

Stress Relaxation

183-15073-ASRP

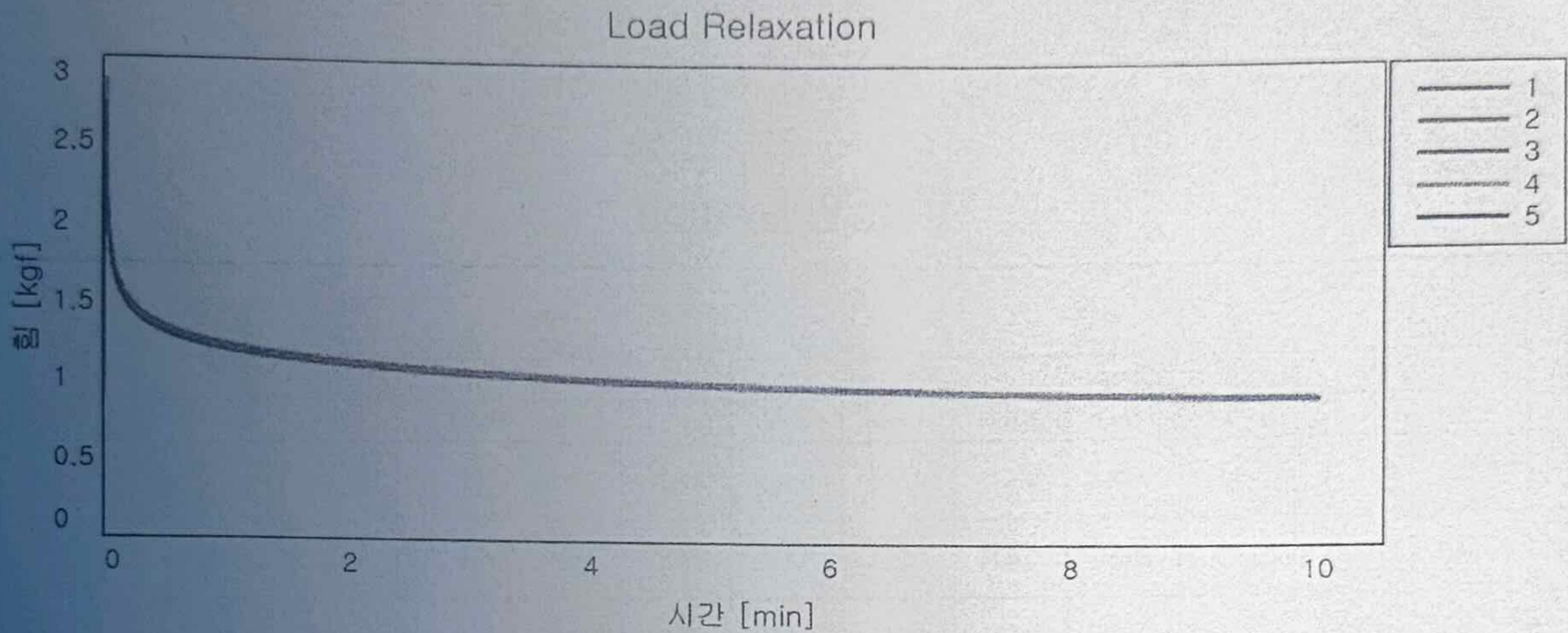
		Stress							Modulus						
		0.1min	0.2min	0.4min	1 min	2 min	4 min	10 min	0.1min	0.2min	0.4min	1 min	2 min	4 min	10 min
2%	+60°C	0.830	0.755	0.694	0.624	0.575	0.526	0.465	42.31	38.51	35.40	31.84	29.30	26.83	23.69
2%	+50°C	0.860	0.782	0.721	0.652	0.604	0.556	0.496	43.87	39.89	36.78	33.23	30.78	28.37	25.28
2%	+40°C	0.921	0.830	0.761	0.685	0.632	0.581	0.518	46.98	42.32	38.83	34.93	32.24	29.63	26.43
2%	+20°C	1.066	0.939	0.849	0.757	0.699	0.646	0.582	54.37	47.88	43.30	38.62	35.65	32.96	29.68
2%	0°C	1.578	1.322	1.152	0.989	0.892	0.812	0.723	80.47	67.41	58.77	50.43	45.50	41.43	36.85
2%	-20°C	3.043	2.389	1.965	1.574	1.354	1.182	1.002	155.17	121.82	100.22	80.25	69.06	60.30	51.10
2%	-30°C	4.913	3.762	3.012	2.330	1.945	1.648	1.338	250.56	191.84	153.60	118.84	99.21	84.05	68.22
2%	-40°C	7.614	5.724	4.512	3.417	2.808	2.338	1.857	388.32	291.92	230.09	174.25	143.22	119.22	94.73
2%	-50°C	13.816	10.299	8.019	5.950	4.821	3.950	3.081	704.64	525.26	408.99	303.46	245.85	201.47	157.1
2%	-60°C	21.451	16.116	12.542	9.229	7.363	5.924	4.482	1093.98	821.94	639.62	470.68	375.51	302.11	228.6

Stress Relaxation Test per Strain 2%

최종 시험 날짜: 2024-05-20

Sample ID: 183-15073+20R.is_trelax

Operator Name	KIM SUN GI
Temperature	20.0 C
Humidity	38.0 %
SPEED	50.0 mm/min
Batch No.	183-15073 +20



	Stress[Bar] (0.1min)	Stress[Bar] (0.2min)	Stress[Bar] (0.4min)	Stress[Bar] (1min)	Stress[Bar] (2min)	Stress[Bar] (4min)	Stress[Bar] (10min)
1	1.060	0.934	0.846	0.756	0.699	0.649	0.587
2	1.071	0.944	0.854	0.763	0.705	0.652	0.587
3	1.082	0.952	0.859	0.764	0.704	0.649	0.582
4	1.062	0.935	0.845	0.753	0.695	0.642	0.577
5	1.056	0.930	0.841	0.750	0.692	0.640	0.576
평균	1.066	0.939	0.849	0.757	0.699	0.646	0.582
표준편차	0.011	0.009	0.007	0.006	0.005	0.005	0.005

