

Overmolding & Material Selection

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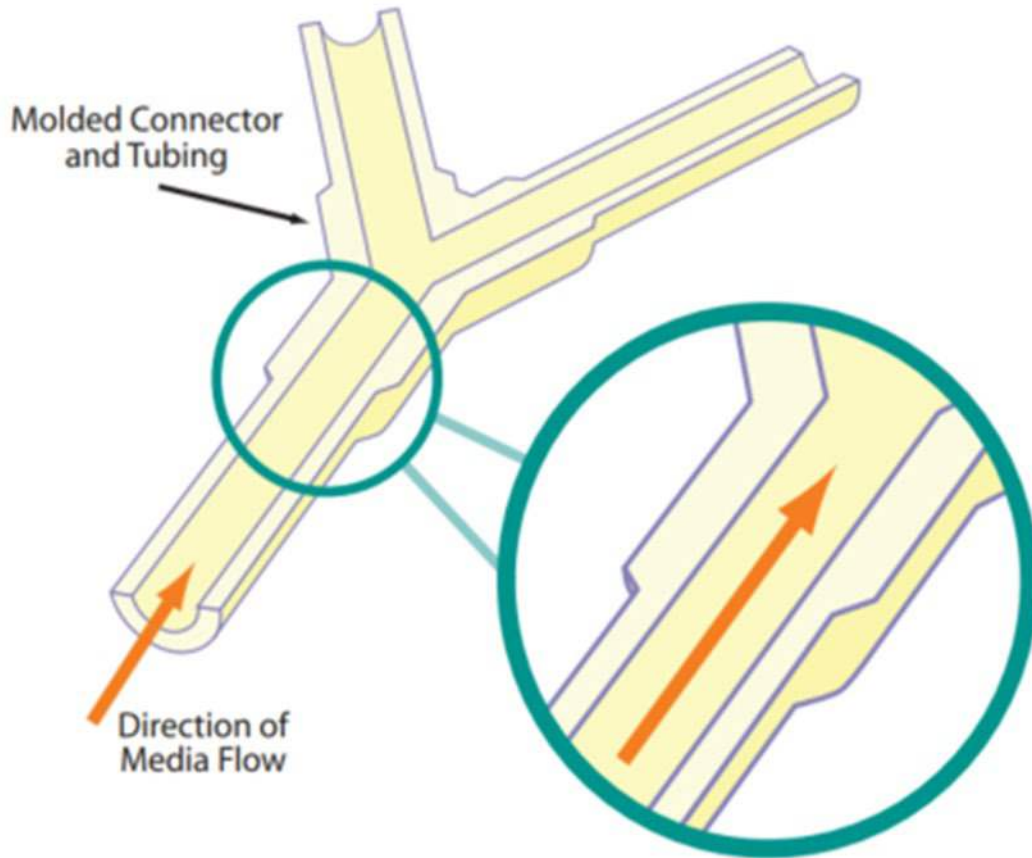


What is overmolding?

Overmolding is an injection molding process that allows for the combination of multiple parts and materials into a single part.

