

# CHART & FIXTURE CATALOG

OPTICAL COMPARATOR  
CHARTS, FIXTURES AND ACCESSORIES



## UNLIMITED SERVICES, INC.

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*"Quality Service is Our Success"*

# STANDARD CHARTS & FIXTURES

Included in this brochure are examples of the most often used chart and fixture types that enable the user to take the greatest advantage of the precision inspection and measuring capabilities of Optical Comparators.

These standard accessories cover a broad range of application. However, several units designed for unique application are also available. Whatever your needs may be, the experience of Unlimited Services can provide an expert and proven solution.

USI Glass comparator charts are resistant to oil or grease and are unharmed by routine cleansing with mild soap and water.

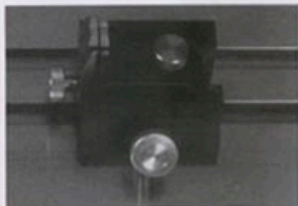
Centerlines are centralized with respect to the ground O.D., thereby permitting rotation of charts without loss of accuracy.

A broad selection of thread charts, both glass and plastic overlays, are available.

## Screw Machine Products Stage

The Screw Machine Products Stage is a fixture upon which two adjustable V-Blocks are clamped. The blocks containing large and small vees can be adjusted for variations in diameters and lengths on a wide variety of screw machine products. Adjustment is accomplished optically on the Comparator. Adjustable Vees can be mounted on either right or left side.

87-3435



## Universal Base Stage

Rapidly positions small parts for inspection of various angles and surfaces. A variety of holding devices may be used for this fixture. (87-3873 vise sold separately)

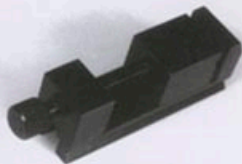
87-2774



## Vise

The Vise can be set either parallel, or at right angles to the table groove. Special jaws may be used for staging irregular shapes. Used with 87-2774 Universal Base Stage.

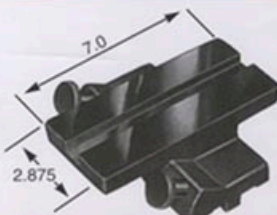
87-3873



## Right Angle Base

A convenient accessory for locating fixtures at right angles to the normal position.

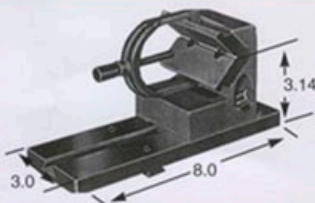
87-2784



## Constant Centerline V-Block

Rapid focusing adjustment makes this useful for staging cylindrical parts of varying diameters. Capacity ranges from 1/4" to 2" diameter.

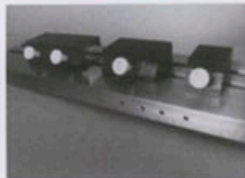
87-2970



## Fixture Base

Finished on the bottom, these bases may be machined to accommodate a variety of holding fixtures.

(LENGTH)	(LENGTH)
1" 87-2468	2" 87-2114
3" 87-2145	4" 87-2146
5" 87-2266	6" 87-2186
1.600"	1.200"
(HEIGHT)	(WIDTH)



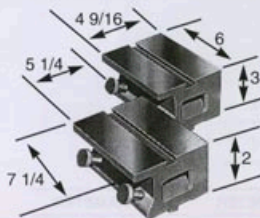
## Centers and Center Blocks

These centers and center blocks can be supplied in 3", 5" and 8" capacities for staging various diameter parts. The centers are carbide-tipped for long life. Female centers are available in hi-speed steel.

CH	MALE CENTERS & CENTER BLOCKS		FEMALE CENTERS & CENTER BLOCKS	
1.645	3" MAX. WORK DIA.	87-2855	3" MAX. WORK DIA.	87-3094
2.643	5" MAX. WORK DIA.	87-2854	5" MAX. WORK DIA.	87-3095
4.272	8" MAX. WORK DIA.	87-2856	8" MAX. WORK DIA.	87-3096



NOTE: CH-CENTER HEIGHT DENOTES DISTANCE FROM STAGE TO CENTER POINT



## Supplemental Fixture Bases Single or Matched Pairs

These units are used when it becomes necessary to elevate holding devices (V-blocks, centers, etc.) an equal distance above the table. They are available singly or as matched pairs.

SINGLES		MATCHED PAIRS	
2"	87-3665	2"	87-3666
3"	87-2198	3"	87-2457

## V-Block Stage

These units provide extreme accuracy for staging cylindrical parts on the O.D. They are available singly, or as matched pairs.

