



Impact Molding Technology

for Horizontal Molding Lines

APPLICATION

Cost and quality of castings depend on the quality of the molds. As a consequence of the increasing casting quality requirements, there is a high demand for near net shape castings. The goal is for the molds to allow production of castings not requiring costly cleaning work, i.e. the molding method must be selected based upon the production requirements.

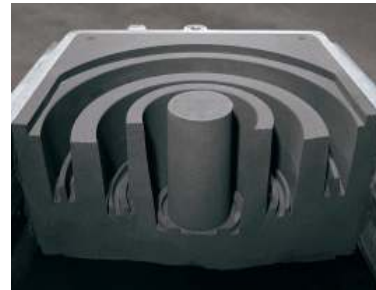
COMPETENCE FROM EXPERIENCE

The experience gained from supplying and supporting horizontal molding lines worldwide represents significant benefits for achieving excellence in mold production. Our impact molding technology covers the entire field of dynamic and mechanical (squeezing) molding processes.

Impact molding lines offer decisive advantages:

- Improvement of casting quality
- Near net shape
- Constant weight
- Improvement of molding properties
- Increased productivity and profitability
- High availability for production
- Environmentally and ergonomically friendly

Impact Molding Plus-Squeeze Molding Multi-System Molding



At EMI, we have your specific solutions to your molding and core room production requirements.

We offer both NEW and REMANUFACTURED equipment to satisfy your budget.

IMPACT MOLDING COMPACTION

This type of compaction uses a single-step pressure impulse to compact the mold. The molding sand is exposed to compressed air, accelerated from the back of the mold, and compacted on the pattern when decelerated. Within milliseconds, the pressure valve opens up a cross-section relative to the flask surface. Thus, by conversion into kinetic energy, the pressure build-up is effective instantly and ensures high and uniform compaction.

The degree of compaction is easily controllable by selecting the compaction pressure of up to 90 psi. Pattern and mold specific features can thus be considered so the proper parameters can be set for repeatable optimum molds.

“PLUS” PRE-COMPACTION

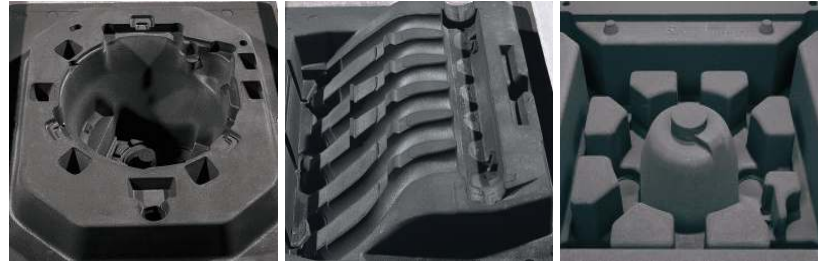
The “plus” dynamic pre-compaction is used for patterns with deep pockets and narrow gaps and features the following functions:

- Enhanced mold filling even in critical pattern areas
- Pre-compaction

The valve ensures the ideal pressure curve for pre-compaction (“broken” pressure gradient).

The pressure intensity is adjustable.

- Slow pressure build-up above the molding sand with a flat curve
- High mold cavity pressure
- The root compaction is increased so that molds with fragile or heavy sections can be perfectly drawn, rolled over and transported through the handling systems.



The pressure is controlled by a single simple valve which has proved successful in foundries under widely variable conditions. Effective pre-compaction requires proper venting but no vent border. Therefore, the entire flask surface is available for the pattern layout.

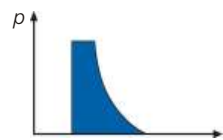
APPLICATION

The dynamic compaction is applied for:

- High sand levels with deep negative pattern areas
- High patterns
- Risers and vent pins

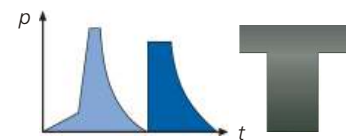
The inverse mold hardness profile (with highest values on the pattern surface and which decrease toward the back of the mold) promotes improved degassing. The high sand density at the mold surface results in perfectly clean casting surfaces.

