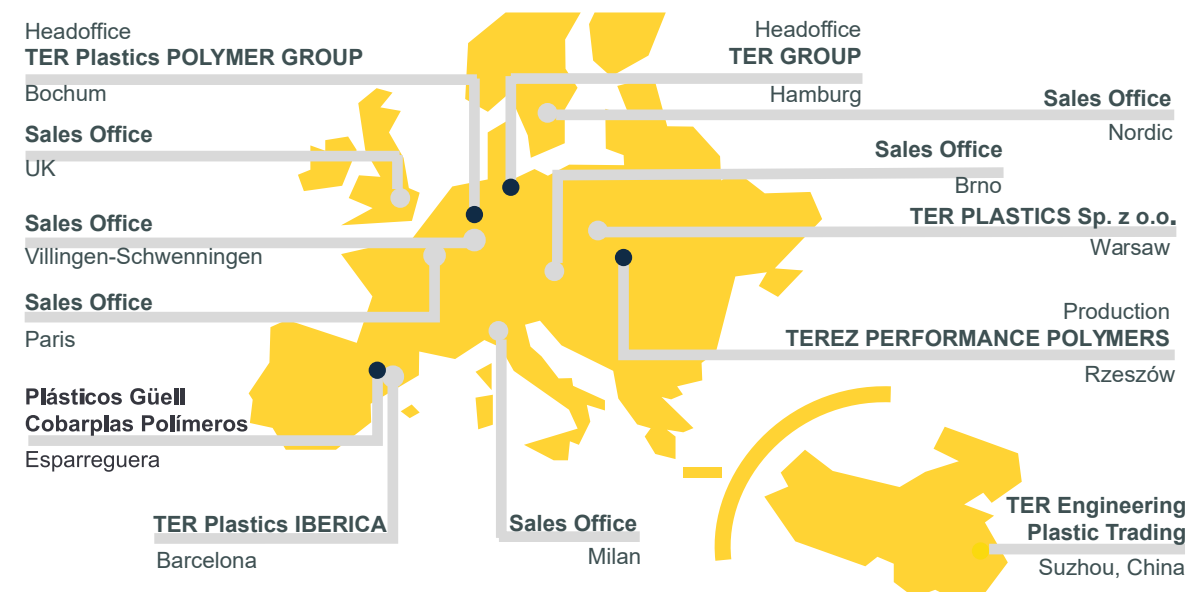




TERmicron

ROTATIONAL MOLDING

Our Locations



Fundamentals Of Rotational Molding

Rotational molding is a manufacturing process tailored for the creation of void structures using thermoplastic materials. In this method, powdered material is introduced into a mold, which is subsequently sealed, heated, and rotated along two perpendicular axes. These axes are positioned at right angles to each other or are mutually perpendicular.

Throughout the heating phase, as the mold resides in the oven, the powder undergoes partial melting, forming a porous film on the inner surface of the mold. Gradually, this film accumulates, resulting in the development of a homogeneous layer with the desired thickness.

It is imperative for the mold to remain in the oven for a sufficient duration to ensure even material distribution and complete molten transformation. Following this phase, the mold is transferred to the cooling area while maintaining its rotation. Cooling is achieved through forced ventilation, water spray, or a combination of both methods. Once the mold has sufficiently cooled, it is relocated to the working area where it is opened. Subsequently, the finalized part is extracted, and the mold is prepared for the subsequent cycle. This systematic process ensures the production of high-quality, consistently formed hollow objects through the application of rotational molding techniques.

Rotational molding exhibits distinctive features that set it apart from alternative processes like blow or injection molding. These differentiators underscore the unique nature of rotational molding:

- 1. Cost-Effective Molds:** The absence of pressure during the processing phase in rotational molding allows for the use of economical molds, contributing to overall cost efficiency.
- 2. Biaxial Mold Rotation:** Rotational molding involves the biaxial rotation of the mold, a characteristic not shared with other molding methods.
- 3. Polymer Powder Usage:** Unlike processes such as blow or injection molding, rotational molding employs polymer powders rather than granules as the primary material.
- 4. Internal Melting Process:** In rotational molding, the material undergoes the melting phase within the closed mold. In contrast, injection molding introduces material in a molten state under pressure.
- 5. Minimal Residual Stresses:** Upon completion, finished parts can be effortlessly removed from the mold with virtually no residual molding stresses, a key advantage of the rotational molding process.
- 6. Design Freedom:** Rotational molding offers unparalleled freedom in mold design, a feature that distinguishes it from other molding systems.

Long Lasting Sustainability

The rotational molding process stands out for its exceptional focus on waste reduction. By optimizing material usage, this method minimizes waste, showcasing a dedicated commitment to environmental responsibility. This sustainable approach not only benefits the planet but also underscores a cost-effective strategy in the production of plastic products.

TERmicron powders can also be produced on the basis of regranulates - regranulates that are produced and micronized on internal compounding lines.

When To Use Rotational Molding

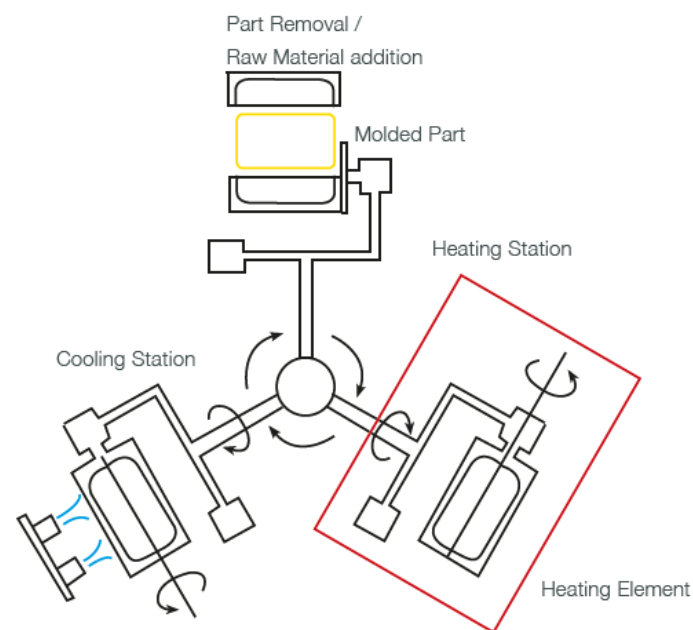
When determining the most suitable molding method for a specific application, careful consideration of various parameters is imperative. The key factors to weigh in the decision-making process include:

- **Component Dimensions:** The dimensions of the component, including both its size and geometry, are crucial factors to take into account.
- **Configuration and Design of the Component:** The general configuration and design of the intended component significantly influence the choice of the manufacturing method.
- **Anticipated Molding Time:** The expected duration for the molding process is another crucial factor that affects the choice of an appropriate molding technique.
- **Component Mass:** The anticipated mass of the end product is a key parameter in determining the suitable molding method.

