Appendix A

Kolmogorov-Smirnov tables

Table A.1 Kolmogorov-Smirnov hypothesis tests for Transversal Cracks (defect 1a). n_{1a}=1. n_g =70. $d_c(1)$=0.975. α=0.05. $\Delta_{0.95}$=2.2. $\Delta_{0.5}$=1.3.

Variable	$D_{\mu_{1a}}$	$H_0(\mu_{1a})$	$D_{\sigma^2_{1a}}$	$H_0(\sigma^2_{1a})$	$H_0(\mu_{1a}) \cup H_0(\sigma^2_{1a})$
in1u	0.614	Accept	0.886	Accept	Accept
in1l	0.8	Accept	0.843	Accept	Accept
in2u	0.6	Accept	0.929	Accept	Accept
in2l	0.971	Accept	0.9	Accept	Accept
in3u	0.557	Accept	0.914	Accept	Accept
in3l	0.914	Accept	0.929	Accept	Accept
in4u	0.529	Accept	0.886	Accept	Accept
in4l	0.529	Accept	0.943	Accept	Accept
in5u	0.543	Accept	0.929	Accept	Accept
in5l	0.814	Accept	0.914	Accept	Accept
in6u	0.743	Accept	0.8	Accept	Accept
in6l	0.8	Accept	0.914	Accept	Accept
in7u	0.571	Accept	0.886	Accept	Accept
in7l	0.814	Accept	0.9	Accept	Accept
in8u	0.9	Accept	0.914	Accept	Accept
in8l	0.986	Reject	0.943	Accept	Reject
nl1u	0.629	Accept	0.871	Accept	Accept
nl1l	0.714	Accept	0.843	Accept	Accept
nl2u	0.543	Accept	0.914	Accept	Accept
nl2l	0.614	Accept	0.914	Accept	Accept
ou1u	0.843	Accept	0.929	Accept	Accept
ou1l	0.529	Accept	0.943	Accept	Accept
ou2u	0.786	Accept	0.8	Accept	Accept
ou2l	0.886	Accept	0.9	Accept	Accept
ou3u	0.743	Accept	0.857	Accept	Accept
ou3l	0.871	Accept	0.929	Accept	Accept
ou4u	0.8	Accept	0.857	Accept	Accept
ou4l	0.743	Accept	0.886	Accept	Accept
ou5u	0.6	Accept	0.9	Accept	Accept
ou5l	0.743	Accept	0.971	Accept	Accept
ou6u	0.6	Accept	0.9	Accept	Accept
ou6l	0.8	Accept	0.943	Accept	Accept
ou7u	0.757	Accept	0.729	Accept	Accept
ou7l	0.829	Accept	0.9	Accept	Accept
ou8u	0.871	Accept	0.843	Accept	Accept
ou8l	0.6	Accept	0.914	Accept	Accept
nr1u	0.971	Accept	0.914	Accept	Accept
nr1l	1	Reject	0.729	Accept	Reject
nr2u	0.986	Reject	0.886	Accept	Reject
nr2l	0.986	Reject	0.814	Accept	Reject
Casting Speed	0.971	Accept	0.943	Accept	Accept
Mould Controller Status	0.943	Accept	0.943	Accept	Accept
Mould level	0.971	Accept	0.971	Accept	Accept
Inlet Temperature	0.886	Accept	0.586	Accept	Accept
Flowrate WL	0.743	Accept	0.5	Accept	Accept
Flowrate WF	0.886	Accept	0.7	Accept	Accept
Flowrate NL	0.543	Accept	0.671	Accept	Accept
Flowrate NR	0.843	Accept	0.8	Accept	Accept
Delta T WL	0.829	Accept	0.929	Accept	Accept
Delta T WF	0.829	Accept	0.929	Accept	Accept
Delta T NL	0.957	Accept	0.914	Accept	Accept
Delta T NR	0.886	Accept	0.886	Accept	Accept
Oscillation Frequency	0.986	Reject	0.943	Accept	Reject
Drive Current	0.771	Accept	0.986	Reject	Reject
Heat Flux WL	0.829	Accept	0.929	Accept	Accept
Heat Flux WF	0.829	Accept	0.914	Accept	Accept
Heat Flux NL	0.957	Accept	0.914	Accept	Accept
Heat Flux NR	0.886	Accept	0.886	Accept	Accept
in1	0.986	Reject	0.957	Accept	Reject
in2	0.986	Reject	0.971	Accept	Reject
in3	1	Reject	0.957	Accept	Reject
in4	0.7	Accept	0.971	Accept	Accept
in5	0.871	Accept	0.943	Accept	Accept
in6	1	Reject	0.957	Accept	Reject
in7	0.971	Accept	0.957	Accept	Accept
in8	1	Reject	0.943	Accept	Reject
nl1	0.586	Accept	0.571	Accept	Accept
nl2	0.543	Accept	0.757	Accept	Accept
ou1	0.957	Accept	0.857	Accept	Accept
ou2	1	Reject	0.9	Accept	Reject
ou3	1	Reject	0.914	Accept	Reject
ou4	1	Reject	0.929	Accept	Reject
ou5	0.886	Accept	0.957	Accept	Accept
ou6	0.5	Accept	0.957	Accept	Accept
ou7	1	Reject	0.943	Accept	Reject
ou8	0.971	Accept	0.814	Accept	Accept
nr1	0.8	Accept	0.814	Accept	Accept
nr2	0.614	Accept	0.614	Accept	Accept

Table A.2 Kolmogorov-Smirnov hypothesis tests for Longitudinal Cracks (defect 1b). n_{1b}=3. n_g =114. $d_c(3)$=0.708. α=0.05. $\Delta_{0.95}$=1.27. $\Delta_{0.5}$=0.751.

Variable	$D_{\mu_{1b}}$	$H_0(\mu_{1b})$	$D_{\sigma^2_{1b}}$	$H_0(\sigma^2_{1b})$	$H_0(\mu_{1b}) \cup H_0(\sigma^2_{1b})$
in1u	0.439	Accept	0.421	Accept	Accept
in1l	0.368	Accept	0.333	Accept	Accept
in2u	0.491	Accept	0.36	Accept	Accept
in2l	0.404	Accept	0.351	Accept	Accept
in3u	0.482	Accept	0.64	Accept	Accept
in3l	0.535	Accept	0.412	Accept	Accept
in4u	0.456	Accept	0.623	Accept	Accept
in4l	0.535	Accept	0.395	Accept	Accept
in5u	0.325	Accept	0.518	Accept	Accept
in5l	0.474	Accept	0.368	Accept	Accept
in6u	0.535	Accept	0.395	Accept	Accept
in6l	0.395	Accept	0.412	Accept	Accept
in7u	0.368	Accept	0.307	Accept	Accept
in7l	0.351	Accept	0.307	Accept	Accept
in8u	0.36	Accept	0.535	Accept	Accept
in8l	0.342	Accept	0.281	Accept	Accept
nl1u	0.316	Accept	0.368	Accept	Accept
nl1l	0.474	Accept	0.491	Accept	Accept
nl2u	0.298	Accept	0.544	Accept	Accept
nl2l	0.43	Accept	0.588	Accept	Accept
ou1u	0.456	Accept	0.447	Accept	Accept
ou1l	0.254	Accept	0.439	Accept	Accept
ou2u	0.605	Accept	0.421	Accept	Accept
ou2l	0.316	Accept	0.272	Accept	Accept
ou3u	0.518	Accept	0.57	Accept	Accept
ou3l	0.579	Accept	0.474	Accept	Accept
ou4u	0.57	Accept	0.316	Accept	Accept
ou4l	0.509	Accept	0.368	Accept	Accept
ou5u	0.377	Accept	0.254	Accept	Accept
ou5l	0.43	Accept	0.307	Accept	Accept
ou6u	0.544	Accept	0.544	Accept	Accept
ou6l	0.737	Reject	0.456	Accept	Reject
ou7u	0.526	Accept	0.482	Accept	Accept
ou7l	0.351	Accept	0.325	Accept	Accept
ou8u	0.553	Accept	0.5	Accept	Accept
ou8l	0.351	Accept	0.377	Accept	Accept
nr1u	0.57	Accept	0.342	Accept	Accept
nr1l	0.658	Accept	0.272	Accept	Accept
nr2u	0.658	Accept	0.412	Accept	Accept
nr2l	0.649	Accept	0.421	Accept	Accept
Casting Speed	0.509	Accept	0.412	Accept	Accept
Mould Controller Status	0.193	Accept	0.193	Accept	Accept
Mould level	0.43	Accept	0.368	Accept	Accept
Inlet Temperature	0.579	Accept	0.711	Reject	Reject
Flowrate WL	0.316	Accept	0.535	Accept	Accept
Flowrate WF	0.447	Accept	0.482	Accept	Accept
Flowrate NL	0.298	Accept	0.307	Accept	Accept
Flowrate NR	0.36	Accept	0.491	Accept	Accept
Delta T WL	0.289	Accept	0.632	Accept	Accept
Delta T WF	0.404	Accept	0.307	Accept	Accept
Delta T NL	0.5	Accept	0.447	Accept	Accept
Delta T NR	0.5	Accept	0.439	Accept	Accept
Oscillation Frequency	0.509	Accept	0.421	Accept	Accept
Drive Current	0.816	Reject	0.509	Accept	Reject
Heat Flux WL	0.447	Accept	0.623	Accept	Accept
Heat Flux WF	0.632	Accept	0.307	Accept	Accept
Heat Flux NL	0.5	Accept	0.447	Accept	Accept
Heat Flux NR	0.5	Accept	0.439	Accept	Accept
in1	0.386	Accept	0.518	Accept	Accept
in2	0.333	Accept	0.456	Accept	Accept
in3	0.333	Accept	0.614	Accept	Accept
in4	0.509	Accept	0.518	Accept	Accept
in5	0.5	Accept	0.465	Accept	Accept
in6	0.658	Accept	0.447	Accept	Accept
in7	0.509	Accept	0.412	Accept	Accept
in8	0.333	Accept	0.395	Accept	Accept
nl1	0.447	Accept	0.36	Accept	Accept
nl2	0.43	Accept	0.298	Accept	Accept
ou1	0.482	Accept	0.43	Accept	Accept
ou2	0.333	Accept	0.228	Accept	Accept
ou3	0.658	Accept	0.412	Accept	Accept
ou4	0.658	Accept	0.5	Accept	Accept
ou5	0.588	Accept	0.333	Accept	Accept
ou6	0.421	Accept	0.491	Accept	Accept
ou7	0.553	Accept	0.386	Accept	Accept
ou8	0.439	Accept	0.474	Accept	Accept
nr1	0.439	Accept	0.298	Accept	Accept
nr2	0.316	Accept	0.447	Accept	Accept

Table A.3 Kolmogorov-Smirnov hypothesis tests for Casting Powder Entrapment (defect 2a). n_{2a}=4. n_g =83. $d_c(4)$=0.624. α=0.05. $\Delta_{0.95}$=1.1. $\Delta_{0.5}$=0.65.