	Modulus[Bar] (0.1min)	Modulus[Bar] (0.2min)	Modulus[Bar] (0.4min)	Modulus[Bar] (1min)	Modulus[Bar] (2min)	Modulus[Bar] (4min)	Modulus[Bar] (10min)
1	54.05	47.64	43.16	38.56	35.67	33.09	29.96
2	54.60	48.13	43.57	38.91	35.94	33.26	29.93
3	55.21	48.54	43.82	38.98	35.89	33.08	29.69
4	54.17	47.70	43.09	38.43	35.45	32.75	29.44
5	53.84	47.42	42.89	38.24	35.28	32.64	29.39
평균	54.37	47.88	43.30	38.62	35.65	32.96	29.68
표준편차	0.543	0.446	0.380	0.317	0.280	0.259	0.264

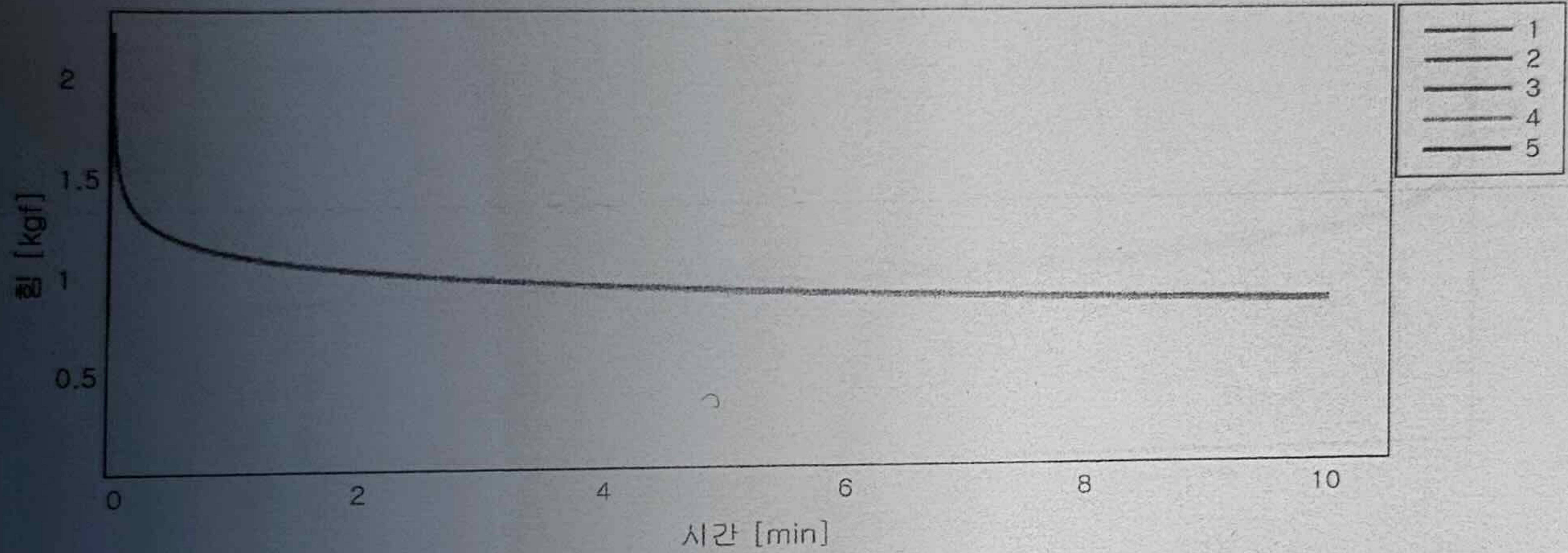
Stress Relaxation Test per Strain 2%

최종 시험 날짜: 2024-05-20

Sample ID: 183-15073 +40R.is_trelax

Operator Name	KIM SUN GI
Temperature	20.0 C
Humidity	38.0 %
SPEED	50.0 mm/min
Batch No.	183-15073 +40

Load Relaxation



	Stress[Bar] (0.1min)	Stress[Bar] (0.2min)	Stress[Bar] (0.4min)	Stress[Bar] (1min)	Stress[Bar] (2min)	Stress[Bar] (4min)	Stress[Bar] (10min)
1	0.927	0.835	0.766	0.690	0.635	0.585	0.522
2	0.927	0.836	0.768	0.691	0.638	0.587	0.525
3	0.922	0.830	0.760	0.680	0.627	0.574	0.510
4	0.919	0.829	0.761	0.688	0.636	0.583	0.518
5	0.910	0.820	0.752	0.676	0.625	0.575	0.516
평균	0.921	0.830	0.761	0.685	0.632	0.581	0.518
표준편차	0.007	0.007	0.006	0.006	0.006	0.006	0.006