Rotational molding, in particular, proves versatile in its ability to produce a wide array of shapes, especially those with a hollow structure. This flexibility opens up possibilities for various applications, including the creation of seemingly solid items with a hollow design, such as sunshades and automobile armrests. Additionally, items initially perceived as closed can be strategically cut into two or more open parts, showcasing the adaptability of rotational molding in meeting diverse manufacturing requirements.



Unparalleled Design Flexibility In Rotational Molding



One of the standout features that distinguishes rotational molding from other molding processes is the unparalleled design freedom it affords. Unlike alternative methods, rotational molding operates without imposing high pressures during the molding process. Consequently, molded parts tend to experience controlled shrinkage and easy detachment from the mold wall.

Rotational molding excels in accommodating objects of varying dimensions, making it particularly well-suited for larger parts. While smaller parts may be more economically produced on high-rate machines such as injection and blow molding, especially when production volumes are substantial, rotational molding emerges as the preferred choice for limited quantities or prototyping endeavors. This preference is underscored by the cost-effectiveness of rotational molding molds.

Notably, rotational molding has demonstrated its capability to produce items of considerable size, weighing several hundred kilograms and boasting up to a three-meter diameter, particularly with polyethylene. Such achievements underscore the inherent limitations of blow and injection molding techniques, which would prove inadequate for the production of objects of comparable scale.

Crucially, the maximum dimensions achievable through rotational molding are primarily dictated by the dimensions of the oven and the capacity of the machinery employed, exemplifying the adaptability and scalability of this molding technique.

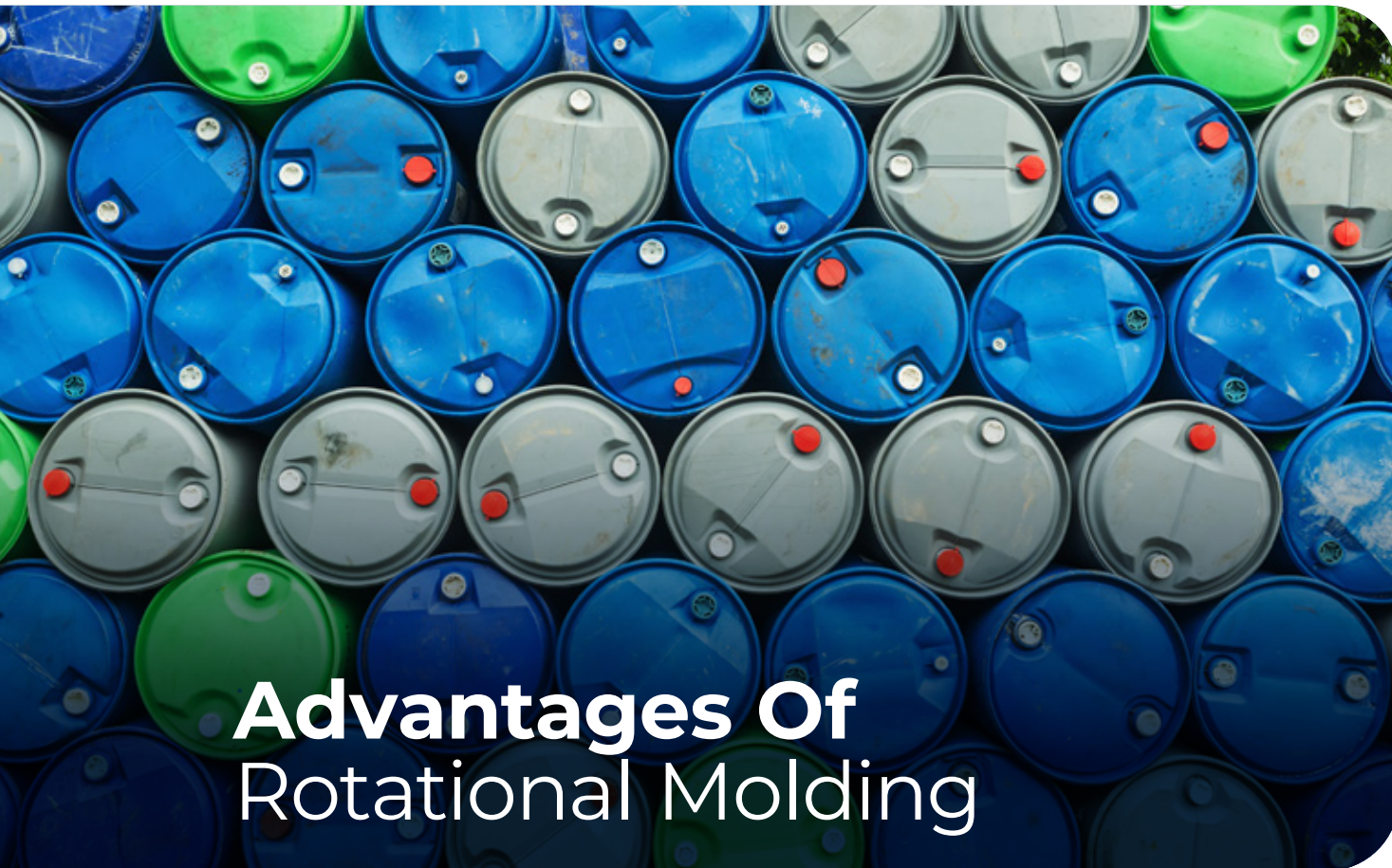
Exploiting The Potential Of Doublewall Items In Rotational Molding

An additional advantage of the rotational molding process lies in its capability to produce double-wall items. However, when employing a double-wall configuration, certain considerations become crucial. Notably, the inner wall, owing to shrinkage, may contract towards the core.