Variable	$D_{\mu_{2a}}$	$H_0(\mu_{2a})$	$D_{\sigma^2_{2a}}$	$H_0(\sigma^2_{2a})$	$H_0(\mu_{2a}) \cup H_0(\sigma^2_{2a})$
in1u	0.654	Reject	0.34	Accept	Reject
in1l	0.446	Accept	0.485	Accept	Accept
in2u	0.605	Accept	0.482	Accept	Accept
in2l	0.325	Accept	0.398	Accept	Accept
in3u	0.617	Accept	0.47	Accept	Accept
in3l	0.184	Accept	0.651	Reject	Reject
in4u	0.509	Accept	0.639	Reject	Reject
in4l	0.53	Accept	0.602	Accept	Accept
in5u	0.367	Accept	0.566	Accept	Accept
in5l	0.352	Accept	0.795	Reject	Reject
in6u	0.494	Accept	0.325	Accept	Accept
in6l	0.304	Accept	0.497	Accept	Accept
in7u	0.437	Accept	0.542	Accept	Accept
in7l	0.202	Accept	0.473	Accept	Accept
in8u	0.533	Accept	0.509	Accept	Accept
in8l	0.59	Accept	0.614	Accept	Accept
nl1u	0.352	Accept	0.373	Accept	Accept
nl1l	0.283	Accept	0.425	Accept	Accept
nl2u	0.449	Accept	0.34	Accept	Accept
nl2l	0.38	Accept	0.364	Accept	Accept
ou1u	0.617	Accept	0.506	Accept	Accept
ou1l	0.446	Accept	0.38	Accept	Accept
ou2u	0.476	Accept	0.482	Accept	Accept
ou2l	0.313	Accept	0.38	Accept	Accept
ou3u	0.259	Accept	0.506	Accept	Accept
ou3l	0.464	Accept	0.518	Accept	Accept
ou4u	0.316	Accept	0.41	Accept	Accept
ou4l	0.521	Accept	0.47	Accept	Accept
ou5u	0.25	Accept	0.627	Reject	Reject
ou5l	0.497	Accept	0.687	Reject	Reject
ou6u	0.34	Accept	0.47	Accept	Accept
ou6l	0.367	Accept	0.377	Accept	Accept
ou7u	0.533	Accept	0.304	Accept	Accept
ou7l	0.307	Accept	0.377	Accept	Accept
ou8u	0.521	Accept	0.422	Accept	Accept
ou8l	0.337	Accept	0.627	Reject	Reject
nr1u	0.485	Accept	0.434	Accept	Accept
nr1l	0.386	Accept	0.434	Accept	Accept
nr2u	0.428	Accept	0.542	Accept	Accept
nr2l	0.446	Accept	0.506	Accept	Accept
Casting Speed	0.488	Accept	0.413	Accept	Accept
Mould Controller Status	0.425	Accept	0.449	Accept	Accept
Mould level	0.494	Accept	0.328	Accept	Accept
Inlet Temperature	0.578	Accept	0.518	Accept	Accept
Flowrate WL	0.47	Accept	0.223	Accept	Accept
Flowrate WF	0.518	Accept	0.651	Reject	Reject
Flowrate NL	0.53	Accept	0.373	Accept	Accept
Flowrate NR	0.301	Accept	0.494	Accept	Accept
Delta T WL	0.476	Accept	0.28	Accept	Accept
Delta T WF	0.464	Accept	0.328	Accept	Accept
Delta T NL	0.452	Accept	0.506	Accept	Accept
Delta T NR	0.47	Accept	0.373	Accept	Accept
Oscillation Frequency	0.488	Accept	0.413	Accept	Accept
Drive Current	0.307	Accept	0.428	Accept	Accept
Heat Flux WL	0.476	Accept	0.292	Accept	Accept
Heat Flux WF	0.464	Accept	0.34	Accept	Accept
Heat Flux NL	0.452	Accept	0.506	Accept	Accept
Heat Flux NR	0.47	Accept	0.386	Accept	Accept
in1	0.392	Accept	0.521	Accept	Accept
in2	0.367	Accept	0.361	Accept	Accept
in3	0.214	Accept	0.605	Accept	Accept
in4	0.473	Accept	0.663	Reject	Reject
in5	0.53	Accept	0.663	Reject	Reject
in6	0.578	Accept	0.605	Accept	Accept
in7	0.506	Accept	0.642	Reject	Reject
in8	0.437	Accept	0.566	Accept	Accept
nl1	0.449	Accept	0.289	Accept	Accept
nl2	0.494	Accept	0.566	Accept	Accept
ou1	0.545	Accept	0.518	Accept	Accept
ou2	0.292	Accept	0.545	Accept	Accept
ou3	0.533	Accept	0.506	Accept	Accept
ou4	0.569	Accept	0.482	Accept	Accept
ou5	0.59	Accept	0.614	Accept	Accept
ou6	0.557	Accept	0.654	Reject	Reject
ou7	0.389	Accept	0.437	Accept	Accept
ou8	0.404	Accept	0.617	Accept	Accept
nr1	0.373	Accept	0.244	Accept	Accept
nr2	0.566	Accept	0.53	Accept	Accept

Table A.4 Kolmogorov-Smirnov hypothesis tests for Other Inclusions (defect 2b). n_{2b}=114. n_g =364. $d_c(114)$=0.127. α=0.05. $\Delta_{0.95}$=0.206. $\Delta_{0.5}$=0.122.

Variable	$D_{\mu_{2b}}$	$H_0(\mu_{2b})$	$D_{\sigma^2_{2b}}$	$H_0(\sigma^2_{2b})$	$H_0(\mu_{2b}) \cup H_0(\sigma^2_{2b})$
in1u	0.175	Reject	0.067	Accept	Reject
in1l	0.0977	Accept	0.0697	Accept	Accept
in2u	0.198	Reject	0.127	Accept	Reject
in2l	0.141	Reject	0.14	Reject	Reject
in3u	0.212	Reject	0.153	Reject	Reject
in3l	0.0942	Accept	0.102	Accept	Accept
in4u	0.171	Reject	0.173	Reject	Reject
in4l	0.0769	Accept	0.162	Reject	Reject
in5u	0.0833	Accept	0.207	Reject	Reject
in5l	0.0605	Accept	0.168	Reject	Reject
in6u	0.095	Accept	0.142	Reject	Reject
in6l	0.0967	Accept	0.168	Reject	Reject
in7u	0.215	Reject	0.157	Reject	Reject
in7l	0.143	Reject	0.178	Reject	Reject
in8u	0.145	Reject	0.0473	Accept	Reject
in8l	0.122	Accept	0.0817	Accept	Accept
nl1u	0.261	Reject	0.17	Reject	Reject
nl1l	0.26	Reject	0.0738	Accept	Reject
nl2u	0.31	Reject	0.0743	Accept	Reject
nl2l	0.249	Reject	0.166	Reject	Reject
ou1u	0.199	Reject	0.136	Reject	Reject
ou1l	0.155	Reject	0.0818	Accept	Reject
ou2u	0.129	Reject	0.122	Accept	Reject
ou2l	0.169	Reject	0.0956	Accept	Reject
ou3u	0.228	Reject	0.109	Accept	Reject
ou3l	0.191	Reject	0.149	Reject	Reject
ou4u	0.154	Reject	0.164	Reject	Reject
ou4l	0.221	Reject	0.146	Reject	Reject
ou5u	0.223	Reject	0.133	Reject	Reject
ou5l	0.2	Reject	0.169	Reject	Reject
ou6u	0.36	Reject	0.253	Reject	Reject
ou6l	0.233	Reject	0.214	Reject	Reject
ou7u	0.217	Reject	0.136	Reject	Reject
ou7l	0.204	Reject	0.1	Accept	Reject
ou8u	0.267	Reject	0.126	Accept	Reject
ou8l	0.154	Reject	0.0804	Accept	Reject
nr1u	0.199	Reject	0.119	Accept	Reject
nr1l	0.0899	Accept	0.155	Reject	Reject
nr2u	0.0831	Accept	0.113	Accept	Accept
nr2l	0.133	Reject	0.102	Accept	Reject
Casting Speed	0.193	Reject	0.105	Accept	Reject
Mould Controller Status	0.0605	Accept	0.0736	Accept	Accept
Mould level	0.126	Accept	0.0717	Accept	Accept
Inlet Temperature	0.136	Reject	0.174	Reject	Reject
Flowrate WL	0.0596	Accept	0.0797	Accept	Accept
Flowrate WF	0.117	Accept	0.2	Reject	Reject
Flowrate NL	0.1	Accept	0.0888	Accept	Accept
Flowrate NR	0.0835	Accept	0.0602	Accept	Accept
Delta T WL	0.155	Reject	0.171	Reject	Reject
Delta T WF	0.257	Reject	0.151	Reject	Reject
Delta T NL	0.1	Accept	0.133	Reject	Reject
Delta T NR	0.107	Accept	0.131	Reject	Reject
Oscillation Frequency	0.258	Reject	0.139	Reject	Reject
Drive Current	0.117	Accept	0.111	Accept	Accept
Heat Flux WL	0.117	Accept	0.177	Reject	Reject
Heat Flux WF	0.185	Reject	0.186	Reject	Reject
Heat Flux NL	0.1	Accept	0.128	Reject	Reject
Heat Flux NR	0.107	Accept	0.145	Reject	Reject
in1	0.188	Reject	0.0839	Accept	Reject
in2	0.174	Reject	0.0935	Accept	Reject
in3	0.188	Reject	0.119	Accept	Reject
in4	0.178	Reject	0.13	Reject	Reject
in5	0.181	Reject	0.179	Reject	Reject
in6	0.186	Reject	0.158	Reject	Reject
in7	0.129	Reject	0.119	Accept	Reject
in8	0.0887	Accept	0.0931	Accept	Accept
nl1	0.213	Reject	0.0979	Accept	Reject
nl2	0.211	Reject	0.0491	Accept	Reject
ou1	0.108	Accept	0.0851	Accept	Accept
ou2	0.0891	Accept	0.0861	Accept	Accept
ou3	0.1	Accept	0.0865	Accept	Accept
ou4	0.139	Reject	0.162	Reject	Reject
ou5	0.099	Accept	0.179	Reject	Reject
ou6	0.244	Reject	0.232	Reject	Reject
ou7	0.122	Accept	0.115	Accept	Accept
ou8	0.134	Reject	0.0773	Accept	Reject
nr1	0.265	Reject	0.118	Accept	Reject
nr2	0.127	Accept	0.114	Accept	Accept

Table A.5 Kolmogorov-Smirnov hypothesis tests for Bleeders (defect 4). n_4=3. n_g =175. $d_c(3)$=0.708. α=0.05. $\Delta_{0.95}$=1.27. $\Delta_{0.5}$=0.751.

