



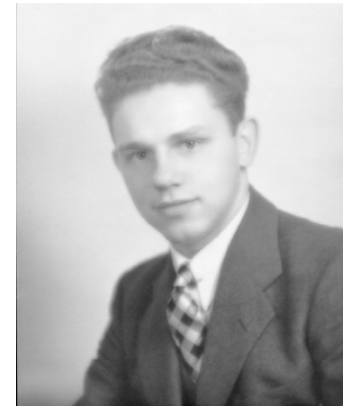
Mold Releases and How to Use Them

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Stoner

About Stoner

- **60 year history - *Paul Stoner*, founder.**
 - child orphan, became successful entrepreneur.
 - Privately owned company, by Stoner's grandson.
- **20+ years to urethane manufacturers**
 - offer multiple solutions specifically designed for the urethane industry
- **Mold Release Specialists**
 - In-house R&D, Manufacturing & Marketing.
 - Three Year Finalist For the Malcolm Baldrige National Quality Award.



Stoner

Stoner, Inc. - Award Winning Quality

■ 2003 Malcolm Baldrige National Quality Award Winner!

- The nation's premier award for performance excellence and quality achievement.
- Stoner was the smallest business to ever receive a Malcolm Baldrige Award in 2003!



■ 2005 Finalist for the Shingo Prize for Excellence In Manufacturing.

- Recipients of this award have demonstrated excellence in lean manufacturing while delivering high levels customer satisfaction with outstanding business results.



Mold Release Essentials

- Select the appropriate mold release
- Chose the optimum application process
- Use the right amount of mold release
- Standardize and document the process
- Troubleshoot effectively

Mold Release Selection Factors

Final Use of Parts

- What type of urethane?
- What surface finish is required?
- Customer requirements?
- Will parts be post decorated?

Mold Release Selection Factors

Safety/Health

- Molding process
- Ventilation
- Physical environment
- Operator training
- Storage area

Mold Release Selection Factors

Environmental / Regulatory Concerns

- Corporate policies
- Local regulations
- Government phase-outs / treaties
- Storage

Mold Release Selection Factors

Productivity / Cost

- Purchase price vs. total cost
- Ease of use / operator preference
- Supplier support
- Mold cleaning
- Storage requirements and handling
- Establish measures of total cost

Types of Mold Release

Active Ingredients

- Silicones
 - Best releases for cast parts
 - Typically shiny or mirror finish on parts
 - Not paintable
 - Use with adequate ventilation
 - Little buildup
 - Proven solution

Types of Mold Release

Active Ingredients

- Waxes
 - Moderate release for cast elastomer
 - Maybe be paintable
 - Typically build up on tools
 - Dull finish on parts
 - Not universal release

Types of Mold Release

Active Ingredients

Others

- Fluorinated materials
- Oils
- Soaps
- Mold Surface Treatments

Types of Mold Release

Delivery Systems

- Aerosol cans
- Spray Tanks
- Bulk Liquid
 - Solvent Based
 - Water Based
 - Volatile Free

Application Process

Wiping / Brushing

- Simplest method
- Difficult for some molds
- Little migration
- Hard to control application
- Operator skin exposure
- Tools
 - Brushes
 - Sponges
 - Rags

Application Process

Spraying

- Best surface finish
- Best coverage
- Requires good ventilation
- Tools
 - Trigger spray bottles
 - Air pressurized sprayers
 - HVLP Spray Guns
 - Air Assisted Airless Spray Guns
 - Electrostatic Spray guns

Using the correct amount of Mold Release

Optimal amount

- Parts release easily
- Molds remain relatively clean
- Surface finish is acceptable
- Parts slippery, not greasy
- Most economical total cost

Using the correct amount of Mold Release

Under-application

- Parts sticking
- Molds require frequent cleaning
- Dull part finish
- Parts dry and rough after de-mold
- Cost savings lost on extra labor / scrapped parts

Using the correct amount of Mold Release

Over application (most common problem)

- Blisters / voids / knitlines
- Rapid build-up of wax based release
- Surface finish variable/ fine details lost
- Wastes mold release

Best Practice

- Apply light mold release application every pour
- Clean tools regularly

Standardize and Document Process

Minimize Variation

- Train operators
- Create and distribute procedures
- Establish realtime feedback
- Document and track changes
- Limit adjustments / options

Establish Reorder Process

- Common problem is that customers run out of mold release

Mold Cleaning

- PU Molds will always foul over time
- Abrasion Scotchbrite pad, brush, glass beads, sandblast
- Chemical cleaners such as NMP, DBE, DMSO
- Dry ice cleaning
- Heating or burning
- PU Molds discard and recast

Troubleshooting

What has changed?

- Sometimes, not always, we identify a mold release issue
- Other common causes
 - Equipment failure or change
 - Formulation change
 - Operator change
 - Process change
 - Temperature changes

Troubleshooting

Isolate and test

- Use systematic process to check one variable at a time
- Keep records of change and outcomes
- Try alternate mold release application method
- Vary amount of mold release
- Try different lot of mold release



Questions?

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