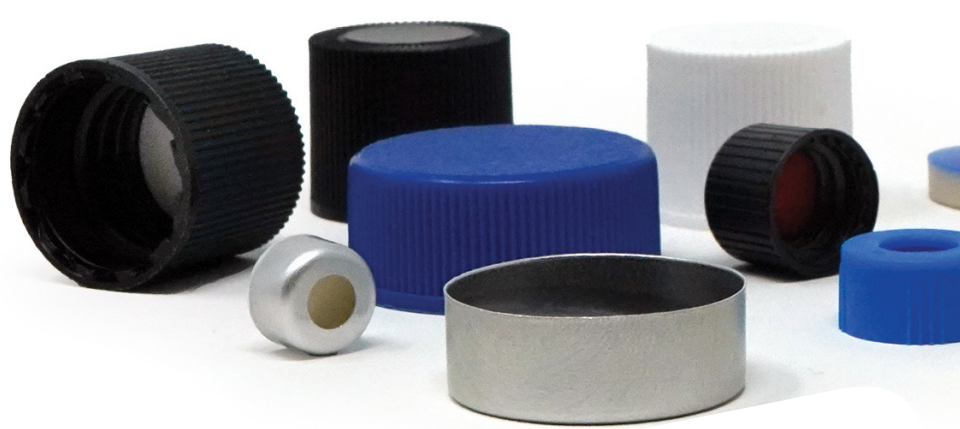


Cap Liner Materials Comparison Chart



	MATERIAL	ADVANTAGES	DISADVANTAGES
STRUCTURE	Silicone	<ul style="list-style-type: none"> • Resealable; ideal for repeated punctures • Performs across broad temperature ranges • Biocompatible and widely accepted in medtech • Chemically inert in many solvent environments • Compatible with EtO and steam sterilization 	<ul style="list-style-type: none"> • Lacks solvent barrier; needs film backing • Can swell or absorb aggressive solvents • Higher extractables than thermoplastics • More expensive than rubber or polyolefins
	Butyl Rubber	<ul style="list-style-type: none"> • Excellent gas and moisture barrier • Compatible with aqueous and mild solvents • Strong sealing performance • Lower cost than silicone or PTFE 	<ul style="list-style-type: none"> • Degrades under high heat or sterilization • Not ideal for harsh solvents or pH extremes • Limited resealability • Can become brittle over time or in cold
BARRIER FILM	PTFE	<ul style="list-style-type: none"> • Outstanding chemical resistance • Ultra-low extractables and leachables • Stable up to 260°C • Effective moisture and gas barrier 	<ul style="list-style-type: none"> • Not resealable without backing • High cost and processing complexity • PFAS-regulated in some regions • Environmentally difficult to recycle
	Polypropylene	<ul style="list-style-type: none"> • Broad solvent compatibility • Fluorine-free and recyclable • Low extractables profile • Scalable and cost-efficient 	<ul style="list-style-type: none"> • Limited heat resistance (no autoclave) • Less effective against strong solvents • Not resealable • May deform under thermal load
	Emerging Materials (Copolymer Polyolefins, Engineered Thermoplastics)	<ul style="list-style-type: none"> • Tunable properties by formulation • PFAS-Free* and sustainability aligned • Suitable for automation • Application-specific optimization 	<ul style="list-style-type: none"> • Less historical validation • Processing conditions can be narrow or material-specific • Compatibility with harsh solvents varies by formulation

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