
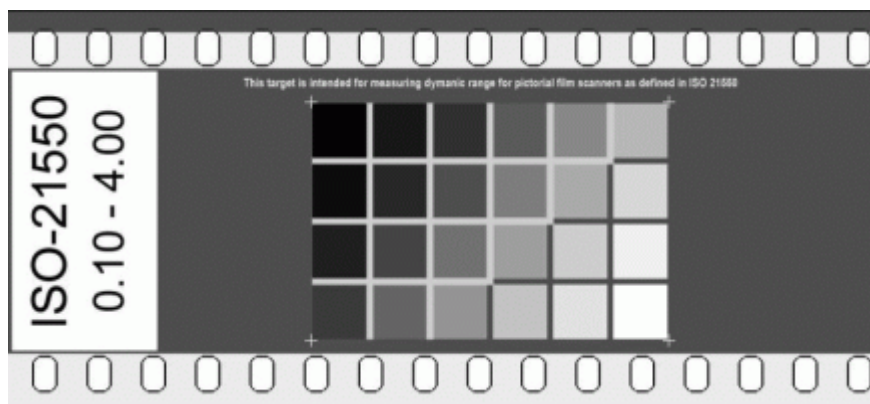


1653 East Main Street Rochester, NY 14609 USA Voice: 585.482.0300 FAX: 585.288.5989 imaging@appliedimage.com	ST-53-X-ISO-21550 Dynamic Range Film Target Product Specifications	APPLIED ® IMAGE Inc 
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Catalog Part No: **ST-53-1** (0.1 to 4 optical densities)
ST-53-2 (0.1 to 6 optical densities)

Product Name: **ISO-21550 Dynamic Range Film Target for Scanners**

Drawing / Photo of part:



Included Batch Data Dated:
June 8, 2005

The above image is an approximate representation of the actual product.
Specifications are subject to change without notice.

Description: Gray scale on 35mm film conforming to ISO-21550, 0 to 4 or 0 to 6 dynamic ranges (The grayscale is a negative image, right-reading on the emulsion side of photographic film.)

Substrate Size, Type, Image Forming Material and Density Range:

<i>Part Number</i>	<i>Density Range</i>	<i>Image Size</i>	<i>Substrate Size</i>	<i>Substrate Type</i>	<i>Image Forming Material</i>
ST-53-1-TM	0.10 to 4.0	4.5 mm per patch,	75 x 35 mm	Perforated 35mm film	Photographic emulsion
ST-53-2-TM	0.10 to 6.0	19 x 28 mm total			

History / typical use: The grayscale image of this product is used to determine the dynamic range capability (in transmission density) of a film scanner or other transmission-imaging device.

Other Information: The ISO-21550 standard document, *Photography-Electronic Scanners For Photographic Images - Dynamic Range Measurements*, is available for purchase at: www.iso.org or www.ansi.org.

Notes: These parts differ from the ISO-21550:2004 standard by the following:

- 1) Section 4.3.2 of that standard specifies 25 or more grayscale patterns. Only 24 are provided on the ST-53 meeting the requirement of 24 of Annex A.
- 2) Density values of the ST-53 do not match those of Annex A. See the tables in this document for the average batch densities.
- 3) ISO-21550, section 4.3.3 specifies fiducial marks at 20 x 30 mm. Actual fiducial distance of the ST-53 measures 18.5 x 27.8 mm.

The ST-53 grayscales are created on 35 mm KODAK VISION Premier Color Print Film 2393. The keeping and dye fade properties of this material are consistent with that media, visually neutral but not spectrally neutral. This dye based media was chosen for its low Callier Q-factors yielding consistent transmission densities despite differing device illumination geometries.

Status A densities reported below are appropriate for imaging media associated with direct visual viewing situations such as photographic slides or paper prints. Status M densities are appropriate for intermediate imaging media such as color negatives (typically with an orange mask).

For critical metrology applications, target specific densities should be measured using appropriate densitometric equipment. Note in the below data that patches 1 & 2 as illustrated in Fig. 1 are of identical minimum density. The user may choose to physically remove the film media in patch 1 (a square area of approximately 0.175 inch or 4.5 mm) in order to provide a true zero density patch. This would provide a 0.0 to 4.0 or 0.0 to 6.0 target.