To facilitate the extraction of the part, effective lubrication of the core is imperative, and extraction should be executed at the right temperature. This attention to detail ensures a smoother and more efficient removal process.

The design phase for rotationally molded parts necessitates careful consideration of the mold surface type. Similar to other plastic materials and molding techniques, a polished mold surface correlates with an enhanced surface finish for the final part. While all mentioned molds can undergo polishing, electro-formed molds stand out as particularly suited for achieving a high-quality surface finish.

For those instances where a matte surface is preferred over a glossy one, sandblasting the mold surface becomes a viable option. It's worth noting that caution is advised when sandblasting cast aluminum molds, as they may become porous beneath the surface. Similarly, sheet steel molds may encounter stress-related problems when subjected to sandblasting. These nuances emphasize the importance of selecting the appropriate mold surface treatment to align with the desired aesthetic and structural outcomes in rotational molding.



Advantages Of Rotational Molding

Rotational molding presents several advantages that contribute to its appeal in various manufacturing scenarios:

1. **Insert Integration:** The process allows for the introduction of plastic or metal inserts as integral parts of the molded item.
2. **Cost-Effective Prototyping:** Prototype molds for experimental purposes can be created with minimal expenses for the mold.
3. **Economical Production Molds:** The production molds employed in rotational molding are generally more economical compared to those utilized in high-pressure molding processes like injection or blow molding.
4. **Reduced Scrap Generation:** The rotational molding process results in less scrap material, contributing to efficiency and waste reduction.
5. **Complex Part Geometry:** Rotational molding excels in producing parts with recesses and intricate outlines, ensuring high-definition surfaces.
6. **Color Variation in a Single Molding:** Simultaneous molding of identical or similar items with different sections in various colors on a single arm is achievable.
7. **Double-Wall Object Production:** Rotational molding facilitates the creation of double-wall objects, expanding design possibilities.
8. **Cross-Linkable Polyethylene Molding:** The technique enables the molding of cross-linkable polyethylene.
9. **Maximum Design Freedom:** Rotational molding provides unparalleled design freedom for parts and products.
10. **Multilayer Part Capability:** It is possible to obtain multilayer parts with rotational molding.



Limitations Of Rotational Molding

However, certain limitations should be acknowledged:

1. **Gradual Thickness Transitions:** Rapid changes in thickness are challenging, necessitating a gradual transition.
2. **Dimensional Tolerance Challenges:** Maintaining very close dimensional tolerances can be difficult, with an average variation in thickness of around 5%.
3. **Limited for Large Production Quantities:** The process is less suitable for the rapid production of large quantities.

ROTATIONAL MOLDING TOOLING

The materials which are mainly used for the production of the moulds are: cast aluminium, electroformed nickel, stainless and non stainless steel sheet. The moulds in cast aluminium are generally used when a better and more even heat transfer is needed, and when perfect mould definition is necessary. The electroformed moulds are widely used for products that require a perfect reproduction of the figure (surface finishing). Steel sheet mould is usually the most economical and is used for simple shapes (ex. cylindrical) and for extremely large products. Cast aluminium mould usually have a thickness of 6-8 mm while sheet steel moulds are usually 2-3 mm thick. Some moulding materials are flexible enough to allow the inclusion of under cuts in the mould. Some materials shrink very easily thus enabling an easy extraction, while others do not tolerate undercuts, and in this case the mould has to be designed with light draft angle in order to detach the finished part. The polymer's shrinkage characteristics has to be known in order to design a mould enabling the production of parts within the required tolerance limits.

Assessing Moulding Cycle Time And Suitability In Rotational Molding

The consideration of cycle time is pivotal in determining the optimal working technique for a given application. While rotational molding may not emerge as a competitive choice for extensive production runs, particularly exceeding 1,000,000 parts per year, its distinctive advantages become evident in smaller runs. Here, the cost-effectiveness of equipment becomes a crucial factor, establishing rotational molding as a favorable option.

For large-scale production series, the dimensions and design of the parts play pivotal roles in method selection. Rotational molding excels in the production of items characterized by relatively thick walls, reaching up to 20 mm. Conversely, it proves less suitable for items with thin walls, as achieving uniform thickness becomes challenging for polyethylene items under 0.7 mm.

