

**PRECISION GAGE & TOOL COMPANY**

# Precision Gage & Tool Company—Reference

## Scales

Precision Gage & Tool offers an assortment of scales to accommodate a variety of applications.

The Hegman Scale is the most common scale used in the paint industry. It is .004" deep at the "0" calibration and runs to the infinite point at "8" where the path runs out to the surface of the gage.

The Mils Scale has been the common denominator through which other scales are interpreted. On Fineness of Grind Gages, one mil equals .001".

Note: On Fineness of Grind Gages, one micron has been rounded to .00004". One mil equals 25 microns.

The NPIRI Scale is designated for ink gages by the National Printing Ink Research Institute. The scale begins with "0" at the infinite point and extends to "10" at a depth of .001". Each division is the equivalent to a tenth of a mil or 2-1/2 microns. This scale has been extended for use on Modified Ink Gages of greater ranges.

## Specials

Precision Gage & Tool manufactures special gages in a variety of path widths, lengths and scales to fit any particular application. Fineness of Grind Gages cover a broad range of industries from pharmaceuticals to peanut butter manufacturing.

## Refinishing

Refinished gages and scrapers are warranted to be the equivalent of new ones, both in wear-life and accuracy. If your gage is worn beyond the point of economic refinishing, Precision Gage & Tool will recommend you purchase a replacement gage and scraper.

## Materials

Precision Gage & Tool Fineness of Grind Gages are available in a variety of materials to fit your requirements.

Steel Gages are hardened and deep-frozen to maintain stability.

Chrome-plated Fineness of Grind Gages are flash chrome plated to increase the wear-life from three to five times.

Stainless Steel Gages are made from AISI type 440-C stainless steel and can be hardened for

longer wear-life. Steel and chrome gages have a hardness of approximately 60 Rockwell C; stainless steel gages range between 56-58 Rockwell C.

Scrapers are made of chrome plated tool steel or 440-C stainless steel hardened to withstand numerous refinishing. A-1 (440-C) scrapers may be chrome plated for added wear and corrosion resistance.

## Gage Certification

Grind gages, applicators, and wedge plates can be certified. Short form certification is a document stating that the item meets or exceeds the standards associated with said gage, and is available only for grind gages. Long form certification, available on all gages, reports the

gage model number, product material, hardness and actual measurement/deviation of critical dimensions. It includes marking a dedicated identification number on each gage, and provides certification of NIST traceability. We can accommodate many special requests, such as using customer provided identification numbers, marking scrapers with identification numbers, and putting specific customer requested certifications periods on certification papers. Primary standards used meet or exceed requirements of Federal Specifications GGG-G15-C. Other standards used are ANSI Z540.1 and ISO 10012-1.

To create a gage tailored to your needs, call Precision Gage & Tool at (937) 866-9666.

Gage Depth Mils	Microns	U.S. Sieve Mesh	NPIRI	Hegman	Paint	
4	101.6	105 #140		0	0	
		88.9			1	1
3	76.2	74 #200		2	2	
		63.5			3	3
		50.8			4	4
2	50.8	53 #270		4	5	
		44 #325			6	6
		38.1			7	7
1	25.4		10	6	8	
			5	7	9	
0	0.0		0	8	10	

# For Research and Development... Quality Control...Production Consistency... Gages from Precision Gage & Tool perform with accuracy and repeatability.

## Fineness of Grind Gages (a) and Scrapers (b)

A Fineness of Grind Gage measures the prevalence of coarse particles in a variety of substances, so that performance of a milling or dispersing operation can be monitored to avoid costly overgrinding. Readings require minimum time and technical skill, yet produce numerical results which can be recorded and reproduced for comparison.

Material to be checked is distributed uniformly by drawing a straight-edged scraper from the deep end to the shallow end of the gage. Particles or agglomerates too large to pass between the moving scraper and the gage path are revealed as "scratches" or "points". Where these occur is read directly on the calibrated gage shoulder.

