

Use this sheet as a quick reference for common power transmission formulas and conversions.

MDS of Michigan helps customers with motors, V-belts, sheaves, bearings, chain, sprockets, reducers, couplings, and other industrial power transmission parts. Keep this printable nearby when checking calculations.

Industrial Unit Conversion Formulas

WHAT IT CALCULATES	FORMULA	REVERSE FORMULA
Horsepower / Kilowatts	$HP = kW \times 1.34$	$kW = HP \times 0.746$
Inches / Millimeters	$in = mm \div 25.4$	$mm = in \times 25.4$
Pounds / Kilograms	$lb = kg \times 2.205$	$kg = lb \times 0.454$
Torque Conversion	$lb-in = Nm \times 8.85$	$Nm = lb-in \times 0.113$
Quarts / Liters	$Quart = Liter \times 1.057$	$Liter = Quart \times 0.946$

Horsepower and Torque Formulas

WHAT IT CALCULATES	FORMULA	USED FOR
Horsepower from Torque	$HP = T(lb-in) \times RPM \div 63025$	Find horsepower from pound-inch torque.
Torque in lb-in	$T(lb-in) = HP \times 63025 \div RPM$	Find torque from horsepower and RPM.
Horsepower from lb-ft Torque	$HP = T(lb-ft) \times RPM \div 5252$	Find horsepower from pound-foot torque.
Torque in lb-ft	$T(lb-ft) = HP \times 5252 \div RPM$	Find pound-foot torque from horsepower and RPM.

QUICK TIP

When replacing a motor, reducer, or drive component, confirm horsepower, RPM, torque, frame size, mounting style, and application requirements before ordering.

Conveyor, Lift, and Belt Speed Formulas

WHAT IT CALCULATES	FORMULA	USED FOR
Lift Horsepower	$HP(lift) = Wgt(lb) \times FPM \div 33000 \times EFF$	Estimate HP to lift a load vertically.
Sliding Horsepower	$HP(slide) = Wgt(lb) \times \mu \times FPM \div 33000 \times EFF$	Estimate HP to move a load across a surface.
Belt Speed	$FPM = 0.2618 \times Dia(in) \times RPM$	Find belt speed in feet per minute.
Pulley RPM	$RPM = FPM \times 3.820 \div Dia(in)$	Find pulley RPM from belt speed and diameter.

Three Phase Motor Horsepower Formula

WHAT IT CALCULATES	FORMULA	USED FOR
3 Phase Motor HP	$HP(3ph) = 1.732 \times V \times I \times PF \times EFF \div 746$	Estimate motor HP from volts, amps, PF, and efficiency.

FORMULA NOTE

These formulas are general industry references. Real-world applications may require additional service factors, efficiency losses, safety factors, and manufacturer recommendations.

Need Help With a Formula or Power Transmission Part?

MDS of Michigan supplies mechanical, electrical, and power transmission products for industrial applications. Whether you are working with motors, V-belts, sheaves, reducers, bearings, roller chain, sprockets, or couplings, our team can help.

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