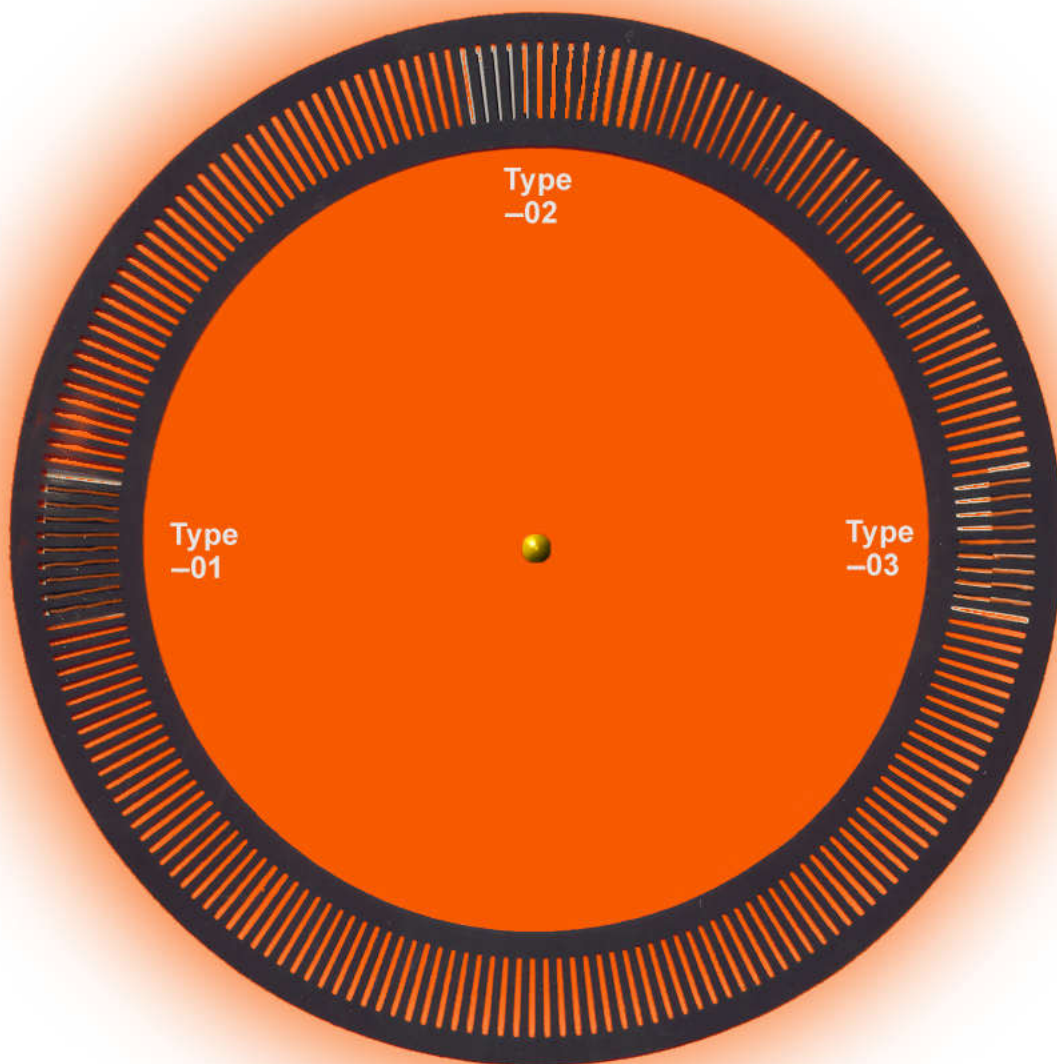


# STANDARD INCREMENTAL DISCS



SHORT FORM CATALOG NO. M-3001-D

**METRIGRAPHICS DIVISION/DYNAMICS RESEARCH CORPORATION**

50 CONCORD STREET, WILMINGTON, MA 01887 • 978/658-6100 • FAX 978/657-7765

# FUNCTIONAL CODE DISC TESTING

Metrigraphics has designed and built a test device for checking transmission variation in code discs.

**D.C. TESTING** VARIATION IN TRANSMISSION OR "D.C. SWING" IS DEFINED AS FOLLOWS:

The maximum variation in transmission measured at the radial center of the code pattern, and projected around the entire pattern (360°) to be 3% -- 10%. (The actual transmission specification assigned is a function of line count, diameter, customer requirements, and manufacturing technique) i.e., photo-emulsion or Metrifiilm™.