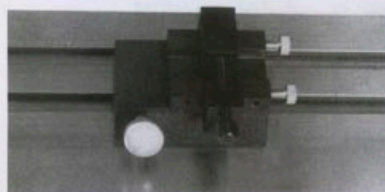
SINGLES		MATCHED PAIRS	
1"	8731-1	1"	8731-2
2"	8732-1	2"	8732-2
3"	8733-1	3"	8733-2
4"	8734-1	4"	8734-2



## Vise Stage

This stage is used for staging small parts when no permanent setup is necessary. The vise can be set either parallel with, or at right angles to the table grooves, and special jaws can be used for staging irregular shapes. Maximum jaw opening is 1-3/16".

87-2430



## Chart Clips

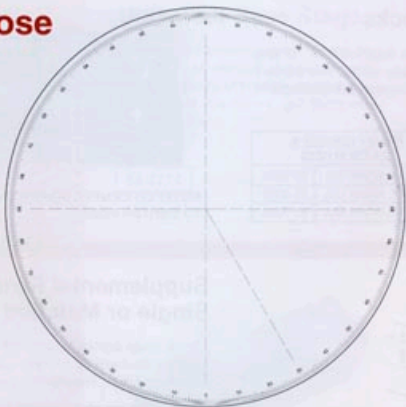
87-4003 (TOP) Windshield wiper type chart clips for all 30" screen models.

87-4217 (BOTTOM) Standard chart clips for all 14" screen models.



## General Purpose Charts

10 Series  
Glass<sup>1</sup> or Plastic<sup>2</sup>



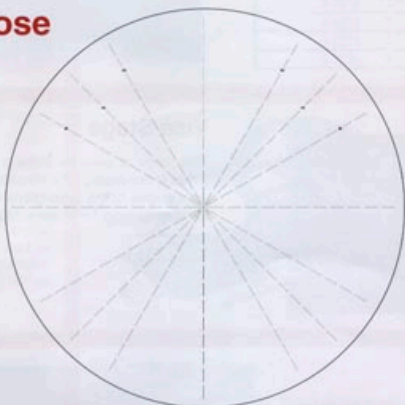
**CHART SIZE AND ORDER NUMBERS**

	10" DIAMETER <sup>3</sup>	14" DIAMETER <sup>3</sup>	20" DIAMETER	30" DIAMETER
10 SERIES	35440	32909	37937	32908

1. Available in glass. To order, add (—02) after order number.
2. Available in glass (protected image). To order, add (—202) after order number.
3. Available in plastic. To order, add (—31) after order number.
4. Available in outside edge protractor ring. To order, add (—8) after order number.

## General Purpose Charts

11 Series  
Glass<sup>1</sup> or Plastic<sup>2</sup>



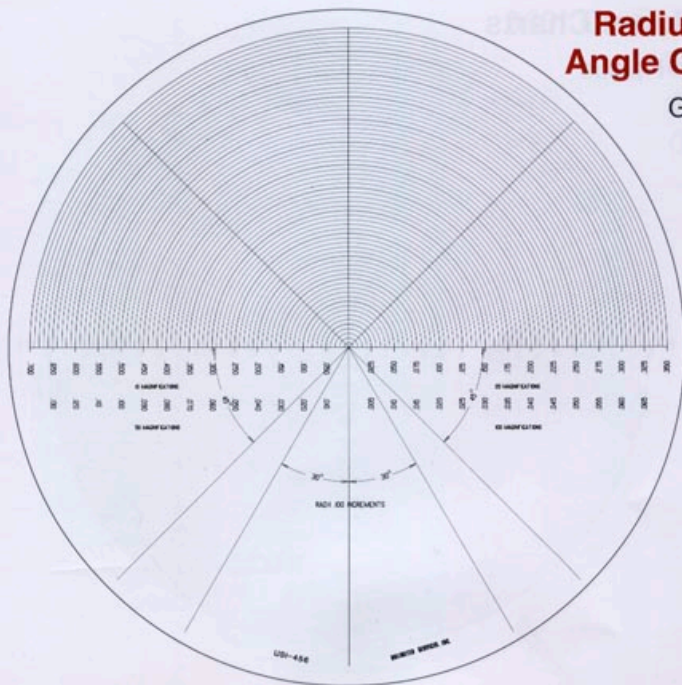
**CHART SIZE AND ORDER NUMBERS**

	10" DIAMETER <sup>3</sup>	14" DIAMETER <sup>3</sup>	20" DIAMETER	30" DIAMETER
11 SERIES	USI-464	USI-382	USI-569	USI-420

1. Available in glass. To order, add (—02) after order number.
2. Available in glass (protected image). To order, add (—202) after order number.
3. Available in plastic. To order, add (—31) after order number.
4. Available in outside edge protractor ring. To order, add (—8) after order number.

