SILICONES and more

Silicone Molds vs. Flexible Polyurethane Molds (for Concrete Products)

Aspect	Silicone Molds	Polyurethane Molds (Flexible)
Flexibility	Very flexible, even at low Shore A hardness	Flexible, but usually stiffer than silicone at the same hardness
Detail Reproduction	**Excellent** – captures even the finest textures	**Good to very good** – slightly less sharp on micro details
Demolding Performance	Very good, **self-releasing** – often no release agent needed	Good, but **release agent usually required**
Abrasion Resistance	Moderate – sensitive to wear from rough, abrasive mixes	**Very good** – more resistant to wear and heavy-duty use
Chemical Resistance	Good, but may swell with long-term exposure to oils or acids	**Better resistance** to oils, plasticizers, pigments, cement water
Temperature Resistance	Excellent (–60 °C to +200 °C)	Limited (usually 0 °C to +60/+80 °C depending on type)
Durability in Production	Average for high volumes, excellent for precise applications	**Longer lifespan** under rough industrial use and high series
Long-Term Shape Stability	Very stable, no shrinkage or deformation over time	May deform over time, especially with heat or improper storage
Shrinkage/Expansion	Virtually none	Light shrinkage (~1–2%) during curing or aging
Price per kg	High (€20–40/kg for industrial grade)	**Lower** (€8–20/kg depending on type and supplier)

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Aspect	Silicone Molds	Polyurethane Molds (Flexible)
Processing Time (Curing)	Generally slow, unless accelerated with additives	**Faster curing** – well-suited for serial production
Environmental Impact	Not biodegradable, but chemically inert	Not biodegradable, **greater impact if burned or leaked**
Repairability	Difficult – silicone doesn't bond well to itself after curing	**More repairable** with PU adhesives or heat
Cost-efficiency for large series	Less suited for high-volume without replacement	**More efficient** for large-scale production and abrasion

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Advantages at a Glance

Silicone Molds – Advantages

- Excellent detail reproduction (even fine textures)
- Very easy demolding (usually no release agent needed)
- Heat-resistant and dimensionally stable
- Ideal for complex or decorative products
- Chemically neutral (safe for pigment-sensitive or acid-sensitive mixes)

Polyurethane Molds – Advantages

- High wear resistance with rough concrete mixtures
- Longer life cycle under heavy use
- Lower material cost
- Fast curing in mold production
- Can be repaired if damaged

Disadvantages at a Glance

Silicone Molds – Disadvantages

- Higher material cost
- Lower abrasion resistance under heavy-duty use

- Slower processing time (unless accelerated)
- More difficult to repair
- Can swell with long-term contact with oils or colorants

Polyurethane Molds – Disadvantages

- Usually requires release agent (extra step and risk of air bubbles)
- Less suitable for extremely fine details
- Risk of deformation during improper storage or heat exposure
- May transfer pigments or additives into the product

When to Use Which Material?

Application Situation	Recommended Material
Decorative tiles with fine textures	**Silicone**
Mass production of paving stones or concrete slabs	**Polyurethane**
Concrete with many pigments or additives	Polyurethane (with release agent)
Exposure to heat or UV	**Silicone**
Budget-sensitive production with higher wear	**Polyurethane**

Liability

Siliconesandmore provides this information to the best of its knowledge and experience but accepts no liability. The customer is responsible for testing the suitability of the products