

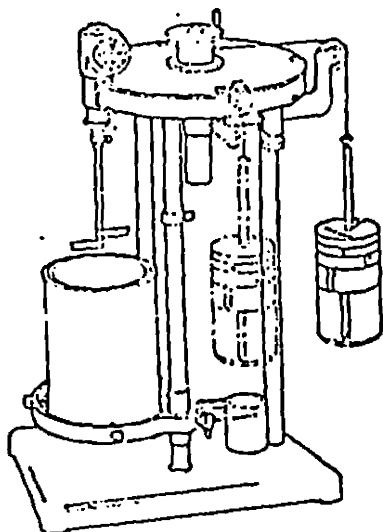


Fig. 9.

Paint Testing Outfit with submerged paddle type rotor, circular metal plate for platform, standard one-pint friction-top can as container, and set of slotted weights.

PAINT TESTING OUTFIT

The Paint Testing Outfit is a modified General Purpose Model and has been cited by the A.S.T.M. in standard method D-562 for testing the consistency of "oil base paints and enamel type paints," and by the U. S. Government in Federal Specification TT-P-341a for "sampling and test methods for paint, varnish, and related materials. In this outfit the usual weight box has been replaced by a set of slotted weights with a suitable hanger, and the cylindrical rotor has been replaced by a submerged paddle type rotor." The test container is a standard one-pint friction-top can 3 $\frac{1}{2}$ inches in diameter which, in use, replaces the usual test sand water bath. It is supported by a circular metal plate provided for the platform.

TEST PROCEDURE

1. Mix the paint sample thoroughly and strain it into the container. Bring the temperature of the sample to $25^{\circ} \pm 0.25^{\circ}\text{C}$ and maintain it at that temperature during the test.
2. Place the container on the metal plate of the platform and raise until the paddle type rotor is centrally immersed in the sample to the mark inscribed on the rotor shaft.

For procedure and report of test results, see A.S.T.M. Standards 1917 Supplement, Part II, Non-Metallic Materials, *Conductibility*, pp. 183-187.

Originally a fork type rotor was used in paint testing outfit, but has been replaced by the submerged paddle type which gives more reproducible results.

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3. Before starting the test, release the brake and check the number of revolutions of the rotor in from 25 to 35 seconds, as measured by a stopwatch. Using different weights, determine the time required for 100 revolutions of the rotor. Select weights that will give at least two readings within a range of 27 to 33 seconds. These determinations should be made from a running start, that is, the rotor should be allowed to make at least 10 revolutions before the timing of the test is started. Determine, by plotting or interpolation, the weight in grams necessary to produce 100 revolutions of the rotor in 30 seconds.

DISCUSSION

Krebs Units and Use of Krebs' Stormer Chart. Many paint manufacturers have adopted Krebs Unit ratings as derived from the Krebs' Stormer Chart, for classifying the consistency of paints. The chart, as shown on page 26, tabulates the driving weight in grams against the time in seconds for 100 revolutions of the paddle.

The same procedure is followed as outlined above, taking care to maintain the temperature of the sample at $25^{\circ}\text{C} \pm 0.25^{\circ}\text{C}$.

The number of Krebs Units is found simply by reading in the appropriate line and column. Thus, if 500 grams caused the paddle to make 100 revolutions in 29 seconds, the material under test would have the consistency of 112 Krebs Units. A paint considered to be of proper brushing consistency has been given the arbitrary value of 100 Krebs Units. Additional paints, both thicker and thinner than this standard, were then prepared and, of these, certain ones were selected to differ in consistency by arbitrarily given values of 10 Krebs Units using the modified Stormer Paint Testing Outfit. Consistency of paints varying from 60 to 160 Krebs Units was then measured. Sufficient weights were employed for each sample to vary the time required for 100 revolutions of the paddle type rotor from 21 to 40 seconds. The table shown on page 26 was then derived by interpolation from these results.

Stroboscopic Attachment (National Lead Company Timer). For use on the Stormer Viscositymeter to accelerate and improve the accuracy of the paint consistency test at rotational speed of 200 r.p.m., in accordance with A.S.T.M. standard method D-562, in which the rate of shear is adopted as a constant, and the force required to produce this prescribed rate is accepted as a measure of consistency. Described in detail under "Attachments," on page 18.