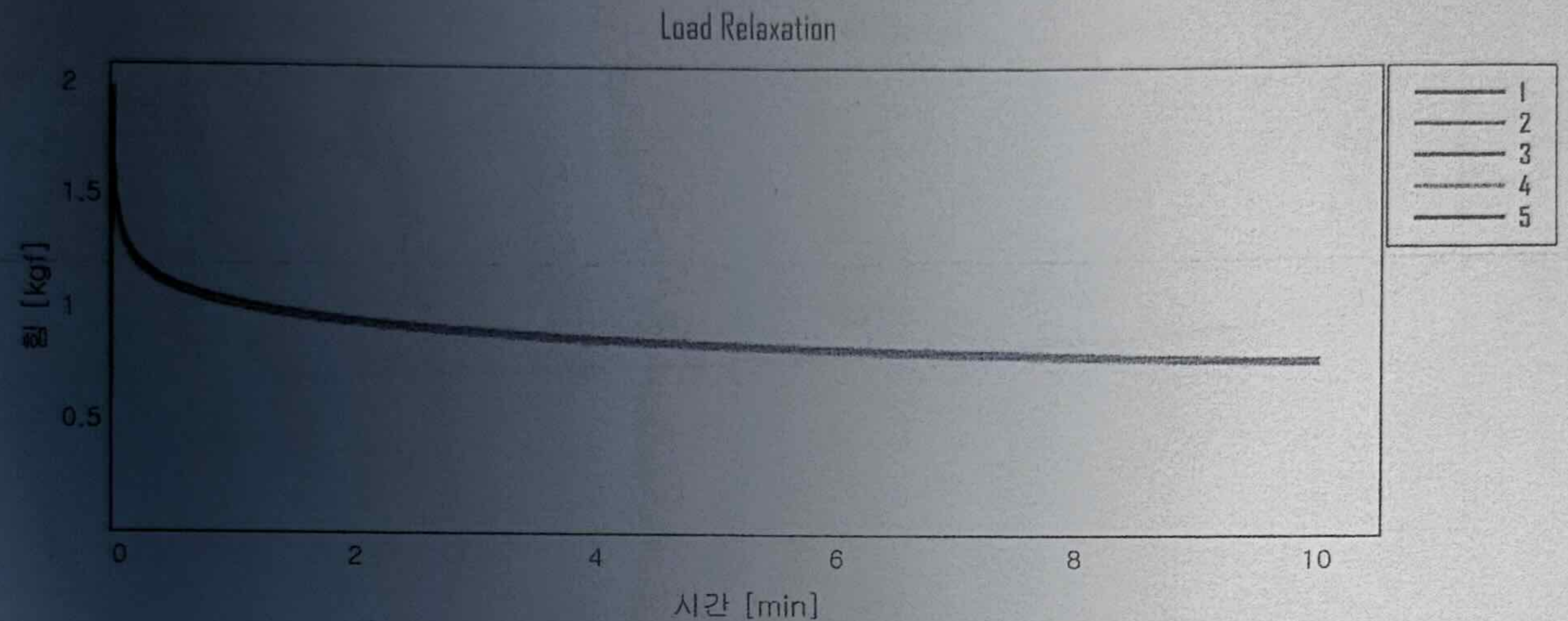
	Modulus[Bar] (0.1min)	Modulus[Bar] (0.2min)	Modulus[Bar] (0.4min)	Modulus[Bar] (1min)	Modulus[Bar] (2min)	Modulus[Bar] (4min)	Modulus[Bar] (10min)
1	47.30	42.58	39.06	35.17	32.41	29.82	26.62
2	47.26	42.64	39.17	35.24	32.54	29.96	26.79
3	47.04	42.31	38.75	34.69	31.96	29.29	26.02
4	46.88	42.27	38.80	35.08	32.41	29.74	26.39
5	46.40	41.80	38.34	34.48	31.86	29.34	26.32
평균	46.98	42.32	38.83	34.93	32.24	29.63	26.43
표준편차	0.367	0.332	0.323	0.331	0.306	0.297	0.293

Stress Relaxation Test per Strain 2%

최종 시험 날짜: 2024-05-21

Sample ID: 183-15073 +50R.is_trelax

Operator Name	KIM SUN GI
Temperature	20.0 C
Humidity	38.0 %
SPEED	50.0 mm/min
Batch No.	183-15073 +50



	Stress[Bar] (0.1min)	Stress[Bar] (0.2min)	Stress[Bar] (0.4min)	Stress[Bar] (1min)	Stress[Bar] (2min)	Stress[Bar] (4min)	Stress[Bar] (10min)
1	0.860	0.782	0.720	0.649	0.599	0.552	0.494
2	0.864	0.783	0.721	0.648	0.597	0.547	0.484
3	0.852	0.774	0.713	0.645	0.595	0.549	0.491
4	0.854	0.779	0.722	0.656	0.616	0.570	0.506
5	0.871	0.792	0.731	0.661	0.611	0.563	0.503
평균	0.860	0.782	0.721	0.652	0.604	0.556	0.496
표준편차	0.007	0.006	0.006	0.007	0.009	0.010	0.009

	Modulus[Bar] (0.1min)	Modulus[Bar] (0.2min)	Modulus[Bar] (0.4min)	Modulus[Bar] (1min)	Modulus[Bar] (2min)	Modulus[Bar] (4min)	Modulus[Bar] (10min)
1	43.87	39.89	36.70	33.08	30.55	28.17	25.18
2	44.05	39.94	36.75	33.03	30.44	27.89	24.69
3	43.46	39.49	36.38	32.88	30.36	27.97	25.02
4	43.57	39.73	36.81	33.47	31.42	29.06	25.82
5	44.40	40.39	37.27	33.70	31.14	28.73	25.67
평균	43.87	39.89	36.78	33.23	30.78	28.37	25.28
표준편차	0.377	0.331	0.318	0.340	0.471	0.507	0.465

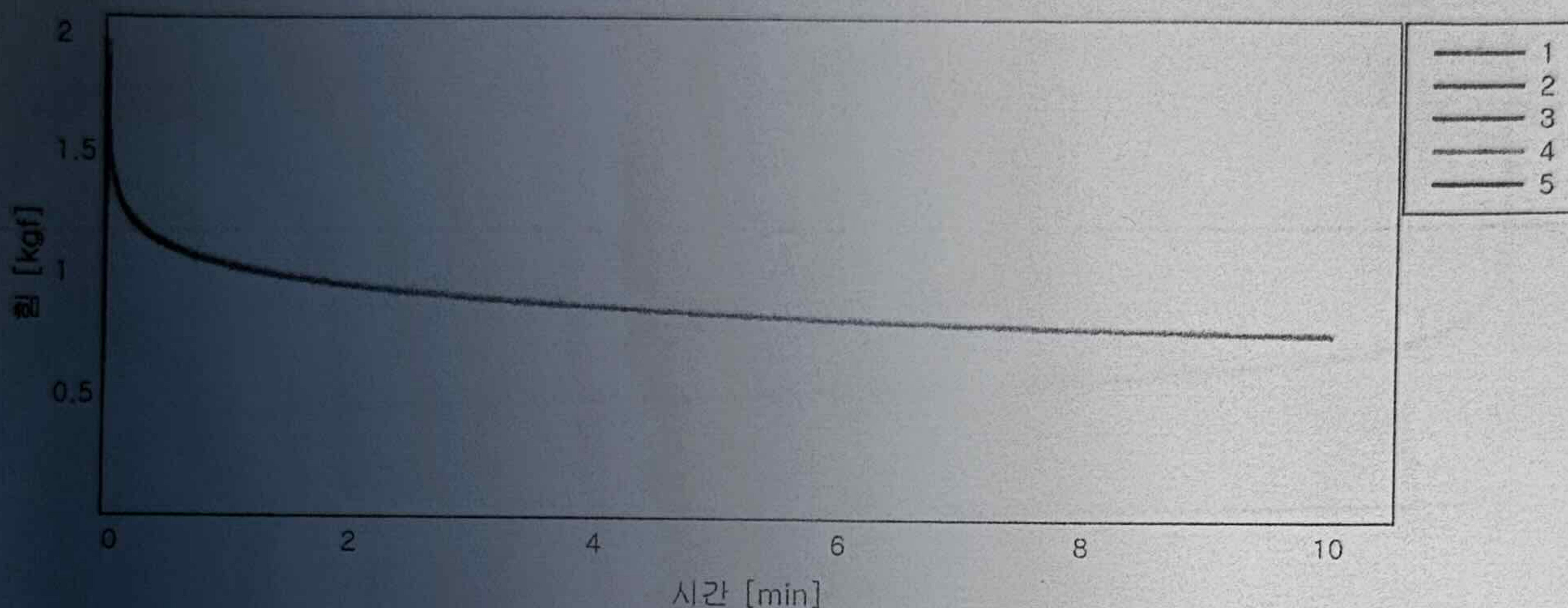
Stress Relaxation Test per Strain 2%

최종 시험 날짜: 2024-06-03

Sample ID: 183-15073 +60RR.is_relax

Operator Name	KIM SUN GI
Temperature	20.0 C
Humidity	38.0 %
SPEED	50.0 mm/min
Batch No.	183-15073 +60

