STERLING metric converter

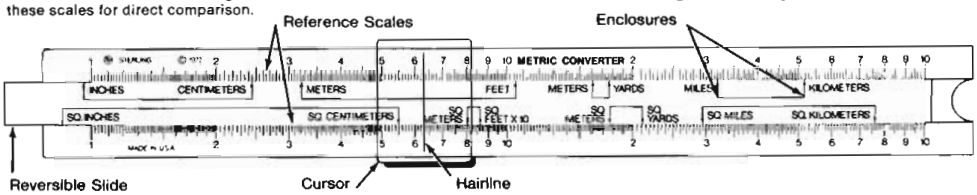
BASED ON THE INTERNATIONAL SYSTEM OF UNITS (SI)

OPERATING INSTRUCTIONS

A complete course in the use and operation of the Metric Converter

The Sterling Metric Converter is an accurate and convenient instrument for converting quantities from the U.S. Standards of Weights and Measures to the Metric System or from the Metric to the U.S. System.

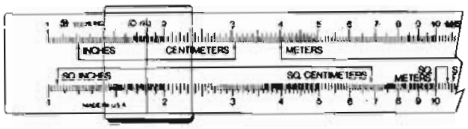
The Metric Converter consists of two basic reference Scales located on the body. The Reversible Slide has a series of black Enclosures showing a pre-plotted relationship between the two measurement systems. Units of Length and Area are on one side of the slide with units of Weight and Volume on the other. The Cursor travels the full length of the body and the Hairline crosses these scales for direct comparison.



GENERAL INFORMATION:

1. The basic reference scales are logarithmic and identical. The first half of the scale starts with the unit 1. The second half of the scale starts with the unit 10. Each half of the scale is further divided into ten parts by printed numbers. The scale between any two printed numbers is further subdivided into at least 10 divisions. These scales enable the reader to represent any value from 1 to 10 on the left half of the scale and from 10 to 100 on the right half. Any other value smaller or larger may be represented by mentally setting these scales to read any other range of one hundred, i.e. 0.1 to 1.0 to 10.0 or 10.0 to 100.0 to 1000.0, etc.

2. These scales can be read accurately to two significant figures; the third significant figure can be readily estimated by eye with just a little practice. For Example:

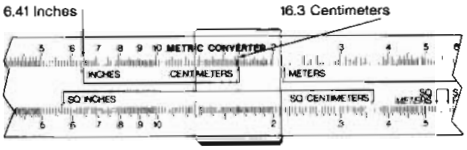


This position could be read as 0.0181 or 0.181 or 1.81 or 18.1

BASIC CONVERSIONS FOR UNITS OF LENGTH AND AREA:

Inches to Centimeters or Millimeters — Find the Inches to Centimeters *(or Millimeters × 10)* enclosure on the slide. Set the left arrow on the inch value to be converted to centimeters. Set the hairline of the cursor over the right arrow and read your answer on the same scale. For Example:

6.41 Inches — 16.3 Centimeters



Note: In this example we mentally set the left-hand portion of the scale to represent values from 1. to 10. Therefore the answer on the right-hand portion of the scale would be read not as 1.63 cm but 16.3 cm.

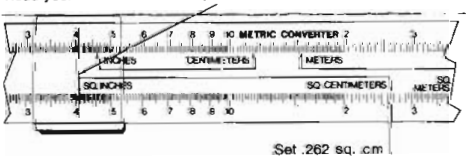
Meters to Feet — Find the Meters to Feet enclosure on the slide. Set the left arrow on the Meter value to be converted to Feet. Set the hairline of the cursor on the right hand arrow and read your answer on the same scale. *Example:* Set the left arrow at 3.29 m and read your answer — 10.8 ft. on the right arrow.

Yards to Meters — Find the Meters to Yards enclosure on the slide. Set the right arrow on the Yard value to be converted to Meters and read your Meter value on the left arrow. *Example:* Set 4.29 yds. on the right arrow and read your answer — 3.92 m on the left arrow.

Miles to Kilometers — Find the Miles to Kilometers enclosure on the slide. Set the left arrow on the Mile value to be converted to Kilometers. Set the hairline of the cursor on the right hand arrow and read your answer on the same scale. *Example:* Set .425 mi. on the left arrow and read your answer — .684 km on the right arrow.

Square Centimeters to Square Inches — Find the Sq. Inches to Sq. Centimeters enclosure on the slide. Set the right arrow on the Square Centimeter value to be converted to Square Inches. Note: In this example it will be obvious that the left arrow of the enclosure is off the scale. Therefore, the setting (.262 sq. cm) must be made on the right half of the scale. Set the hairline of the cursor over the left arrow and read your answer.

Read your answer — .0406 Sq. In.