1. IMPACT Molding Compaction

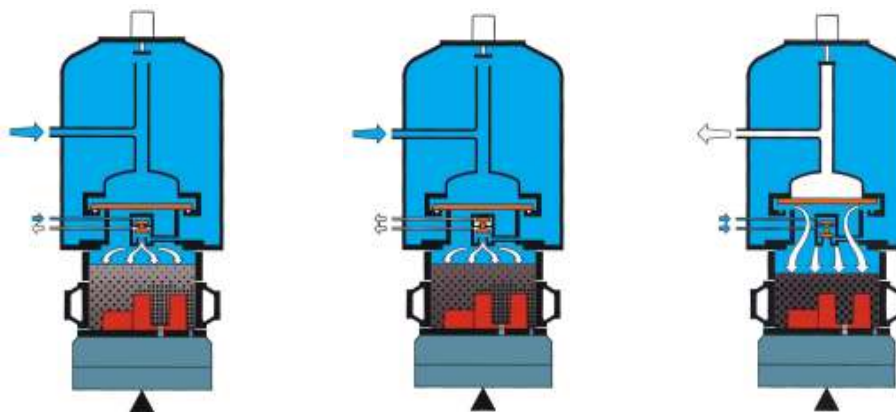


Compaction by air impulse

2. PLUS IMPACT Molding Compaction



Enhanced mold filling and effective pre-compaction in critical pattern areas followed by compaction by air impulse



“Plus” pre-compaction

The pressure impulse is divided into two phases and is characterized by a flat pressure gradient at first and then by a steep gradient with high mold cavity pressure. This ensures an enhanced mold filling in critical pattern areas and effective pre-compaction.

Impact compaction

The pressure vessel is abruptly depressurized via a disc valve. By the expansion of the air, the final compaction is effected. This technique is often used as the sole means of compaction.

PLUS-SQUEEZE MOLDING COMPACTION

Impact molding compaction is characterized by an inverse mold hardness profile with highest values on the pattern surface which decrease toward the back of the mold. The mechanical squeezing is the exact opposite. By combining the two methods the advantages of both can be realized.

With this process the mold is produced in two steps. The compaction unit consists of a valve for dynamic "plus" pre-compaction and a special squeeze pad for mechanical squeezing. The flexible, resilient pad is made from urethane and protected against damage by a tough cover. As a squeezing tool, this pad is a suitable and reliable component which has proved successful in many applications. The pad inevitably adapts to the contour of the pattern so that the mold is compacted extraordinarily uniform.

Molds for predominantly flat parts can be compacted by squeezing with a flexible pad, only.

APPLICATION

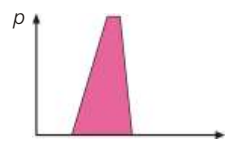
- Wide range of patterns
- Large, deep and negative pattern areas
- Deep pockets reaching close to the back of the mold
- Small distances to the flask walls
- High mold compaction close to the back of the mold



ADVANTAGES OF THE PLUS-SQUEEZE COMPACTION

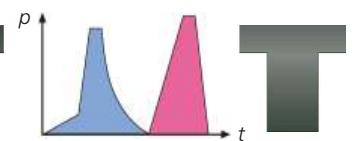
- High, uniform mold stability
- Elimination of 'over compaction' in high pattern parts combined with 'under compaction' in adjacent areas
- Higher compaction on the mold perimeter due to the steel frame of the pad
- The squeeze pad is a simple, cost-saving and practically maintenance-free compaction tool.