Load Relaxation



	Stress[Bar] (0.1min)	Stress[Bar] (0.2min)	Stress[Bar] (0.4min)	Stress[Bar] (1min)	Stress[Bar] (2min)	Stress[Bar] (4min)	Stress[Bar] (10min)
1	0.820	0.746	0.688	0.619	0.570	0.526	0.468
2	0.823	0.749	0.690	0.619	0.573	0.523	0.462
3	0.839	0.764	0.698	0.626	0.575	0.525	0.465
4	0.840	0.764	0.702	0.634	0.579	0.529	0.465
5	0.827	0.752	0.693	0.624	0.575	0.527	0.463
평균	0.830	0.755	0.694	0.624	0.575	0.526	0.465
표준편차	0.009	0.008	0.006	0.006	0.003	0.002	0.002

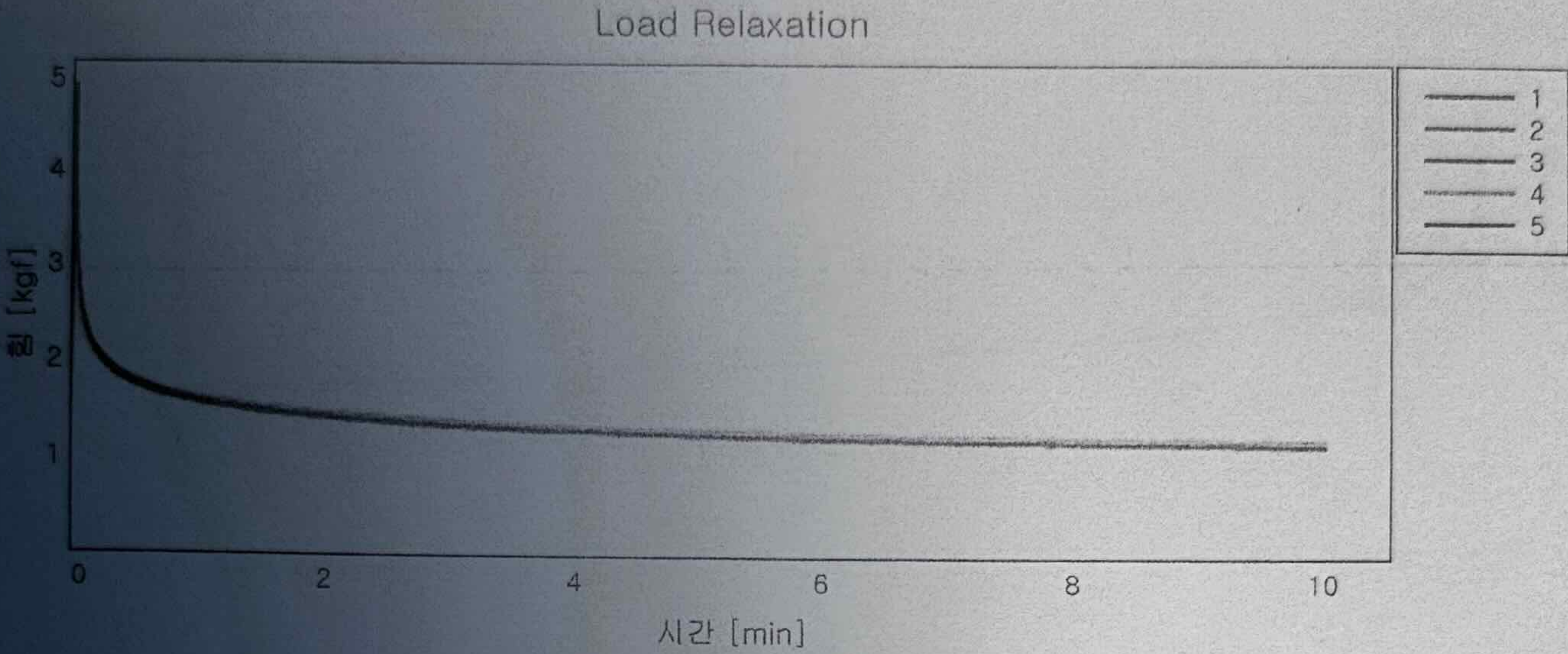
	Modulus[Bar] (0.1min)	Modulus[Bar] (0.2min)	Modulus[Bar] (0.4min)	Modulus[Bar] (1min)	Modulus[Bar] (2min)	Modulus[Bar] (4min)	Modulus[Bar] (10min)
1	41.81	38.05	35.07	31.59	29.09	26.84	23.87
2	41.97	38.21	35.21	31.56	29.21	26.70	23.54
3	42.77	38.95	35.62	31.95	29.35	26.77	23.72
4	42.82	38.98	35.79	32.32	29.53	26.99	23.71
5	42.20	38.36	35.32	31.81	29.32	26.86	23.62
평균	42.31	38.51	35.40	31.84	29.30	26.83	23.69
표준편차	0.461	0.429	0.295	0.309	0.163	0.110	0.122

Stress Relaxation Test per Strain 2%

최종 시험 날짜: 2024-05-22

Sample ID: 183-15073-0R.is_trelax

Operator Name	KIM SUN GI
Temperature	20.0 C
Humidity	38.0 %
SPEED	50.0 mm/min
Batch No.	183-15073 -0