Variable	D_{μ_4}	$H_0(\mu_4)$	$D_{\sigma_4^2}$	$H_0(\sigma_4^2)$	$H_0(\mu_4) \cup H_0(\sigma_4^2)$
in1u	0.389	Accept	0.234	Accept	Accept
in1l	0.455	Accept	0.309	Accept	Accept
in2u	0.434	Accept	0.469	Accept	Accept
in2l	0.309	Accept	0.417	Accept	Accept
in3u	0.314	Accept	0.463	Accept	Accept
in3l	0.455	Accept	0.587	Accept	Accept
in4u	0.305	Accept	0.429	Accept	Accept
in4l	0.421	Accept	0.472	Accept	Accept
in5u	0.341	Accept	0.297	Accept	Accept
in5l	0.261	Accept	0.371	Accept	Accept
in6u	0.406	Accept	0.48	Accept	Accept
in6l	0.571	Accept	0.446	Accept	Accept
in7u	0.371	Accept	0.354	Accept	Accept
in7l	0.411	Accept	0.509	Accept	Accept
in8u	0.276	Accept	0.377	Accept	Accept
in8l	0.261	Accept	0.709	Reject	Reject
nl1u	0.663	Accept	0.68	Accept	Accept
nl1l	0.491	Accept	0.467	Accept	Accept
nl2u	0.646	Accept	0.31	Accept	Accept
nl2l	0.6	Accept	0.354	Accept	Accept
ou1u	0.314	Accept	0.457	Accept	Accept
ou1l	0.307	Accept	0.255	Accept	Accept
ou2u	0.286	Accept	0.45	Accept	Accept
ou2l	0.387	Accept	0.547	Accept	Accept
ou3u	0.377	Accept	0.36	Accept	Accept
ou3l	0.37	Accept	0.543	Accept	Accept
ou4u	0.394	Accept	0.314	Accept	Accept
ou4l	0.455	Accept	0.335	Accept	Accept
ou5u	0.432	Accept	0.404	Accept	Accept
ou5l	0.423	Accept	0.461	Accept	Accept
ou6u	0.434	Accept	0.623	Accept	Accept
ou6l	0.503	Accept	0.817	Reject	Reject
ou7u	0.383	Accept	0.297	Accept	Accept
ou7l	0.337	Accept	0.341	Accept	Accept
ou8u	0.291	Accept	0.358	Accept	Accept
ou8l	0.33	Accept	0.415	Accept	Accept
nr1u	0.295	Accept	0.552	Accept	Accept
nr1l	0.444	Accept	0.524	Accept	Accept
nr2u	0.404	Accept	0.337	Accept	Accept
nr2l	0.421	Accept	0.423	Accept	Accept
Casting Speed	0.484	Accept	0.472	Accept	Accept
Mould Controller Status	0.185	Accept	0.185	Accept	Accept
Mould level	0.37	Accept	0.434	Accept	Accept
Inlet Temperature	0.337	Accept	0.316	Accept	Accept
Flowrate WL	0.32	Accept	0.592	Accept	Accept
Flowrate WF	0.514	Accept	0.293	Accept	Accept
Flowrate NL	0.48	Accept	0.282	Accept	Accept
Flowrate NR	0.429	Accept	0.322	Accept	Accept
Delta T WL	0.451	Accept	0.461	Accept	Accept
Delta T WF	0.509	Accept	0.421	Accept	Accept
Delta T NL	0.577	Accept	0.375	Accept	Accept
Delta T NR	0.354	Accept	0.455	Accept	Accept
Oscillation Frequency	0.467	Accept	0.253	Accept	Accept
Drive Current	0.358	Accept	0.455	Accept	Accept
Heat Flux WL	0.518	Accept	0.472	Accept	Accept
Heat Flux WF	0.537	Accept	0.421	Accept	Accept
Heat Flux NL	0.577	Accept	0.381	Accept	Accept
Heat Flux NR	0.354	Accept	0.455	Accept	Accept
in1	0.274	Accept	0.253	Accept	Accept
in2	0.571	Accept	0.417	Accept	Accept
in3	0.326	Accept	0.52	Accept	Accept
in4	0.316	Accept	0.509	Accept	Accept
in5	0.318	Accept	0.4	Accept	Accept
in6	0.457	Accept	0.474	Accept	Accept
in7	0.267	Accept	0.606	Accept	Accept
in8	0.366	Accept	0.514	Accept	Accept
nl1	0.394	Accept	0.467	Accept	Accept
nl2	0.589	Accept	0.501	Accept	Accept
ou1	0.577	Accept	0.324	Accept	Accept
ou2	0.358	Accept	0.552	Accept	Accept
ou3	0.248	Accept	0.484	Accept	Accept
ou4	0.299	Accept	0.375	Accept	Accept
ou5	0.41	Accept	0.512	Accept	Accept
ou6	0.52	Accept	0.874	Reject	Reject
ou7	0.337	Accept	0.312	Accept	Accept
ou8	0.364	Accept	0.352	Accept	Accept
nr1	0.484	Accept	0.444	Accept	Accept
nr2	0.56	Accept	0.27	Accept	Accept

Table A.6 Kolmogorov-Smirnov hypothesis tests for Deep Oscillation Marks (defect 5a). n_{5a}=8. n_g =354. $d_c(8)$=0.457. α=0.05. $\Delta_{0.95}$=0.778. $\Delta_{0.5}$=0.46.

Variable	$D_{\mu_{5a}}$	$H_0(\mu_{5a})$	$D_{\sigma^2_{5a}}$	$H_0(\sigma^2_{5a})$	$H_0(\mu_{5a}) \cup H_0(\sigma^2_{5a})$
in1u	0.216	Accept	0.473	Reject	Reject
in1l	0.215	Accept	0.516	Reject	Reject
in2u	0.303	Accept	0.276	Accept	Accept
in2l	0.383	Accept	0.263	Accept	Accept
in3u	0.186	Accept	0.35	Accept	Accept
in3l	0.22	Accept	0.325	Accept	Accept
in4u	0.316	Accept	0.296	Accept	Accept
in4l	0.233	Accept	0.404	Accept	Accept
in5u	0.331	Accept	0.361	Accept	Accept
in5l	0.332	Accept	0.331	Accept	Accept
in6u	0.28	Accept	0.322	Accept	Accept
in6l	0.402	Accept	0.338	Accept	Accept
in7u	0.316	Accept	0.31	Accept	Accept
in7l	0.264	Accept	0.33	Accept	Accept
in8u	0.308	Accept	0.248	Accept	Accept
in8l	0.358	Accept	0.342	Accept	Accept
nl1u	0.343	Accept	0.417	Accept	Accept
nl1l	0.38	Accept	0.369	Accept	Accept
nl2u	0.352	Accept	0.263	Accept	Accept
nl2l	0.319	Accept	0.525	Reject	Reject
ou1u	0.275	Accept	0.227	Accept	Accept
ou1l	0.22	Accept	0.206	Accept	Accept
ou2u	0.164	Accept	0.333	Accept	Accept
ou2l	0.2	Accept	0.354	Accept	Accept
ou3u	0.24	Accept	0.397	Accept	Accept
ou3l	0.313	Accept	0.481	Reject	Reject
ou4u	0.328	Accept	0.454	Accept	Accept
ou4l	0.284	Accept	0.317	Accept	Accept
ou5u	0.364	Accept	0.348	Accept	Accept
ou5l	0.477	Reject	0.333	Accept	Reject
ou6u	0.376	Accept	0.337	Accept	Accept
ou6l	0.373	Accept	0.35	Accept	Accept
ou7u	0.285	Accept	0.371	Accept	Accept
ou7l	0.243	Accept	0.358	Accept	Accept
ou8u	0.379	Accept	0.309	Accept	Accept
ou8l	0.328	Accept	0.307	Accept	Accept
nr1u	0.447	Accept	0.254	Accept	Accept
nr1l	0.347	Accept	0.294	Accept	Accept
nr2u	0.285	Accept	0.248	Accept	Accept
nr2l	0.364	Accept	0.281	Accept	Accept
Casting Speed	0.271	Accept	0.282	Accept	Accept
Mould Controller Status	0.169	Accept	0.174	Accept	Accept
Mould level	0.291	Accept	0.262	Accept	Accept
Inlet Temperature	0.174	Accept	0.22	Accept	Accept
Flowrate WL	0.173	Accept	0.369	Accept	Accept
Flowrate WF	0.226	Accept	0.227	Accept	Accept
Flowrate NL	0.521	Reject	0.189	Accept	Reject
Flowrate NR	0.465	Reject	0.297	Accept	Reject
Delta T WL	0.353	Accept	0.398	Accept	Accept
Delta T WF	0.463	Reject	0.324	Accept	Reject
Delta T NL	0.458	Reject	0.296	Accept	Reject
Delta T NR	0.47	Reject	0.348	Accept	Reject
Oscillation Frequency	0.274	Accept	0.28	Accept	Accept
Drive Current	0.203	Accept	0.395	Accept	Accept
Heat Flux WL	0.593	Reject	0.437	Accept	Reject
Heat Flux WF	0.647	Reject	0.336	Accept	Reject
Heat Flux NL	0.458	Reject	0.296	Accept	Reject
Heat Flux NR	0.472	Reject	0.34	Accept	Reject
in1	0.363	Accept	0.598	Reject	Reject
in2	0.357	Accept	0.323	Accept	Accept
in3	0.314	Accept	0.29	Accept	Accept
in4	0.257	Accept	0.328	Accept	Accept
in5	0.185	Accept	0.355	Accept	Accept
in6	0.234	Accept	0.352	Accept	Accept
in7	0.323	Accept	0.35	Accept	Accept
in8	0.196	Accept	0.463	Reject	Reject
nl1	0.4	Accept	0.607	Reject	Reject
nl2	0.345	Accept	0.341	Accept	Accept
ou1	0.285	Accept	0.242	Accept	Accept
ou2	0.172	Accept	0.402	Accept	Accept
ou3	0.315	Accept	0.441	Accept	Accept
ou4	0.383	Accept	0.35	Accept	Accept
ou5	0.214	Accept	0.32	Accept	Accept
ou6	0.342	Accept	0.351	Accept	Accept
ou7	0.291	Accept	0.401	Accept	Accept
ou8	0.176	Accept	0.48	Reject	Reject
nr1	0.47	Reject	0.297	Accept	Reject
nr2	0.508	Reject	0.282	Accept	Reject

Table A.7 Kolmogorov-Smirnov hypothesis tests for Uneven Oscillation Marks (defect 5b). n_{5b}=5. n_g =256. $d_c(5)$=0.565. α=0.05. $\Delta_{0.95}$=0.984. $\Delta_{0.5}$=0.581.

Variable	$D_{\mu_{5b}}$	$H_0(\mu_{5b})$	$D_{\sigma^2_{5b}}$	$H_0(\sigma^2_{5b})$	$H_0(\mu_{5b}) \cup H_0(\sigma^2_{5b})$
in1u	0.515	Accept	0.363	Accept	Accept
in1l	0.387	Accept	0.374	Accept	Accept
in2u	0.409	Accept	0.543	Accept	Accept
in2l	0.327	Accept	0.523	Accept	Accept
in3u	0.5	Accept	0.664	Reject	Reject
in3l	0.312	Accept	0.527	Accept	Accept
in4u	0.527	Accept	0.574	Reject	Reject
in4l	0.402	Accept	0.295	Accept	Accept
in5u	0.676	Reject	0.633	Reject	Reject
in5l	0.281	Accept	0.527	Accept	Accept
in6u	0.48	Accept	0.598	Reject	Reject
in6l	0.633	Reject	0.496	Accept	Reject
in7u	0.586	Reject	0.574	Reject	Reject
in7l	0.336	Accept	0.265	Accept	Accept
in8u	0.637	Reject	0.633	Reject	Reject
in8l	0.562	Accept	0.299	Accept	Accept
nl1u	0.594	Reject	0.538	Accept	Reject
nl1l	0.53	Accept	0.53	Accept	Accept
nl2u	0.535	Accept	0.379	Accept	Accept
nl2l	0.551	Accept	0.491	Accept	Accept
ou1u	0.551	Accept	0.547	Accept	Accept
ou1l	0.641	Reject	0.359	Accept	Reject
ou2u	0.527	Accept	0.562	Accept	Accept
ou2l	0.336	Accept	0.48	Accept	Accept
ou3u	0.578	Reject	0.559	Accept	Reject
ou3l	0.309	Accept	0.582	Reject	Reject
ou4u	0.641	Reject	0.539	Accept	Reject
ou4l	0.383	Accept	0.531	Accept	Accept
ou5u	0.613	Reject	0.5	Accept	Reject
ou5l	0.273	Accept	0.668	Reject	Reject
ou6u	0.441	Accept	0.621	Reject	Reject
ou6l	0.379	Accept	0.668	Reject	Reject
ou7u	0.48	Accept	0.578	Reject	Reject
ou7l	0.359	Accept	0.391	Accept	Accept
ou8u	0.445	Accept	0.355	Accept	Accept
ou8l	0.453	Accept	0.373	Accept	Accept
nr1u	0.402	Accept	0.39	Accept	Accept
nr1l	0.523	Accept	0.287	Accept	Accept
nr2u	0.484	Accept	0.476	Accept	Accept
nr2l	0.437	Accept	0.398	Accept	Accept
Casting Speed	0.378	Accept	0.363	Accept	Accept
Mould Controller Status	0.267	Accept	0.275	Accept	Accept
Mould level	0.334	Accept	0.221	Accept	Accept
Inlet Temperature	0.324	Accept	0.445	Accept	Accept
Flowrate WL	0.225	Accept	0.625	Reject	Reject
Flowrate WF	0.707	Reject	0.707	Reject	Reject
Flowrate NL	0.57	Reject	0.252	Accept	Reject
Flowrate NR	0.234	Accept	0.297	Accept	Accept
Delta T WL	0.262	Accept	0.512	Accept	Accept
Delta T WF	0.316	Accept	0.323	Accept	Accept
Delta T NL	0.457	Accept	0.48	Accept	Accept
Delta T NR	0.461	Accept	0.421	Accept	Accept
Oscillation Frequency	0.456	Accept	0.316	Accept	Accept
Drive Current	0.449	Accept	0.308	Accept	Accept
Heat Flux WL	0.409	Accept	0.523	Accept	Accept
Heat Flux WF	0.409	Accept	0.323	Accept	Accept
Heat Flux NL	0.453	Accept	0.48	Accept	Accept
Heat Flux NR	0.461	Accept	0.417	Accept	Accept
in1	0.461	Accept	0.299	Accept	Accept
in2	0.433	Accept	0.539	Accept	Accept
in3	0.519	Accept	0.512	Accept	Accept
in4	0.59	Reject	0.339	Accept	Reject
in5	0.71	Reject	0.472	Accept	Reject
in6	0.773	Reject	0.609	Reject	Reject
in7	0.512	Accept	0.613	Reject	Reject
in8	0.562	Accept	0.52	Accept	Accept
nl1	0.367	Accept	0.628	Reject	Reject
nl2	0.508	Accept	0.555	Accept	Accept
ou1	0.457	Accept	0.406	Accept	Accept
ou2	0.609	Reject	0.449	Accept	Reject
ou3	0.574	Reject	0.41	Accept	Reject
ou4	0.539	Accept	0.476	Accept	Accept
ou5	0.809	Reject	0.456	Accept	Reject
ou6	0.66	Reject	0.52	Accept	Reject
ou7	0.27	Accept	0.434	Accept	Accept
ou8	0.304	Accept	0.288	Accept	Accept
nr1	0.581	Reject	0.296	Accept	Reject
nr2	0.284	Accept	0.507	Accept	Accept