This test method has been standardized in:

ASTM D-1210

ASTM D-1316

ISO 1524

DIN 53230

DEF 1053-M82

FTMS 141a Method 4411.1 Rev. C

BS 3900-C6

## Specifications of Fineness of Grind Gages

Catalog Number	Block Size	Path Size	Number of Paths	Scales	Range	Name or Usual Application
25	1/2 x 2-1/2 x 4-3/4"	1/2 x 2"	2	Hegman Mils	8-0 0-5	Group of gages most commonly referred to as "Hegman Gages" used for a wide variety of paints and other compounds.
45	1/2 x 2-1/2 x 6-3/4"	1/2 x 4"	2	Hegman Mils	8-0 0-5	
65	1/2 x 2-1/2 x 8"	1/2 x 6"	2	Hegman Mils	8-0 0-5	
5251	1/2 x 2-1/2 x 6-3/4"	1/2 x 5"	2	Microns Mils Hegman	0-25 0-1 8-6	Group of gages commonly referred to as "Paint Club Gages" most often used for paints, varnishes and lacquers. See ASTM Test Method D-1210, also Federal Test Method No. 141, Method 4411 Rev. C.
5252	1/2 x 2-1/2 x 6-3/4"	1/2 x 5"	2	Microns Mils Hegman	0-50 0-2 8-4	
5254	1/2 x 2-1/2 x 6-3/4"	1/2 x 5"	2	Microns Mils Hegman	0-100 0-4 8-0	
51	3/4 x 3-1/2 x 7-1/2"	2 x 5"	1	Hegman Microns	8-6 0-25	These gages have a single, wide path which aids in the discerning of contamination. This is a popular gage where "wet" master samples are not used for comparison.
52	3/4 x 3-1/2 x 7-1/2"	2 x 5"	1	Hegman Microns	8-4 0-50	
54	3/4 x 3-1/2 x 7-1/2"	2 x 5"	1	Hegman Microns	8-0 0-100	
6251/2-MU	3/4 x 3-1/2 x 9-1/2"	1 x 6-1/4"	2	Microns	0-12-1/2	Popular in foreign usage because of large size and micron calibration; this group includes the shallowest standard gage which is 12-1/2 microns, total range.
6251	3/4 x 3-1/2 x 9-1/2"	1 x 6-1/4"	2	Hegman Microns	8-6 0-25	
6252	3/4 x 3-1/2 x 9-1/2"	1 x 6-1/4"	2	Hegman Microns	8-4 0-50	
6254	3/4 x 3-1/2 x 9-1/2"	1 x 6-1/4"	2	Hegman Microns	8-0 0-100	
PD-250	3/4 x 3-1/2 x 9-1/2"	1 x 6-1/4"	2	Microns Microns	0-50 0-250	
9484	1/2 x 2-1/2 x 6-3/4"	1/2 x 5"	2	Microns Microns	0-50 0-250	Smaller version of PD-250
PB-20	1/2 x 2-1/2 x 9-1/2"	1/2 x 8"	2	Mils	0-20	Peanut Butter Gage
PB-30	1/2 x 2-1/2 x 9-1/2"	1/2 x 8"	2	Mils	0-30	
PH-125	3/4 x 1-1/2 x 8"	1/2 x 6"	1	Microns	0-125	Pharmaceutical Gage
CMA-185	3/4 x 2-1/2 x 12"	1/2 x 10-1/2"	2	Microns Microns	0-105 80-185	Chocolate Gage, Chocolate Manufacturers Ass'n.

## Specifications of Scrapers for Fineness of Grind Gages

Catalog Number	Thickness, Width, Length	Description
A-1	1/4 x 1-1/2 x 3-3/4"	Two edges with .015" radius making line contact. For 1-1/2" through 3-1/2" gages. Two edges with .015" radius making line contact. For 4" and 4-1/2" gages. Two edges with .015" radius making line contact. For FPBAA-C and some special gages.
A-3	3/8 x 1-1/2 x 4-5/8"	
A-4	3/8 x 1-1/2 x 6-3/4"	
IA-1	1/4 x 3-5/8" wide with insulated handle for use with heated gages.	
B-1	Footed or block-type scraper for 2-1/2" wide gages, one flat edge.	
B-2	Footed or block-type scraper for 3-1/2" wide gages, one flat edge.	
B-3	Footed or block-type scraper for 4-1/2" wide printing plates, one flat edge.	
Warren Block Scraper	Footed or block-type scraper for Warren wedge printing plates, one flat edge.	