3. SQUEEZE ONLY Molding Compaction

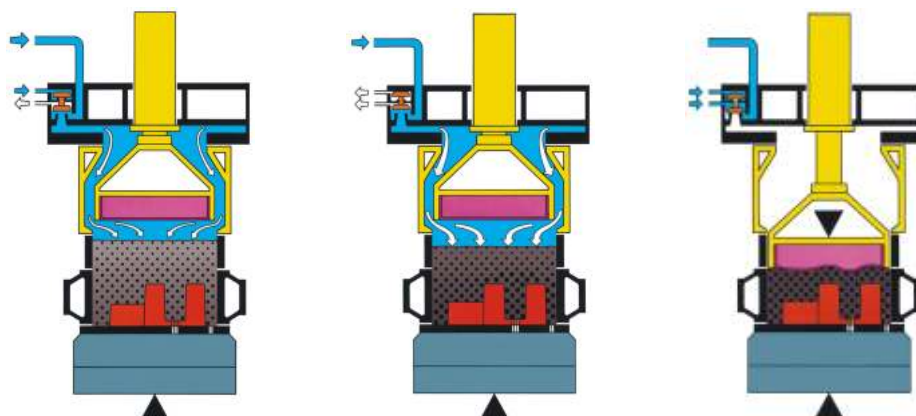


Compaction by squeezing (only)

4. PLUS-SQUEEZE Molding Compaction



Enhanced mold filling and effective pre-compaction in critical pattern areas followed by compaction by squeezing



"Plus" pre-compaction

The pressure impulse is divided into two phases and is characterized by a flat pressure gradient at first and then by a steep gradient with high mold cavity pressure. This ensures an enhanced mold filling in critical pattern areas and effective pre-compaction.

Mechanical compaction

Final compaction by squeezing with a special squeeze pad. 'Over compaction' and 'under compaction' and the resulting negative features can be excluded

MULTI-SYSTEM MOLDING COMPACTION

A wide pattern range requires highly variable compaction techniques and it is especially important that the molding technique is adapted to the pattern for optimum molding results.

The multi-system molding machine comprises all state-of-the-art compaction techniques in one machine. The mold is compacted by impact, squeezing, or by the combination of these methods:

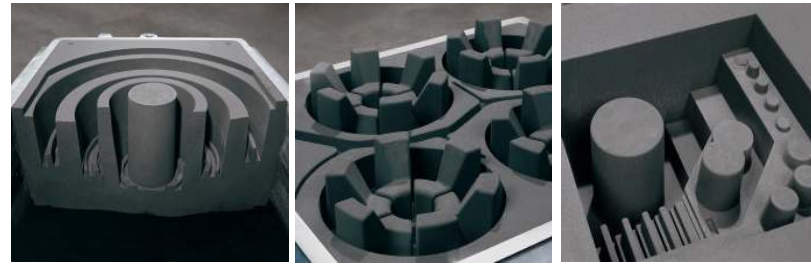
- Single-step impact
- Multi-step impact
- Mechanical squeezing
- Impact and squeezing

The compaction options are set via a selector switch. Impact and squeezing pressure can be set for optimum results for a given pattern. Precise setting of the compaction parameters ensures process and production reliability.

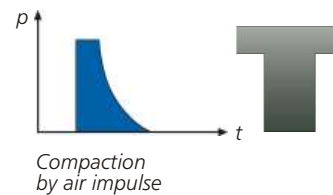
SIMPLE, RELIABLE COMPACTION TOOLS

The multi-system as a universal molding principle allows application of the most effective compaction techniques: Any pattern which is moldable in green sand can be produced.

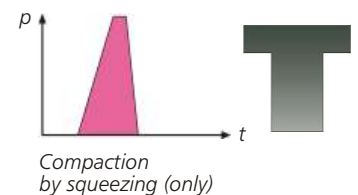
Matched to the pattern, the compaction options can be applied solely or in combination.