	Stress[Bar] (0.1min)	Stress[Bar] (0.2min)	Stress[Bar] (0.4min)	Stress[Bar] (1min)	Stress[Bar] (2min)	Stress[Bar] (4min)	Stress[Bar] (10min)
1	1.580	1.318	1.147	0.982	0.884	0.805	0.714
2	1.575	1.319	1.152	0.991	0.898	0.819	0.727
3	1.570	1.312	1.140	0.979	0.883	0.803	0.720
4	1.569	1.320	1.157	0.996	0.898	0.821	0.731
5	1.595	1.341	1.165	0.996	0.898	0.814	0.721
평균	1.578	1.322	1.152	0.989	0.892	0.812	0.723
표준편차	0.011	0.011	0.009	0.008	0.008	0.008	0.006

	Modulus[Bar] (0.1min)	Modulus[Bar] (0.2min)	Modulus[Bar] (0.4min)	Modulus[Bar] (1min)	Modulus[Bar] (2min)	Modulus[Bar] (4min)	Modulus[Bar] (10min)
1	80.57	67.20	58.52	50.06	45.08	41.03	36.42
2	80.34	67.28	58.73	50.56	45.81	41.77	37.06
3	80.05	66.89	58.15	49.91	45.02	40.97	36.73
4	80.01	67.30	59.02	50.80	45.79	41.87	37.28
5	81.36	68.38	59.42	50.81	45.78	41.53	36.78
평균	80.47	67.41	58.77	50.43	45.50	41.43	36.85
표준편차	0.546	0.568	0.481	0.422	0.409	0.416	0.328

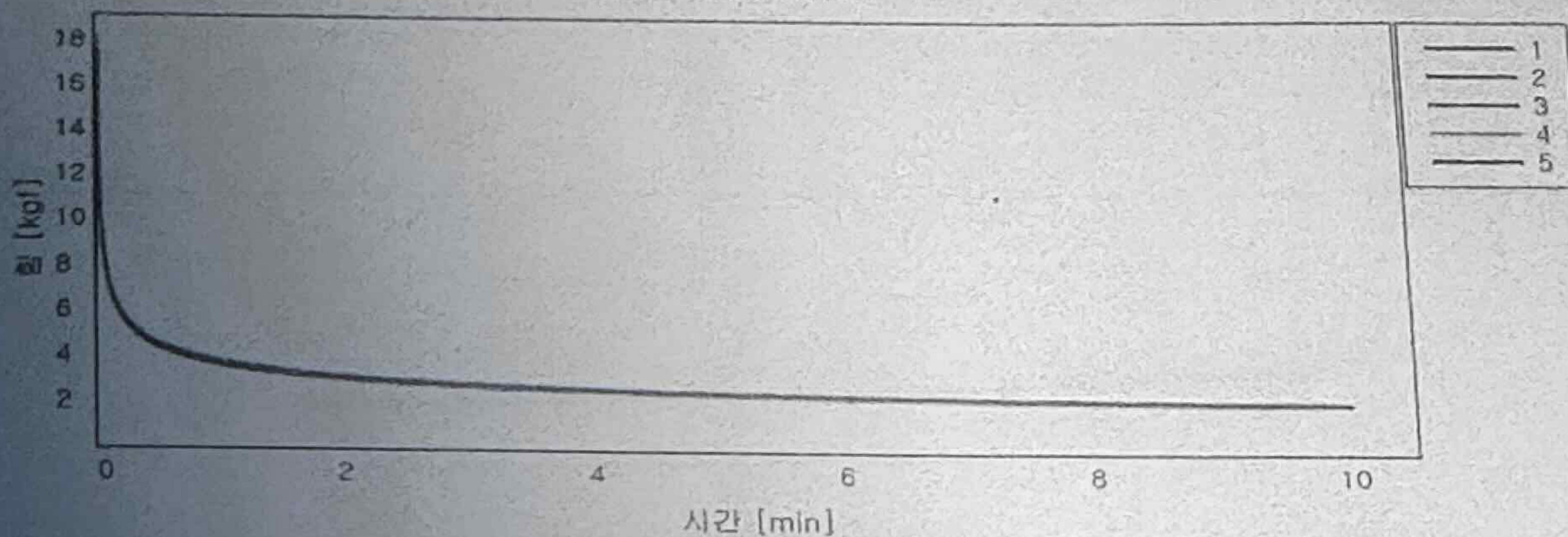
Stress Relaxation Test per Strain 2%

최종 시험 날짜: 2024-05-23

Sample ID: 183-15073-30R.is_relax

Operator Name	KIM SUN GI
Temperature	20.0 C
Humidity	38.0 %
SPEED	50.0 mm/min
Batch No.	183-15073 -30

Load Relaxation



	Stress[Bar] (0.1min)	Stress[Bar] (0.2min)	Stress[Bar] (0.4min)	Stress[Bar] (1min)	Stress[Bar] (2min)	Stress[Bar] (4min)	Stress[Bar] (10min)
1	4.914	3.746	2.987	2.301	1.920	1.619	1.325
2	4.957	3.764	3.001	2.306	1.915	1.623	1.321
3	4.905	3.773	3.027	2.341	1.953	1.659	1.334
4	4.906	3.775	3.020	2.348	1.964	1.660	1.344
5	4.883	3.751	3.023	2.356	1.975	1.680	1.364
평균	4.913	3.762	3.012	2.330	1.945	1.648	1.338
표준편차	0.027	0.013	0.017	0.025	0.027	0.026	0.017

	Modulus[Bar] (0.1min)	Modulus[Bar] (0.2min)	Modulus[Bar] (0.4min)	Modulus[Bar] (1min)	Modulus[Bar] (2min)	Modulus[Bar] (4min)	Modulus[Bar] (10min)
1	250.60	191.05	152.36	117.34	97.90	82.55	67.56
2	252.81	191.94	153.03	117.59	97.67	82.80	67.39
3	250.14	192.42	154.39	119.38	99.63	84.60	68.05
4	250.21	192.50	154.04	119.73	100.15	84.66	68.55
5	249.03	191.29	154.19	120.18	100.70	85.66	69.54
평균	250.56	191.84	153.60	118.84	99.21	84.05	68.22
표준편차	1.389	0.654	0.871	1.291	1.357	1.331	0.867