Status A Densitometry:

Status A is the acceptance standard for reflection densitometers for measuring photographic color prints. It can also be used in transmission mode for color transparencies. This standard is specified in ANSI PH2.18 for densitometer response.

Status E Densitometry:

Status E indicates a densitometer response that is the accepted standard in Europe for color reflection densitometers in place of Status T for measuring graphic arts and production materials.

Status I Densitometry:

Status I is a narrow band or interference type densitometer response.

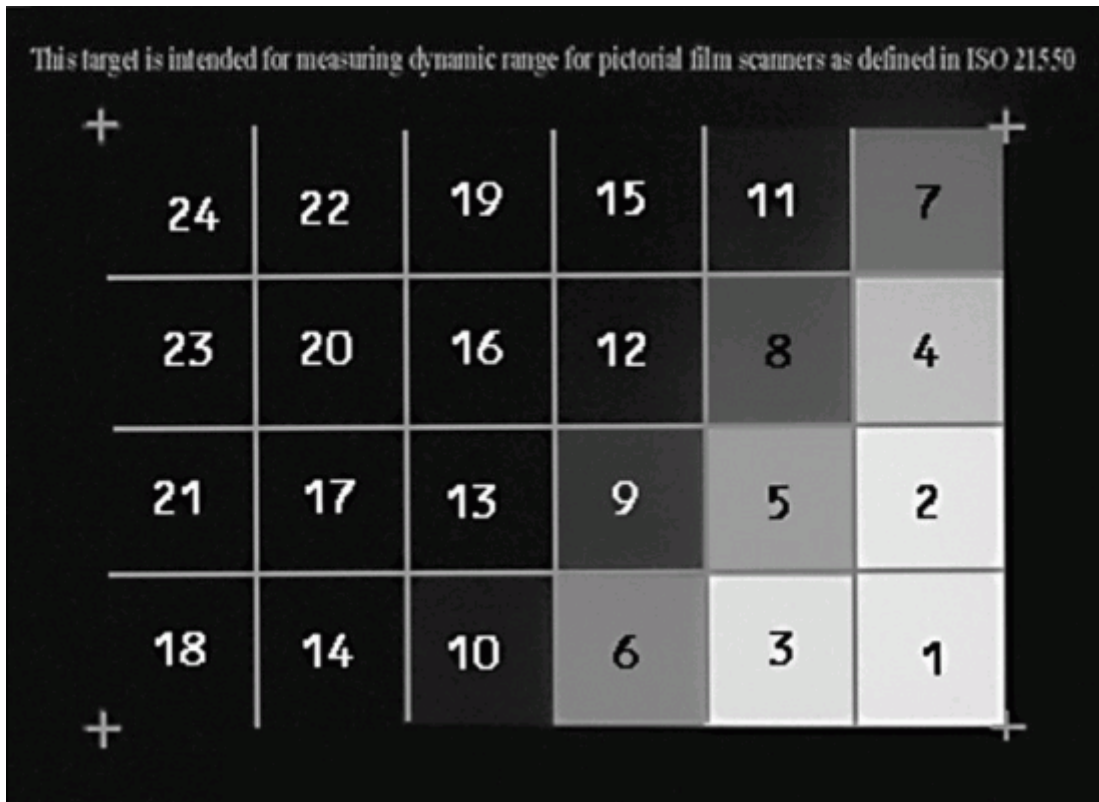
Status M Densitometry:

Status M is a standard response function of a densitometer used for measurement of prepress films such as color negative film that is not meant to be viewed directly but printed on photographic paper.

Status T Densitometry:

Wide band color reflection densitometer response is referred to as Status T. It is the accepted standard in the United States for color reflection densitometers. It is used for measuring graphic arts production materials such as press proofs, off-press proofs, and press sheets.