Set .262 sq. cm

Square Meters to Square Feet — Find the Square Meters to Square Feet × 10 enclosure on the slide. Set the hairline of the cursor on the left hand arrow and read your answer on the right hand arrow. *Example:* Set 12.2 Square Meters on the left arrow and read your answer — 131 Square Feet on the right arrow, remembering to multiply your answer by 10, as the slide indicates.

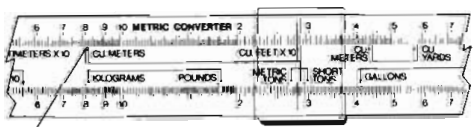
Square Meters to Square Yards — Find the Square Meters to Square Yards enclosure on the slide. Set the left arrow on the Square Meter value to be converted to Square Yards. Set the hairline of the cursor on the right hand arrow and read your answer on the same scale. *Example:* Set .185 sq. m on the left arrow and read your answer — .221 sq. yds. on the right arrow.

Square Kilometers to Square Miles — Find the Square Miles to Square Kilometers enclosure on the slide. Set the right arrow on the Square Kilometer value to be converted to Square Miles and read your Square Mile value on the left arrow. *Example:* Set 1.55 sq. km on the right arrow and read your answer — .599 sq. mi. on the left arrow.

BASIC CONVERSIONS FOR UNITS OF WEIGHT AND VOLUME:

Cubic Inches to Cubic Centimeters — Find the Cubic Inches to Cubic Centimeters × 10 enclosure on the slide. Set the left arrow on the Cubic Inch value to be converted to Cubic Centimeters and read your converted value on the right arrow. *Example:* Set 92.5 cu. in. on the left arrow and read your answer — 1520 cu. cm on the right arrow. Remember you have to multiply by 10 to achieve this answer.

Cubic Meters to Cubic Feet — Find the Cubic Meters to Cubic Feet × 10 enclosure on the slide. Set the left arrow on the Cubic Meter value to be converted to Cubic Feet. Now set the hairline of the cursor over the right arrow and read your answer on the same scale, remembering to multiply your answer by 10 as the scale indicates.

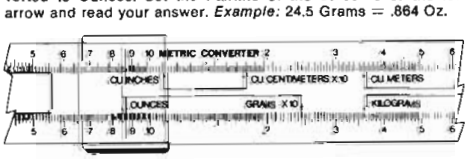


8.11 cu. m — Read this value as 28.6. Multiply this value by 10 . . . 28.6 × 10 = 286 cu. ft.

Cubic Meters to Cubic Yards — Find the Cubic Meters to Cubic Yards enclosure on the slide. Set the left arrow on the Cubic Meters value to be converted to Cubic Yards and read your converted value on the right arrow. *Example:* Set 5.18 cu. m on the left arrow and read your answer — 6.78 cu. yds. on the right arrow.

Liters to Quarts — Find the Liters to Quarts enclosure on the slide. Set the left arrow on the Liter value to be converted to Quarts and read your answer on the right arrow. *Example:* Set 12.2 Liters on the left arrow and read your answer — 12.9 Qts. on the right arrow.

Grams to Ounces — Find the Ounces to Grams × 10 enclosure on the slide. Set the right arrow on the Gram value to be converted to Ounces. Set the hairline of the cursor over the left arrow and read your answer. *Example:* 24.5 Grams = .864 Oz.



Note: Care must be taken in the placement of the decimal point in this example. On all the conversions indicating a factor of 10 and when using the converter from left to right, *multiply* your answer by 10. When moving from right to left *divide* your answer by 10. In this case the answer would be 8.64 ÷ 10 = .864 Oz.

Pounds to Kilograms — Find the Kilograms to Pounds enclosure on the slide. Set the right arrow on the Pound value to be converted to Kilograms and read your Kilogram value on the left arrow. *Example:* 12.5 lbs. equals 5.67 kg.

Metric Tons to Short Tons — Find the Metric Ton to Short Ton enclosure on the slide. Set the left arrow on the Metric Ton value to be converted to Short Tons and read your answer on the right arrow. *Example:* 9560 Metric Tons equals 10500 Short Tons.

Liters to Gallons — Find the Gallons to Liters enclosure on the slide. Set the right arrow on the Liter value to be converted to Gallons and read your answer on the left arrow. *Example:* 35.6 Liters equals 9.40 Gallons.

USEFUL INFORMATION

1. When very large or small metric numbers are used, the following list of prefixes and symbols may be applied. *For Example:* Instead of using 12 million meters we could convert to 12 mega meters, or instead of using one thousandth of a liter we could convert to 1 milliliter.