Table A.8 Kolmogorov-Smirnov hypothesis tests for Stopmarks (defect 6). n_6=19. n_g =170. $d_c(19)$=0.301. α=0.05. $\Delta_{0.95}$=0.505. $\Delta_{0.5}$=0.298.

Variable	D_{μ_6}	$H_0(\mu_6)$	$D_{\sigma_6^2}$	$H_0(\sigma_6^2)$	$H_0(\mu_6) \cup H_0(\sigma_6^2)$
in1u	0.29	Accept	0.742	Reject	Reject
in1l	0.396	Reject	0.695	Reject	Reject
in2u	0.426	Reject	0.748	Reject	Reject
in2l	0.514	Reject	0.672	Reject	Reject
in3u	0.349	Reject	0.742	Reject	Reject
in3l	0.408	Reject	0.707	Reject	Reject
in4u	0.337	Reject	0.742	Reject	Reject
in4l	0.244	Accept	0.724	Reject	Reject
in5u	0.385	Reject	0.725	Reject	Reject
in5l	0.35	Reject	0.718	Reject	Reject
in6u	0.396	Reject	0.737	Reject	Reject
in6l	0.602	Reject	0.642	Reject	Reject
in7u	0.426	Reject	0.73	Reject	Reject
in7l	0.508	Reject	0.654	Reject	Reject
in8u	0.349	Reject	0.701	Reject	Reject
in8l	0.531	Reject	0.583	Reject	Reject
nl1u	0.567	Reject	0.719	Reject	Reject
nl1l	0.52	Reject	0.777	Reject	Reject
nl2u	0.348	Reject	0.707	Reject	Reject
nl2l	0.331	Reject	0.625	Reject	Reject
ou1u	0.308	Reject	0.765	Reject	Reject
ou1l	0.325	Reject	0.677	Reject	Reject
ou2u	0.291	Accept	0.73	Reject	Reject
ou2l	0.56	Reject	0.683	Reject	Reject
ou3u	0.402	Reject	0.724	Reject	Reject
ou3l	0.495	Reject	0.684	Reject	Reject
ou4u	0.567	Reject	0.742	Reject	Reject
ou4l	0.467	Reject	0.771	Reject	Reject
ou5u	0.361	Reject	0.73	Reject	Reject
ou5l	0.455	Reject	0.695	Reject	Reject
ou6u	0.313	Reject	0.66	Reject	Reject
ou6l	0.313	Reject	0.678	Reject	Reject
ou7u	0.508	Reject	0.742	Reject	Reject
ou7l	0.554	Reject	0.689	Reject	Reject
ou8u	0.502	Reject	0.777	Reject	Reject
ou8l	0.537	Reject	0.718	Reject	Reject
nr1u	0.554	Reject	0.719	Reject	Reject
nr1l	0.292	Accept	0.678	Reject	Reject
nr2u	0.368	Reject	0.737	Reject	Reject
nr2l	0.361	Reject	0.731	Reject	Reject
Casting Speed	0.748	Reject	0.748	Reject	Reject
Mould Controller Status	0.666	Reject	0.666	Reject	Reject
Mould level	0.631	Reject	0.408	Reject	Reject
Inlet Temperature	0.18	Accept	0.207	Accept	Accept
Flowrate WL	0.167	Accept	0.438	Reject	Reject
Flowrate WF	0.325	Reject	0.572	Reject	Reject
Flowrate NL	0.215	Accept	0.326	Reject	Reject
Flowrate NR	0.227	Accept	0.672	Reject	Reject
Delta T WL	0.683	Reject	0.707	Reject	Reject
Delta T WF	0.724	Reject	0.701	Reject	Reject
Delta T NL	0.747	Reject	0.689	Reject	Reject
Delta T NR	0.695	Reject	0.725	Reject	Reject
Oscillation Frequency	0.748	Reject	0.766	Reject	Reject
Drive Current	0.259	Accept	0.407	Reject	Reject
Heat Flux WL	0.671	Reject	0.713	Reject	Reject
Heat Flux WF	0.666	Reject	0.707	Reject	Reject
Heat Flux NL	0.747	Reject	0.689	Reject	Reject
Heat Flux NR	0.695	Reject	0.725	Reject	Reject
in1	0.489	Reject	0.76	Reject	Reject
in2	0.342	Reject	0.789	Reject	Reject
in3	0.224	Accept	0.783	Reject	Reject
in4	0.28	Accept	0.76	Reject	Reject
in5	0.186	Accept	0.759	Reject	Reject
in6	0.413	Reject	0.725	Reject	Reject
in7	0.233	Accept	0.771	Reject	Reject
in8	0.472	Reject	0.719	Reject	Reject
nl1	0.566	Reject	0.642	Reject	Reject
nl2	0.46	Reject	0.384	Reject	Reject
ou1	0.206	Accept	0.724	Reject	Reject
ou2	0.413	Reject	0.783	Reject	Reject
ou3	0.115	Accept	0.76	Reject	Reject
ou4	0.151	Accept	0.777	Reject	Reject
ou5	0.154	Accept	0.742	Reject	Reject
ou6	0.365	Reject	0.701	Reject	Reject
ou7	0.224	Accept	0.772	Reject	Reject
ou8	0.202	Accept	0.718	Reject	Reject
nr1	0.542	Reject	0.343	Reject	Reject
nr2	0.265	Accept	0.713	Reject	Reject

Table A.9 Kolmogorov-Smirnov hypothesis tests for Depressions (defect 8). n_8=82. n_g =391. $d_c(82)$=0.15. α=0.05. $\Delta_{0.95}$=0.243. $\Delta_{0.5}$=0.144.

Variable	D_{μ_8}	$H_0(\mu_8)$	$D_{\sigma_8^2}$	$H_0(\sigma_8^2)$	$H_0(\mu_8) \cup H_0(\sigma_8^2)$
in1u	0.171	Reject	0.0953	Accept	Reject
in1l	0.109	Accept	0.0691	Accept	Accept
in2u	0.165	Reject	0.089	Accept	Reject
in2l	0.118	Accept	0.107	Accept	Accept
in3u	0.194	Reject	0.0994	Accept	Reject
in3l	0.121	Accept	0.132	Accept	Accept
in4u	0.159	Reject	0.151	Reject	Reject
in4l	0.0873	Accept	0.107	Accept	Accept
in5u	0.0679	Accept	0.15	Accept	Accept
in5l	0.0871	Accept	0.183	Reject	Reject
in6u	0.0719	Accept	0.118	Accept	Accept
in6l	0.108	Accept	0.151	Reject	Reject
in7u	0.185	Reject	0.143	Accept	Reject
in7l	0.148	Accept	0.189	Reject	Reject
in8u	0.154	Reject	0.056	Accept	Reject
in8l	0.177	Reject	0.0876	Accept	Reject
nl1u	0.176	Reject	0.169	Reject	Reject
nl1l	0.164	Reject	0.066	Accept	Reject
nl2u	0.23	Reject	0.0641	Accept	Reject
nl2l	0.2	Reject	0.148	Accept	Reject
ou1u	0.142	Accept	0.123	Accept	Accept
ou1l	0.1	Accept	0.068	Accept	Accept
ou2u	0.14	Accept	0.118	Accept	Accept
ou2l	0.134	Accept	0.133	Accept	Accept
ou3u	0.21	Reject	0.146	Accept	Reject
ou3l	0.242	Reject	0.183	Reject	Reject
ou4u	0.09	Accept	0.126	Accept	Accept
ou4l	0.166	Reject	0.151	Reject	Reject
ou5u	0.141	Accept	0.123	Accept	Accept
ou5l	0.168	Reject	0.182	Reject	Reject
ou6u	0.264	Reject	0.217	Reject	Reject
ou6l	0.247	Reject	0.215	Reject	Reject
ou7u	0.222	Reject	0.0898	Accept	Reject
ou7l	0.168	Reject	0.19	Reject	Reject
ou8u	0.231	Reject	0.182	Reject	Reject
ou8l	0.134	Accept	0.127	Accept	Accept
nr1u	0.161	Reject	0.0855	Accept	Reject
nr1l	0.133	Accept	0.0743	Accept	Accept
nr2u	0.119	Accept	0.0827	Accept	Accept
nr2l	0.151	Reject	0.152	Reject	Reject
Casting Speed	0.196	Reject	0.0735	Accept	Reject
Mould Controller Status	0.0575	Accept	0.0496	Accept	Accept
Mould level	0.0934	Accept	0.0794	Accept	Accept
Inlet Temperature	0.129	Accept	0.187	Reject	Reject
Flowrate WL	0.0876	Accept	0.0943	Accept	Accept
Flowrate WF	0.12	Accept	0.0625	Accept	Accept
Flowrate NL	0.124	Accept	0.14	Accept	Accept
Flowrate NR	0.0891	Accept	0.131	Accept	Accept
Delta T WL	0.228	Reject	0.115	Accept	Reject
Delta T WF	0.274	Reject	0.155	Reject	Reject
Delta T NL	0.152	Reject	0.12	Accept	Reject
Delta T NR	0.162	Reject	0.114	Accept	Reject
Oscillation Frequency	0.2	Reject	0.171	Reject	Reject
Drive Current	0.145	Accept	0.0964	Accept	Accept
Heat Flux WL	0.158	Reject	0.178	Reject	Reject
Heat Flux WF	0.185	Reject	0.166	Reject	Reject
Heat Flux NL	0.152	Reject	0.117	Accept	Reject
Heat Flux NR	0.162	Reject	0.113	Accept	Reject
in1	0.268	Reject	0.0887	Accept	Reject
in2	0.26	Reject	0.0968	Accept	Reject
in3	0.19	Reject	0.122	Accept	Reject
in4	0.116	Accept	0.127	Accept	Accept
in5	0.203	Reject	0.183	Reject	Reject
in6	0.194	Reject	0.179	Reject	Reject
in7	0.105	Accept	0.148	Accept	Accept
in8	0.174	Reject	0.046	Accept	Reject
nl1	0.206	Reject	0.108	Accept	Reject
nl2	0.191	Reject	0.0967	Accept	Reject
ou1	0.185	Reject	0.0969	Accept	Reject
ou2	0.145	Accept	0.151	Reject	Reject
ou3	0.117	Accept	0.15	Accept	Accept
ou4	0.116	Accept	0.148	Accept	Accept
ou5	0.0968	Accept	0.148	Accept	Accept
ou6	0.175	Reject	0.211	Reject	Reject
ou7	0.0882	Accept	0.169	Reject	Reject
ou8	0.24	Reject	0.139	Accept	Reject
nr1	0.24	Reject	0.118	Accept	Reject
nr2	0.136	Accept	0.118	Accept	Accept

Appendix B

Anderson-Darling tables

Table B.1 Anderson-Darling hypothesis tests for Transversal Cracks (defect 1a). n_{1a}=1. n_g =70. $a_c^2(1)$=2.492. α=0.05.

