

PROPERTIES OF ELEMENTARY PARTICLES (D5)

Particle Name	Symbol	Antiparticle	Invariant Mass m_0 [MeV/c ²] (Uncertainty)	Electric Charge Q [e]	Type and Sub-type / Generation	Spin S	Mean Life τ [per eV] (Uncertainty)
Up Quark	u	Antiup (\bar{u})	2.160 000 000 000 ^{+0.49} - 0.26	$+\frac{2}{3}$	Quark: Up-type, Gen. I	$\frac{1}{2}$	-
Down Quark	d	Antidown (\bar{d})	4.670 000 000 000 ^{+0.48} - 0.17	$-\frac{1}{3}$	Quark: Down-type, Gen. I	$\frac{1}{2}$	-
Charm Quark	c	Anticharm (\bar{c})	1 270.000 000 000 000 \pm 20	$+\frac{2}{3}$	Quark: Up-type, Gen. II	$\frac{1}{2}$	-
Strange Quark	s	Antistrange (\bar{s})	93.400 000 000 000 ^{+8.6} - 3.4	$-\frac{1}{3}$	Quark: Down-type, Gen. II	$\frac{1}{2}$	-
Top Quark	t	Antitop (\bar{t})	172 690.000 000 000 000 \pm 300	$+\frac{2}{3}$	Quark: Up-type, Gen. III	$\frac{1}{2}$	-
Bottom Quark	b	Antibottom (\bar{b})	4 180.000 000 000 000 ⁺³⁰ - 20	$-\frac{1}{3}$	Quark: Down-type, Gen. III	$\frac{1}{2}$	-
Electron	e	Positron (e^+)	0.510 998 950 000 \pm 0.000 000 000 15	-1	Lepton: Charged, Gen. I	$\frac{1}{2}$	$> 6.6 \times 10^{28}$ a
Electron Neutrino	ν_e	Electron Antineutrino ($\bar{\nu}_e$)	< 0.000 001 100 000	$< 4 \times 10^{-35}$	Lepton: Neutral, Gen. I	$\frac{1}{2}$	> 300 s
Muon	μ	Antimuon (μ^+)	105.658 375 500 000 \pm 0.000 002 3	-1	Lepton: Charged, Gen. II	$\frac{1}{2}$	$(2.196\,981\,1 \pm 0.000\,002\,2) \times 10^{-6}$ s
Muon Neutrino	ν_μ	Muon Antineutrino ($\bar{\nu}_\mu$)	< 0.190 000 000 000	$< 4 \times 10^{-35}$	Lepton: Neutral, Gen. II	$\frac{1}{2}$	> 300 s
Tau (Tauon)	τ	Antitau (τ^+)	1 776.860 000 000 000 \pm 0.12	-1	Lepton: Charged, Gen. III	$\frac{1}{2}$	$(290.3 \pm 0.5) \times 10^{-15}$ s
Tau Neutrino	ν_τ	Tau Antineutrino ($\bar{\nu}_\tau$)	< 18.200 000 000 000	$< 4 \times 10^{-35}$	Lepton: Neutral, Gen. III	$\frac{1}{2}$	> 300 s
Photon	γ	-	$< 1 \times 10^{-24}$	$< 1 \times 10^{-46}$	Boson: Gauge	1	-
Gluon	g	-	0 (Theoretical)	0	Boson: Gauge	1	-

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<i>W⁺</i>	W^+	-	80 377.000 000 000 000 \pm 12	1	Boson: Gauge	1	-
<i>W⁻</i>	W^-	-	80 377. 000 000 000 000 \pm 12	-1	Boson: Gauge	1	-
<i>Z</i>	Z	-	91 187.600 000 000 000 \pm 2.1	0	Boson: Gauge	1	-
<i>Higgs</i>	H^0	-	125 250.000 000 000 000 \pm 170	0	Boson: Scalar	0	1.6×10^{-22} s

Notes:

- Uncertainty: Provided in Standard Uncertainty Form ($1 \pm \sigma$) and Combined Standard Uncertainty Form ($1^{+\sigma}_{-\sigma}$)

Units:

- MeV/c²: Megaelectronvolts/Speed of Light² (Mass)
- e : Elementary Charge
- a: Year
- s: Second

Sources:

- Particle Name ^[1]
- Symbol ^[1]
- Invariant Mass, m_0 ^[1]
- Electric Charge, Q ^[1]
- Type and Sub-type/Generation ^[1]
- Spin, S ^[1]
- Mean Life, τ ^{[1] [2]}