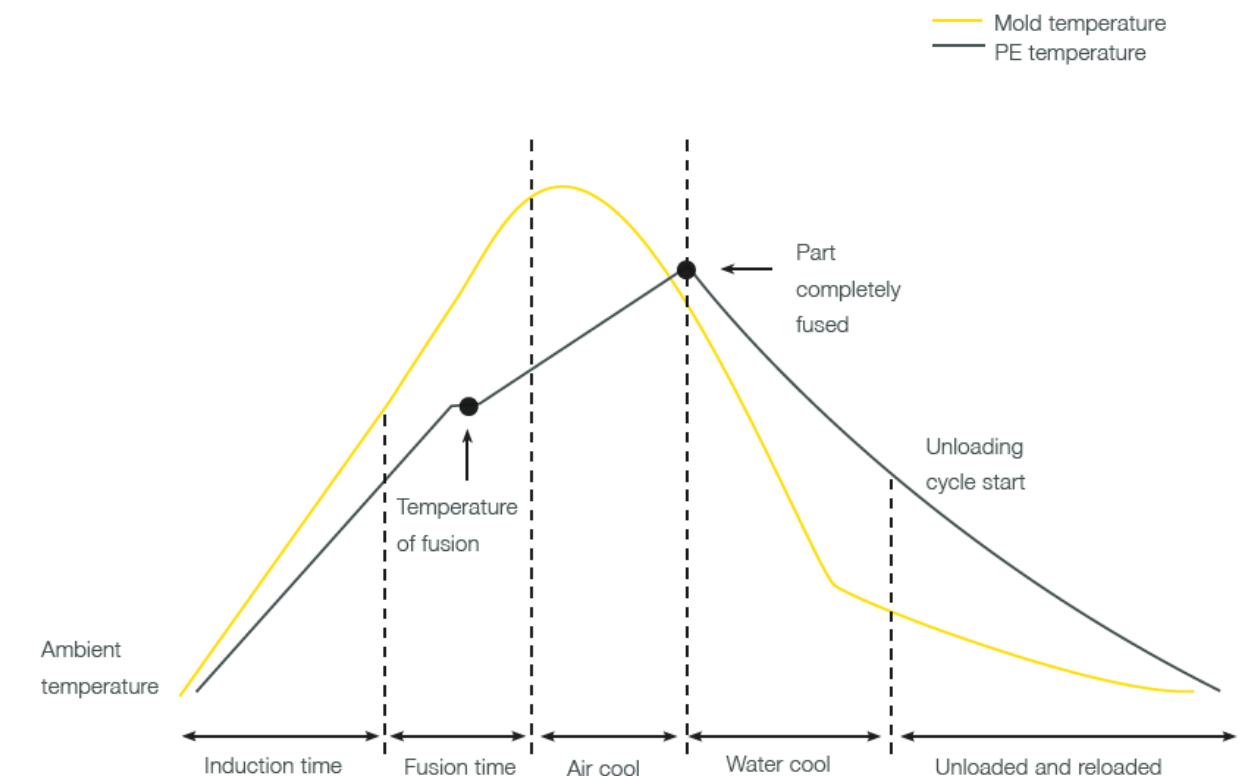
In theory, rotational molding accommodates a diverse range of polymers; however, practical applications are constrained by the substantial influence of thermal degradation. This degradation, attributed to the residence time in the oven, significantly impacts the physical and mechanical characteristics of the final product. Notably, the physical attributes of rotationally molded parts differ from those of injection-molded samples. Consequently, practical tests are indispensable before finalizing the choice of material, ensuring alignment with the desired product specifications.

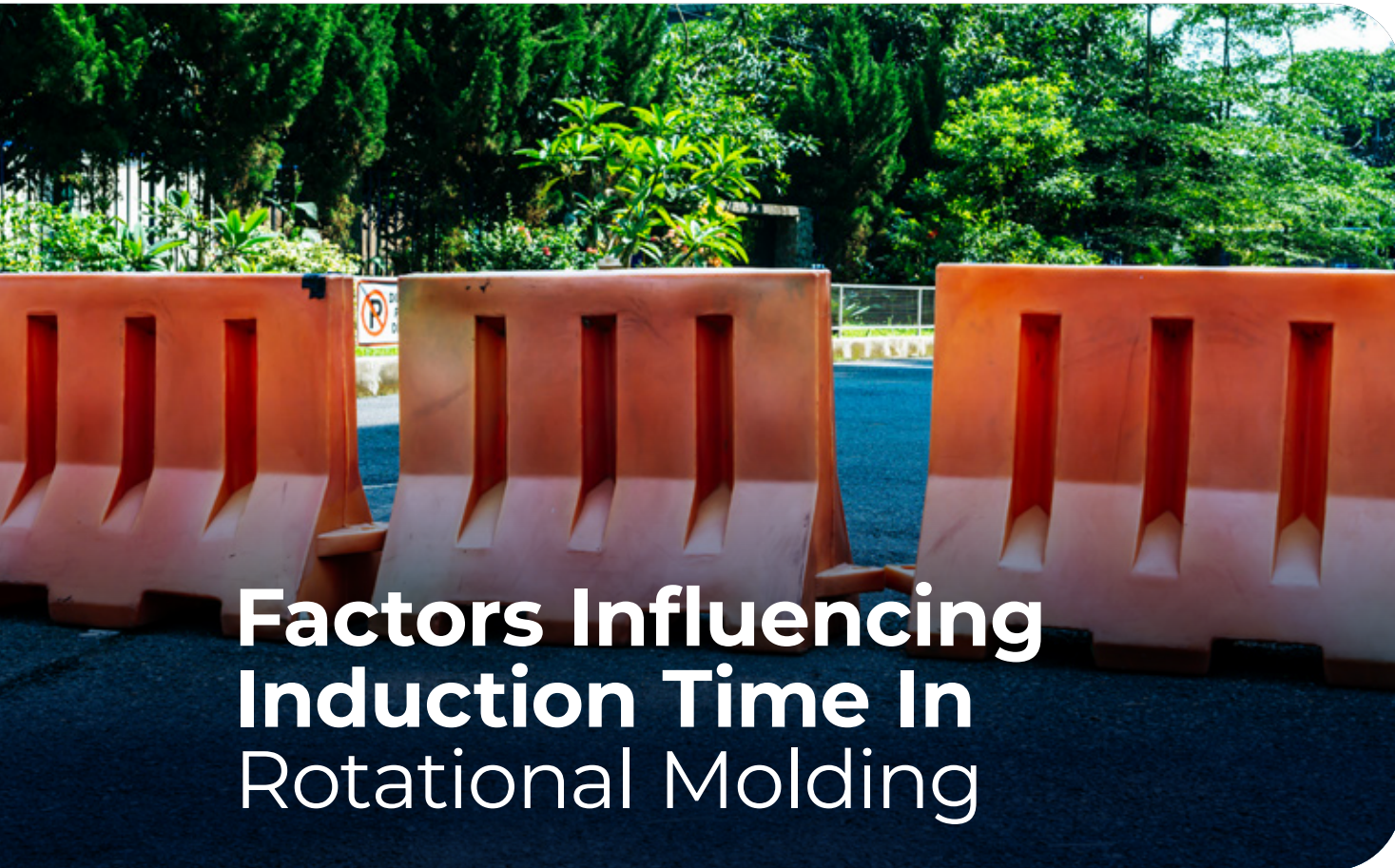
Dynamic Nature Of Oven Residence Time Cycle In Rotational Molding

The thermal dynamics of rotational molding classify it as a heat exchange process in a non-stationary condition. Unlike processes reaching equilibrium, rotational molding entails a continuous fluctuation in mold temperature throughout the entire cycle (refer to fig. 2).