Variable	$A^2_{\mu_{1a}}$	$H_0(\mu_{1a})$	$A^2_{\sigma^2_{1a}}$	$H_0(\sigma^2_{1a})$	$H_0(\mu_{1a}) \cup H_0(\sigma^2_{1a})$
in1u	0.44	Accept	1.29	Accept	Accept
in1l	0.833	Accept	1.02	Accept	Accept
in2u	0.427	Accept	1.71	Accept	Accept
in2l	2.58	Reject	1.41	Accept	Reject
in3u	0.399	Accept	1.55	Accept	Accept
in3l	1.55	Accept	1.71	Accept	Accept
in4u	0.39	Accept	1.29	Accept	Accept
in4l	0.39	Accept	1.92	Accept	Accept
in5u	0.394	Accept	1.71	Accept	Accept
in5l	0.889	Accept	1.55	Accept	Accept
in6u	0.655	Accept	0.833	Accept	Accept
in6l	0.833	Accept	1.55	Accept	Accept
in7u	0.407	Accept	1.29	Accept	Accept
in7l	0.889	Accept	1.41	Accept	Accept
in8u	1.41	Accept	1.55	Accept	Accept
in8l	3.26	Reject	1.92	Accept	Reject
nl1u	0.455	Accept	1.19	Accept	Accept
nl1l	0.589	Accept	1.02	Accept	Accept
nl2u	0.394	Accept	1.55	Accept	Accept
nl2l	0.44	Accept	1.55	Accept	Accept
ou1u	1.02	Accept	1.71	Accept	Accept
ou1l	0.39	Accept	1.92	Accept	Accept
ou2u	0.782	Accept	0.833	Accept	Accept
ou2l	1.29	Accept	1.41	Accept	Accept
ou3u	0.655	Accept	1.1	Accept	Accept
ou3l	1.19	Accept	1.71	Accept	Accept
ou4u	0.833	Accept	1.1	Accept	Accept
ou4l	0.655	Accept	1.29	Accept	Accept
ou5u	0.427	Accept	1.41	Accept	Accept
ou5l	0.655	Accept	2.58	Reject	Reject
ou6u	0.427	Accept	1.41	Accept	Accept
ou6l	0.833	Accept	1.92	Accept	Accept
ou7u	0.693	Accept	0.621	Accept	Accept
ou7l	0.952	Accept	1.41	Accept	Accept
ou8u	1.19	Accept	1.02	Accept	Accept
ou8l	0.427	Accept	1.55	Accept	Accept
nr1u	2.58	Reject	1.55	Accept	Reject
nr1l	∞	Reject	0.621	Accept	Reject
nr2u	3.26	Reject	1.29	Accept	Reject
nr2l	3.26	Reject	0.889	Accept	Reject
Casting Speed	2.58	Reject	1.92	Accept	Reject
Mould Controller Status	1.92	Accept	1.92	Accept	Accept
Mould level	2.58	Reject	2.58	Reject	Reject
Inlet Temperature	1.29	Accept	0.416	Accept	Accept
Flowrate WL	0.655	Accept	0.386	Accept	Accept
Flowrate WF	1.29	Accept	0.561	Accept	Accept
Flowrate NL	0.394	Accept	0.511	Accept	Accept
Flowrate NR	1.02	Accept	0.833	Accept	Accept
Delta T WL	0.952	Accept	1.71	Accept	Accept
Delta T WF	0.952	Accept	1.71	Accept	Accept
Delta T NL	2.19	Accept	1.55	Accept	Accept
Delta T NR	1.29	Accept	1.29	Accept	Accept
Oscillation Frequency	3.26	Reject	1.92	Accept	Reject
Drive Current	0.735	Accept	3.26	Reject	Reject
Heat Flux WL	0.952	Accept	1.71	Accept	Accept
Heat Flux WF	0.952	Accept	1.55	Accept	Accept
Heat Flux NL	2.19	Accept	1.55	Accept	Accept
Heat Flux NR	1.29	Accept	1.29	Accept	Accept
in1	3.26	Reject	2.19	Accept	Reject
in2	3.26	Reject	2.58	Reject	Reject
in3	26.6	Reject	2.19	Accept	Reject
in4	0.561	Accept	2.58	Reject	Reject
in5	1.19	Accept	1.92	Accept	Accept
in6	26.6	Reject	2.19	Accept	Reject
in7	2.58	Reject	2.19	Accept	Reject
in8	26.6	Reject	1.92	Accept	Reject
nl1	0.416	Accept	0.407	Accept	Accept
nl2	0.394	Accept	0.693	Accept	Accept
ou1	2.19	Accept	1.1	Accept	Accept
ou2	26.6	Reject	1.41	Accept	Reject
ou3	26.6	Reject	1.55	Accept	Reject
ou4	26.6	Reject	1.71	Accept	Reject
ou5	1.29	Accept	2.19	Accept	Accept
ou6	0.386	Accept	2.19	Accept	Accept
ou7	26.6	Reject	1.92	Accept	Reject
ou8	2.58	Reject	0.889	Accept	Reject
nr1	0.833	Accept	0.889	Accept	Accept
nr2	0.44	Accept	0.44	Accept	Accept

Table B.2 Anderson-Darling hypothesis tests for Longitudinal Cracks (defect 1b). n_{1b}=3. n_g =114. $a_c^2(3)$=2.492. α=0.05.

Variable	$A^2_{\mu_{1b}}$	$H_0(\mu_{1b})$	$A^2_{\sigma^2_{1b}}$	$H_0(\sigma^2_{1b})$	$H_0(\mu_{1b}) \cup H_0(\sigma^2_{1b})$
in1u	0.818	Accept	0.556	Accept	Accept
in1l	∞	Reject	0.419	Accept	Reject
in2u	0.858	Accept	0.423	Accept	Accept
in2l	0.537	Accept	0.534	Accept	Accept
in3u	1.14	Accept	1.36	Accept	Accept
in3l	1.08	Accept	0.704	Accept	Accept
in4u	0.66	Accept	1.28	Accept	Accept
in4l	0.865	Accept	0.52	Accept	Accept
in5u	0.357	Accept	0.813	Accept	Accept
in5l	0.989	Accept	0.581	Accept	Accept
in6u	1.46	Accept	0.644	Accept	Accept
in6l	0.582	Accept	0.505	Accept	Accept
in7u	0.474	Accept	0.31	Accept	Accept
in7l	0.347	Accept	0.426	Accept	Accept
in8u	∞	Reject	0.93	Accept	Reject
in8l	∞	Reject	0.273	Accept	Reject
nl1u	0.718	Accept	0.559	Accept	Accept
nl1l	1.1	Accept	0.883	Accept	Accept
nl2u	0.456	Accept	0.829	Accept	Accept
nl2l	1	Accept	1.06	Accept	Accept
ou1u	0.875	Accept	0.642	Accept	Accept
ou1l	0.302	Accept	0.542	Accept	Accept
ou2u	1.94	Accept	0.672	Accept	Accept
ou2l	0.731	Accept	0.258	Accept	Accept
ou3u	1.35	Accept	1.05	Accept	Accept
ou3l	1.12	Accept	0.796	Accept	Accept
ou4u	1.78	Accept	0.379	Accept	Accept
ou4l	0.725	Accept	0.436	Accept	Accept
ou5u	0.441	Accept	0.258	Accept	Accept
ou5l	0.642	Accept	0.302	Accept	Accept
ou6u	0.872	Accept	0.89	Accept	Accept
ou6l	1.89	Accept	0.7	Accept	Accept
ou7u	1.01	Accept	0.965	Accept	Accept
ou7l	0.57	Accept	0.416	Accept	Accept
ou8u	1.57	Accept	0.951	Accept	Accept
ou8l	0.525	Accept	0.409	Accept	Accept
nr1u	1.39	Accept	0.404	Accept	Accept
nr1l	∞	Reject	0.266	Accept	Reject
nr2u	∞	Reject	0.502	Accept	Reject
nr2l	∞	Reject	0.671	Accept	Reject
Casting Speed	1.25	Accept	0.75	Accept	Accept
Mould Controller Status	4.25	Reject	1.49	Accept	Reject
Mould level	0.695	Accept	0.492	Accept	Accept
Inlet Temperature	1.49	Accept	1.84	Accept	Accept
Flowrate WL	0.411	Accept	1.01	Accept	Accept
Flowrate WF	0.953	Accept	0.91	Accept	Accept
Flowrate NL	0.353	Accept	0.356	Accept	Accept
Flowrate NR	0.385	Accept	0.884	Accept	Accept
Delta T WL	0.343	Accept	1.43	Accept	Accept
Delta T WF	0.627	Accept	0.381	Accept	Accept
Delta T NL	1.24	Accept	0.848	Accept	Accept
Delta T NR	1.11	Accept	0.678	Accept	Accept
Oscillation Frequency	1.06	Accept	0.627	Accept	Accept
Drive Current	3.63	Reject	1.33	Accept	Reject
Heat Flux WL	0.813	Accept	1.41	Accept	Accept
Heat Flux WF	1.57	Accept	0.389	Accept	Accept
Heat Flux NL	1.24	Accept	0.928	Accept	Accept
Heat Flux NR	1.11	Accept	0.73	Accept	Accept
in1	0.901	Accept	0.731	Accept	Accept
in2	8.57	Reject	0.658	Accept	Reject
in3	8.63	Reject	1.1	Accept	Reject
in4	1.34	Accept	0.904	Accept	Accept
in5	1.08	Accept	0.684	Accept	Accept
in6	11.9	Reject	0.8	Accept	Reject
in7	9.37	Reject	0.496	Accept	Reject
in8	8.68	Reject	0.484	Accept	Reject
nl1	∞	Reject	0.514	Accept	Reject
nl2	0.997	Accept	0.332	Accept	Accept
ou1	9.08	Reject	0.546	Accept	Reject
ou2	8.59	Reject	0.229	Accept	Reject
ou3	11.9	Reject	0.501	Accept	Reject
ou4	4.24	Reject	0.711	Accept	Reject
ou5	1.82	Accept	0.391	Accept	Accept
ou6	0.626	Accept	0.722	Accept	Accept
ou7	9.41	Reject	0.436	Accept	Reject
ou8	8.83	Reject	0.758	Accept	Reject
nr1	0.949	Accept	0.299	Accept	Accept
nr2	0.315	Accept	0.738	Accept	Accept

Table B.3 Anderson-Darling hypothesis tests for Casting Powder Entrapment (defect 2a). n_{2a}=4. n_g =83. $a_c^2(4)$=2.492. α=0.05.

