

# WACKER

# SILICONES

## Processing



# Introduction

- Wacker HCR and LSR silicone rubbers can be processed in a variety of ways
  - Extrusion
  - Compression molding
  - Transfer molding
  - Injection molding
  - Knife coating (on textiles)
- Selecting the best process
  - Properties specification?
  - Chemical and physical properties required?
  - Production run size?
  - Liquid or solid silicone rubber?
  - Geometry of the part?
  - Which equipment is available?

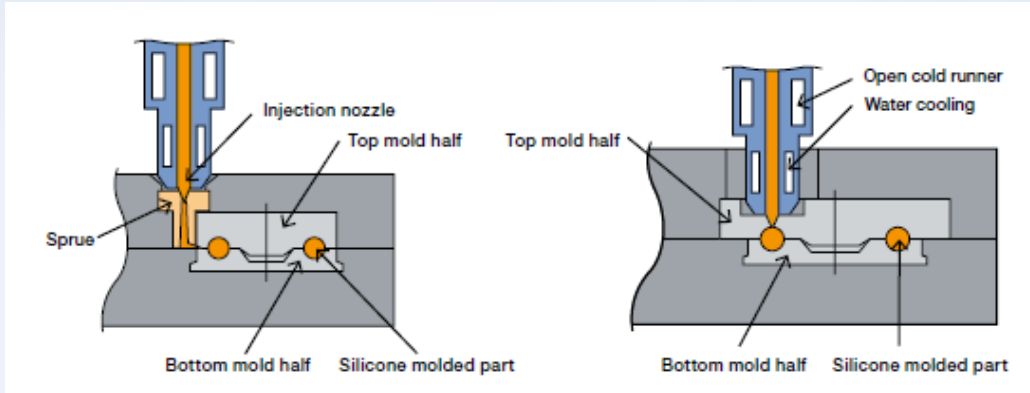
# Processing Silicone Elastomers

- Solid silicone elastomer (HCR)
  - Processing is highly variable, so that a wide range of different parts can be made with a few basic silicone grades
  - High flexibility for small-to-medium series
- Liquid silicone elastomer (LSR)
  - Two part system
  - Short cycle times (low viscosity, high curing speed)
  - Process can be fully automated
  - Molds with up to 256 cavities
  - Suitable for complex part geometry
  - 2K injection molding
  - No secondary finishing

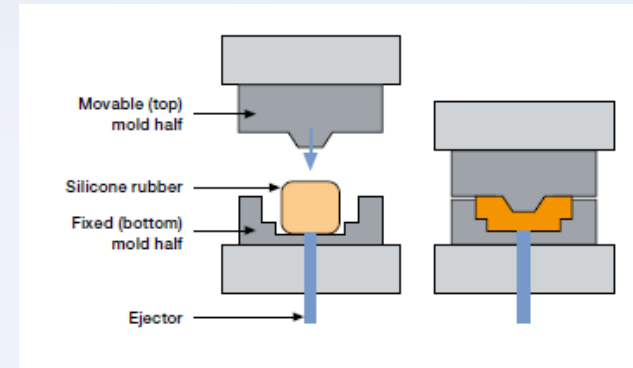
## Selection of the Rubber Grade by Process

Processing	Solid silicone rubber	Liquid silicone rubber
Extrusion	•	
Coextrusion	•	
Compression molding	•	
Transfer molding	•	
Injection molding	•	•
Doctor blade	•	•
Calendering	•	
Low-pressure filling		• (low-viscosity grades)