# Radius and Angle Charts

Glass<sup>1</sup> or Plastic<sup>2</sup>



## INCHES

### CHART SIZE AND ORDER NUMBERS

MAGNIFICATION/INCREMENT	10" DIAMETER <sup>3</sup>	14" DIAMETER <sup>3</sup>	20" DIAMETER	30" DIAMETER
10X .010				
20X .005				
50X .002	USI-471	USI-456	USI-554	USI-457
100X .001				
31.25X .002	USI-472	USI-458	USI-559	USI-459
62.5X .001				

## MILLIMETERS

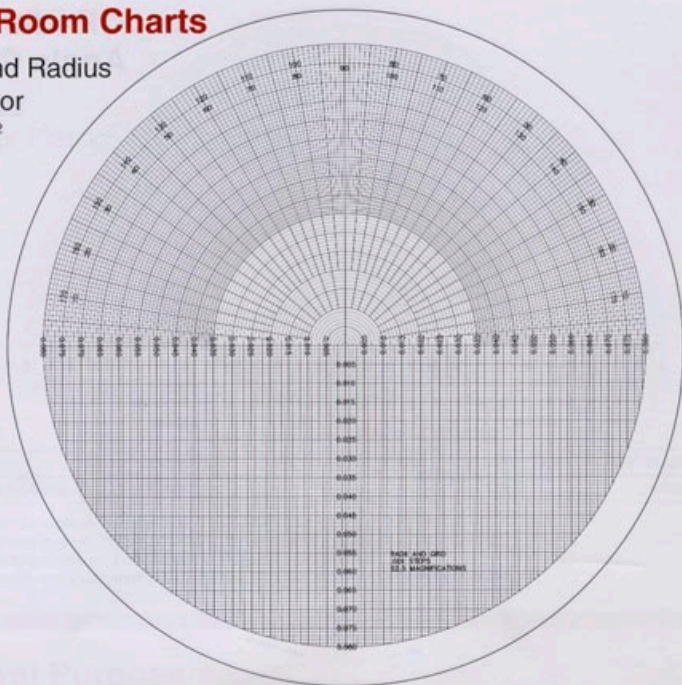
### CHART SIZE AND ORDER NUMBERS

MAGNIFICATION/INCREMENT	10" DIAMETER <sup>3</sup>	14" DIAMETER <sup>3</sup>	20" DIAMETER	30" DIAMETER
10X 0.2				
20X 0.1				
50X 0.04	M2010	M2020	M2030	M2040
100X 0.02				

1. Available in glass. To order, add (—02) after order number.
2. Available in glass (protected image). To order, add (—202) after order number.
3. Available in plastic. To order, add (—31) after order number.
4. Available in outside edge protractor ring. To order, add (—8) after order number.

## Tool Room Charts

Grid and Radius  
Glass<sup>1</sup> or  
Plastic<sup>2</sup>



### INCHES

### CHART SIZE AND ORDER NUMBERS

MAGNIFICATION INCREMENT	10" DIAMETER <sup>3</sup>	14" DIAMETER <sup>3</sup>	20" DIAMETER	30" DIAMETER
10X .005	USI-494	USI-317	USI-557	USI-318
20X .0025	USI-495	USI-399	USI-563	USI-394
31.25X .002	USI-498	USI-402	USI-564	USI-397
50X .001	USI-496	USI-400	USI-565	USI-395
62.5X .001	USI-499	USI-403	USI-566	USI-396
100X .0005	USI-497	USI-401	USI-567	USI-396

### MILLIMETERS

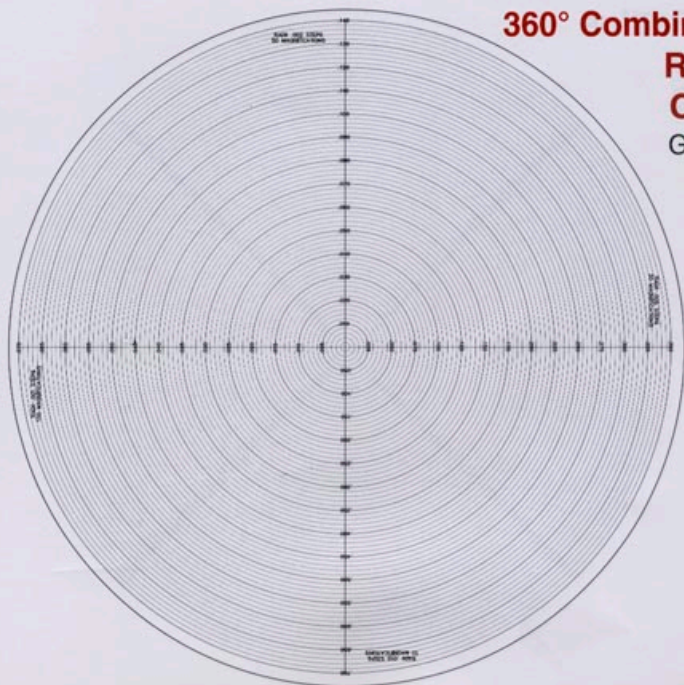
### CHART SIZE AND ORDER NUMBERS

MAGNIFICATION INCREMENT	10" DIAMETER <sup>3</sup>	14" DIAMETER <sup>3</sup>	20" DIAMETER	30" DIAMETER
10X 0.2	M4010	M4020	M4030	M4040
20X 0.1	M4110	M4120	M4130	M4140
30X 0.05	M4210	M4220	M4230	M4240
50X 0.4	M4310	M4320	M4330	M4340
60X 0.25	M4410	M4420	M4430	M4440
100X 0.02	M4510	M4520	M4530	M4540