Variable	$A^2_{\mu_{2a}}$	$H_0(\mu_{2a})$	$A^2_{\sigma^2_{2a}}$	$H_0(\sigma^2_{2a})$	$H_0(\mu_{2a}) \cup H_0(\sigma^2_{2a})$
in1u	2.87	Reject	0.65	Accept	Reject
in1l	0.879	Accept	1.01	Accept	Accept
in2u	3.14	Reject	0.808	Accept	Reject
in2l	0.601	Accept	0.869	Accept	Accept
in3u	1.87	Accept	0.848	Accept	Accept
in3l	0.181	Accept	2.6	Reject	Reject
in4u	0.945	Accept	1.95	Accept	Accept
in4l	1.32	Accept	2.3	Accept	Accept
in5u	0.822	Accept	1.68	Accept	Accept
in5l	0.663	Accept	4.13	Reject	Reject
in6u	1.52	Accept	0.593	Accept	Accept
in6l	0.584	Accept	7.93	Reject	Reject
in7u	1.53	Accept	1.27	Accept	Accept
in7l	0.37	Accept	2.39	Accept	Accept
in8u	∞	Reject	0.99	Accept	Reject
in8l	∞	Reject	1.73	Accept	Reject
nl1u	0.801	Accept	0.515	Accept	Accept
nl1l	0.308	Accept	1.03	Accept	Accept
nl2u	1.03	Accept	0.518	Accept	Accept
nl2l	1.1	Accept	0.568	Accept	Accept
ou1u	3.35	Reject	0.91	Accept	Reject
ou1l	1.77	Accept	0.873	Accept	Accept
ou2u	2.34	Accept	1	Accept	Accept
ou2l	∞	Reject	0.993	Accept	Reject
ou3u	0.405	Accept	1.52	Accept	Accept
ou3l	7.67	Reject	0.969	Accept	Reject
ou4u	0.581	Accept	1.12	Accept	Accept
ou4l	7.21	Reject	1.74	Accept	Reject
ou5u	∞	Reject	1.86	Accept	Reject
ou5l	7.82	Reject	2.42	Accept	Reject
ou6u	0.539	Accept	1.03	Accept	Accept
ou6l	0.625	Accept	0.873	Accept	Accept
ou7u	8.46	Reject	0.437	Accept	Reject
ou7l	0.589	Accept	0.744	Accept	Accept
ou8u	2.06	Accept	0.924	Accept	Accept
ou8l	0.714	Accept	1.86	Accept	Accept
nr1u	∞	Reject	1.06	Accept	Reject
nr1l	∞	Reject	1.28	Accept	Reject
nr2u	1.56	Accept	1.17	Accept	Accept
nr2l	1.63	Accept	1.26	Accept	Accept
Casting Speed	8.55	Reject	0.879	Accept	Reject
Mould Controller Status	6.8	Reject	2.09	Accept	Reject
Mould level	1.32	Accept	0.564	Accept	Accept
Inlet Temperature	1.61	Accept	1.38	Accept	Accept
Flowrate WL	1	Accept	0.34	Accept	Accept
Flowrate WF	1.28	Accept	1.77	Accept	Accept
Flowrate NL	1.38	Accept	0.845	Accept	Accept
Flowrate NR	0.495	Accept	1.54	Accept	Accept
Delta T WL	2.07	Accept	0.316	Accept	Accept
Delta T WF	1.56	Accept	0.407	Accept	Accept
Delta T NL	1.73	Accept	1.12	Accept	Accept
Delta T NR	2.2	Accept	0.806	Accept	Accept
Oscillation Frequency	8.55	Reject	1.44	Accept	Reject
Drive Current	0.43	Accept	1.44	Accept	Accept
Heat Flux WL	2.07	Accept	0.327	Accept	Accept
Heat Flux WF	1.55	Accept	0.483	Accept	Accept
Heat Flux NL	1.73	Accept	1.12	Accept	Accept
Heat Flux NR	2.2	Accept	0.826	Accept	Accept
in1	∞	Reject	1.51	Accept	Reject
in2	0.649	Accept	1.19	Accept	Accept
in3	0.315	Accept	8.39	Reject	Reject
in4	1.58	Accept	9.05	Reject	Reject
in5	1.97	Accept	9.98	Reject	Reject
in6	2.08	Accept	9.6	Reject	Reject
in7	2.23	Accept	3.32	Reject	Reject
in8	1.52	Accept	1.67	Accept	Accept
nl1	1.05	Accept	0.361	Accept	Accept
nl2	0.874	Accept	1.35	Accept	Accept
ou1	1.87	Accept	1.28	Accept	Accept
ou2	6.44	Reject	2.06	Accept	Reject
ou3	7.95	Reject	1.54	Accept	Reject
ou4	8.12	Reject	1.09	Accept	Reject
ou5	7.72	Reject	2.61	Reject	Reject
ou6	7.47	Reject	2.88	Reject	Reject
ou7	0.948	Accept	1.71	Accept	Accept
ou8	1.01	Accept	3.03	Reject	Reject
nr1	0.833	Accept	0.337	Accept	Accept
nr2	1.2	Accept	1.42	Accept	Accept

Table B.4 Anderson-Darling hypothesis tests for Other Inclusions (defect 2b). n_{2b}=114. n_g =364. $a_c^2(114)$=2.492. α=0.05.

Variable	$A^2_{\mu_{2b}}$	$H_0(\mu_{2b})$	$A^2_{\sigma^2_{2b}}$	$H_0(\sigma^2_{2b})$	$H_0(\mu_{2b}) \cup H_0(\sigma^2_{2b})$
in1u	4.28	Reject	0.629	Accept	Reject
in1l	1.95	Accept	0.791	Accept	Accept
in2u	∞	Reject	∞	Reject	Reject
in2l	∞	Reject	2.67	Reject	Reject
in3u	9.62	Reject	∞	Reject	Reject
in3l	∞	Reject	∞	Reject	Reject
in4u	∞	Reject	6.33	Reject	Reject
in4l	∞	Reject	5.47	Reject	Reject
in5u	2.34	Accept	7.86	Reject	Reject
in5l	0.652	Accept	6.76	Reject	Reject
in6u	1.67	Accept	4.63	Reject	Reject
in6l	∞	Reject	6.72	Reject	Reject
in7u	7.94	Reject	∞	Reject	Reject
in7l	5.38	Reject	∞	Reject	Reject
in8u	3.9	Reject	0.306	Accept	Reject
in8l	3.6	Reject	0.995	Accept	Reject
nl1u	15.7	Reject	5.06	Reject	Reject
nl1l	15.5	Reject	1.59	Accept	Reject
nl2u	22.8	Reject	1.26	Accept	Reject
nl2l	13.7	Reject	3.94	Reject	Reject
ou1u	5.99	Reject	3.39	Reject	Reject
ou1l	4.82	Reject	1.35	Accept	Reject
ou2u	∞	Reject	2.9	Reject	Reject
ou2l	∞	Reject	1.07	Accept	Reject
ou3u	∞	Reject	1.98	Accept	Reject
ou3l	∞	Reject	3.14	Reject	Reject
ou4u	∞	Reject	6.66	Reject	Reject
ou4l	∞	Reject	6.28	Reject	Reject
ou5u	∞	Reject	2.07	Accept	Reject
ou5l	11.3	Reject	6.9	Reject	Reject
ou6u	32.7	Reject	14	Reject	Reject
ou6l	21.3	Reject	15.6	Reject	Reject
ou7u	∞	Reject	∞	Reject	Reject
ou7l	∞	Reject	∞	Reject	Reject
ou8u	14.5	Reject	2.39	Accept	Reject
ou8l	6.94	Reject	0.757	Accept	Reject
nr1u	8.74	Reject	2.84	Reject	Reject
nr1l	1.8	Accept	∞	Reject	Reject
nr2u	0.772	Accept	∞	Reject	Reject
nr2l	2.32	Accept	∞	Reject	Reject
Casting Speed	∞	Reject	2.09	Accept	Reject
Mould Controller Status	1.62e+003	Reject	90.1	Reject	Reject
Mould level	2.68	Reject	1.09	Accept	Reject
Inlet Temperature	1.8	Accept	3.75	Reject	Reject
Flowrate WL	0.424	Accept	0.988	Accept	Accept
Flowrate WF	2.32	Accept	6.62	Reject	Reject
Flowrate NL	2.03	Accept	1.55	Accept	Accept
Flowrate NR	0.945	Accept	0.406	Accept	Accept
Delta T WL	4.76	Reject	4.65	Reject	Reject
Delta T WF	12.8	Reject	2.93	Reject	Reject
Delta T NL	2.18	Accept	2.77	Reject	Reject
Delta T NR	1.67	Accept	2.27	Accept	Accept
Oscillation Frequency	∞	Reject	19.3	Reject	Reject
Drive Current	1.52	Accept	∞	Reject	Reject
Heat Flux WL	4.82	Reject	6.2	Reject	Reject
Heat Flux WF	5.7	Reject	4.13	Reject	Reject
Heat Flux NL	2.2	Accept	2.79	Reject	Reject
Heat Flux NR	1.66	Accept	2.24	Accept	Accept
in1	∞	Reject	0.69	Accept	Reject
in2	6.44	Reject	1.99	Accept	Reject
in3	∞	Reject	2.06	Accept	Reject
in4	7.21	Reject	∞	Reject	Reject
in5	5.29	Reject	6.72	Reject	Reject
in6	18.8	Reject	5.16	Reject	Reject
in7	3.2	Reject	3.61	Reject	Reject
in8	2.01	Accept	0.855	Accept	Accept
nl1	∞	Reject	1.47	Accept	Reject
nl2	∞	Reject	0.324	Accept	Reject
ou1	1.53	Accept	1.07	Accept	Accept
ou2	2.2	Accept	1.17	Accept	Accept
ou3	3.81	Reject	1.24	Accept	Reject
ou4	9.08	Reject	4.62	Reject	Reject
ou5	5.86	Reject	∞	Reject	Reject
ou6	12.8	Reject	11.7	Reject	Reject
ou7	2.24	Accept	2.72	Reject	Reject
ou8	4.09	Reject	1.12	Accept	Reject
nr1	16.2	Reject	3.23	Reject	Reject
nr2	3.24	Reject	∞	Reject	Reject

Table B.5 Anderson-Darling hypothesis tests for Bleeders (defect 4). n_4=3. n_g =175. $a_c^2(3)$=2.492. α=0.05.