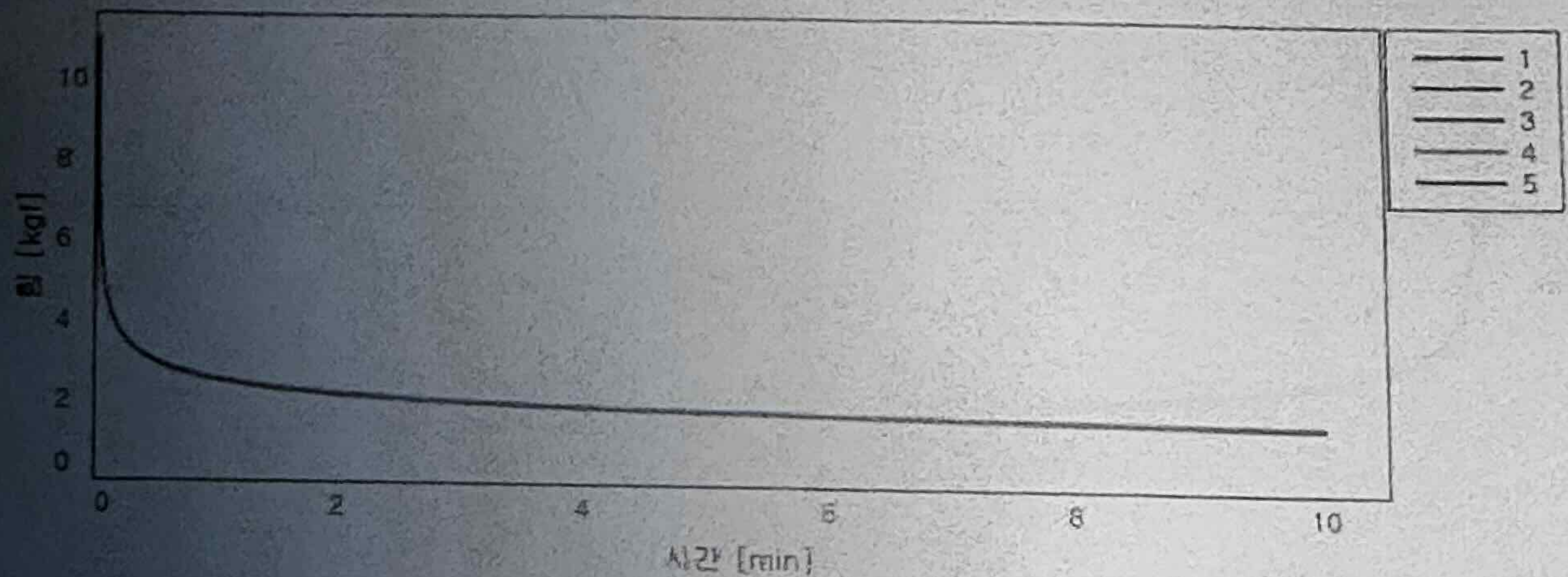
Stress Relaxation Test per Strain 2%

시험 일자: 2024-05-23

Sample ID: 183-15073-20R.is_trelax

Operator Name	KIM SUN GI
Temperature	20.0 C
Humidity	38.0 %
SPEED	50.0 mm/min
Batch No.	183-15073 -20

Load Relaxation



	Stress[Bar] (0.1min)	Stress[Bar] (0.2min)	Stress[Bar] (0.4min)	Stress[Bar] (1min)	Stress[Bar] (2min)	Stress[Bar] (4min)	Stress[Bar] (10min)
1	3.022	2.375	1.955	1.565	1.342	1.174	0.997
2	3.024	2.385	1.968	1.582	1.368	1.200	1.023
3	3.021	2.371	1.956	1.570	1.359	1.193	1.010
4	3.083	2.415	1.978	1.582	1.357	1.181	0.996
5	3.062	2.396	1.968	1.569	1.344	1.164	0.985
평균	3.043	2.389	1.965	1.574	1.354	1.182	1.002
표준편차	0.028	0.018	0.010	0.008	0.011	0.014	0.015

	Modulus[Bar] (0.1min)	Modulus[Bar] (0.2min)	Modulus[Bar] (0.4min)	Modulus[Bar] (1min)	Modulus[Bar] (2min)	Modulus[Bar] (4min)	Modulus[Bar] (10min)
1	154.15	121.14	99.71	79.80	68.45	59.89	50.82
2	154.24	121.65	100.37	80.66	69.78	61.19	52.16
3	154.09	120.95	99.77	80.08	69.33	60.85	51.51
4	157.21	123.16	100.90	80.69	69.18	60.22	50.79
5	156.17	122.21	100.36	80.03	68.55	59.37	50.24
평균	155.17	121.82	100.22	80.25	69.06	60.30	51.10
표준편차	1.436	0.894	0.491	0.400	0.556	0.731	0.743