This dynamic behavior extends to the resin temperature within the mold, emphasizing the critical role of mold residence time in the oven for successful molding. The aggregate duration that the mold spends in the oven is referred to as the "residence time in the oven."

Initiating the cycle, the first phase is denoted as the "induction time," representing the duration necessary for the mold to attain the melting temperature of the resin. Subsequently, the second phase is characterized as the "melting time," signifying the period required for complete resin melting. This nuanced understanding of the oven residence time cycle underscores the intricacies involved in achieving optimal molding outcomes in rotational molding processes.





Factors Influencing Induction Time In Rotational Molding

The duration of the induction time in rotational molding is contingent upon several variables, encompassing:

1. **Oven Temperature:** The temperature maintained in the oven is a pivotal factor influencing induction time.
2. **Resin Melting Temperature:** The specific temperature at which the resin undergoes melting is a key determinant.
3. **Heat Transfer Speed:** The speed at which heat transfers concerning the mold's surface significantly impacts the induction time.
4. **Mold Thickness:** The thickness of the mold plays a role in determining the duration of the induction phase.
5. **Surface-to-Volume Ratio:** The ratio between the surface area and the volume of the mold contributes to the induction time dynamics.
6. **Heat Exchange Coefficient:** The efficiency of heat exchange, influenced by the mold material's heat exchange coefficient, affects induction time.
7. **Oven Recovery Time:** The time required for the oven to recover after heat fluctuations is a variable that influences induction time.

The predominant heating system employed in contemporary rotational molding is the circulation of hot air, representing a widespread and effective method in the industry.



Variables Influencing Melting Time During Oven Cycle

The melting time, constituting the second phase of the oven cycle in rotational molding, is subject to a range of variables. These parameters, organized based on their impact on melting time, include:

1. **Part Thickness:** The thickness of the part emerges as a critical factor influencing the duration of the melting phase.
2. **Oven Temperature:** The temperature within the oven significantly affects the melting time of the resin.
3. **Heating Air Velocity:** The speed at which the heating air circulates plays a role in determining the melting time.
4. **Surface-to-Volume Ratio:** Similar to its impact on induction time, the ratio between mold surface and volume affects the dynamics of melting time.
5. **Resin Powder Particle Size:** The size of resin powder particles contributes to the overall melting time duration.
6. **Mold Heat Capacity per Surface Unit:** The capacity of the mold to retain heat per unit of surface area influences melting time.
7. **Resin Melting Temperature and Heat of Fusion:** The specific melting temperature of the resin and its heat of fusion are critical factors affecting the overall duration of the melting phase.

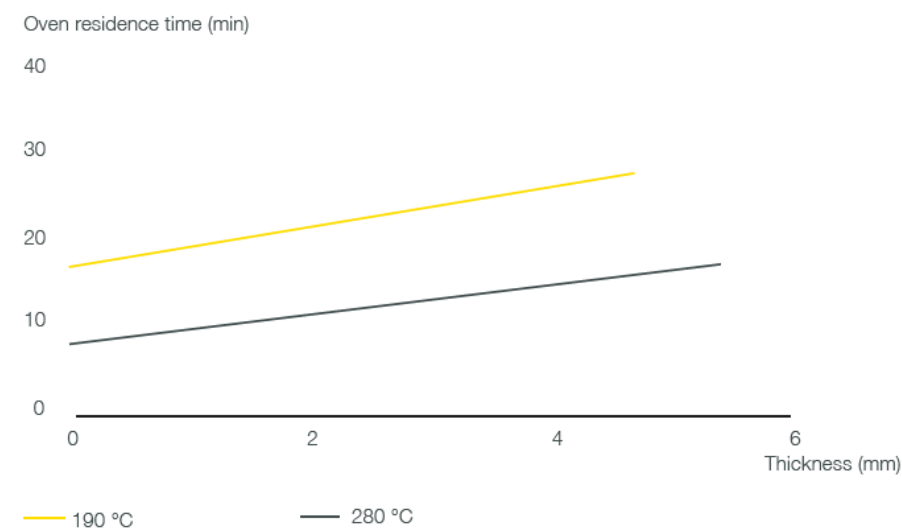
Understanding and managing these variables are crucial for achieving precise control over the melting time during the rotational molding process.

Impact Of Variables On Melting Time And Final Part Quality

Each of the aforementioned factors plays a pivotal role not only in shaping the melting time during the rotational molding process but also in influencing the ultimate quality of the finished part. Let's delve into a comprehensive exploration of each factor to discern their precise impact on the process and identify optimization strategies.

The fundamental determinant of melting time is the wall thickness of the molded part. As illustrated in Fig. 3, there exists a direct correlation between the residence time in the oven and the thickness of the part. Typically, part thickness is a parameter that cannot be arbitrarily altered, as it is contingent upon the specific requirements of the intended use.

Furthermore, the oven temperature significantly influences melting time dynamics. The melting speed can be notably enhanced in certain scenarios by adjusting the oven temperature, such as raising it from 200°C to 300°C. While thickness and temperature are often fixed parameters, understanding their influence allows for strategic optimization of the entire rotational molding cycle, ensuring both efficiency and the attainment of high-quality finished parts.



Optimizing Oven Residence Time And Its Impact On Productivity

The variation in residence time within the oven emerges as a critical factor with the potential to enhance overall productivity. However, a cautious approach is required to prevent pushing the oven to excessively high temperatures in a bid to expedite the cycle. While such actions may theoretically boost productivity, the resultant cost savings could be offset by heightened expenses in mold and machine maintenance. Moreover, there exists the risk of thermal degradation, a consequence of elevated temperatures, potentially jeopardizing the quality of the molded parts.

The fusion time, a significant component of the melting phase, is intricately linked to particle sizes. Larger particle dimensions necessitate prolonged melting times due to the reduced contact area between the heated mold surface and non-molten particles. This effect becomes less pronounced for powders with a particle diameter under 500 µm.

Certain parameters, such as resin fusion temperature and the surface/volume ratio of the mold, remain fixed as they hinge on the specific resin and end-use requirements. Although they influence cycle time, these parameters are not easily modifiable for improvement.

The optimum heating air velocity is a predetermined parameter established by machinery manufacturers through meticulous evaluations. This velocity holds significance as it significantly influences the heating time of the mold.