Variable	$A^2_{\mu_4}$	$H_0(\mu_4)$	$A^2_{\sigma_4^2}$	$H_0(\sigma_4^2)$	$H_0(\mu_4) \cup H_0(\sigma_4^2)$
in1u	0.635	Accept	0.249	Accept	Accept
in1l	0.613	Accept	0.425	Accept	Accept
in2u	0.558	Accept	0.865	Accept	Accept
in2l	0.318	Accept	0.574	Accept	Accept
in3u	0.396	Accept	0.99	Accept	Accept
in3l	0.797	Accept	1.79	Accept	Accept
in4u	0.626	Accept	0.518	Accept	Accept
in4l	0.687	Accept	1.05	Accept	Accept
in5u	0.583	Accept	0.301	Accept	Accept
in5l	0.268	Accept	0.454	Accept	Accept
in6u	0.862	Accept	0.626	Accept	Accept
in6l	1.07	Accept	0.625	Accept	Accept
in7u	0.396	Accept	0.547	Accept	Accept
in7l	0.533	Accept	0.756	Accept	Accept
in8u	0.429	Accept	0.615	Accept	Accept
in8l	0.295	Accept	1.78	Accept	Accept
nl1u	1.52	Accept	1.59	Accept	Accept
nl1l	1.25	Accept	0.779	Accept	Accept
nl2u	1.74	Accept	0.694	Accept	Accept
nl2l	2.1	Accept	0.748	Accept	Accept
ou1u	0.353	Accept	0.84	Accept	Accept
ou1l	0.279	Accept	0.312	Accept	Accept
ou2u	0.324	Accept	0.648	Accept	Accept
ou2l	0.442	Accept	1.09	Accept	Accept
ou3u	0.51	Accept	0.506	Accept	Accept
ou3l	0.492	Accept	1.17	Accept	Accept
ou4u	1.08	Accept	0.343	Accept	Accept
ou4l	0.842	Accept	0.397	Accept	Accept
ou5u	0.618	Accept	0.75	Accept	Accept
ou5l	0.606	Accept	1.51	Accept	Accept
ou6u	0.697	Accept	1.26	Accept	Accept
ou6l	0.912	Accept	2.92	Reject	Reject
ou7u	0.468	Accept	0.314	Accept	Accept
ou7l	0.336	Accept	0.487	Accept	Accept
ou8u	0.304	Accept	0.524	Accept	Accept
ou8l	0.427	Accept	0.51	Accept	Accept
nr1u	0.584	Accept	1.46	Accept	Accept
nr1l	0.64	Accept	1.16	Accept	Accept
nr2u	0.618	Accept	0.461	Accept	Accept
nr2l	0.582	Accept	0.56	Accept	Accept
Casting Speed	1.24	Accept	0.861	Accept	Accept
Mould Controller Status	4.81	Reject	1.92	Accept	Reject
Mould level	0.49	Accept	0.677	Accept	Accept
Inlet Temperature	0.353	Accept	0.768	Accept	Accept
Flowrate WL	0.411	Accept	1.65	Accept	Accept
Flowrate WF	0.727	Accept	0.507	Accept	Accept
Flowrate NL	0.746	Accept	0.373	Accept	Accept
Flowrate NR	0.671	Accept	0.821	Accept	Accept
Delta T WL	0.794	Accept	0.785	Accept	Accept
Delta T WF	1.07	Accept	0.539	Accept	Accept
Delta T NL	1.38	Accept	0.395	Accept	Accept
Delta T NR	0.78	Accept	0.662	Accept	Accept
Oscillation Frequency	1.75	Accept	0.613	Accept	Accept
Drive Current	0.436	Accept	0.726	Accept	Accept
Heat Flux WL	1.05	Accept	0.719	Accept	Accept
Heat Flux WF	1.39	Accept	0.521	Accept	Accept
Heat Flux NL	1.38	Accept	0.394	Accept	Accept
Heat Flux NR	0.78	Accept	0.671	Accept	Accept
in1	0.265	Accept	0.316	Accept	Accept
in2	1.16	Accept	0.599	Accept	Accept
in3	0.401	Accept	1.5	Accept	Accept
in4	0.891	Accept	1.21	Accept	Accept
in5	0.289	Accept	0.496	Accept	Accept
in6	0.704	Accept	0.621	Accept	Accept
in7	0.269	Accept	1.23	Accept	Accept
in8	1.12	Accept	1.18	Accept	Accept
nl1	0.434	Accept	0.916	Accept	Accept
nl2	1.13	Accept	0.875	Accept	Accept
ou1	0.981	Accept	0.413	Accept	Accept
ou2	0.432	Accept	1.14	Accept	Accept
ou3	0.279	Accept	0.832	Accept	Accept
ou4	0.647	Accept	0.466	Accept	Accept
ou5	0.514	Accept	1.26	Accept	Accept
ou6	0.933	Accept	3.68	Reject	Reject
ou7	0.375	Accept	0.393	Accept	Accept
ou8	0.502	Accept	0.409	Accept	Accept
nr1	0.835	Accept	0.817	Accept	Accept
nr2	1.03	Accept	0.448	Accept	Accept

Table B.6 Anderson-Darling hypothesis tests for Deep Oscillation Marks (defect 5a). n_{5a}=8. n_g =354. $a_c^2(8)$=2.492. α=0.05.

Variable	$A^2_{\mu_{5a}}$	$H_0(\mu_{5a})$	$A^2_{\sigma^2_{5a}}$	$H_0(\sigma^2_{5a})$	$H_0(\mu_{5a}) \cup H_0(\sigma^2_{5a})$
in1u	0.692	Accept	2.87	Reject	Reject
in1l	0.43	Accept	4.12	Reject	Reject
in2u	0.853	Accept	1.3	Accept	Accept
in2l	1.67	Accept	0.972	Accept	Accept
in3u	0.282	Accept	2.14	Accept	Accept
in3l	0.43	Accept	1.49	Accept	Accept
in4u	0.874	Accept	1.48	Accept	Accept
in4l	0.44	Accept	1.8	Accept	Accept
in5u	0.935	Accept	1.78	Accept	Accept
in5l	0.682	Accept	1.82	Accept	Accept
in6u	0.97	Accept	1.62	Accept	Accept
in6l	1.39	Accept	1.96	Accept	Accept
in7u	1.04	Accept	1.29	Accept	Accept
in7l	0.479	Accept	2.3	Accept	Accept
in8u	1.15	Accept	0.771	Accept	Accept
in8l	1.31	Accept	1.49	Accept	Accept
nl1u	1.71	Accept	2.09	Accept	Accept
nl1l	1.13	Accept	2.08	Accept	Accept
nl2u	0.796	Accept	0.772	Accept	Accept
nl2l	1.05	Accept	2.64	Reject	Reject
ou1u	0.814	Accept	0.6	Accept	Accept
ou1l	0.683	Accept	0.468	Accept	Accept
ou2u	0.328	Accept	1.25	Accept	Accept
ou2l	0.428	Accept	2.15	Accept	Accept
ou3u	0.764	Accept	1.72	Accept	Accept
ou3l	0.806	Accept	2.26	Accept	Accept
ou4u	1.27	Accept	2.51	Reject	Reject
ou4l	0.791	Accept	2.06	Accept	Accept
ou5u	1.37	Accept	1.36	Accept	Accept
ou5l	1.8	Accept	1.25	Accept	Accept
ou6u	1.62	Accept	1.98	Accept	Accept
ou6l	1.38	Accept	4.57	Reject	Reject
ou7u	0.713	Accept	2.06	Accept	Accept
ou7l	0.694	Accept	1.87	Accept	Accept
ou8u	1.42	Accept	1.24	Accept	Accept
ou8l	1.3	Accept	1.22	Accept	Accept
nr1u	2.18	Accept	0.609	Accept	Accept
nr1l	2.19	Accept	0.983	Accept	Accept
nr2u	1.74	Accept	0.531	Accept	Accept
nr2l	2.8	Reject	0.764	Accept	Reject
Casting Speed	0.921	Accept	0.973	Accept	Accept
Mould Controller Status	13.1	Reject	5.7	Reject	Reject
Mould level	0.908	Accept	0.998	Accept	Accept
Inlet Temperature	0.376	Accept	0.431	Accept	Accept
Flowrate WL	0.311	Accept	1.78	Accept	Accept
Flowrate WF	1.37	Accept	0.993	Accept	Accept
Flowrate NL	4.11	Reject	0.37	Accept	Reject
Flowrate NR	2.75	Reject	0.939	Accept	Reject
Delta T WL	2.16	Accept	1.88	Accept	Accept
Delta T WF	3.64	Reject	1.48	Accept	Reject
Delta T NL	3.83	Reject	1.26	Accept	Reject
Delta T NR	3.49	Reject	1.27	Accept	Reject
Oscillation Frequency	1.02	Accept	2.16	Accept	Accept
Drive Current	0.72	Accept	1.35	Accept	Accept
Heat Flux WL	4.13	Reject	2.07	Accept	Reject
Heat Flux WF	5.32	Reject	1.43	Accept	Reject
Heat Flux NL	3.83	Reject	1.09	Accept	Reject
Heat Flux NR	3.5	Reject	1.23	Accept	Reject
in1	1.23	Accept	4.31	Reject	Reject
in2	1.34	Accept	1.98	Accept	Accept
in3	0.889	Accept	4.15	Reject	Reject
in4	1.13	Accept	2.01	Accept	Accept
in5	0.409	Accept	2.98	Reject	Reject
in6	0.61	Accept	3.09	Reject	Reject
in7	1.08	Accept	2.43	Accept	Accept
in8	0.407	Accept	2.17	Accept	Accept
nl1	1.96	Accept	4.81	Reject	Reject
nl2	1.9	Accept	0.925	Accept	Accept
ou1	0.651	Accept	0.759	Accept	Accept
ou2	0.404	Accept	2.39	Accept	Accept
ou3	0.835	Accept	2.31	Accept	Accept
ou4	1.97	Accept	1.49	Accept	Accept
ou5	0.446	Accept	1.06	Accept	Accept
ou6	1.13	Accept	2.23	Accept	Accept
ou7	0.772	Accept	5.7	Reject	Reject
ou8	0.57	Accept	3.26	Reject	Reject
nr1	3.17	Reject	0.849	Accept	Reject
nr2	3.57	Reject	1.2	Accept	Reject

Table B.7 Anderson-Darling hypothesis tests for Uneven Oscillation Marks (defect 5b). n_{5b}=5. n_g =256. $a_c^2(5)$=2.492. α=0.05.

Variable	$A^2_{\mu_{5b}}$	$H_0(\mu_{5b})$	$A^2_{\sigma^2_{5b}}$	$H_0(\sigma^2_{5b})$	$H_0(\mu_{5b}) \cup H_0(\sigma^2_{5b})$
in1u	1.99	Accept	1.01	Accept	Accept
in1l	1.12	Accept	1.08	Accept	Accept
in2u	1.84	Accept	2.29	Accept	Accept
in2l	0.886	Accept	1.7	Accept	Accept
in3u	1.84	Accept	2.45	Accept	Accept
in3l	0.467	Accept	1.48	Accept	Accept
in4u	2.23	Accept	1.83	Accept	Accept
in4l	0.9	Accept	0.675	Accept	Accept
in5u	3.2	Reject	2.15	Accept	Reject
in5l	0.482	Accept	1.45	Accept	Accept
in6u	1.85	Accept	2.38	Accept	Accept
in6l	3.34	Reject	1.29	Accept	Reject
in7u	2.38	Accept	2.44	Accept	Accept
in7l	5.72	Reject	0.828	Accept	Reject
in8u	2.14	Accept	2.57	Reject	Reject
in8l	1.55	Accept	0.649	Accept	Accept
nl1u	2.89	Reject	2.12	Accept	Reject
nl1l	3.91	Reject	1.97	Accept	Reject
nl2u	2.08	Accept	1.4	Accept	Accept
nl2l	3.04	Reject	2.04	Accept	Reject
ou1u	2.23	Accept	6.4	Reject	Reject
ou1l	2.51	Reject	1.03	Accept	Reject
ou2u	2.62	Reject	2.3	Accept	Reject
ou2l	0.575	Accept	1.41	Accept	Accept
ou3u	2.36	Accept	2.64	Reject	Reject
ou3l	0.547	Accept	2.37	Accept	Accept
ou4u	3.95	Reject	1.6	Accept	Reject
ou4l	0.697	Accept	1.71	Accept	Accept
ou5u	3.16	Reject	2.08	Accept	Reject
ou5l	0.519	Accept	2.43	Accept	Accept
ou6u	1.23	Accept	3.24	Reject	Reject
ou6l	0.827	Accept	2.74	Reject	Reject
ou7u	1.15	Accept	1.73	Accept	Accept
ou7l	0.781	Accept	0.746	Accept	Accept
ou8u	1.29	Accept	1.09	Accept	Accept
ou8l	1.45	Accept	1.63	Accept	Accept
nr1u	0.902	Accept	0.819	Accept	Accept
nr1l	2.25	Accept	0.664	Accept	Accept
nr2u	1.16	Accept	1.37	Accept	Accept
nr2l	0.913	Accept	0.819	Accept	Accept
Casting Speed	0.848	Accept	1.11	Accept	Accept
Mould Controller Status	7.13	Reject	3.3	Reject	Reject
Mould level	0.63	Accept	0.487	Accept	Accept
Inlet Temperature	0.532	Accept	6.88	Reject	Reject
Flowrate WL	0.497	Accept	2.03	Accept	Accept
Flowrate WF	3.89	Reject	2.76	Reject	Reject
Flowrate NL	3.2	Reject	0.406	Accept	Reject
Flowrate NR	0.343	Accept	0.501	Accept	Accept
Delta T WL	0.345	Accept	1.32	Accept	Accept
Delta T WF	0.497	Accept	0.553	Accept	Accept
Delta T NL	1.61	Accept	1.63	Accept	Accept
Delta T NR	1.27	Accept	1.26	Accept	Accept
Oscillation Frequency	1.49	Accept	1.1	Accept	Accept
Drive Current	1.49	Accept	0.707	Accept	Accept
Heat Flux WL	0.786	Accept	1.34	Accept	Accept
Heat Flux WF	0.897	Accept	0.502	Accept	Accept
Heat Flux NL	1.6	Accept	1.59	Accept	Accept
Heat Flux NR	1.27	Accept	1.23	Accept	Accept
in1	1.38	Accept	0.76	Accept	Accept
in2	1.38	Accept	1.55	Accept	Accept
in3	1.66	Accept	1.47	Accept	Accept
in4	2.58	Reject	0.813	Accept	Reject
in5	6.17	Reject	1.72	Accept	Reject
in6	∞	Reject	2.01	Accept	Reject
in7	1.31	Accept	2.2	Accept	Accept
in8	1.92	Accept	1.88	Accept	Accept
nl1	0.872	Accept	3.46	Reject	Reject
nl2	1.77	Accept	3.68	Reject	Reject
ou1	1.42	Accept	0.92	Accept	Accept
ou2	3.27	Reject	1.37	Accept	Reject
ou3	4.25	Reject	0.805	Accept	Reject
ou4	3.21	Reject	1.57	Accept	Reject
ou5	5.29	Reject	1.51	Accept	Reject
ou6	2.51	Reject	7.54	Reject	Reject
ou7	0.388	Accept	0.918	Accept	Accept
ou8	0.572	Accept	0.709	Accept	Accept
nr1	1.97	Accept	0.779	Accept	Accept
nr2	0.45	Accept	1.46	Accept	Accept

Table B.8 Anderson-Darling hypothesis tests for Stopmarks (defect 6). n_6=19. n_g =170. $a_c^2(19)$=2.492. α=0.05.