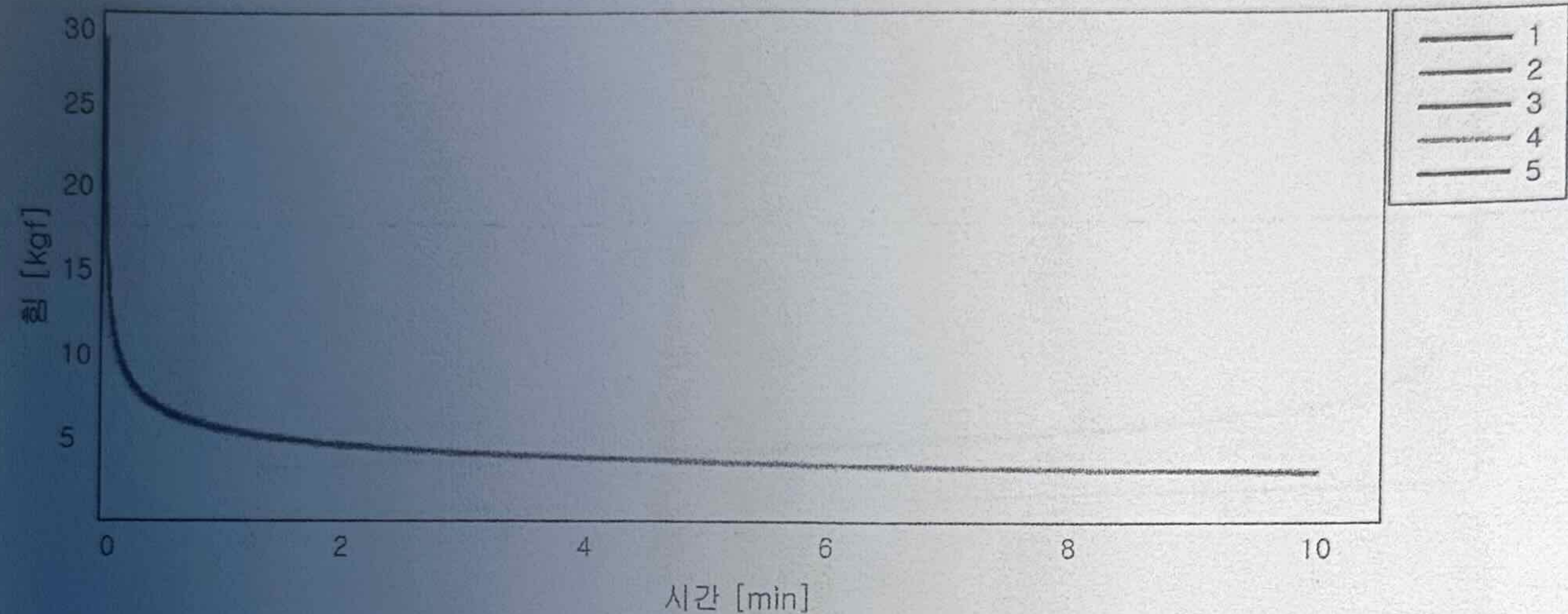
Stress Relaxation Test per Strain 2%

최종 시험 날짜: 2024-05-24

Sample ID: 183-15073 -40R.is_trelax

Operator Name	KIM SUN GI
Temperature	20.0 C
Humidity	38.0 %
SPEED	50.0 mm/min
Batch No.	183-15073 -40

Load Relaxation



	Stress[Bar] (0.1min)	Stress[Bar] (0.2min)	Stress[Bar] (0.4min)	Stress[Bar] (1min)	Stress[Bar] (2min)	Stress[Bar] (4min)	Stress[Bar] (10min)
1	7.529	5.647	4.460	3.368	2.772	2.301	1.861
2	7.770	5.848	4.603	3.489	2.858	2.372	1.867
3	7.674	5.757	4.516	3.422	2.812	2.329	1.848
4	7.463	5.657	4.482	3.424	2.827	2.366	1.890
5	7.634	5.710	4.497	3.380	2.773	2.321	1.822
평균	7.614	5.724	4.512	3.417	2.808	2.338	1.857
표준편차	0.121	0.082	0.055	0.048	0.037	0.030	0.025

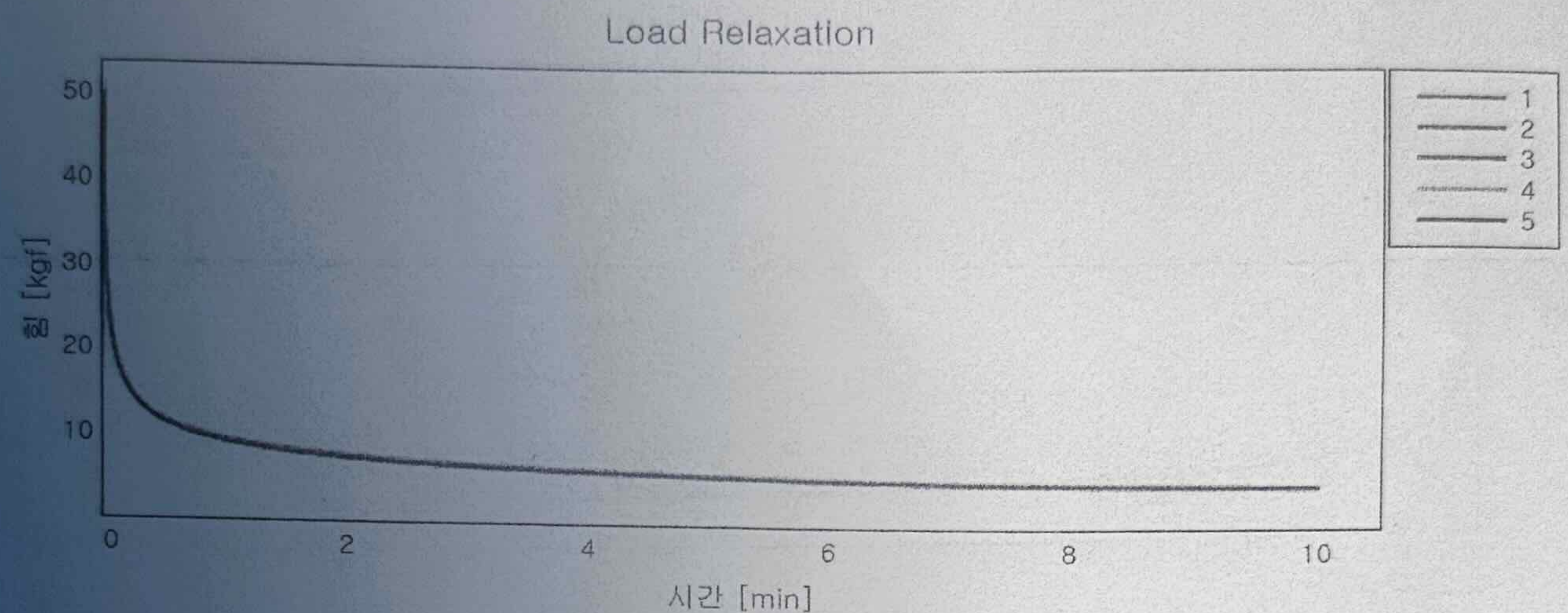
	Modulus[Bar] (0.1min)	Modulus[Bar] (0.2min)	Modulus[Bar] (0.4min)	Modulus[Bar] (1min)	Modulus[Bar] (2min)	Modulus[Bar] (4min)	Modulus[Bar] (10min)
1	384.00	288.01	227.46	171.77	141.35	117.35	94.90
2	396.29	298.24	234.73	177.94	145.76	120.96	95.22
3	391.35	293.61	230.33	174.51	143.41	118.77	94.23
4	380.60	288.52	228.60	174.64	144.19	120.67	96.41
5	389.35	291.23	229.35	172.38	141.40	118.37	92.90
평균	388.32	291.92	230.09	174.25	143.22	119.22	94.73
표준편차	6.166	4.189	2.796	2.423	1.886	1.545	1.292

Stress Relaxation Test per Strain 2%

최종 시험 날짜: 2024-05-30

Sample ID: 183-15073 -50R.is_trelax

Operator Name	KIM SUN GI
Temperature	20.0 C
Humidity	38.0 %
SPEED	50.0 mm/min
Batch No.	183-15073 -50