Thickness and material selection for the mold are dictated by factors such as part shape, cost considerations, expected life, and equipment availability. Typically, a thicker mold wall results in longer cycles but offers extended mold life, enhanced parting line aesthetics, and necessitates less frequent maintenance. Balancing these factors is integral to achieving an optimal and sustainable rotational molding process.

Assessing Factor Importance And Optimizing Oven Residence

The significance of each influencing factor must be carefully evaluated on a case-by-case basis, considering the required number of parts and the desired surface quality. The oven recovery time, a critical element, represents the duration required for the oven to return to the set temperature after introducing a cold mold. This time hinges on factors such as mold weight, initial temperature upon oven entry, set oven temperature, and burner capacity. A recovery time under one minute is generally considered normal.

Given that the residence time in the oven is a pivotal parameter in the entire cycle, ongoing efforts have been directed towards its reduction. Enhanced resin stabilization has facilitated the use of higher processing temperatures, while advancements in mold construction technology have allowed for thinner walls without compromising mold longevity. Additionally, improved burner designs have enhanced the thermal efficiency of modern ovens.

DETERMINING OPTIMAL RESIDENCE TIME IN THE OVEN

The establishment of the optimum residence time is typically accomplished through trial and error. A recommended approach involves characterizing molded parts produced with different cycles, involving visual examinations and subsequent mechanical testing. A correctly molded part should exhibit optimal mechanical characteristics, including impact resistance at low temperatures and tensile strength at break. Furthermore, the inner surface should be smooth, dull, and match the outer color.

Insufficient cycle time may result in an inadequately compact molding with a powdery surface and small air blisters internally. This manifests in lower ultimate tensile stress (U.T.S.) at break and compromised Izod resistance. Conversely, an excessively long oven cycle may yield a molding with a smooth or yellowed inner surface, a potent acid odor, reduced MFR (melt flow rate), and diminished mechanical characteristics. This indicates resin degradation due to thermal oxidation, affecting properties such as impact resistance. Achieving the optimal residence time is crucial for ensuring the production of high-quality molded parts.

Optimizing Impact Resistance Through Controlled Residence Time

The impact resistance of a molded part experiences a gradual increase as the resin undergoes the melting process until reaching an optimal state. This evolution typically spans from the period just before complete melting, where small air bubbles concentrate toward the inner wall, to the point of complete resin melting without any occurrence of thermal degradation.

Once the resin is fully molten and no thermal degradation has taken place, the impact resistance reaches its peak. However, if heating persists beyond this optimal point, rapid resin degradation initiates, leading to a significant decline in mechanical characteristics.

A notable feature in contemporary warm air ovens is the capability to independently vary the temperature in each arm, offering enhanced control and flexibility. Another advantage lies in the ability to dynamically adjust the oven temperature throughout the cycle. This dynamic adjustment allows for the reduction of residence time in the oven by regulating its temperature, optimizing heat transfer during each phase of the heating cycle. This fine-tuned control contributes to the preservation of mechanical properties and ensures the production of high-quality molded parts.



Evolution Of Cooling Cycle Techniques

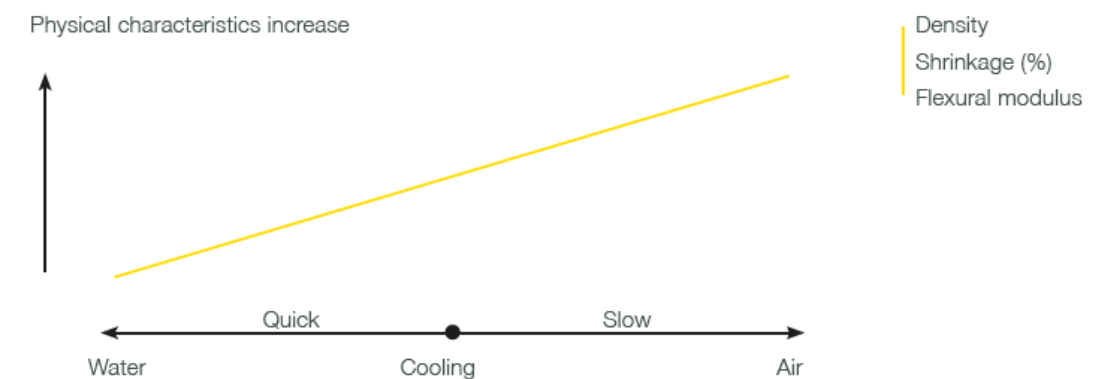
In the early stages, mold cooling in rotational molding relied solely on air, facilitated by large fans. However, to expedite cycle times, the introduction of water spray cooling became a pivotal innovation. Presently, a standard cooling cycle integrates outer cooling using fans and/or water spray, and in certain instances, inner cooling (inside the molded part) is employed as well.

Modern cooling cycles, often facilitated by timers, allow for strategic timing adjustments. This includes the option to delay the commencement of the cooling cycle, extending the melting cycle to ensure complete resin melting in the inner layer of the part. During this delay, fan cooling may be utilized to gradually decrease mold temperature, facilitating a slow and controlled cooling of the molded part.

This deliberate approach serves to postpone distortion of the molding, ultimately enhancing low-temperature mechanical properties. Rapid cooling, especially in crystalline polymers, has the tendency to increase the amorphous structure content. For materials like linear low-density polyethylene (LLDPE), gradual cooling is preferred to mitigate the need for extensive mold maintenance due to thermal impact or shock.

In Rotational Molding

Certain polymers, such as high-density polyethylene (HDPE), are not typically recommended for rotomolding applications. This is attributed to their requirement for slower cooling, resulting in increased stiffness, fragility, mechanical rigidity, and a higher shrinkage percentage. Fig. 4 illustrates the relationship between cooling speed and various physical characteristics of polyethylene.