### Footnotes to Gage and Scraper Specifications

- 1) Block sizes shown are approximate. 2) Path length shown is the length of the calibrated section only.
- 3) Hegman Scale is designated "NS" on gages manufactured prior to 1969.
- 4) Hegman Scale is designated "H" on gages manufactured after 1968.
- 5) Though one micron equals .00003937", we have rounded off to .00004" for Calibration.
- 6) All Fineness of Grind gages are equipped with the A-1 scraper.



# Gages for Printing Inks

The reliable, easy-to-use **NPRI Production Grindometer** measures mill performance to decrease the inkmaker's labor costs, capital investment and power requirements.

The Grindometer consists of a machined block, grooved for sample ink, and an A-1 scraper for draw down. Grooves are one inch wide and 25 microns deep at the top. The tapered paths are graduated from one to ten according to depth, in ten thousandths of an inch increments. The A-1 scraper has two edges which are rounded to a 15 mil radius—rounded edges increase wear life compared to a sharp edge by reducing the effect of operators using varying blade angles. An extra scraper should be kept on hand as a master.

## Ink Gage Kit (a)

Includes G-1 gage in a wooden case and A-1 scraper in a vinyl case.

## Wedge Printing Plate (b)

The Wedge Printing Plate is used for quick and easy proof press testing of stocks and inks. It is especially effective in the routing production of standard prints having controlled ink film thickness. Stock ink combinations can be tested for print quality, as well as other performance properties such as gloss, holdout, drying time, varnishability, rub or fade resistance.

The plate consists of precision grooves which are inked with a hand-drawn scraper. Ink is laid down and cleaned up quickly, film thickness is controlled at known levels and variables of roller distribution are eliminated.

Models for variable film thickness produce a continuous range of film thickness in a single impression. Uniform film thickness models are used when testing for a large print area. A multi-path uniform model allows several different levels of uniform film thickness to be proofed simultaneously.

## Ink Gages

Catalog Number	Block Size	Path Size	No. of Paths
G-1	3/4 x 3-1/2 x 9-1/2"	1 x 6-1/4"	2
G-2	3/4 x 3-1/2 x 9-1/2"	1 x 6-1/4"	2
G-3	3/4 x 3-1/2 x 9-1/2"	1 x 6-1/4"	2
SI-1	1/2 x 2-1/2 x 8"	1/2 x 6-1/4"	2
SI-2	1/2 x 2-1/2 x 8"	1/2 x 6-1/4"	2
SI-3	1/2 x 2-1/2 x 8"	1/2 x 6-1/4"	2

Catalog Number	Scales	Range	Usual Application
G-1/SI-1	NPRI Microns	0-10 0-25	General Ink Gage
G-2/SI-2	NPRI Microns	0-20 0-50	Flexco Etc.
G-3/SI-3	NPRI Microns	0-30 0-75	Coarser Inks

## Wedge Printing Plates

Name or Number	Block Size	Path Size	Number of Paths	Scales	Range	Comments
<b>Variable Film Thickness</b>						
NPRI-A	3-1/2 x 9-1/2"	1 x 6-1/4"	2	NPRI Micron	0-10 0-25	
NPRI-B	4-1/2 x 9-1/2"	1-1/2 x 6-1/4"	2	Micron Actual Depth	0-12 0-15	Marking at 80% fillage. Not marked.
<b>Uniform Film Thickness</b>						
FPBAA-C"	6-1/2 x 4"	1-1/2 x 4"	3	Mils	0.2 0.4 0.6	
6960-1	6-1/2 x 4"	1-1/2 x 4"	3	Mils	0.2 0.3 0.4	
6960-2	6-1/2 x 4"	1-1/2 x 4"	3	Mils	0.5 0.6 0.7	
Warren-2	4 x 6 1/2 or 7-1/2"	3 x 6 1/2 or 7-1/2"	1	Mils	0.3	No marked scale.
Warren-3	4 x 6 1/2 or 7-1/2"	3 x 6-1/2 or 7-1/2"	1	Mils	0.4	No marked scale.
Warren-4	4 x 6 1/2 or 7-1/2"	3 x 6-1/2 or 7-1/2"	1	Mils	0.5	No marked scale.
Warren-5	4 x 6 1/2 or 7-1/2"	3 x 6-1/2 or 7-1/2"	1	Mils	0.6	No marked scale.
Lindner	5 1/2 x 8 or 6-1/2"	2 x 8 or 6-1/2"	2	Microns	15	No marked scale.
BSI-10	5 1/2 x 8 or 6-1/2"	2 x 8 or 6-1/2"	2	Microns	10	No marked scale.
<b>Combination Uniform and Variable Film Thickness</b>						
6401	5 1/2 x 8	2 x 8" 2 x 6-1/4"	2	Microns	15 0-15	No marked scale. Graduated micron scale marked

