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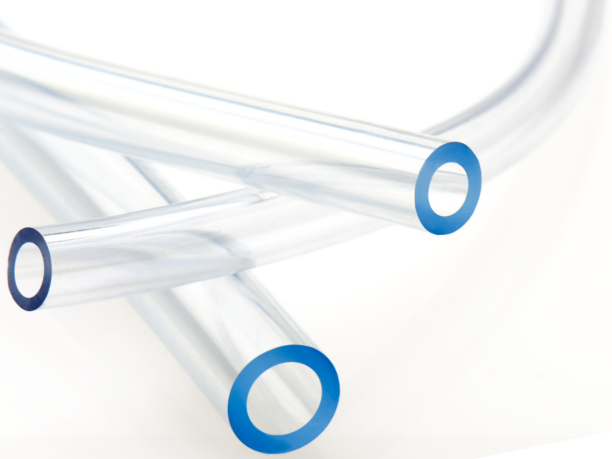
Silicone vs. Thermoplastic Tubing Comparison Chart



CRITERIA	SILICONE	THERMOPLASTICS (TPU, PEBA, TPE)
Heat Resistance	Excellent, holds shape and elasticity under repeated steam or thermal spikes	Grade dependent, high-heat grades exist but most soften or creep with steam
Flexibility & Kink Resistance	High elasticity, resists collapse even at tight bends	Tunable; softer grades may kink without thicker walls or reinforcement
Gas Permeability	Higher; may require thicker walls or barrier runs for gas-sensitive systems	Lower; better barrier to oxygen and CO_2 in closed systems
Chemical Resistance	Good with aqueous solutions; some solvents can swell or soften	Formulation dependent; options for strong solvent and alcohol resistance
Bonding & Assembly	Requires adhesives, primers, or mechanical fittings for dissimilar joins	Solvent bonding, RF/thermal welding, and overmolding for integrated builds
Pump Segment Performance	Strong elastic recovery, stable flow in peristaltic duty	Low-spallation grades available; validate under your pump cycle
Sterilization Compatibility	Excellent with EtO and steam; some grades handle radiation	Good with EtO; steam and radiation compatibility vary by grade

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