The output data is in graphic form and, therefore, becomes a permanent record to remain with the disc until final assembly.

This test is "standard procedure" for discs produced at Metrigraphics. A copy of the transmission graph can be included with each disc upon request.

**The correlation of data gained in this test and the performance of discs in customer applications have been found to be very high.**

## HARMONIC TESTING

Harmonic error testing by use of a flutter meter is a means whereby signal output from a rotating disc is compared to a stable frequency. It is essential to the method that the rotating speed be extremely uniform. To that end, we have developed a sophisticated air bearing spindle. This spindle, which is mounted in an eight inch thick granite surface plate, reduces systematic errors and allows direct identification of disc errors.

Major advantages of the system are that harmonic error components can be isolated (by frequency selection) and measured directly in a manner which closely approximates customer applications. Disc error identification to better than 1 arc second is achievable.

# THE METRIFILM™ PROCESS

Metrifiilm™ (evaporated Inconel) has many desirable and unique characteristics, which makes it an ideal media for producing discs. For example:

## EXTREME DURABILITY

The discs are durable and can be easily cleaned and handled without fear of degradation. Emulsion has a delicate surface requiring careful handling and avoidance of harsh environments: heat, cold and humidity.

## HIGH TRANSMISSION

Transmission of the clear spaces is equal to that of the base material. This is unlike photo emulsion which has a clear gelatin left in the undeveloped areas that reduces the transmission.

## ACUTE EDGE DEFINITION

Line edge definition is extremely acute allowing for a more accurate duplication of the high accuracies inherent in the "original masters".

## SIMPLIFIED FIELD SERVICE

Discs become clouded with atmospheric dirt in time even in the best environment. Field service of units is greatly simplified in that service men can clean the disc with acetone and cotton without fear of damaging the disc or altering its performance.

# DISC AND GRATING SPECIFICATIONS-SINGLE TRACK

## STANDARD DISCS

## ZERO PULSE AVAILABLE ON MOST DISCS

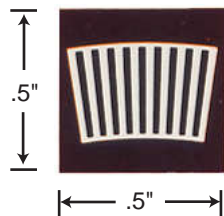
Model	Pattern		Glass Substrate		Glass Thickness	Line Count
	OD	ID	OD	ID		
A-15	1.280"	1.030"	1.315"	.187"	.060"	From 20 Cycles to 12,000 Cycles
B-77	1.900"	1.596"	1.984"	.380"	.030"	
C-29	2.174"	1.826"	2.250"	.500"	.060"	
D-35	2.850"	2.265"	2.937"	.560"	.060"	
E-150	1.180"	0.880"	1.210"	.675"	.060"	

SPECIFICATIONS: T.I.R. of Pattern to Glass .005" Max.  
Optical Density  $\geq 2.5$   
Space/Line Ratio Nominally 1:1

