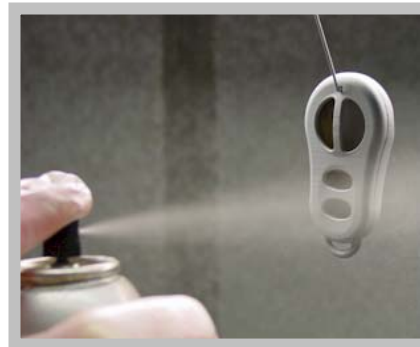




# Applications Guide – Silicon Moulds

## Appendix for: JohnsonDiversey Equipment EMA



# Silicon Molding for Vacuum Casting



# Silicon Molding with Objet

- Why PolyJet is best
- Customer references
- Advantages of Silicon Molding
- Recommended silicones
- Process tips

# Why PolyJet for Silicon Molding

- Crisp details
- Excellent accuracy of 100-200 $\mu$ m
- Thin walls of 600 $\mu$ m
- Smooth surfaces
- Fast overall build to get master



# Why Silicon Molding

- Fast inexpensive molds
- Excellent detail reproduction
- Option of using multiple materials
- Good material properties, close to that of thermoplastics
- Undercuts
- Good for up to about 50 parts
- Bridges the gap between rapid prototyping and hard tooling



# Suggested Silicons to use

- VTX 950 from MCP
- Shinetsu Addition Cure KE1310ST
- Wacker 4644 silicon
- RTV630 from MG Chemicals

# Addition vs. Condensation Cure

- Two types of silicon
  - Addition:
    - A+B to harden
    - Can accelerate with heat
    - No outgassing
    - No shrinkage, best for high precision parts
  - Condensation:
    - Hardens with condensation or a catalyst (also A+B)
    - No heat acceleration
    - Outgassing can occur
    - Shrinkage can occur
- Most of our customers use Addition-type for precise parts and in order to accelerate curing time.

# Process Suggestion to Avoid Inhibition

Inhibition issues solved with the following procedure:

- Clean part with WaterJet
- Put into sodium hydroxide (caustic soda) for a 45 minutes
- Clean once again with WaterJet
- Blow water off with air and let the parts dry
- Spray part with release agent and make sure the release agent is dry before silicon comes in touch with the part

# User Tips: Avoid Inhibition

- Issues that affect inhibition
  - some paints and lacquers
  - super glue
  - fingerprints on the model
  - mixing the silicone in PVC containers
  - mixing silicone at the wrong temperature.
- Extra time should be spent preparing the model
  - Extra water jetting at a higher pressure and then a fine sand blast.
  - Also cure the silicone in an oven at 35°C (or higher) rather than at 23Deg.C that the manufacturers recommend
- Inhibition is worse in glossy mode, better in matte