1. Available in glass. To order, add (—02) after order number.
2. Available in glass (protected image). To order, add (—202) after order number.
3. Available in plastic. To order, add (—31) after order number.
4. Available in outside edge protractor ring. To order, add (—8) after order number.

# 360° Combination Radius Charts

Glass<sup>1</sup> or  
Plastic<sup>2</sup>



## 2-WAY COMBINATION (INCHES)

MAGNIFICATION/INCREMENT		10" DIAMETER <sup>3</sup>	14" DIAMETER <sup>3</sup>	20" DIAMETER	30" DIAMETER
FINE	31.25X/.002	USI-465	USI-238	USI-561	USI-252
	62.5X/.001				
COARSE	31.25X/.005	USI-466	USI-32	USI-562	USI-250
	62.5X/.0025				

## CHART SIZE AND ORDER NUMBERS

## 4-WAY COMBINATION (INCHES)

MAGNIFICATION/INCREMENT		10" DIAMETER <sup>3</sup>	14" DIAMETER <sup>3</sup>	20" DIAMETER	30" DIAMETER
FINE	10X/.005	USI-467	USI-139	USI-558	USI-248
	20X/.0025				
	50X/.001				
	100X/.0005				
COARSE	10X/.010	USI-468	USI-26	USI-560	USI-249
	20X/.005				
	50X/.005				
	100X/.001				

## CHART SIZE AND ORDER NUMBERS

## 4-WAY COMBINATION (MILLIMETERS)

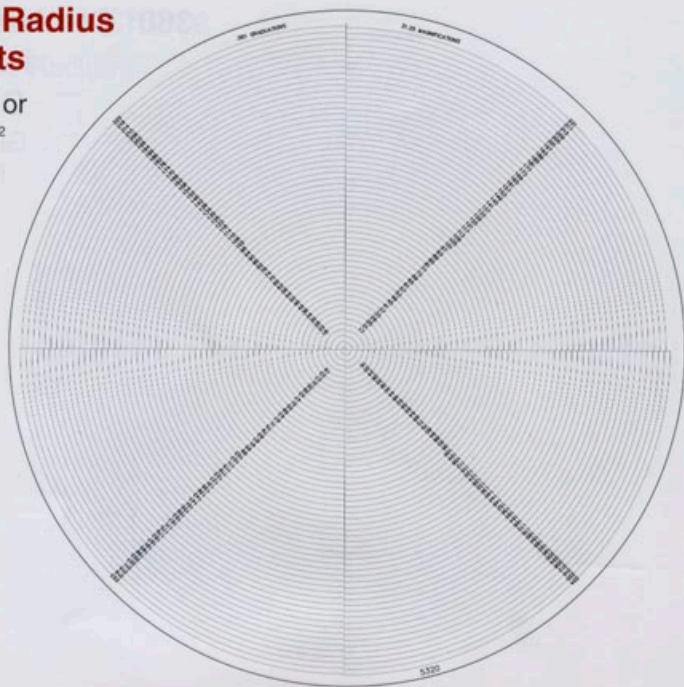
MAGNIFICATION/INCREMENT		10" DIAMETER <sup>3</sup>	14" DIAMETER <sup>3</sup>	20" DIAMETER	30" DIAMETER
10X/0.2	10X/0.2	M3710	M3720	M3730	M3740
	20X/0.1				
	50X/0.04				
	100X/0.02				

## CHART SIZE AND ORDER NUMBERS

1. Available in glass. To order, add (—02) after order number.
2. Available in glass (protected image). To order, add (—202) after order number.
3. Available in plastic. To order, add (—31) after order number.
4. Available in outside edge protractor ring. To order, add (—8) after order number.