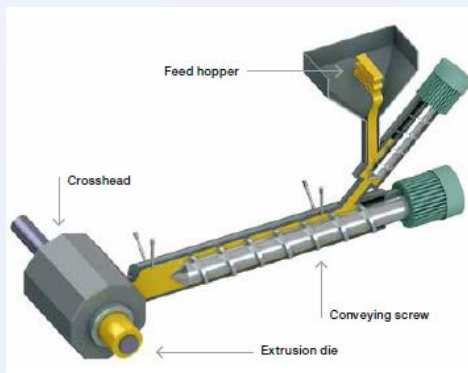
# Silicone Elastomer Processes



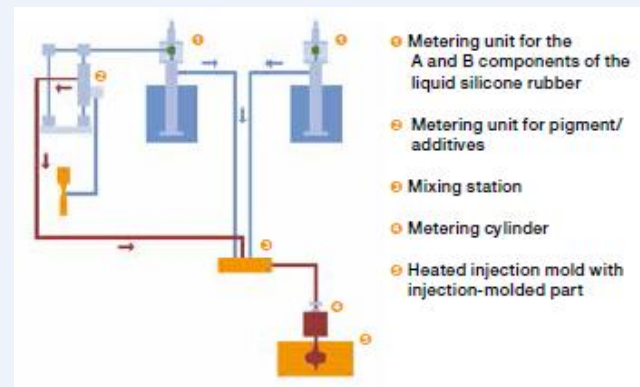
Solid Injection Molding



Compression Molding



Extrusion

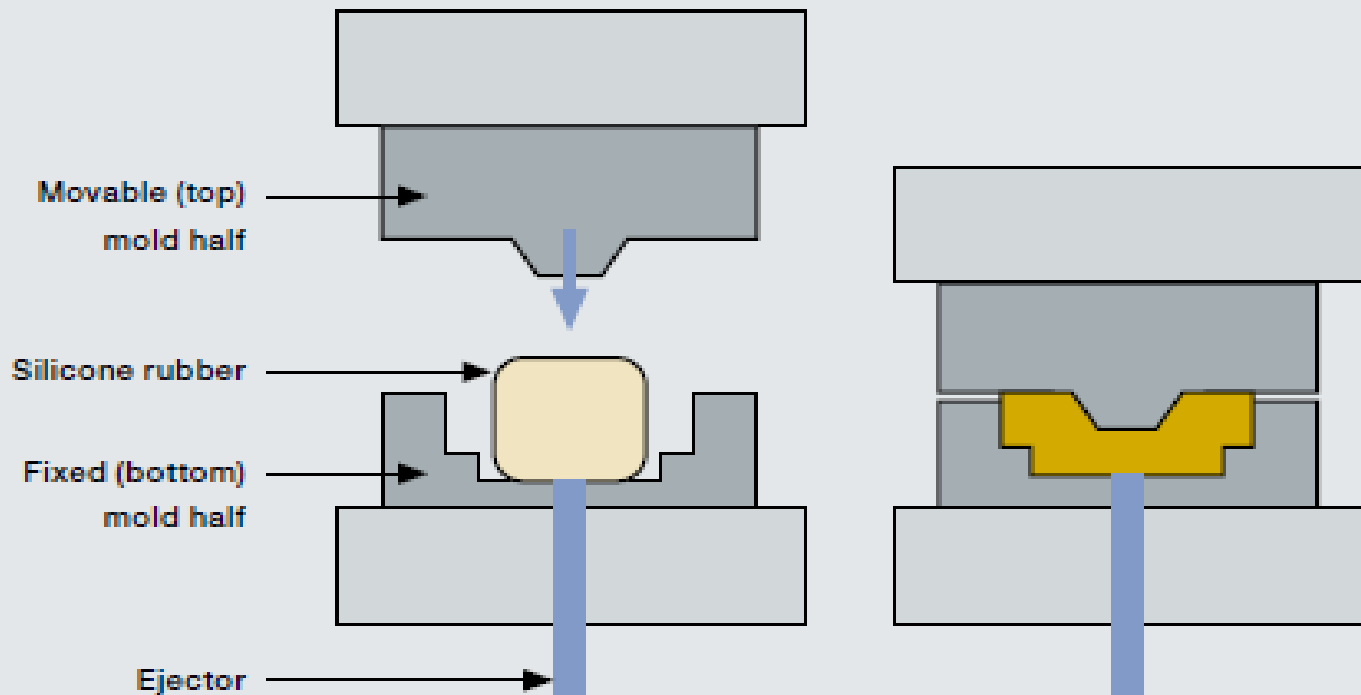


Liquid Injection Molding (LIM)