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KREBS' STORMER CHART WITH INTERPOLATIONS

Drilling Weights in Grams

Seconds for 100 Revolutions	73	100	125	150	175	200	225	250	275	300	325	350	375	400	425	450	475	500	525	550	575	600	625	650	675	700	725	750	775	800	825	850	875	900	925	950	975	1000	
24	48	52	56	60	64	68	72	76	80	84	88	92	96	100	104	108	112	116	120	124	128	132	136	140	144	148	152	156	160	164	168	172	176	180	184	188	192	196	200
25	49	53	57	61	65	69	73	77	81	85	89	93	97	101	105	109	113	117	121	125	129	133	137	141	145	149	153	157	161	165	169	173	177	181	185	189	193	197	201
26	50	54	58	62	66	70	74	78	82	86	90	94	98	102	106	110	114	118	122	126	130	134	138	142	146	150	154	158	162	166	170	174	178	182	186	190	194	198	202
27	51	55	59	63	67	71	75	79	83	87	91	95	99	103	107	111	115	119	123	127	131	135	139	143	147	151	155	159	163	167	171	175	179	183	187	191	195	199	203
28	52	56	60	64	68	72	76	80	84	88	92	96	100	104	108	112	116	120	124	128	132	136	140	144	148	152	156	160	164	168	172	176	180	184	188	192	196	200	
29	53	57	61	65	69	73	77	81	85	89	93	97	101	105	109	113	117	121	125	129	133	137	141	145	149	153	157	161	165	169	173	177	181	185	189	193	197	201	
30	54	58	62	66	70	74	78	82	86	90	94	98	102	106	110	114	118	122	126	130	134	138	142	146	150	154	158	162	166	170	174	178	182	186	190	194	198	202	
31	55	59	63	67	71	75	79	83	87	91	95	99	103	107	111	115	119	123	127	131	135	139	143	147	151	155	159	163	167	171	175	179	183	187	191	195	199	203	
32	56	60	64	68	72	76	80	84	88	92	96	100	104	108	112	116	120	124	128	132	136	140	144	148	152	156	160	164	168	172	176	180	184	188	192	196	200		
33	57	61	65	69	73	77	81	85	89	93	97	101	105	109	113	117	121	125	129	133	137	141	145	149	153	157	161	165	169	173	177	181	185	189	193	197	201		
34	58	62	66	70	74	78	82	86	90	94	98	102	106	110	114	118	122	126	130	134	138	142	146	150	154	158	162	166	170	174	178	182	186	190	194	198	202		
35	59	63	67	71	75	79	83	87	91	95	99	103	107	111	115	119	123	127	131	135	139	143	147	151	155	159	163	167	171	175	179	183	187	191	195	199	203		
36	60	64	68	72	76	80	84	88	92	96	100	104	108	112	116	120	124	128	132	136	140	144	148	152	156	160	164	168	172	176	180	184	188	192	196	200			
37	61	65	69	73	77	81	85	89	93	97	101	105	109	113	117	121	125	129	133	137	141	145	149	153	157	161	165	169	173	177	181	185	189	193	197	201			
38	62	66	70	74	78	82	86	90	94	98	102	106	110	114	118	122	126	130	134	138	142	146	150	154	158	162	166	170	174	178	182	186	190	194	198	202			
39	63	67	71	75	79	83	87	91	95	99	103	107	111	115	119	123	127	131	135	139	143	147	151	155	159	163	167	171	175	179	183	187	191	195	199	203			
40	64	68	72	76	80	84	88	92	96	100	104	108	112	116	120	124	128	132	136	140	144	148	152	156	160	164	168	172	176	180	184	188	192	196	200	204			

NOTE:—The stormer plates a Krebs Unit rating obtained at a low number of seconds per 100 revolutions will not show a rating obtained at a high number of seconds. This difference can be calculated by using only determining from inch close to 30 seconds per 100 revolutions; consequently, for good repeatability only the blacked section of the chart should be used. When using 25 gram increments in the weight may fall to give a rating within the preferred section. 25-gram increments may be used and a resulting obtained directly from the interpolated values shown for this section of the chart.

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