## Step Radius Charts

Glass<sup>1</sup> or  
Plastic<sup>2</sup>



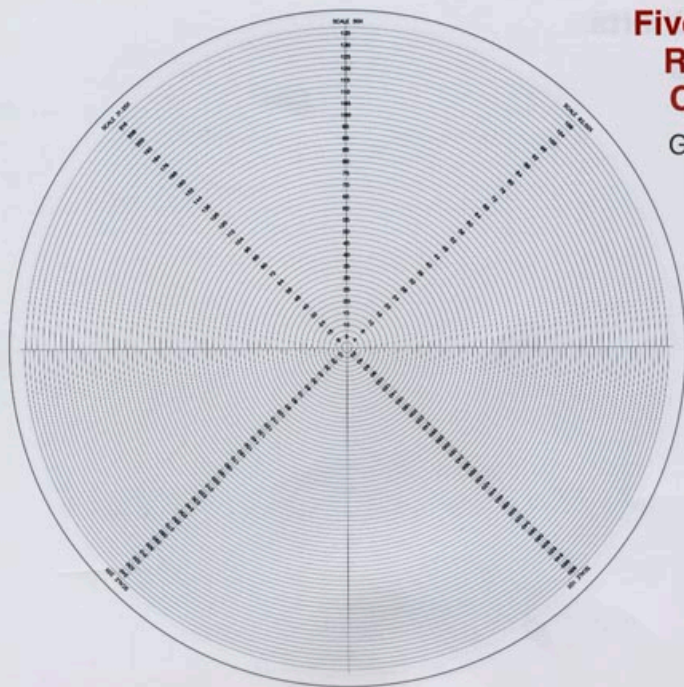
**CHART SIZE AND ORDER NUMBERS**

MAGNIFICATION INCREMENT	10" DIAMETER <sup>1</sup>	14" DIAMETER <sup>1</sup>	20" DIAMETER	30" DIAMETER
10X .001	5110	5120	5130	5140
20X .001	5210	5220	5230	5240
31.25X .001	5310	5320	5330	5340
62.5X .001	5410	5420	5430	5440

1. Available in glass. To order, add (—02) after order number.
2. Available in glass (protected image). To order, add (—202) after order number.
3. Available in plastic. To order, add (—31) after order number.
4. Available in outside edge protractor ring. To order, add (—8) after order number.

# Five-way Radius Charts

Glass<sup>1</sup> or  
Plastic<sup>2</sup>



## INCHES

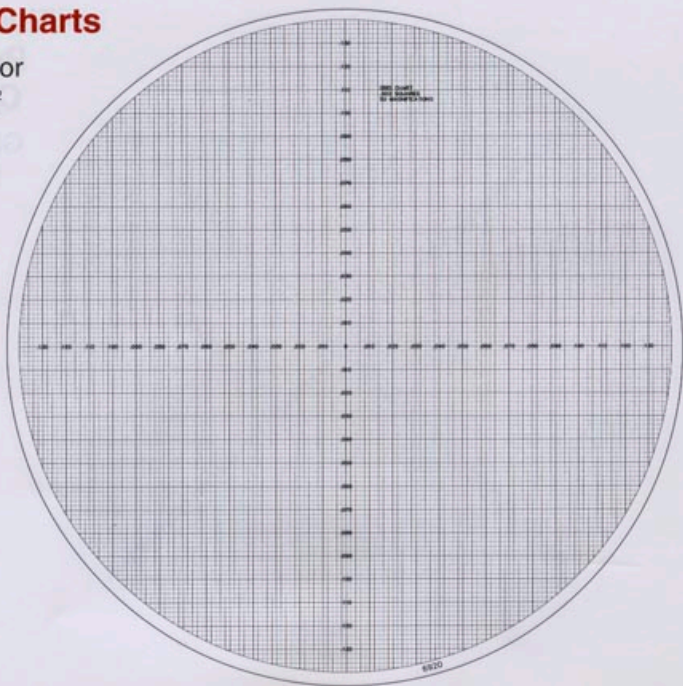
## CHART SIZE AND ORDER NUMBERS

MAGNIFICATION/INCREMENT	10" DIAMETER <sup>1</sup>	14" DIAMETER <sup>1</sup>	20" DIAMETER	30" DIAMETER
TOP HALF				
31.25X .004				
50X .0025				
62.5X .002				
LOWER HALF				
10X .010	USI-549	USI-547	USI-568	USI-548
20X .005				

1. Available in glass. To order, add (—02) after order number.
2. Available in glass (protected image). To order, add (—202) after order number.
3. Available in plastic. To order, add (—31) after order number.
4. Available in outside edge protractor ring. To order, add (—8) after order number.

