745	100	24.94	1.188	*100*
10	150	7.79	0.354	100	SS3_2	-25	9.90	0.016	11					
9	200	8.32	0.382	100	5-1	21	16.67	0.998	97					
13	300	8.83	0.485	100	5-4	50	19.07	0.672	100					

Table 7 - Charpy test results for RHS specimens.

4340 – Low energy					4340 – High energy					T200 – Super-high energy				
Specimen id	**T (°C)**	***KV* (J)**	***LE* (mm)**	***SFA* (%)**	**Specimen id**	**T (°C)**	***KV* (J)**	***LE* (mm)**	***SFA* (%)**	**Specimen id**	**T (°C)**	***KV* (J)**	***LE* (mm)**	***SFA* (%)**
LL-R12	-186	1.08	0.020	3	HH-R1	-181	4.16	0.110	17	SH-R2	-194	6.41	0.140	42
LL-R3	-159	1.08	0.040	5	HH-R4	-147	4.52	0.140	22	SH-R12	-164	8.45	0.210	43
LL-R7	-118	1.94	0.020	9	HH-R10	-130	6.71	0.250	50	SH-R9	-152	14.52	0.450	65
LL-R5	-101	2.57	0.040	9	HH-R8	-121	9.17	0.350	71	SH-R6	-143	15.44	0.490	67
LL-R4	-74	2.58	0.030	12	HH-R2	-98	12.84	0.420	92	SH-R3	-125	17.84	0.600	71
LL-R2	-50	2.97	0.030	19	HH-R6	-76	13.61	0.420	100	SH-R10	-115	16.34	0.480	75
LL-R6	-25	3.08	0.050	28	HH-R7	-50	14.86	0.530	100	SH-R4	-100	22.19	0.680	100
LL-R9	0	3.47	0.070	48	HH-R11	-30	14.75	0.660	100	SH-R11	-76	24.39	0.780	100
LL-R1	22	3.99	0.090	58	HH-R12	-20	14.64	0.630	100	SH-R1	-50	24.61	0.840	100
LL-R11	99	4.87	0.110	100	HH-R9	22	16.50	0.700	100	SH-R8	-20	26.21	0.860	100
LL-R10	197	5.82	0.170	100	HH-R5	101	17.80	0.710	100	SH-R5	22	27.87	0.970	100
LL-R8	292	6.02	0.210	100	HH-R3	235	19.01	0.770	100	SH-R7	101	29.83	0.960	100

[‡‡] For this test, it was not possible to estimate the value of *SFA* through optical measurements. The reported value is therefore the average of the estimations obtained from the instrumented test records.
[§§] Instrumented signal not acquired.