

The Alder Hill News Jim-Dandy Metric Weight Ratio Converter

By The Alder Hill Outhouse Monster

Young rainbow trout die at significantly increased rates if they are exposed one month to 38 parts per quadrillion (ppq) of 2,3,7,8-TCDD ("dioxin") in their water. Do you know that 38 ppq is equivalent to 38 inches in 85 round trips to the sun and back?

Quick: Is micrograms/kilograms parts per million, billion, or trillion? Answer: parts per billion.

Photocopy your Jim-Dandy Metric Weight Ratio Converter, cut it out, mount it on gold, and hang it on your wall. Make a lot of copies; give them away; keep one in your wallet. —Ed.

Finally, after more than ten years of research, development, and procrastination, it's done! No longer need you spend countless hours pulling your hair, trying to remember, research, calculate, divine, or otherwise convert metric weight ratios.

The Jim-Dandy Converter handles most of the common weight (or, to be more precise, mass) conversion problems. If you know you need it, you know how to use it: Just find your TOEs!

We've also included a table of comparisons commonly used by industry (I.E.'s, or Industrial Equivalents). We're interested in collecting any good ones you hear, as long as we can get an exact quote and citation.

Watch out, however, for the "apples and oranges" problem. For example, some aquatic toxicologists like to use measures such as ug/l (micrograms per liter). One side of their ratio is mass and the other side is volume, however, and that doesn't translate easily. One liter of fresh water weighs one kilogram at sea level, but salt water or water at other elevations will not weigh precisely one kilogram. If anyone develops or finds conversion tables for some of these types of problems, we'd love to have a copy and would pass them on.

The Alder Hill Outhouse Monster functions at Alder Hill Farm in Tidewater, Oregon.

Table One
Metric Weight Equivalents

Measure	kg	gm	mg	ug	ng	pg	fg
kg (kilogram)	= 1	10 ³	10 ⁶	10 ⁹	10 ¹²	10 ¹⁵	10 ¹⁸
gm (gram)	= 10 ⁻³	1	10 ³	10 ⁶	10 ⁹	10 ¹²	10 ¹⁵
mg (milligram)	= 10 ⁻⁶	10 ⁻³	1	10 ³	10 ⁶	10 ⁹	10 ¹²
ug (microgram)	= 10 ⁻⁹	10 ⁻⁶	10 ⁻³	1	10 ³	10 ⁶	10 ⁹
ng (nanogram)	= 10 ⁻¹²	10 ⁻⁹	10 ⁻⁶	10 ⁻³	1	10 ³	10 ⁶
pg (picogram)	= 10 ⁻¹⁵	10 ⁻¹²	10 ⁻⁹	10 ⁻⁶	10 ⁻³	1	10 ³
fg (femtogram)	= 10 ⁻¹⁸	10 ⁻¹⁵	10 ⁻¹²	10 ⁻⁹	10 ⁻⁶	10 ⁻³	1

Table Two
Table One Equivalents (TOEs)

TOEs	Part per	Exponent
gm/kg mg/gm ug/mg ng/ug pg/ng fg/pg	= thousand	(10 ⁻³)
mg/kg ug/gm ng/mg pg/ug gf/ng	= million	(10 ⁻⁶)
ug/kg ng/gm pg/mg fg/ug	= billion	(10 ⁻⁹)
ng/kg pg/gm fg/mg	= trillion	(10 ⁻¹²)
pg/kg fg/gm	= quadrillion	(10 ⁻¹⁵)
fg/kg	= quintillion	(10 ⁻¹⁸)

Table Three
Industrial Equivalents (I.E.'s)
—ppm (part per million)—

- One second in 11.57 days
- One inch in 15.78 miles
- One inch-square postage stamp in a 6,944-square-foot lot

—ppb (part per billion)—

- One second in 32 years
- One inch in 15,782 miles (about two-thirds around the equator)
- One inch-square postage stamp in a 159-acre farm

—ppt (part per trillion)—

- One second in 32,000 years
- One inch in 15,782,828 miles (about two-thirds of the way to Venus)
- One inch-square postage stamp in a city of 249 square miles (4 times larger than Washington, DC)
- One drop in an olympic size swimming pool

—ppq (part per quadrillion)—

- One second in 32,000,000 years
- One inch in 15,782,828,280 miles (about 85 round trips to the sun and back)
- One inch-square postage stamp in 249,000 square miles (all of New England, New York, New Jersey, Maryland, Virginia, North Carolina, and part of South Carolina)

* All but one of the I.E.'s (see footnote b) are quoted from American Paper Institute. "At-A-Glance: Dioxin in the Pulp and Paper Industry." 8/19/87 Master Copy.

b Quoted from Weyerhaeuser Canada Ltd, Kamloops, B.C., press release (April 13, 1988). The comparison was originally made, however, by Dr. Ralph Ross, former head of U.S. EPA's Dioxin Implementation Plan, on loan to EPA from USDA, in the mid-1970s.