## STANDARD GRATINGS

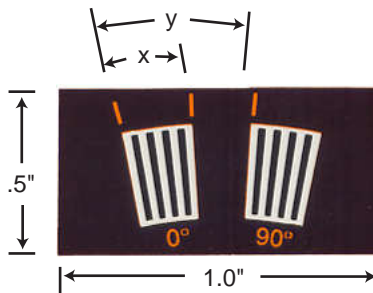
## ZERO PULSE AVAILABLE ON MOST GRATINGS

**TYPE - 01** Non-Phased Section of Disc

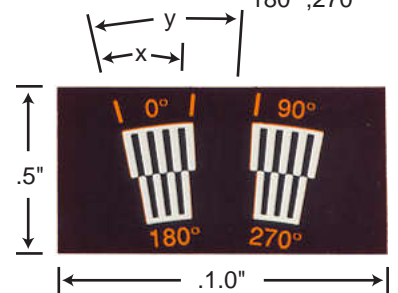


Except E - 150  
.177 X .5

**TYPE - 02** Dual-Phased 0°, 90°

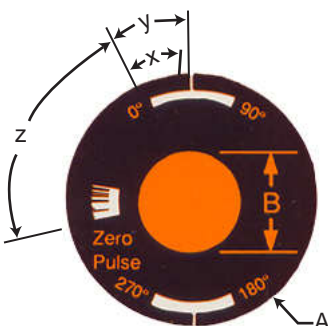


**TYPE - 03** Quad-Phased 0°, 90°, 180°, 270°



Except E - 150  
.270 X .5

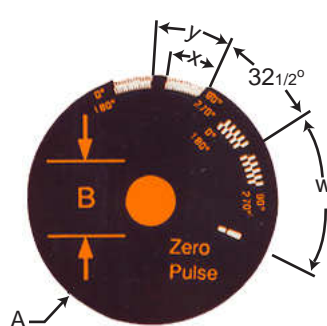
**TYPE - 04** Quad-Phased



Model D35  
Model D35 EM  
Similar

A	B
2.937	1.437

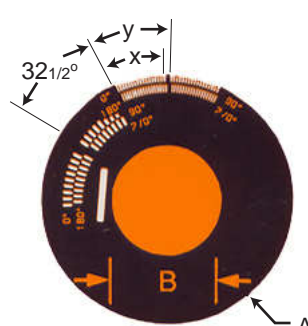
**TYPE - 05** Quad-Phased



Model C29 EM

A	B
2.250	1.060

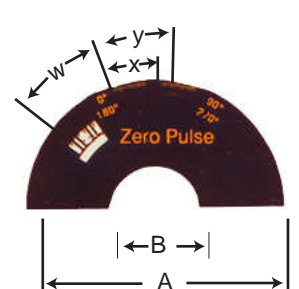
**TYPE - 06** Quad-Phased



Model B77 EM

A	B
1.984	.900

**TYPE - 07** Quad-Phased



	A	B
Model B77	1.984	.900
Model C29	2.250	1.120

SPECIFICATIONS: Pattern Centered Within .010"  
Optical Density  $\geq 2.5$   
Space/Line Ratio Nominally 1:1

X = 18° Minimum  
Y = 25° Rounded to Nearest 1/4 Cycle

W = 45 Cycles  
Z = 111 Cycles

# DISC AND GRATING SPECIFICATIONS-DUAL TRACK

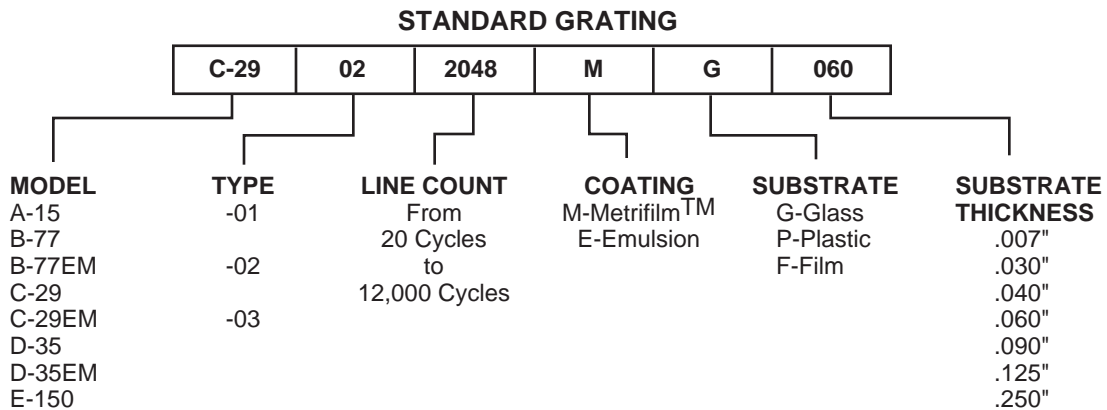
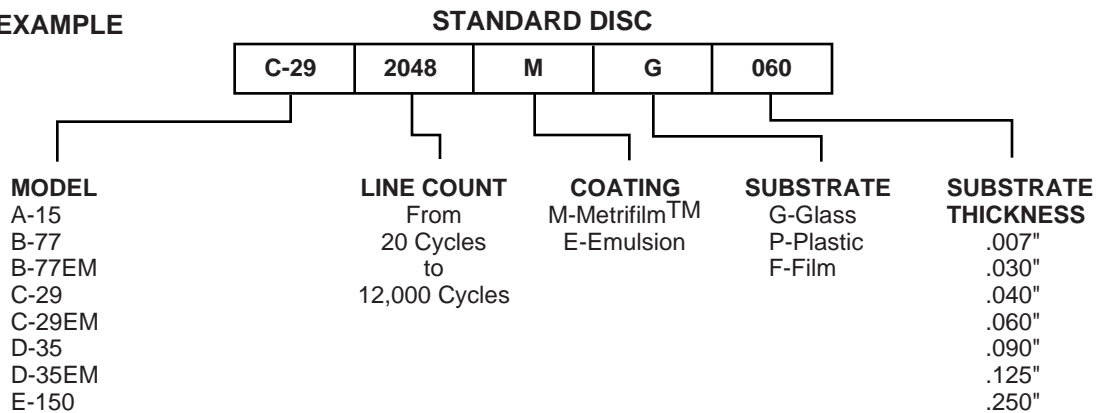
## STANDARD DISCS – DUAL TRACK, ENGLISH/METRIC CONVERSION