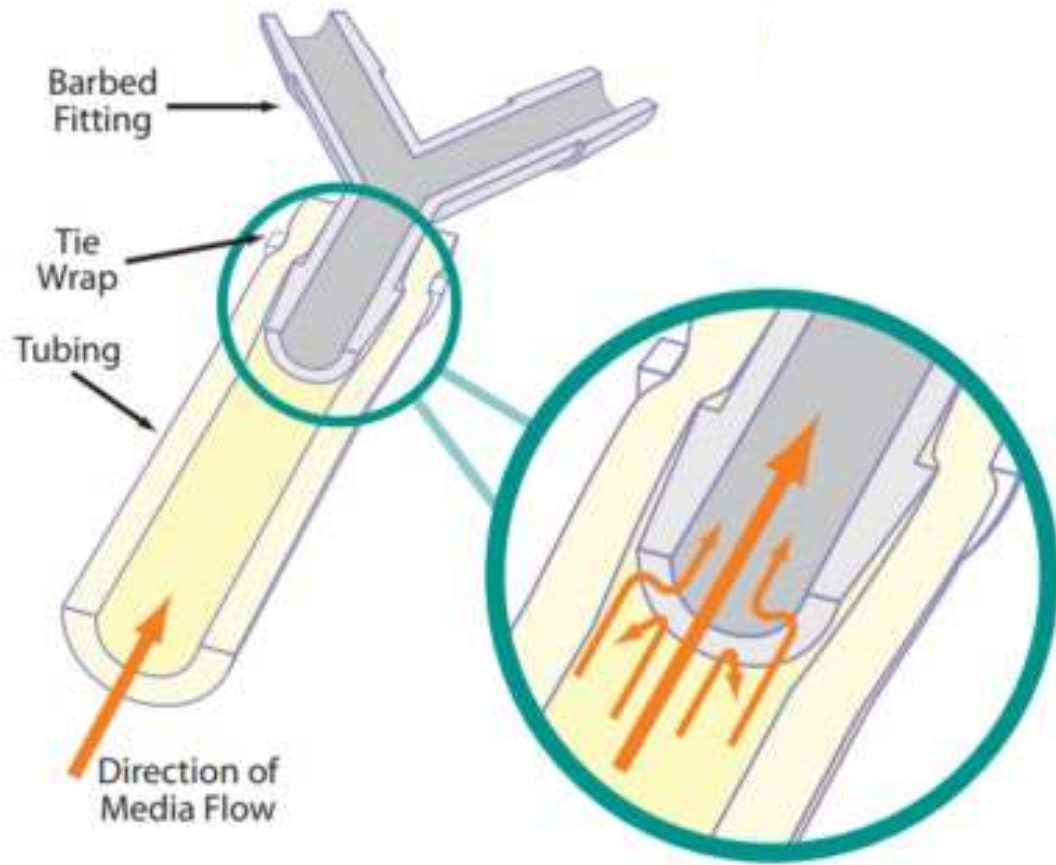


Overmolded Assembly



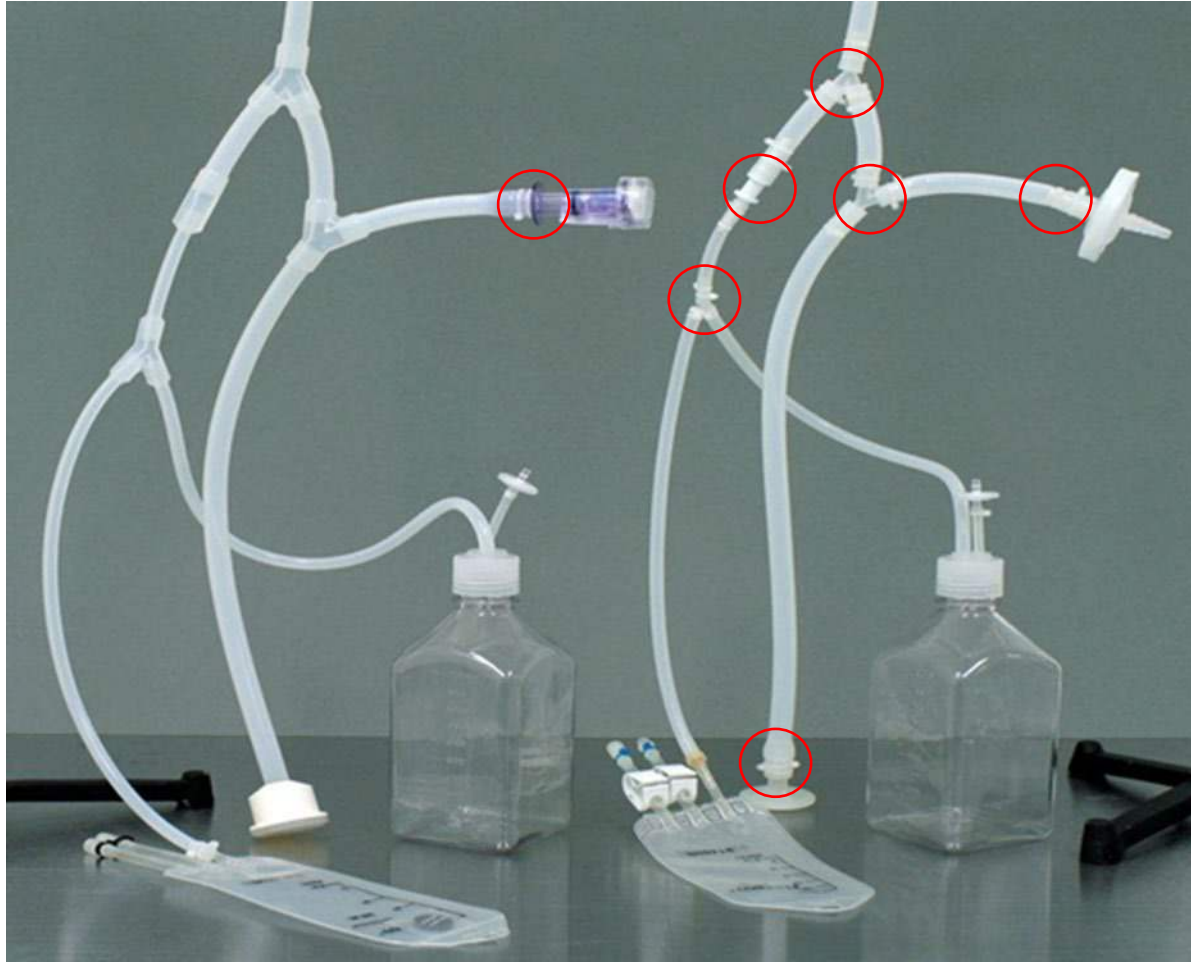
- Smooth inner bore
- Seamless
- No assembling required
- Same materials
- Laminar flow
- No additional components

Assembly with Fittings



- Entrapment areas
- Potential leak points
- Manual assembly
- Different materials
- Turbulent flow
- Supply chain risk

Fittings vs. Assembly Example



Leak Points

Barbed

Molded

13

1

Validation

- All overmolding must be defective free before being considered good
 - 10 defective free consecutive shots must be completed
- Validation testing includes:
 - Bubble emissions (1.5x working pressure of tubing)
 - Burst testing (failure must not be at junction)

Materials

	Silicone	TPE
Type	Thermoset	Thermoplastic elastomer
Temperature Range	-50° F to 400° F	-40° F to 140° F
Chemical Resistance	Good	Good to Better
Permeability	High	Medium
Sealable / Weldable	No	Yes
Surface	Tacky	Less Tacky
Color	Translucent	Translucent
Recyclable	Yes	Yes

Silicone is Weird

- Is an adhesive, polymer, oil, sealant and more
- Can be catalyzed with platinum or peroxide
- Doesn't melt but will burn
- Will change with gamma sterilization
- Has an extruded form – HCR and injection molded form - LSR

TPE is interesting

- Both a rubber and a plastic
- Are a mix of polymers or copolymers
- Melt processable
- Use less energy to process than silicone
- Polyurethane (TPU) can be considered a TPE
- Can be 3D printed

Questions?