THESE PREFIXES MAY BE APPLIED TO ALL UNITS IN THE METRIC SYSTEM

THE INTERNATIONAL SYSTEM OF UNITS (SI)

Multiples and submultiples	Prefixes	Symbols	Multiples and submultiples	Prefixes	Symbols
$1\ 000\ 000\ 000\ 000 = 10^{12}$	tera	T	$0.1 = 10^{-1}$	deci	d
$1\ 000\ 000\ 000 = 10^{9}$	giga	G	$*0.01 = 10^{-2}$	centi	c
$*1\ 000\ 000 = 10^{6}$	mega	M	$*0.001 = 10^{-3}$	milli	m
$*1000 = 10^{3}$	kilo	k	$*0.000\ 001 = 10^{-6}$	micro	μ
$100 = 10^{2}$	hecto	h	$0.000\ 000\ 001 = 10^{-9}$	nano	n
$10 = 10$	deka	da	$0.000\ 000\ 000\ 001 = 10^{-12}$	pico	p

*Most commonly used

2. For more precise calculation (greater than 3 significant figures), you may find the following list of standard conversions useful:

COMMON EQUIVALENTS AND CONVERSIONS

Conversions from American System to Metric and Vice Versa Including Equivalents

	Approximate Common Equivalents		Conversions Accurate to Parts Per Million	
LENGTH	1 inch	= 25 millimeters	inches × 25.4*	= millimeters
	1 millimeter	= 0.04 inch	millimeters × 0.0393701	= inches
	1 inch	= 2.54 centimeters	inches × 2.540000	= centimeters
	1 centimeter	= 0.3937 inch	centimeters × 0.393701	= inches
	1 foot	= 0.3 meter	feet × 0.3048*	= meters
	1 meter	= 3.3 feet	meters × 3.28084	= feet
	1 yard	= 0.9 meter	yards × 0.9144*	= meters
	1 meter	= 1.1 yards	meters × 1.09361	= yards
	1 mile	= 1.6 kilometers	miles × 1.60934	= kilometers
	1 kilometer	= 0.6 mile	kilometers × 0.621371	= miles
AREA	1 square inch	= 6.5 square centimeters	square inches × 6.4516*	= square centimeters
	1 square centimeter	= 0.16 square inch	square centimeters × 0.155000	= square inches
	1 square foot	= 0.09 square meter	square feet × 0.0929030	= square meters
	1 square meter	= 11 square feet	square meters × 10.7639	= square feet
	1 square yard	= 0.8 square meter	square yards × 0.836127	= square meters
	1 square meter	= 1.2 square yards	square meters × 1.19599	= square yards
	1 square mile	= 2.590 square kilometers	square miles × 2.58888	= square kilometers
	1 square kilometer	= 0.3861 square miles	square kilometers × 0.386138	= square miles
VOLUME	1 cubic inch	= 16 cubic centimeters	cubic inches × 16.3871	= cubic centimeters
	1 cubic centimeter	= 0.06 cubic inch	cubic centimeters × 0.0610237	= cubic inches
	1 cubic foot	= 0.03 cubic meter	cubic feet × 0.0283168	= cubic meters
	1 cubic meter	= 35 cubic feet	cubic meters × 35.3147	= cubic feet
	1 cubic yard	= 0.8 cubic meter	cubic yards × 0.764555	= cubic meters
	1 cubic meter	= 1.3 cubic yards	cubic meters × 1.30795	= cubic yards
	1 quart (lq.)	= 1 liter†	quarts (llq.) × 0.946353	= liters
	1 liter†	= 1 quart (lq.)	liters × 1.05669	= quarts (lq.)
	1 gallon	= 4 liters	gallons × 3.78541	= liters
	1 liter	= .25 gallon	liters × 0.264172	= gallons
MASS	1 ounce (avdp)	= 28 grams	ounces (avdp) × 28.3495	= grams
	1 gram	= 0.035 ounces (avdp)	grams × 0.0352740	= ounces (avdp)
	1 pound (avdp)	= 0.45 kilogram	pounds (avdp) × 0.453592	= kilograms
	1 kilogram	= 2.2 pounds (avdp)	kilograms × 2.20462	= pounds (avdp)
	1 short ton	= .9078 metric ton	short tons × 0.907029	= metric tons
	1 metric ton	= 1.102 short tons	metric tons × 1.10250	= short tons

†common term not used in SI *exact

Reminders:

1. If you mentally set the unit 1 at the left of the scale to be 0.1, the center 1 would be 1.0 and the right 1 would be 10.0. Always remember your initial setting. This will minimize the decimal point placement errors in your calculations.

2. If you try to perform a conversion operation and the arrow that should have given your answer is off the scale, move the arrow on the slide to the corresponding value to be converted on the other half of the scale. Your conversion is now possible.