Variable	$A^2_{\mu_6}$	$H_0(\mu_6)$	$A^2_{\sigma_6^2}$	$H_0(\sigma_6^2)$	$H_0(\mu_6) \cup H_0(\sigma_6^2)$
in1u	2.12	Accept	32.3	Reject	Reject
in1l	5.03	Reject	21.6	Reject	Reject
in2u	5.3	Reject	38.5	Reject	Reject
in2l	9.97	Reject	27	Reject	Reject
in3u	4.34	Reject	32.5	Reject	Reject
in3l	4.73	Reject	35.6	Reject	Reject
in4u	5.16	Reject	31.9	Reject	Reject
in4l	1.46	Accept	44	Reject	Reject
in5u	4.39	Reject	30.6	Reject	Reject
in5l	2.8	Reject	52.7	Reject	Reject
in6u	6.64	Reject	28	Reject	Reject
in6l	∞	Reject	18.8	Reject	Reject
in7u	8.35	Reject	31.1	Reject	Reject
in7l	10.6	Reject	30.5	Reject	Reject
in8u	6.72	Reject	25.8	Reject	Reject
in8l	13.5	Reject	17.6	Reject	Reject
nl1u	∞	Reject	29.8	Reject	Reject
nl1l	∞	Reject	39	Reject	Reject
nl2u	2.59	Reject	27.2	Reject	Reject
nl2l	3.73	Reject	25	Reject	Reject
ou1u	2.02	Accept	29.2	Reject	Reject
ou1l	2.58	Reject	20.8	Reject	Reject
ou2u	3.41	Reject	32.2	Reject	Reject
ou2l	15	Reject	19.5	Reject	Reject
ou3u	∞	Reject	26.9	Reject	Reject
ou3l	9.93	Reject	24.2	Reject	Reject
ou4u	13.7	Reject	29.1	Reject	Reject
ou4l	8.08	Reject	30.9	Reject	Reject
ou5u	6.05	Reject	26.5	Reject	Reject
ou5l	9.73	Reject	23.5	Reject	Reject
ou6u	3.33	Reject	20.1	Reject	Reject
ou6l	2.88	Reject	19.6	Reject	Reject
ou7u	10.4	Reject	29.9	Reject	Reject
ou7l	10.7	Reject	20.2	Reject	Reject
ou8u	12.1	Reject	30.1	Reject	Reject
ou8l	15.5	Reject	18.8	Reject	Reject
nr1u	13.5	Reject	22.3	Reject	Reject
nr1l	4.25	Reject	21.9	Reject	Reject
nr2u	5.29	Reject	31.6	Reject	Reject
nr2l	4.47	Reject	33.4	Reject	Reject
Casting Speed	25.6	Reject	29.9	Reject	Reject
Mould Controller Status	14.9	Reject	22	Reject	Reject
Mould level	16.5	Reject	5.74	Reject	Reject
Inlet Temperature	1.39	Accept	0.716	Accept	Accept
Flowrate WL	1.02	Accept	6.13	Reject	Reject
Flowrate WF	1.85	Accept	8.02	Reject	Reject
Flowrate NL	1.08	Accept	2.49	Accept	Accept
Flowrate NR	1.24	Accept	19.2	Reject	Reject
Delta T WL	24.6	Reject	21.4	Reject	Reject
Delta T WF	30.1	Reject	23.4	Reject	Reject
Delta T NL	26.3	Reject	17.3	Reject	Reject
Delta T NR	22.5	Reject	23.8	Reject	Reject
Oscillation Frequency	25.8	Reject	38.1	Reject	Reject
Drive Current	1.35	Accept	6.94	Reject	Reject
Heat Flux WL	24.1	Reject	22	Reject	Reject
Heat Flux WF	29.1	Reject	23.4	Reject	Reject
Heat Flux NL	26.3	Reject	17.1	Reject	Reject
Heat Flux NR	22.5	Reject	23.6	Reject	Reject
in1	4.76	Reject	26.2	Reject	Reject
in2	2.92	Reject	33	Reject	Reject
in3	1.44	Accept	37.3	Reject	Reject
in4	3.23	Reject	49	Reject	Reject
in5	0.798	Accept	30.1	Reject	Reject
in6	5.83	Reject	28.5	Reject	Reject
in7	1.02	Accept	29.3	Reject	Reject
in8	7.72	Reject	26.7	Reject	Reject
nl1	11.9	Reject	19.6	Reject	Reject
nl2	8.43	Reject	7.42	Reject	Reject
ou1	0.802	Accept	41.8	Reject	Reject
ou2	5.67	Reject	31.2	Reject	Reject
ou3	0.334	Accept	28	Reject	Reject
ou4	0.795	Accept	52	Reject	Reject
ou5	0.562	Accept	28.7	Reject	Reject
ou6	1.89	Accept	37.4	Reject	Reject
ou7	1.08	Accept	33.3	Reject	Reject
ou8	0.793	Accept	28.6	Reject	Reject
nr1	10.5	Reject	4.57	Reject	Reject
nr2	1.9	Accept	20.4	Reject	Reject

Table B.9 Anderson-Darling hypothesis tests for Depressions (defect 8). n_8=82. n_g =391. $a_c^2(82)$=2.492. α=0.05.

Variable	$A^2_{\mu_8}$	$H_0(\mu_8)$	$A^2_{\sigma^2_8}$	$H_0(\sigma^2_8)$	$H_0(\mu_8) \cup H_0(\sigma^2_8)$
in1u	4.4	Reject	1.09	Accept	Reject
in1l	1.27	Accept	0.518	Accept	Accept
in2u	∞	Reject	∞	Reject	Reject
in2l	∞	Reject	1.59	Accept	Reject
in3u	4.29	Reject	∞	Reject	Reject
in3l	∞	Reject	∞	Reject	Reject
in4u	∞	Reject	2.49	Reject	Reject
in4l	∞	Reject	1.74	Accept	Reject
in5u	0.676	Accept	3.49	Reject	Reject
in5l	0.65	Accept	4.61	Reject	Reject
in6u	∞	Reject	1.63	Accept	Reject
in6l	∞	Reject	3.08	Reject	Reject
in7u	4.28	Reject	1.68	Accept	Reject
in7l	4.1	Reject	3.55	Reject	Reject
in8u	4.19	Reject	0.201	Accept	Reject
in8l	5.57	Reject	0.746	Accept	Reject
nl1u	4.94	Reject	2.81	Reject	Reject
nl1l	4.88	Reject	0.534	Accept	Reject
nl2u	6.59	Reject	0.286	Accept	Reject
nl2l	5.1	Reject	2.02	Accept	Reject
ou1u	∞	Reject	0.719	Accept	Reject
ou1l	∞	Reject	0.256	Accept	Reject
ou2u	∞	Reject	2.06	Accept	Reject
ou2l	2.58	Reject	1.33	Accept	Reject
ou3u	∞	Reject	1.76	Accept	Reject
ou3l	∞	Reject	3.45	Reject	Reject
ou4u	∞	Reject	2.23	Accept	Reject
ou4l	∞	Reject	2.65	Reject	Reject
ou5u	∞	Reject	1.18	Accept	Reject
ou5l	5.12	Reject	4.98	Reject	Reject
ou6u	15.6	Reject	8.01	Reject	Reject
ou6l	16.4	Reject	9.2	Reject	Reject
ou7u	∞	Reject	∞	Reject	Reject
ou7l	∞	Reject	3.11	Reject	Reject
ou8u	5.9	Reject	3.57	Reject	Reject
ou8l	2.81	Reject	1.27	Accept	Reject
nr1u	3.49	Reject	0.495	Accept	Reject
nr1l	2.12	Accept	∞	Reject	Reject
nr2u	2.09	Accept	∞	Reject	Reject
nr2l	3.22	Reject	∞	Reject	Reject
Casting Speed	7.26	Reject	0.972	Accept	Reject
Mould Controller Status	204	Reject	61.9	Reject	Reject
Mould level	1.33	Accept	0.641	Accept	Accept
Inlet Temperature	2.46	Accept	3.64	Reject	Reject
Flowrate WL	0.765	Accept	0.696	Accept	Accept
Flowrate WF	1.49	Accept	0.408	Accept	Accept
Flowrate NL	1.08	Accept	1.3	Accept	Accept
Flowrate NR	0.984	Accept	1.56	Accept	Accept
Delta T WL	7.83	Reject	1.35	Accept	Reject
Delta T WF	8.58	Reject	3.11	Reject	Reject
Delta T NL	2.1	Accept	1.36	Accept	Accept
Delta T NR	2.82	Reject	1.22	Accept	Reject
Oscillation Frequency	8.98	Reject	14.6	Reject	Reject
Drive Current	1.97	Accept	0.757	Accept	Accept
Heat Flux WL	2.92	Reject	3.1	Reject	Reject
Heat Flux WF	4.15	Reject	4.07	Reject	Reject
Heat Flux NL	2.22	Accept	1.26	Accept	Accept
Heat Flux NR	3.02	Reject	1.16	Accept	Reject
in1	9.29	Reject	0.75	Accept	Reject
in2	5.82	Reject	∞	Reject	Reject
in3	∞	Reject	1.86	Accept	Reject
in4	2.38	Accept	1.98	Accept	Accept
in5	4.73	Reject	4.7	Reject	Reject
in6	6.38	Reject	4.72	Reject	Reject
in7	2.07	Accept	2.53	Reject	Reject
in8	5.57	Reject	0.258	Accept	Reject
nl1	∞	Reject	1.52	Accept	Reject
nl2	4.08	Reject	1.01	Accept	Reject
ou1	3.23	Reject	0.926	Accept	Reject
ou2	2.2	Accept	3.2	Reject	Reject
ou3	2.93	Reject	4.01	Reject	Reject
ou4	2.98	Reject	2.94	Reject	Reject
ou5	3.92	Reject	3.26	Reject	Reject
ou6	4.86	Reject	8.39	Reject	Reject
ou7	0.822	Accept	3.28	Reject	Reject
ou8	7.2	Reject	2.14	Accept	Reject
nr1	8.72	Reject	2.02	Accept	Reject
nr2	2.56	Reject	∞	Reject	Reject