# Grid Charts

Glass<sup>1</sup> or  
Plastic<sup>2</sup>



## INCHES

### CHART SIZE AND ORDER NUMBERS

MAGNIFICATION INCREMENT	10" DIAMETER <sup>3</sup>	14" DIAMETER <sup>3</sup>	20" DIAMETER	30" DIAMETER
10X/.005	6010	6020	6030	6040
10X/.010	6110	6120	6130	6140
20X/.0025	6210	6220	6230	6240
20X/.005	6310	6320	6330	6340
31.25X/.001	6410	6420	6430	6440
31.25X/.002	6510	6520	6530	6540
31.25X/.005	6610	6620	6630	6640
62.5X/.001	6710	6720	6730	6740
50X/.001	6810	6820	6830	6840
50X/.002	6910	6920	6930	6940
100X/.0005	7010	7010	7030	7040
100X/.001	7110	7120	7130	7140

## MILLIMETERS

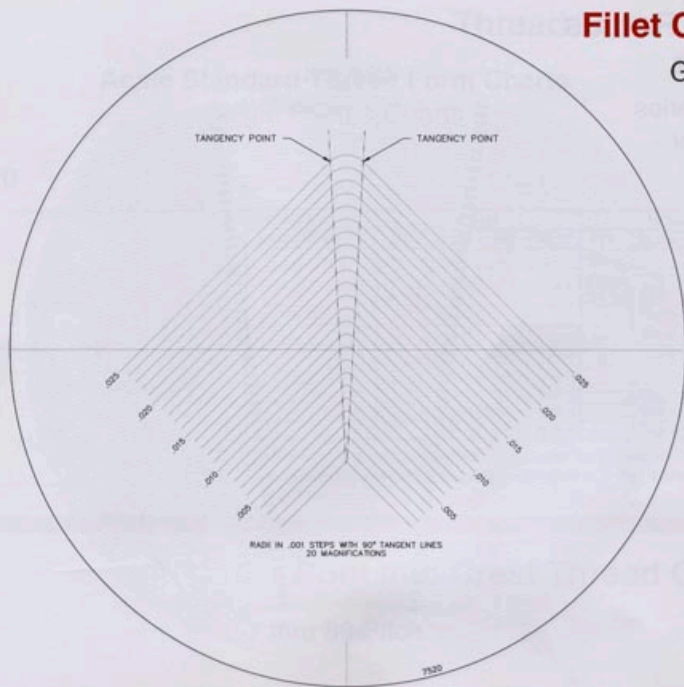
### CHART SIZE AND ORDER NUMBERS

MAGNIFICATION INCREMENT	10" DIAMETER <sup>3</sup>	14" DIAMETER <sup>3</sup>	20" DIAMETER	30" DIAMETER
10X/0.2	M6010	M6020	M6030	M6040
20X/0.1	M6210	M6220	M6230	M6240
50X/0.04	M6810	M6820	M6830	M6840
100X/0.02	M7010	M7020	M7030	M7040

1. Available in glass. To order, add (—02) after order number.
2. Available in glass (protected image). To order, add (—202) after order number.
3. Available in plastic. To order, add (—31) after order number.
4. Available in outside edge protractor ring. To order, add (—8) after order number.

## Fillet Charts

Glass<sup>1</sup> or  
Plastic<sup>2</sup>



### INCHES

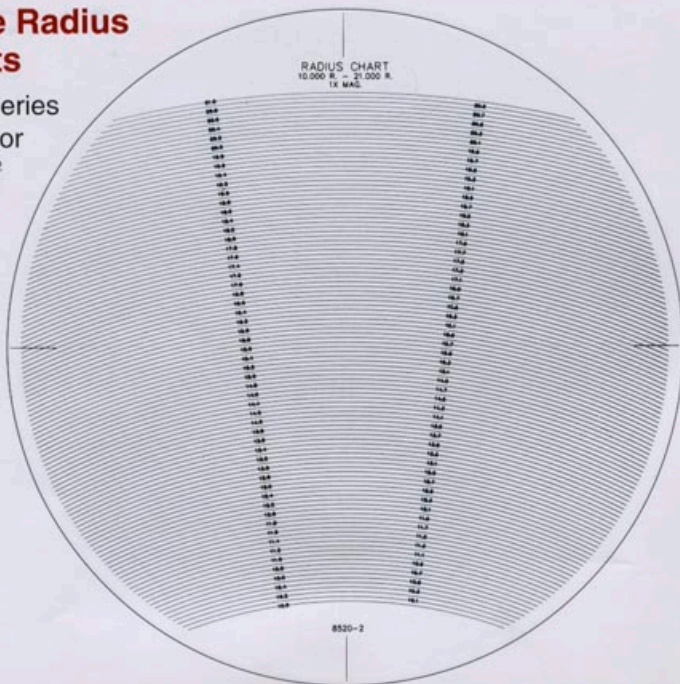
### CHART SIZE AND ORDER NUMBERS

MAGNIFICATION INCREMENT	14" DIAMETER (ONLY)
20X: .001 increments from .001 thru 0.25	7520
20X: .001 increments from .025 thru .050	7720
31.25X: .001 increments from .001 thru .025	7620
31.25X: .001 increments from .025 thru .050	7820

1. Available in glass. To order, add (—02) after order number.
2. Available in glass (protected image). To order, add (—202) after order number.
3. Available in plastic. To order, add (—31) after order number.
4. Available in outside edge protractor ring. To order, add (—8) after order number.