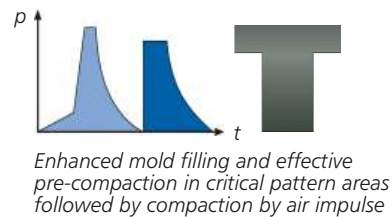
1. IMPACT Molding Compaction



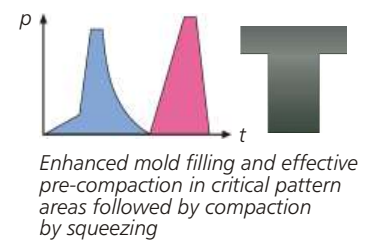
3. SQUEEZE ONLY Molding Compaction



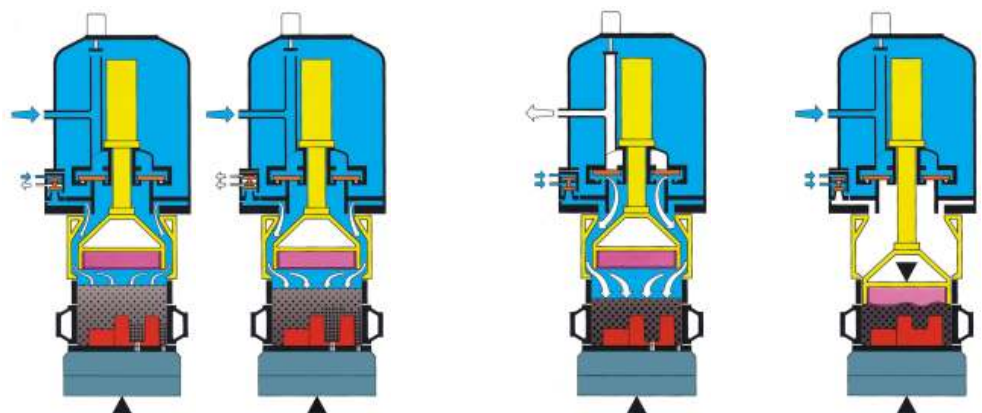
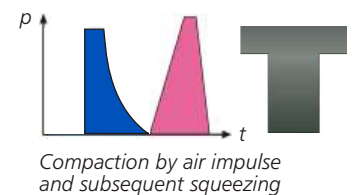
2. PLUS IMPACT Molding Compaction



4. PLUS-SQUEEZE Molding Compaction



5. MULTI-SYSTEM Molding Compaction



"Plus" pre-compaction

Impact compaction

Mechanical compaction

MULTI-SYSTEM APPLICATIONS

Targeted applications of this compaction technology offers numerous decisive advantages.:

- High, uniform mold compaction results. The tendency of mold swelling or post-compaction during pouring is reduced or eliminated.
- Mold compaction can easily be adapted to the pattern- specific requirements
- Lower, uniform poured weights of castings
- Close weight tolerances
- Thinner, more uniform wall thicknesses
- Higher accuracy
- Lower machining allowance
- Elimination of cores
- Less pattern wear
- Full utilization of the pattern plates due to better compaction of pattern areas located close to the flask walls
- Sharper edges, therefore, less cleaning work required

ADVANCED DESIGN PAYS OFF

The design of the multi-system molding machines allows integration of all compaction techniques:

Impact

Plus-Squeeze

Squeeze

EMI's Growth Continues...

EMI has acquired the exclusive rights to the Sutter Product line, worldwide, and the North American rights to the IMPACT Molding Systems from DISA. EMI also distributes and services Lüber gas generators and core sand preparation systems.

Technical Data *Please contact us for specific solutions to your applications.*

Flask Size max. (in.)	32 x 24 x 12/12	40 x 32 x 16/16	48 x 40 x 20/20
Basic output (molds/h) of 1 (2) machine(s)			
Impact	125 (220)	120 (205)	115 (195)
Plus-Impact	105 (195)	100 (175)	95 (165)
Plus Squeeze	125 (205)	120 (205)	115 (195)
Impact + Squeeze	115 (205)	110 (190)	105 (180)
Squeezing Only	125 (220)	120 (205)	115 (195)