

DiamondKote TECHNICAL BULLETIN



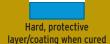
HOW MOLD RELEASE WORKS

Imparts a physical and chemical barrier between the mold surface and compound being molded

Prevents the elastomer from adhering to the mold.







FOCUSED SELLING RUBBER TO METAL / ANTI VIBRATION

- · Natural rubber and EPDM predominate in this sector
- · Generally done by injection molding
- Significant user of our semi-permanent Franklynn DiamondKote™ release agents

AVB / RTM FAILURE MODES (PAIN POINTS)

- Weld Lines In anti-vibration and rubber-to-metal molding, Weld lines (aka Knit
 or Meld lines) can form at the junction of two flow points. Due to pressure and
 geometric variables, a line forms because the two separate flows of elastomer
 are unable to properly bond during the molding process. Knit lines are points of
 weakness in a component.
- Bond Failure During anti-vibration component molding, a bond failure occurs
 if the rubber fails to properly adhere to a metal insert. The failure can be a
 result of the process aides used in the rubber compounding process and/or
 during the molding process as a result of the release agent used.
- Flow Cracks If rubber is obstructed or does not flow evenly into the mold, then it can become brittle and break open. Flow cracks vary based on durometer, injection speed, and temperature; however, they can be addressed via process aides and/or mold release aides.
- Dirty Molds Tool cleanliness can impact many points of the operational
 process. The molds themselves have different surface finishes, drafts, draws,
 and undercuts which impact how dirty a mold can become, what materials can
 adhere to it, and how effectively a part can be demolded. When a tool becomes
 'fouled', operations will see an increase in scrap as a result of rubber material
 not flowing properly, and release issues with subsequent parts. Operations will
 have to shut down and clean the mold, costing hours of production time.



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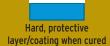
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VALUE PROP FOR ANTI-VIBRATION SEGMENT

- · Anti-Vibration Market Segment needs:
 - Increase throughput and optimize their production process to meet/exceed customer order demands.
 - Ensure the highest level of finished part quality by eliminating rubber-to-metal bond failures which can result in returns and lost or decreased business.
 - Optimize mold flow to reduce defects from knit lines, finish, and flow cracks.
 - Decrease mold release usage and decrease per-unit costs to stay competitive with other AVB part suppliers.
 - Decrease scrap to ensure operational excellence, and reduce/eliminate rework costs.
 - Decrease operational downtime by reducing need for mold cleaning.
- ITW's Franklynn DiamondKote™ Mold Release Agents provide an average \$550,000 in savings for a typical Tier 2 supplier. The cost savings are derived from an average 50% reduction in mold release consumption, 3-10% increase in production throughput, and a 20% reduction in scrap. Specifically, we are able to address the top pain points in the AVB industry that drive these operational costs by:
 - Reducing the spray frequency by an average of 59% and mold release consumption by an average of 50% per molding cycle.
 - Reducing open clamp time by an average of 3% to allow more cycles per shift.
 - Reduce mold heat loss (which causes scrap and rework) by reducing spray frequency.
 - Reduce/eliminate scrap resulting from rubber process aides (adhesive residue & by-products of off-gassing) building up on the mold by an average of 48%.
 - Reduce the number of mold cleanings by an average of 20% which will increase production efficiency and increase tool life.
- Franklynn DiamondKote™ solutions are all:
 - Water-based, ensuring the AVB facility does not exceed its VOC limits and does not expose
 operators to hazardous chemicals.
 - Use high performance materials in our formulas that meet the highest standards of the AVB market. Our superior formulations easily pass "flood" and "destruction" tests.
 - Our products are designed and supported by a highly trained and experienced technical team. Our Field Sales Representatives and Technical Service Specialists are always there to answer your questions and assist you with application
- As demonstrated by ITW Pro Brands: ISO-9001 Certification, competitive lab and field testing, over 100 years of collective experience in Mold Release Coatings, experience as a preferred supplier to the largest companies in the AVB Segment, and validated ROIs for our release formulas (Confidential)



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