# Large Radius Charts

8520 Series  
Glass<sup>1</sup> or  
Plastic<sup>2</sup>



## ORDER NUMBER

## ACTUAL SIZE OF RADIUS (.001 increments)

ORDER NUMBER	ACTUAL SIZE OF RADIUS (.001 increments)		
8520	Complete Set of 10 Charts as listed below		
8520-1	.1000	thru	11.0000
8520-2	10.0000	thru	21.0000
8520-3	20.0000	thru	31.0000
8520-4	30.0000	thru	41.0000
8520-5	40.0000	thru	51.0000
8520-6	50.0000	thru	61.0000
8520-7	60.0000	thru	71.0000
8520-8	70.0000	thru	81.0000
8520-9	80.0000	thru	91.0000
8520-10	90.0000	thru	101.0000

1. Available in glass. To order, add (-02) after order number.
2. Available in glass (protected image). To order, add (-202) after order number.
3. Available in plastic. To order, add (-31) after order number.
4. Available in 14" diameter only, other sizes quoted on request.
5. Chart(s) supplied with data sheets showing inspected radius size at 10X, 20X, 31.25X, 50X, 62.5X and 100X magnifications.

# Thread Form Charts

## Acme Standard Thread Form Charts Single Outline Charts

### STYLE 20

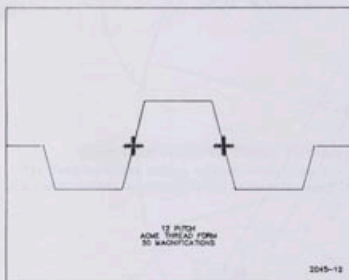
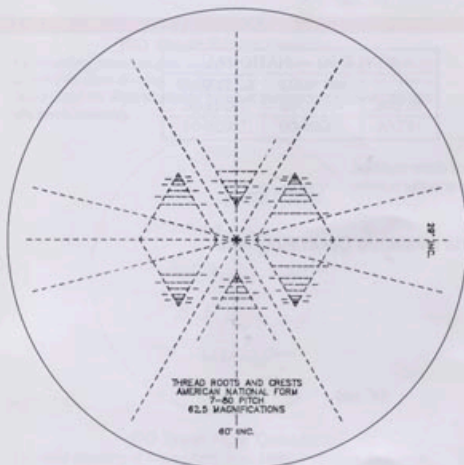


CHART SIZE MAGNIFICATION	8"X10"				10"X12"			
	20X	31.25X	50X	62.5X	20X	31.25X	50X	62.5X
2	—	—	—	—	T2052-02	—	—	—
3	T2042-03	—	—	—	T2052-03	T2053-03	—	—
4	T2042-04	T2043-04	—	—	T2052-04	T2053-04	—	—
5	—	T2043-05	—	—	—	T2053-05	T2055-05	—
6	—	T2043-06	T2045-06	—	—	T2053-06	T2055-06	T2056-06
8	—	T2043-08	T2045-08	T2046-08	—	T2053-08	T2055-08	T2056-08
10	—	T2043-10	T2045-10	T2046-10	—	T2053-10	T2055-10	T2056-10
12	—	T2043-12	T2045-12	T2046-12	—	T2053-12	T2055-12	T2056-12
14	—	T2043-14	T2045-14	T2046-14	—	T2053-14	T2055-14	T2056-14
16	—	T2043-16	T2045-16	T2046-16	—	T2053-16	T2055-16	T2056-16

1. Available in glass. To order, add (—02) after order number.
2. Available in plastic. To order, add (—31) clear or (—32) frosted, after order number.