Figure 1 – Numbered Density Patch Locations



Status A and Status M Batch Statistics: *June 8, 2005 Batch Data*

ST-53-1 0.10 - 4.0 Status A Density - Batch Statistics (n=5)

Patch #	Density				RMS		
	Visual	Red	Green	Blue	Red	Green	Blue
1	0.107	0.118	0.094	0.154	0.0030	0.0008	0.0008
2	0.107	0.119	0.094	0.153	0.0021	0.0010	0.0022
3	0.125	0.143	0.110	0.160	0.0036	0.0024	0.0012
4	0.217	0.247	0.197	0.247	0.0053	0.0086	0.0017
5	0.426	0.470	0.394	0.504	0.0142	0.0166	0.0039
6	0.718	0.769	0.680	0.821	0.0193	0.0267	0.0089
7	1.050	1.108	1.009	1.155	0.0222	0.0338	0.0152
8	1.418	1.472	1.369	1.618	0.0262	0.0388	0.0212
9	1.869	1.930	1.808	2.185	0.0396	0.0426	0.0178
10	2.312	2.411	2.238	2.607	0.0402	0.0509	0.0208
11	2.496	2.616	2.424	2.694	0.0344	0.0510	0.0345
12	2.672	2.784	2.591	3.005	0.0420	0.0477	0.0180
13	2.922	3.052	2.837	3.241	0.0482	0.0561	0.0339
14	3.160	3.316	3.072	3.418	0.0496	0.0519	0.0276
15	3.262	3.403	3.178	3.522	0.0524	0.0396	0.0430
16	3.307	3.457	3.218	3.601	0.0319	0.0408	0.0427
17	3.422	3.560	3.339	3.676	0.0441	0.0638	0.0465
18	3.540	3.678	3.461	3.743	0.0202	0.0456	0.0282
19	3.641	3.757	3.569	3.854	0.0589	0.0384	0.0883
20	3.690	3.798	3.619	3.917	0.0618	0.0476	0.0649
21	3.759	3.849	3.698	3.940	0.0659	0.0618	0.0682
22	3.842	3.889	3.801	3.987	0.0390	0.0505	0.0727
23	3.900	3.952	3.854	4.073	0.0336	0.0560	0.0605
24	4.028	4.053	4.000	4.144	0.0810	0.0819	0.1500

ST-53-2 0.10 - 6.0 Status A Density - Batch Statistics (n=5)

Patch #	Density				RMS		
	Visual	Red	Green	Blue	Red	Green	Blue
1	0.131	0.163	0.112	0.154	0.0011	0.0009	0.0012
2	0.131	0.164	0.112	0.155	0.0021	0.0014	0.0012
3	0.153	0.190	0.133	0.167	0.0019	0.0029	0.0014
4	0.264	0.319	0.239	0.268	0.0032	0.0083	0.0039
5	0.521	0.602	0.481	0.548	0.0078	0.0212	0.0091
6	0.880	0.991	0.829	0.918	0.0118	0.0302	0.0142
7	1.297	1.438	1.237	1.319	0.0113	0.0390	0.0185
8	1.789	1.948	1.716	1.869	0.0188	0.0449	0.0264
9	2.412	2.609	2.322	2.562	0.0275	0.0636	0.0434
10	3.027	3.299	2.921	3.162	0.0352	0.0630	0.0407
11	3.270	3.569	3.167	3.325	0.0263	0.0630	0.0354
12	3.534	3.834	3.420	3.693	0.0270	0.0556	0.0314
13	3.898	4.220	3.781	4.041	0.0295	0.0631	0.0399
14	4.270	4.640	4.148	4.383	0.0629	0.0603	0.0482
15	4.434	4.794	4.312	4.561	0.0366	0.0591	0.0427
16	4.500	4.867	4.375	4.646	0.0381	0.0451	0.0330
17	4.705	5.062	4.583	4.837	0.0373	0.0542	0.0325
18	4.935	5.394	4.797	5.081	0.0799	0.0411	0.0451
19	5.072	5.402	4.954	5.215	0.0499	0.0409	0.0438
20	5.140	5.488	5.019	5.287	0.0265	0.0330	0.0336
21	5.417	5.871	5.276	5.609	0.1877	0.0523	0.0877
22	5.581	5.923	5.456	5.772	0.2878	0.0770	0.1479
23	5.811	6.417	5.650	6.067	0.0983	0.0526	0.0827
24	6.307	6.740	6.166	6.539	0.0864	0.0623	0.1082

ST-53-1 0.10 - 4.0 Status M Density - Batch Statistics (n=5)