Note: All models are type high, .916/.918" thickness.

\* Each path has a uniform film thickness, but the thickness is different in each path. Any other combinations may be ordered.



# Precision Wet Film Applicators

Easy-to-use, accurate **Precision Wet Film Applicators** lay down a uniform thickness of film for observation and testing. Their reliability has made them a standard in both experimental and quality control situations.

2-path models are made of chrome plated steel or hardened 440-C stainless steel. 8-path film applicators are made of hardened 440-C stainless steel. Bird-Style Applicators are marked with 1/2 actual clearance, all other applicators are calibrated to actual gap clearance. Film thickness deposited may vary from 40% to 80% of the actual clearance.

## Ordering 2-Path Applicators (a & b)

Select an applicator based on conformation and use, then construct a specification number beginning with film width, then the least clearance, followed by the greater clearance. For example, "4610 Stainless" indicates 4" clearance width, 6 mil clearance on one side and a 10 mil clearance on the other, in stainless steel.

Chrome plated steel U-shaped 2-path applicators are available in 2" to 10" path width. Clearance tolerance is  $\pm .2$  mil. Stainless steel 2-path applicators are available in 2" to 14" path width. Clearance tolerance is  $\pm .2$  mil.

## Dow Film Caster (Latex Applicator)

A U-shaped 2-path applicator with a 7 and 10 mil gap clearance and a thicker land width. This applicator allows a second coat of paint to be applied over a hardened based coat while the applicator ends remain in contact with the uncoated panel surface.

## Bird-Style Applicators (d)

Easy-to-clean, single clearance Bird-Style Applicators are durable enough for even the heaviest usage. PGT Bird-Style Applicators are made from a single piece of hardened 440-C stainless steel, and are shipped with certification. Note that Bird-Style Applicators are marked to 1/2 of the actual gap clearance.

## Cube-Style Applicators (e)

Convenient, easy-to-use 1" cube-style applicators are available in single and double path configurations.

## Use the following chart for ordering 8-Path Applicators (c)

Catalog Number	Overall Width	Path Width	Actual Path Depth, Mils	Approx. Film Thickness
1 14 15	3" 4" 5"	2" 3" 4"	1, 2, 3, 4, 5, 6, 7, 8 mils	1/2, 1, 1-1/2, 2, 2-1/2, 3, 3-1/2, 4 mils
2 24 25	3" 4" 5"	2" 3" 4"	5, 10, 15, 20, 25, 30, 40, 50	2-1/2, 5, 7-1/2, 10 12-1/2, 15, 20, 25
3 34 35	3" 4" 5"	2" 3" 4"	1/2, 1, 1-1/2, 2, 3, 4, 5, 6	1/4, 1/2, 3/4, 1 1-1/2, 2, 2-1/2, 3



# Quality testing products for the coatings industry

## Sag Meter (a)

Sag Meters produce a series of equally spaced coating stripes of varying thickness. When placed on a vertical surface, the stripes reveal the thickness at which the coating resists sag. Precision Gage & Tool provides meters for all coating thickness ranges; High (14-60 mil), Medium (4-24 mil), Low (1-6 mil), and Standard (3-12 mil). See ASTM D-4400 for proper test procedures.



## Leslie Applicator and Sag Marker (b)

Apply varied width stripes with a thickness of 1-18 mils. Can be used with a Leslie Sag Marker.

## NYPC Leveling Test Blade (c)

The New York Paint Club Leveling Test Blade allows better production analysis through accurate leveling measurements. Its rapid draw-down test method correlates well with brushout ratings, eliminates wetting of the substrate as a variable, provides clearly defined numerical ratings and is completely reproducible from one operator to another. It is not applicable to unpigmented products, textured finished or dark colors. Critical specifications of the test blade are described in ASTM D-2801.