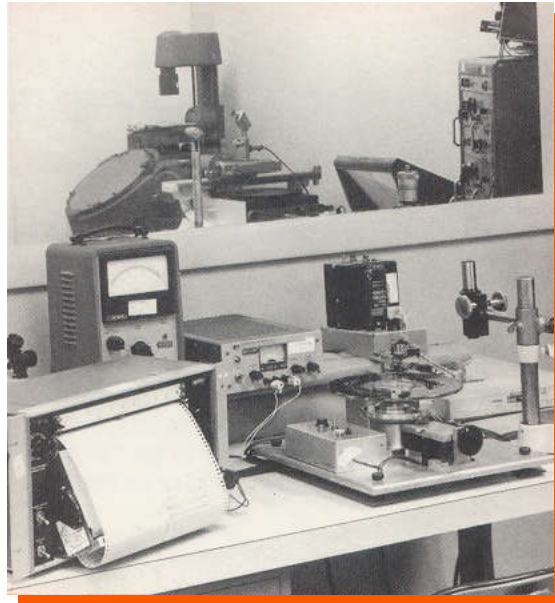
Model	Pattern Outside Track		Pattern Inside Track		Glass OD	Size ID
	OD	ID	OD	ID		
B-77EM	1.900"	1.596"	1.574"	1.270"	1.984"	.380"
C-29EM	2.124"	1.874"	1.854"	1.604"	2.250"	.500"
D-35EM	2.850"	2.264"	2.236"	1.650"	2.937"	.560"

STANDARD GRATINGS – DUAL TRACK, ENGLISH/METRIC CONVERSION  
 Gratings for English/Metric Conversion Discs Are Similar to the Single Track Gratings. Most are Quadra-phased and come in Circular Disc Form or as Sections. Please call for detailed information

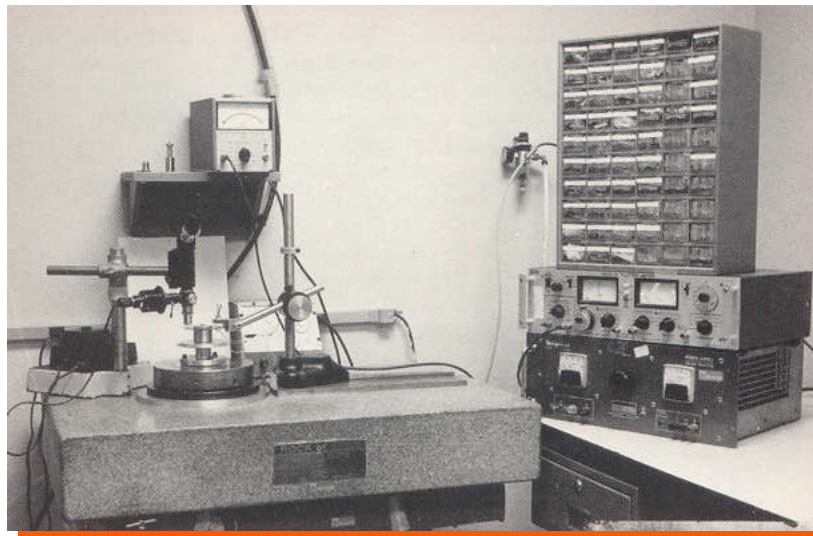
## ORDER BY PART NUMBER

### EXAMPLE





**D.C. TESTING OF CODE DISC TRANSMISSION VARIATION**



**HARMONIC ERROR TESTING OF CODE DISCS**

## **OTHER PRODUCTS CREATED BY METRIGRAPHICS**

Precision Linear Scales	M-3004-B
Electroformed Parts	M-3011-A
Resolution Targets	M-3000-D
Metriform™ II	M-3010A



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