## Root and Crest Thread Charts

### 7 thru 80 Pitch



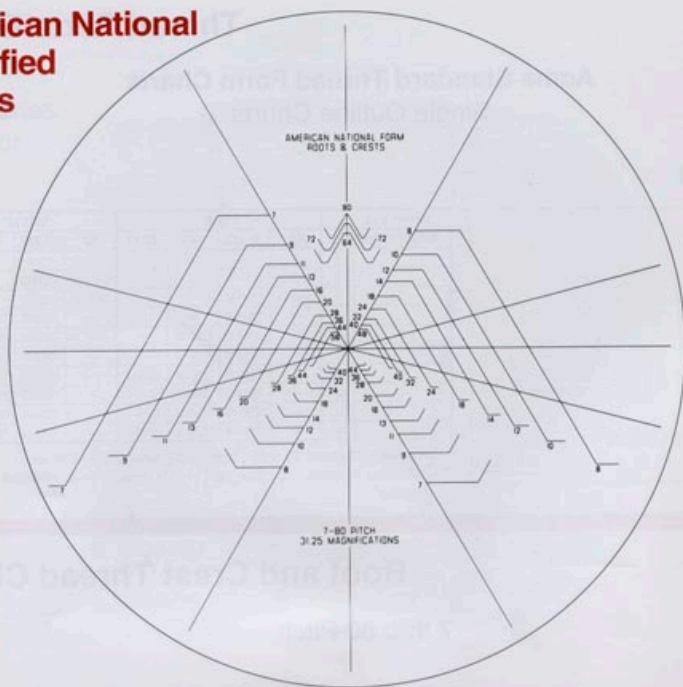
- STYLE 10** — AMERICAN NATIONAL FORM  
**STYLE 11** — UNIFIED SCREW FORM

STYLE 10		
	50X MAG.	62.5XMAG
10"DIA.	T1015-00	T1016-00
14"DIA.	T1025-00	T1026-00

STYLE 11		
	50X MAG.	62.5XMAG
10"DIA.	T1115-00	T1116-00
14"DIA.	T1125-00	T1126-00

1. Available in glass. To order, add (—02) after order number.
2. Available in plastic. To order, add (—31) clear or (—32) frosted, after order number.

# American National & Unified Forms



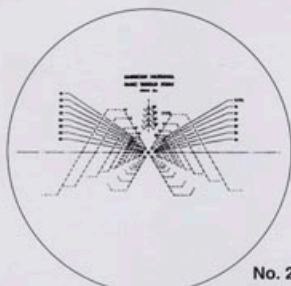
STYLE 31 — UNIFIED		
	50X MAG.	62.5XMAG
10"DIA.	T3115-00	T3116-00
14"DIA.	T3125-00	T3126-00

STYLE 30 — NATIONAL		
	50X MAG.	62.5XMAG
10"DIA.	T3015-00	T3016-00
14"DIA.	T3025-00	T3026-00

1. Available in glass. To order, add (—02) after order number.
2. Available in plastic. To order, add (—31) after order number.

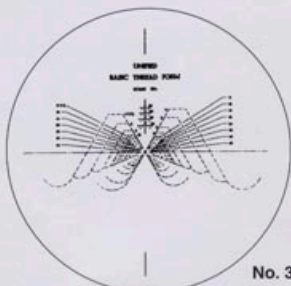
Additional Style Thread Charts Available Upon Request.

**WHEN ORDERING THREAD CHARTS, PLEASE SPECIFY MAGNIFICATION OF COMPARATOR.**



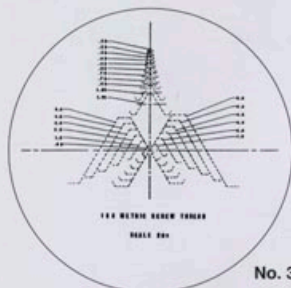
**American National Basic Thread Form**

For checking thread angles, root and crest-forms and depth, from 4 to 80 pitch threads, as defined in the Federal Standard Handbook H-28.



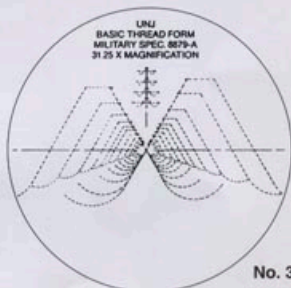
**Unified Basic Thread Form**

For checking thread angles, root and crest-forms and depth, from 4 to 80 pitch threads, as defined in the 1978 edition of Federal Standard H-28.



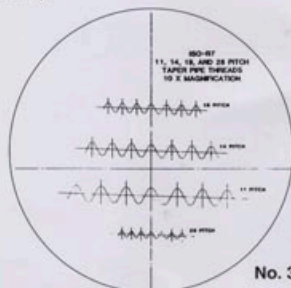
**ISO Metric Screw Threads**

For checking thread angles, root and crest-forms and depth, from .25 to 6.0 mm pitch threads, as defined in the 1978 edition to Federal Standard H-28. Also available in same format as chart no. 36 (single pitch threads).



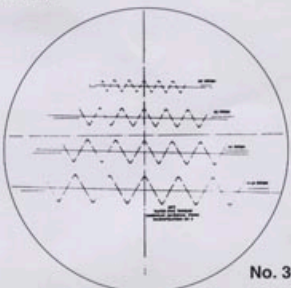
**UNJ Basic Thread Form, Military Spec. 8879A**

For checking thread angles, root and crest-forms and depth, from 4 to 80 pitch threads, as defined in the 1973 Military Specification Manual MIL-S-8879A. Also available in same format as chart no. 36 (single pitch threads).



**ISO Taper Pipe Threads**

For rapid checking of thread form, lead, taper, truncation, and included angle.



**American National Form Taper Pipe Thread**

For rapid checking of thread form, lead, taper, etc., as defined in National Bureau of Standards Handbook H-28.

Note: Should your particular thread form needs not be shown in charts 29-36, please specify the type of thread form you wish and we are certain Unlimited Services, Inc. can meet your requirements.

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