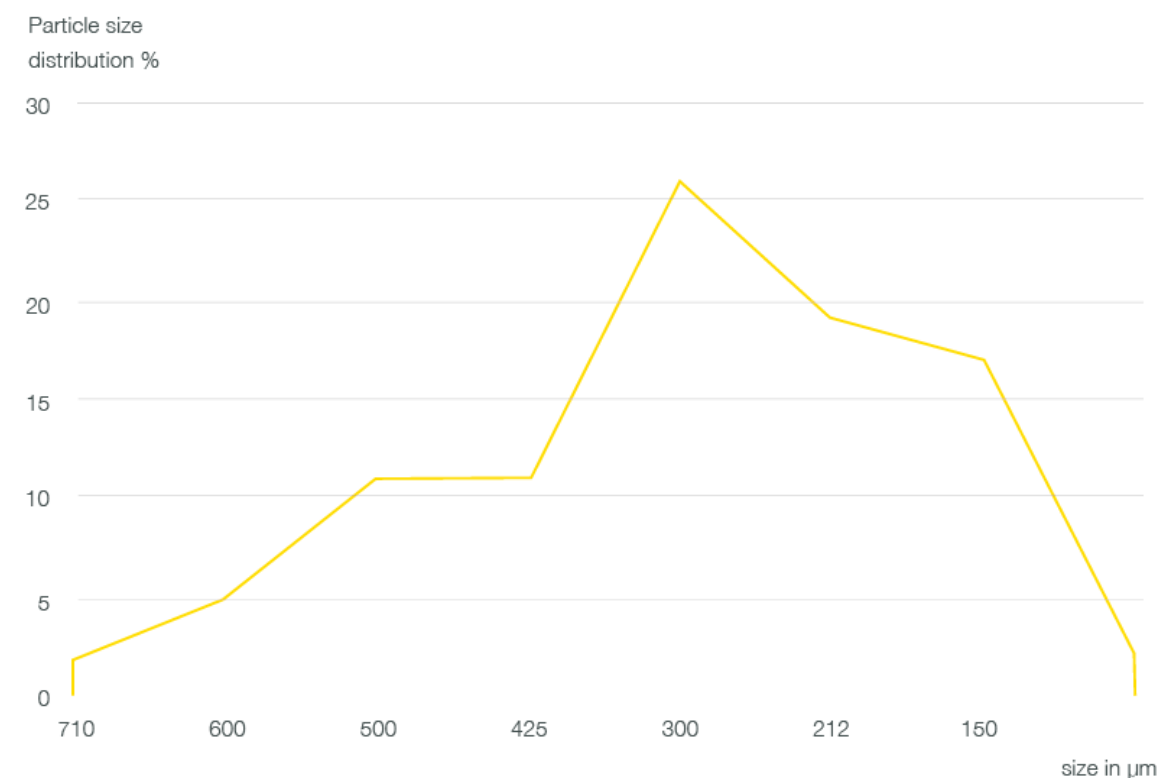


FINE-TUNING ROTATIONAL MOULDING: NAVIGATING POWDER RESIN PARTICLE SIZE

The process of selecting a resin for rotational molding extends beyond assessing its chemical and physical properties; it delves into the nuanced characteristics of the powder itself. Key among these considerations are the size, shape, and uniformity of the particles, each wielding a potential influence on the final product's quality.

The preferred particle is one that exhibits a swift and efficient flow into intricate angles and recesses, seamlessly adheres to the mold, undergoes melting without the formation of bubbles, and contributes minimally to thermal effects. Our practical experience suggests that when working with high viscosity resins (Low MFR), finer particles prove beneficial for achieving superior surface reproduction.

Optimal particles boast a smooth surface and a narrow size distribution, playing a crucial role in the success of the rotational molding process. Careful consideration and selection of resin particles contribute to improved flow dynamics, impeccable adherence to the mold, and the attainment of a flawless, bubble-free finish with minimal thermal impact.



Optimal powder particle size, approximately 300 μm , is crucial in rotational moulding. Larger particles demand prolonged oven residence times for polymer melting, resulting in reduced physical characteristics due to oxidation or thermal degradation. In resin selection, consider the apparent viscosity at low shear rates; a polymer with low viscosity (high MFR) enables quality surface reproduction even with large particles. Dry flow, measured in seconds, is another critical powder characteristic, influencing material flow dynamics and easily assessed with appropriate devices.

TERmicron boasts a narrow molecular weight distribution, making it an excellent choice for rotational molding. This feature endows the product with robust mechanical strength and resistance to stress cracking. Manufacturers, in their resin selection, should note that at higher densities:

increases:

- the softening temperature
- the stiffness
- the shrinkage
- the creep resistance
- the abrasion resistance

decreases:

- the impact resistance
- the flexibility
- the tenacity at low temperatures
- the stress cracking resistance

At lower MFI:

increases:

- the impact strength resistance at low temperatures
- the stress cracking resistance (ESCR)
- the viscosity of moulded material
- creep resistance

FINE-TUNING ROTATIONAL MOULDING:
UNDERSTANDING ROTATION RATIOS

In the realm of rotational molding, the rotation ratio is intricately tied to the shape of the mold and its mounting configuration. Symmetrical molds, like spheres or cubes, call for a specific speed variation ratio between the major and minor axes. For instance, if the maximum dimension aligns with the main rotation axis, a recommended speed variation ratio is 4:1. Conversely, if the maximum dimension is perpendicular to the main axis, the speed ratio should be inverted to 1:4. Irregularly shaped molds may necessitate ratios ranging from 8:1 to 2:1.

Given the inherent complexity of many molds, determining the most effective rotation ratio often involves experimental evaluation. Guideline speeds for major and minor axes for various shapes are provided in Table 1 for reference. Calculating the rotation ratio becomes straightforward once the speed of each axis is established.

FINE-TUNING ROTATIONAL MOULDING:
CONSIDERATIONS FOR SPEED AND RATIO

In the realm of rotational moulding, two pivotal variables demand careful consideration: the speed of rotation and the ratio between the rotation speeds of the two axes. It's important to emphasize that rotational moulding differs significantly from a centrifugal process. The typical configuration of molds, with the center of gravity situated away from the intersection of the two axes, necessitates a thoughtful approach to mounting.

Mounting molds in a way that ensures all surfaces are at varying distances from the center of rotation becomes crucial. This strategic placement aims to steer clear of potent centrifugal forces that could otherwise disrupt the even distribution of molten resin, leading to undesirable variations in wall thickness.