# Fabricating With Silicone

## HCR Compression Molding

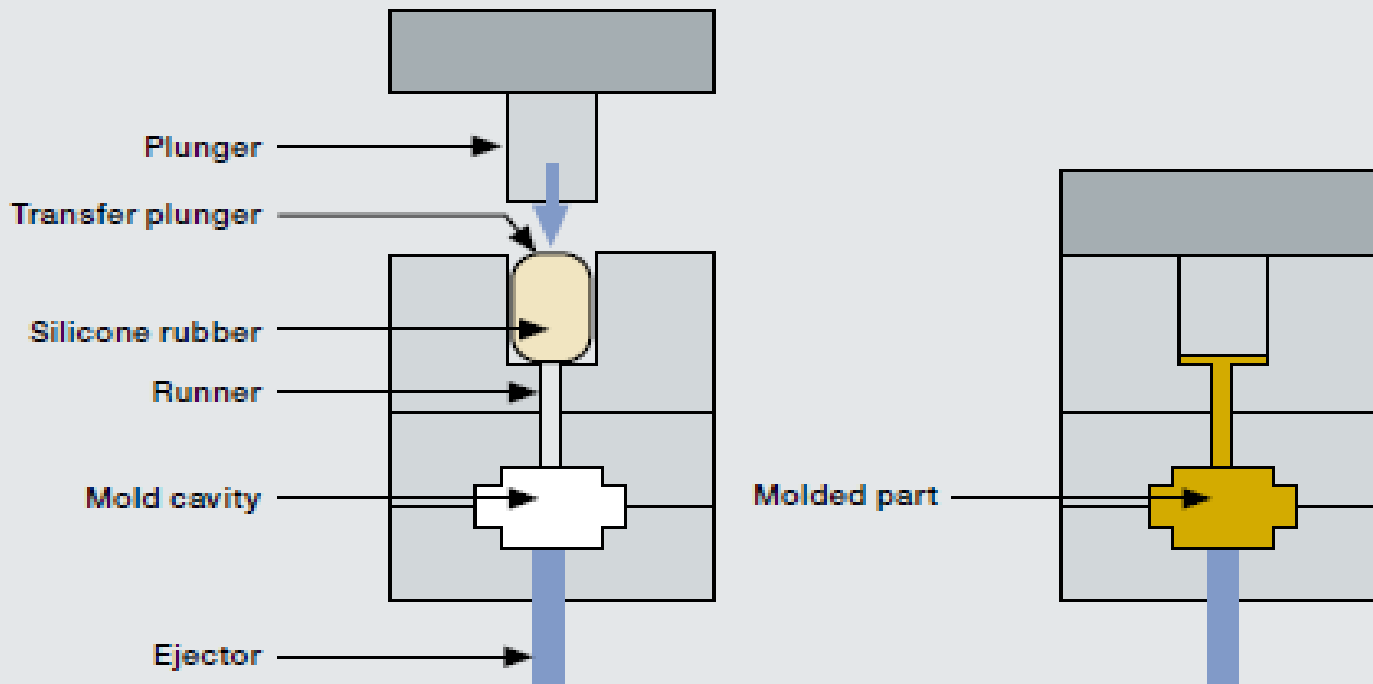
### Compression molding



# Fabricating With Silicone

## HCR Transfer Molding

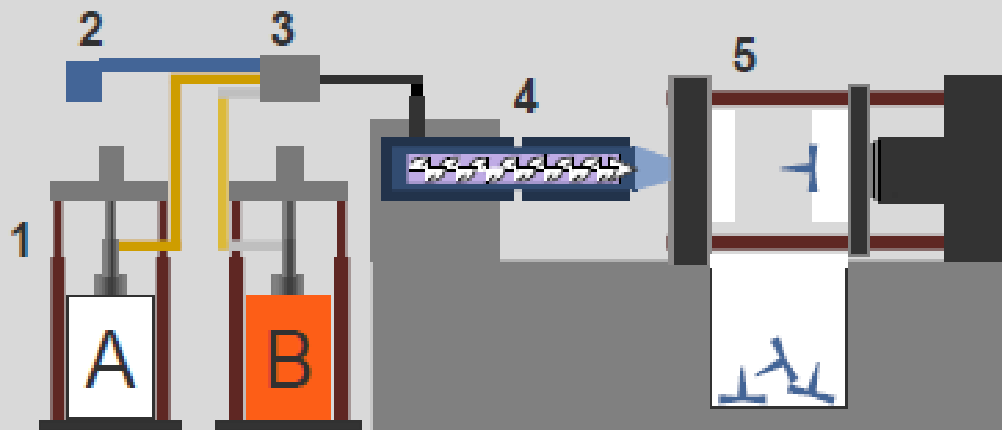
### Transfer molding



# Fabricating With Silicone

## LSR Injection Molding

### Injection molding / Process technology



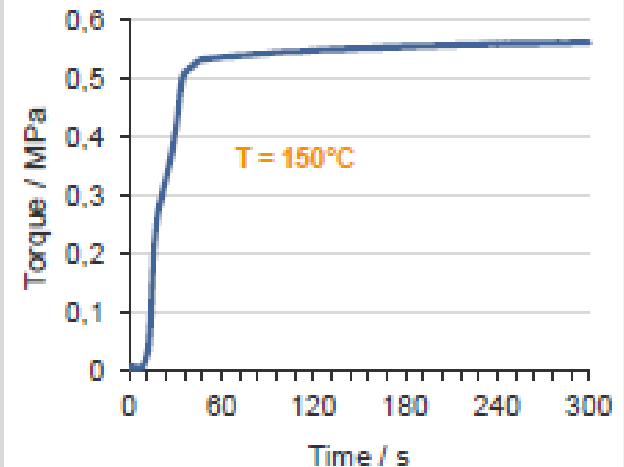
- (1) Metering device for A- and B-components
- (2) Metering device for pigment

- (3) Static mixer
- (4) Cooled metering screw
- (5) Heated injection mould

### Curing characteristics

- 180 °C: 5 - 8 seconds per 1 mm of thickness

### Curing behavior



Delivery forms:

Pails (Hobbocks) = 20 kg

Drums = 200 kg

# HCR Storage

- Solid silicone rubber can be stored up to 12 months depending on the grade
- Products stored longer than the above may still be usable...properties should be checked
- Long term storage of HTV silicone may cause a rise in Mooney” viscosity...this is reversible
- Rubber stored too long may be restored by replastating on a roll mill
- Recommended storage conditions
  - Store in closed containers in cool rooms at 0 to 30°C
  - No direct sunlight
  - Keep separate from organic rubber and crosslinking chemicals



# LSR Storage

- If properly stored Wacker LSR liquid silicone rubber has a shelf life of up to 12 months
- Even if the product is stored for longer than recommended storage you can usually still use it...properties should be checked
- As with HTV silicones viscosity may increase during storage...this can be reversed
  - Material can still be processed despite higher viscosity
- Recommended storage conditions
  - Store in closed containers in a cool room at 0 to 30°C
  - No exposure to direct sunlight
  - Higher average temperatures may shorten shelf life

**Thank You !**