## NPIRI Premix Gage (d)

Proper premixing decreases subsequent roll mill time and labor costs, improves ink batch uniformity and decreases the volume of hang back on the mill. This gage is ideal for plant laboratory personnel in setting up optimum premixing procedures for specific formulations. The NPIRI Premix Gage evaluates premix quality, revealing when the premix is really ready for the mill. Similar to a wet film thickness gage, the Premix Gage is a draw-down blade which deposits wedge-shaped films of premix. The state of dispersion is judged from the number and distribution of scratches in the film. NPIRI Bulletin No. 58, "NPIRI Premix Gage", contains all instruction and statistical data.

Catalog No. P-12 (0-12 Mils)

Catalog No. P-24 (0-24 Mils)

Catalog No. P-48 (0-48 Mils)

## Notch Spool Test Roller (e)

Critical tool for determining the tendency of a paint to "spatter" when applied with a roller. ASTM D-4707 describes the proper use of the test roller and other apparatus.



## Sealant Slump Flow Test Jig (f)

Needed for laboratory testing for the degree of slump of a sealant when applied to a vertical joint. When used according to ASTM D-2202, reveals slump in .01" increments.



### **Cross-Cut Tool Kit (a & b)**

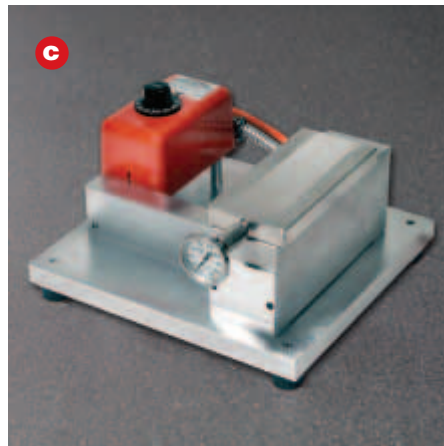
For Adhesion and Flexibility Tests in accordance with ASTM Test Method D-3359; this kit is the most precise tool of its type available. Includes blade, blade holder/handle, hex wrench for changing blades, extra clamp screw, flaking and cleaning brush, and lighted magnifier, all in a finished wooden case. Kit includes user guide and a roll of test tape. Individual blades can be ordered in Fine (11 center teeth, 13 teeth total, 1.0mm spacing), Medium (11 teeth total, 1.5mm spacing), Coarse (6 center teeth, 8 teeth total, 2.0mm spacing) or a special blade with 6 teeth and 1.0mm spacing.

### **Heated Fineness of Grind Gage (c)**

The Heated Fineness of Grind Gage is used for a variety of hot melt applications. Specify any desired range or scale arrangement on a 2-1/2" or 3-1/2" wide gage; heat range to 250°F. The gage is supplied with an insulated model A-1 scraper.

### **Vacuum Plate (d)**

Holds charts in place for proper drawdown. 300 Series Vacuum Plate measures 9" x 12", and features a 304 stainless steel top and tool steel base.





Since its beginnings in 1929, Precision Gage & Tool Co. has maintained a leadership role in the manufacture of high-accuracy fineness of grind gages and film applicators for the worldwide ink and paint industries. Over the years, PGT has added to its capability with a line of specialized gaging equipment for railroads, and a variety of custom gages and fixtures for a broad range of industrial applications.

In 1998, PGT acquired the complete line of world renowned Sheffield gages, including Precisionaire<sup>®</sup>, Micronaire<sup>®</sup> and electronic column systems, paper and bearing gages, air gage tooling, automatic and manual gaging fixtures and SOFT 2000 computer systems. With experienced Sheffield personnel on staff, PGT is your single source for Sheffield Gage engineering, sales and service.



## **PRECISION GAGE & TOOL COMPANY**

375 Gargrave Road  
Dayton, Ohio 45449  
Phone: (937) 866-9666 Fax: (937) 866-9661  
E-mail: [pgt@pgtgage.com](mailto:pgt@pgtgage.com)  
[www.pgtgage.com](http://www.pgtgage.com)