For optimal results, both major and minor axis speeds should be kept at relatively low levels, typically below 20 RPM. This precaution helps mitigate centrifugal effects, promoting a more uniform distribution of molten resin. Striking the right balance between rotation speeds and oven temperatures is essential for achieving shorter cycle times, underlining the delicate interplay of these factors in fine-tuning the rotational moulding process for enhanced efficiency and impeccable product quality.

$$\text{ratio} = N_1 / (N_2 - N_1)$$

Here, N1 represents the speed of the major axis in revolutions per minute (rev/min), and N2 denotes the speed of the minor axis in rev/min. This formula provides a practical means to fine-tune rotational molding parameters based on the unique characteristics of the mold and the desired outcomes.

Rotation Ratios
For Typical Shapes

RATIO	Shapes	Major Axis	Minor Axis
1/4	Pipes, curved air ducts, tyres	4	20
1/4	Spherical balls and balloons	5	25
4/2	Complex shapes, cubes, globes	8	10
2/1	Rings, tyres	6	9
2/1	Frames, round flat shapes	10	15
5/1	Air ducts	5	6
8/1	Straight tube	8	9
1/5	Cylinders	4	5
1/3	Gasoline tanks, suitcases	6	22,5





Chemical Resistance

TERmicron resins exhibit notable resistance to various acidic and basic chemical agents. It's important to note that organic substances with a paraffinic nature, such as hydrocarbons or oils, may be absorbed by the polymer due to their chemical affinity with polyethylene. This absorption can lead to swelling, consequently reducing the mechanical resistance of the article.

This phenomenon is mitigated in resins with higher crystallinity (density) and greater molecular weight (lower MFI). Designing products with increased thickness further helps counteract this effect. Surfactants, owing to their chemical nature, have the potential to permeate the polymer, accelerating micro-fracturing, particularly when using higher fluidity and high-density polymer grades. Such substances, commonly found in detergents, may also exist in nature.

The resistance of TERmicron to surfactants is measured by Environmental Stress Cracking Resistance (ESCR), evaluated according to ASTM D 1693/B standard. This test assesses the rate of breakage formation in a U-shaped curved and cut polymer strip immersed in a solution containing a surfactant at 50°C.

A noteworthy development is the introduction of our TERmicron hexene grades. Many of them, featuring comonomer hexene, showcases high resistance to ESCR, exceeding 1,000 hours

Grades	Density	MFI	Productgroup	Chemical Tanks	Tanks	Industrial Products	Marine Products	Toys	Lawn and Gardening
TERmicron PE LLD (C6) 934 03 UV	0,934	3,5	LLDPE						

U.V. Protection In Polyethylene

Extended exposure of polyethylene to sunlight can lead to photodegradation, evident in color changes (resin yellowing) and the formation of microcracks. Ultraviolet (U.V.) radiation, the most energetic component of the light spectrum, is the primary culprit behind this degradation.

The pace of degradation hinges on factors such as radiation intensity, daily exposure hours, and geographical latitude. Through empirical evidence, it's established that products with ultraviolet stabilization exhibit a lifespan extension of two to four times when compared to those crafted from non-stabilized resins.

Augmenting the resins with pigments generally serves as effective anti-U.V. protection, contingent on pigment type and dispersion level. For instance, incorporating 2% well-dispersed carbon black provides commendable protection against U.V. degradation.





Diverse Utiliyzations Of Termicron Resins In Rotational Moulding

The optimal TERmicron resin selection is pivotal for achieving a well-balanced set of characteristics tailored to the specific requirements of the intended product. With the ongoing evolution of new resins, the applications of rotational moulding with TERmicron are continually expanding.

Common application domains encompass various sectors:

- Industrial Products: Containers designed for the storage and transportation of chemical agents and industrial materials
- Lawn and Gardening: Tanks crafted for fertilizers and herbicides.
- Home Furnishings: Inclusion in the creation of lamps and design objects.
- Consumer: Deployment in the manufacturing of tanks and toys
- Automotive: Utilization in gasoline tanks, air ducts and intakes, and elements like the new jersey.
- Marine: Contribution to the construction of boats, canoes, wind surfs, and buoys.

Our product range encompasses particle sizes ranging from 300 µm to 1500 µm. Additionally, we offer custom color developments tailored to our customers' preferences and application techniques. With our in-house production, we ensure a swift and competent service, characterized by short decision-making processes and effective communication channels to provide the best possible support for our customers. Our aim is to deliver optimal service to meet your needs.

TERmicron Grade Overview

Grades	Density	Viscosity	Product-group	Chemical Tanks	Tanks	Industrial Products	Marine Products	Toys	Lawn and Gardening
TERmicron PA 6 01 145*	01	146	PA		x	x			x
TERmicron PA 6 01 132*	01	132	PA		x	x			x
TERmicron PA 6 01 140*	01	140	PA		x	x			

*TERmicron grades are available in natural, colors and based on regranulates or as prime materials

Grades	Density	MFI	Product-group	Chemical Tanks	Tanks	Industrial Products	Marine Products	Toys	Lawn and Gardening
TERmicron mMDPE (C6) 935 06 UV*	0,935	6	mMDPE		x			x	
TERmicron PE LLD (C8) 939 04 UV*	0,939	3,8	LLDPE		x	x	x		
TERmicron PE LLD (C6) 934 03 UV*	0,934	3,5	LLDPE		x	x			
TERmicron PE LMD (C6) 94 04 UV*	0,940	4	LLDPE	x	x	x	x		
TERmicron PE LLD (C6) 937 04 UV*	0,937	4	LLDPE	x	x	x	x		
TERmicron PE LLD(C6) 935 07 UV	0,935	7	LLDPE	x	x	x			x
TERmicron PE LLD 941 03 UV*	0,941	3,5	LLDPE	x	x	x			
TERmicron PE LLD 936 04 UV*	0,936	4	LLDPE		x	x			x
TERmicron PE LLD 936 06 UV*	0,936	6	LLDPE			x	x	x	x
TERmicron PE LLD 935 09 UV*	0,935	9	LLDPE			x		x	x

*TERmicron grades are available in natural, colors and based on regranulates or as prime materials

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