Practice:

Using the standard conversions available in the table above, try the following problems in *longhand*. (Answers Below)

1. 122 cu. cm Is equal to_____cubic in.
2. 9 qt. Is equal to_____liters
3. 15.2 oz. Is equal to_____grams
4. 15.3 ft. is equal to_____meters
5. 43.4 m^2 Is equal to_____ft^2

Now, using the Sterling Metric Converter, calculate the same problems again and note the amount of time you have saved.

Answers: 1. 7.44 cu. in. 2. 8.52 liters 3. 431 grams
4. 4.66 meters 5. 467 ft^2

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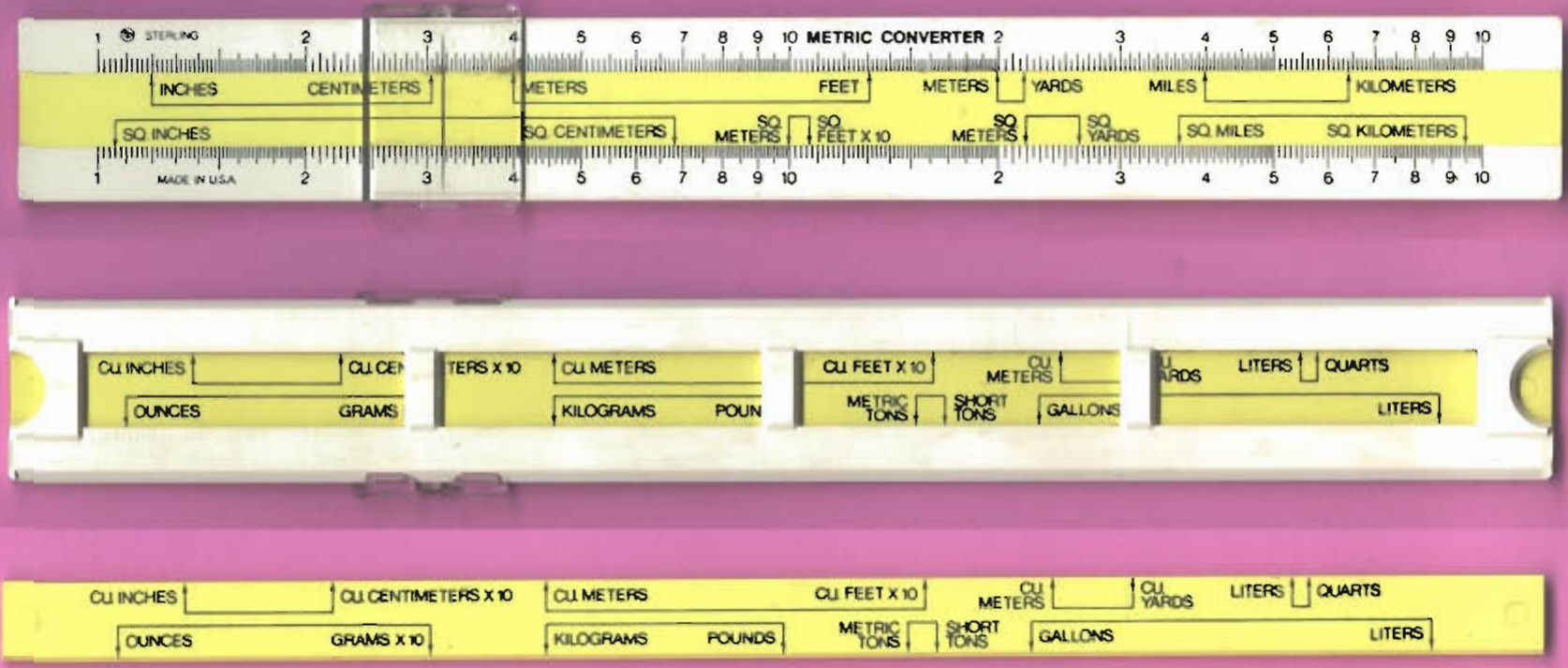
STERLING
METRIC CONVERTER
INCHES
CENTIMETERS
METERS
FEET
METERS
YARDS
MILES
KILOMETERS
SQ. INCHES
SQ. CENTIMETERS
SQ. METERS
SQ. FEET X 10
SQ. METERS
SQ. YARDS
SQ. MILES
SQ. KILOMETERS
MADE IN U.S.A.
CU. INCHES
OUNCES
GRAMS
TERS X 10
CU. METERS
KILOGRAMS
POUN
CU. FEET X 10
CU. METERS
METRIC TONS
SHORT TONS
GALLONS
LITERS
QUARTS
LITERS
CU. INCHES
CU. CENTIMETERS X 10
OUNCES
GRAMS X 10
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