	Stress[Bar] (0.1min)	Stress[Bar] (0.2min)	Stress[Bar] (0.4min)	Stress[Bar] (1min)	Stress[Bar] (2min)	Stress[Bar] (4min)	Stress[Bar] (10min)
1	14.132	10.470	8.061	5.906	4.730	3.849	2.981
2	14.211	10.503	8.088	5.924	4.763	3.870	3.035
3	13.227	10.175	8.082	6.108	4.979	4.071	3.152
4	14.044	10.360	8.051	5.971	4.861	4.016	3.156
5	13.468	9.987	7.815	5.841	4.771	3.946	3.081
평균	13.816	10.299	8.019	5.950	4.821	3.950	3.081
표준편차	0.440	0.216	0.115	0.100	0.101	0.094	0.076

	Modulus[Bar] (0.1min)	Modulus[Bar] (0.2min)	Modulus[Bar] (0.4min)	Modulus[Bar] (1min)	Modulus[Bar] (2min)	Modulus[Bar] (4min)	Modulus[Bar] (10min)
1	720.71	534.00	411.12	301.20	241.23	196.30	152.0
2	724.78	535.63	412.48	302.12	242.89	197.37	154.8
3	674.58	518.93	412.18	311.53	253.92	207.64	160.8
4	716.25	528.37	410.58	304.54	247.89	204.80	161.0
5	686.89	509.35	398.57	297.89	243.30	201.24	157.1
평균	704.64	525.26	408.99	303.46	245.85	201.47	157.1
표준편차	22.457	11.030	5.874	5.104	5.148	4.815	3.854

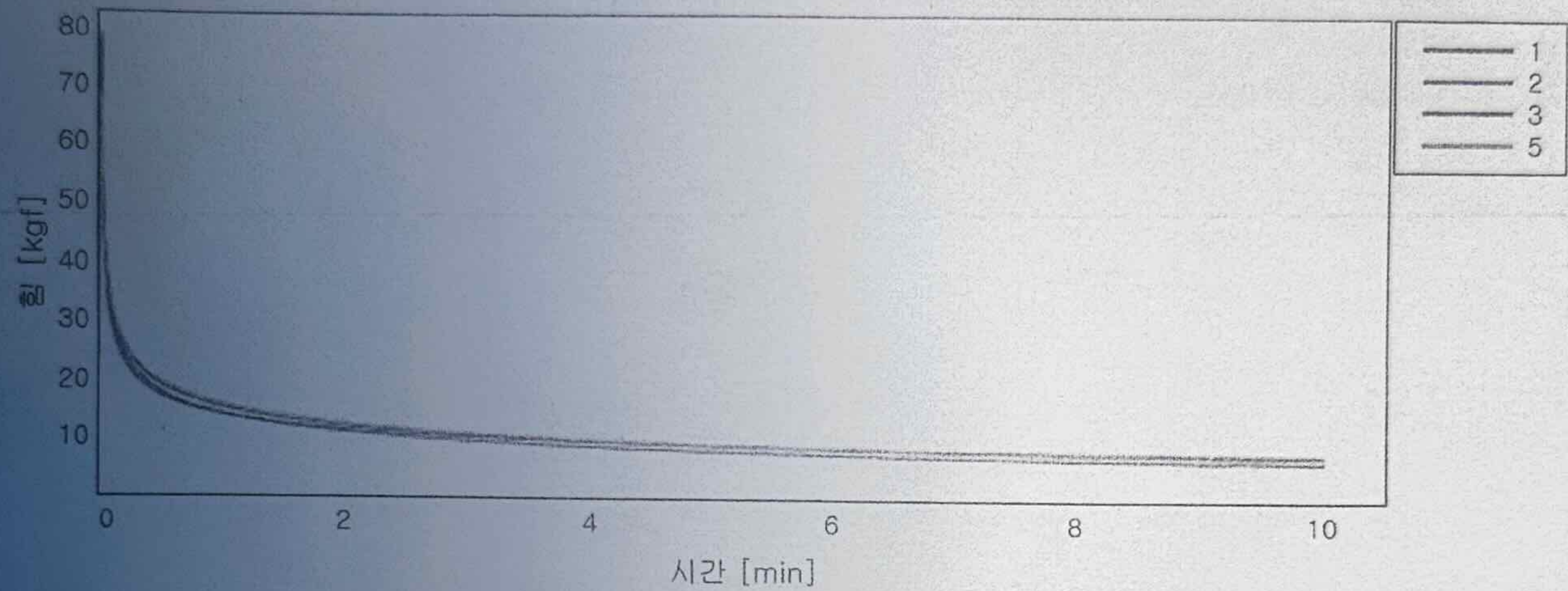
Stress Relaxation Test per Strain 2%

최종 시험 날짜: 2024-06-05

Sample ID: 183-15073-60RR.is_trelax

Operator Name	KIM SUN GI
Temperature	20.0 C
Humidity	38.0 %
SPEED	50.0 mm/min
Batch No.	183-15073 -60

Load Relaxation



	Stress[Bar] (0.1min)	Stress[Bar] (0.2min)	Stress[Bar] (0.4min)	Stress[Bar] (1min)	Stress[Bar] (2min)	Stress[Bar] (4min)	Stress[Bar] (10min)
1	20.732	15.411	11.993	8.969	7.356	6.134	4.914
2	21.985	16.484	12.798	9.363	7.458	5.975	4.555
3	21.644	16.034	12.337	8.896	6.953	5.505	4.032
5	21.441	16.537	13.039	9.688	7.685	6.080	4.429
평균	21.451	16.116	12.542	9.229	7.363	5.924	4.482
표준편차	0.529	0.522	0.468	0.368	0.306	0.287	0.364

	Modulus[Bar] (0.1min)	Modulus[Bar] (0.2min)	Modulus[Bar] (0.4min)	Modulus[Bar] (1min)	Modulus[Bar] (2min)	Modulus[Bar] (4min)	Modulus[Bar] (10min)
1	1057.34	785.96	611.65	457.43	375.15	312.85	250.6
2	1121.23	840.66	652.67	477.49	380.35	304.73	232.3
3	1103.86	817.73	629.17	453.71	354.61	280.75	205.6
5	1093.49	843.40	665.00	494.08	391.94	310.10	225.9
평균	1093.98	821.94	639.62	470.68	375.51	302.11	228.6
표준편차	26.975	26.603	23.848	18.774	15.601	14.629	18.557