Patch #	Density				RMS		
	Visual	Red	Green	Blue	Red	Green	Blue
1	0.110	0.132	0.094	0.147	0.0039	0.0008	0.0005
2	0.111	0.134	0.094	0.146	0.0030	0.0010	0.0023
3	0.130	0.162	0.111	0.153	0.0048	0.0023	0.0014
4	0.226	0.280	0.200	0.238	0.0076	0.0084	0.0019
5	0.444	0.534	0.399	0.488	0.0186	0.0160	0.0036
6	0.746	0.869	0.689	0.798	0.0257	0.0255	0.0086
7	1.088	1.249	1.021	1.123	0.0296	0.0322	0.0143
8	1.466	1.653	1.383	1.570	0.0344	0.0365	0.0202
9	1.925	2.156	1.823	2.111	0.0491	0.0396	0.0154
10	2.368	2.671	2.255	2.513	0.0517	0.0466	0.0199
11	2.549	2.879	2.440	2.599	0.0440	0.0464	0.0310
12	2.725	3.050	2.606	2.888	0.0517	0.0425	0.0158
13	2.968	3.304	2.850	3.107	0.0554	0.0516	0.0312
14	3.195	3.505	3.086	3.282	0.0632	0.0470	0.0218
15	3.292	3.583	3.187	3.379	0.0665	0.0348	0.0276
16	3.336	3.620	3.229	3.443	0.0343	0.0376	0.0295
17	3.442	3.680	3.349	3.524	0.0463	0.0580	0.0391
18	3.553	3.773	3.467	3.605	0.0313	0.0407	0.0184
19	3.642	3.806	3.571	3.704	0.0666	0.0394	0.0589
20	3.692	3.866	3.617	3.758	0.0871	0.0426	0.0387
21	3.748	3.849	3.697	3.808	0.0494	0.0606	0.0554
22	3.817	3.854	3.793	3.861	0.0455	0.0435	0.0508
23	3.881	3.932	3.850	3.937	0.0356	0.0515	0.0434
24	3.995	3.983	3.995	4.031	0.0737	0.0781	0.1087

ST-53-2 0.10 - 6.0 Status M Density - Batch Statistics (n=5)

Patch #	Density				RMS		
	Visual	Red	Green	Blue	Red	Green	Blue
1	0.126	0.146	0.111	0.162	0.0018	0.0014	0.0012
2	0.126	0.146	0.111	0.161	0.0008	0.0008	0.0013
3	0.147	0.170	0.132	0.174	0.0017	0.0028	0.0014
4	0.255	0.287	0.236	0.276	0.0029	0.0085	0.0039
5	0.504	0.545	0.476	0.562	0.0074	0.0214	0.0087
6	0.854	0.903	0.820	0.939	0.0108	0.0307	0.0137
7	1.261	1.315	1.225	1.350	0.0105	0.0401	0.0182
8	1.744	1.788	1.702	1.915	0.0168	0.0464	0.0264
9	2.358	2.403	2.306	2.634	0.0250	0.0663	0.0423
10	2.970	3.054	2.903	3.257	0.0323	0.0661	0.0394
11	3.215	3.314	3.149	3.422	0.0226	0.0669	0.0351
12	3.478	3.572	3.403	3.815	0.0236	0.0599	0.0296
13	3.847	3.962	3.766	4.175	0.0316	0.0674	0.0359
14	4.225	4.387	4.131	4.535	0.0483	0.0643	0.0462
15	4.389	4.536	4.298	4.729	0.0242	0.0632	0.0425
16	4.458	4.617	4.361	4.824	0.0331	0.0493	0.0294
17	4.668	4.831	4.571	5.022	0.0309	0.0595	0.0306
18	4.902	5.133	4.784	5.332	0.0528	0.0451	0.0668
19	5.049	5.229	4.945	5.441	0.0287	0.0468	0.0333
20	5.117	5.306	5.012	5.509	0.0155	0.0368	0.0574
21	5.394	5.640	5.268	5.962	0.1062	0.0530	0.1816
22	5.571	5.799	5.450	6.091	0.1560	0.0743	0.3128
23	5.804	6.207	5.643	6.742	0.1485	0.0511	0.1724
24	6.383	6.790	6.222	7.283	0.0552	0.0942	0.2404