The Westland Corporation

PROCESSOR

PERSONALITY PROFILING

Dave Larson
President


Dave Larson

Why is it not everyone acts the way I do in certain situations? Something which energizes me only stresses out other people. Personality profiling certainly explains some of the reasons. Are you an extrovert or introvert? Are you guided by your feelings or logic?

Those are just two of the factors personality profiling (testing) can determine. Basically, such profiling is helpful in identifying features of a personality in a way that can be useful in understanding and predicting someone's behavior.

The advantages of personality profiling are numerous. It can help us understand why a person acts the way they do or give an indication of how a person will react in a certain situation.

On an individual level, knowing your personality profile might help explain what motivates you. It could even make clear why you relate easily to some people but are totally frustrated by others.

In a business environment, such knowledge can be helpful in deciding which employee is best suited for a particular task.

It could even make clear why you relate easily to some people but are totally frustrated by others.

Working with resins today is not much different. In a molding operation, one needs to be able to predict the behavior of the resin being processed.

Different resins have different melt characteristics. While there are no "right" or "wrong" personalities, there are proven ways to increase production by understanding the melt profile for a resin and how it relates to a screw design profile.

That is one of the differences Westland can offer you. More than just another screw and barrel supplier, Westland Corporation works closely with resin manufacturers in order to understand the many new materials that keep coming on the market.

We also have a strong reputation for working closely with our customers to design screws profiled for the resin or resins being processed. This can help a molding operation run with more continuity.

After learning more about process profiling inside this issue, contact us. We stand ready to help and consider it a privilege to contribute to the continued success of our customers.

If you have any questions on the information contained in this issue, or our products and services, just call us at 800-247-1144.

The FBI Ten Most Wanted List ... do you know?

2010 marks the 60th Anniversary of the FBI's Ten Most Wanted List.

The standard candidate for addition to the "Top Ten" list has changed as the FBI's priorities have changed. The original "Top Ten" list was comprised entirely of murderers, bank robbers, and escaped prisoners. The current list, while it still includes several murderers, an escaped convict and a bank robber, also includes organized crime leaders and an international terrorist.

A "Top Tenner's" odds of a long life on the run are not promising. Do you know the amount of time fugitives (other than current Top Tenners) have spent on the list over the past 20 years?

ANSWER INSIDE

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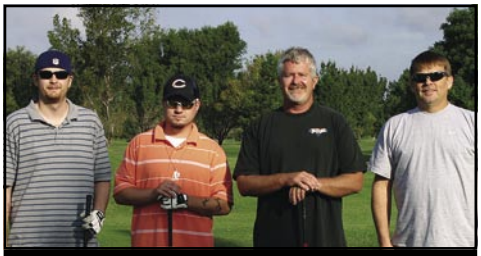


Winners of the 2010 Westland Corporation Employee Golf Tournament from left to right: Nick Wangsgard, Machine Operator; David Larson, Machinist; Dan Johnson, Vice President; and Terry Hackney, CNC Operator.

Winners of the 2010 Westland Corporation Employee Horseshoe Tournament from left to right: Terry Williams, Sr. Process and Sales Engineer and Tom Kramer, First Shift Supervisor.

Dave Larson, President shown with Teresa Holst, Assistant Treasurer, by her Royal Copenhagen porcelain.

TERESA HOLST RECEIVES 30 YEAR AWARD

Teresa Holst was recently recognized for having completed 30 years of exemplary service at Westland Corporation. Teresa's long history with our company has proved to be a valuable resource, and another reason we can claim "Our People Make The Difference".

Currently, Teresa handles all the human resource responsibilities for the company plus many accounting functions. She is also our resident logistics and export guru!

In recognition of her service, Teresa chose to receive several pieces of Royal Copenhagen porcelain to add to her collection.

PROCESS PROFILING

Achieving Repeatable and Predictable Results

In today's world, the term profiling can be controversial not to mention considered inappropriate or even illegal. However, within the criminal realm, basic profiling -- identifying the perpetrator of a crime based on an analysis of the crime and the way it was committed -- is a common investigative tool.

Profiling is a very important part of achieving and maintaining profitability in a molding operation. All processors strive for repeatable and predictable processes. Being able to identify the variables that must be considered in order to achieve repeatable and predictable behaviors is key to reaching processing goals.

Some of the most important variables are:

–Screw Design and the Resin Melt Curve;
–Heat Generated by the Screw Design; and
–Barrel Heat Profiles.

Screw Design and the Resin Melt Curve

To minimize blockages or obstructions in plasticizing, it is necessary to match the melt profile of the resin (melt curve) to the screw profile. (Volume 5 Issue 2 of the Westland Processor is devoted to preventing blockage in your process.)

The flight profile of a screw can and will be considerably different depending on the resin for which the screw is designed to process. General purpose screws can also be profiled differently from one screw supplier to another … and from one OEM to another. (See Figure 1) There are no standards in our industry for a general purpose screw design.

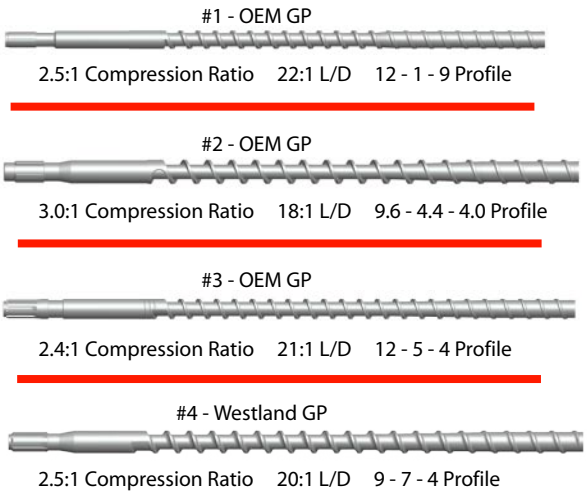
Each design will affect the way the resin melts. Each design will process differently. Westland's general purpose screw is designed more towards processing amorphous resins, which is a lower shear design, in order to accommodate running a wide variety of resins.

The more we accommodate the melt and shear curve of the resin, the greater the opportunity to achieve a homogeneous and isothermal melt quality. A homogeneous and isothermal melt quality is a must in maintaining a robust process. Homogeneous means the melt quality is constant throughout the melt pool with minimum property loss in the resin. Isothermal indicates the temperature of the resin is uniform throughout the melt pool.

Heat Generated by the Screw Design

When an obstruction or blockage occurs in a reciprocating screw, hot spots are established due to the increase force pushing the resin against the surface (root) of the screw and the surface of the barrel.

FIGURE 1



When the screw is reciprocating, these obstructions or blockages occur, causing high shear rates in localized areas of the screw. This provides an opportunity for inconsistent melt temperature which can cause differences within a shot or shot-to-shot due to the changes in molecular weight and viscosity of the resin.

Typically, amorphous resins have a long melt curve (gradual) and high-crystalline resins have a short melt curve (rapid melt) with a defined melting point.

Amorphous resins should be gradually changed from a solid to a melt. Screws with longer transition zones and deeper channel depths with lower compression ratios help protect amorphous resins from burning and degrading.

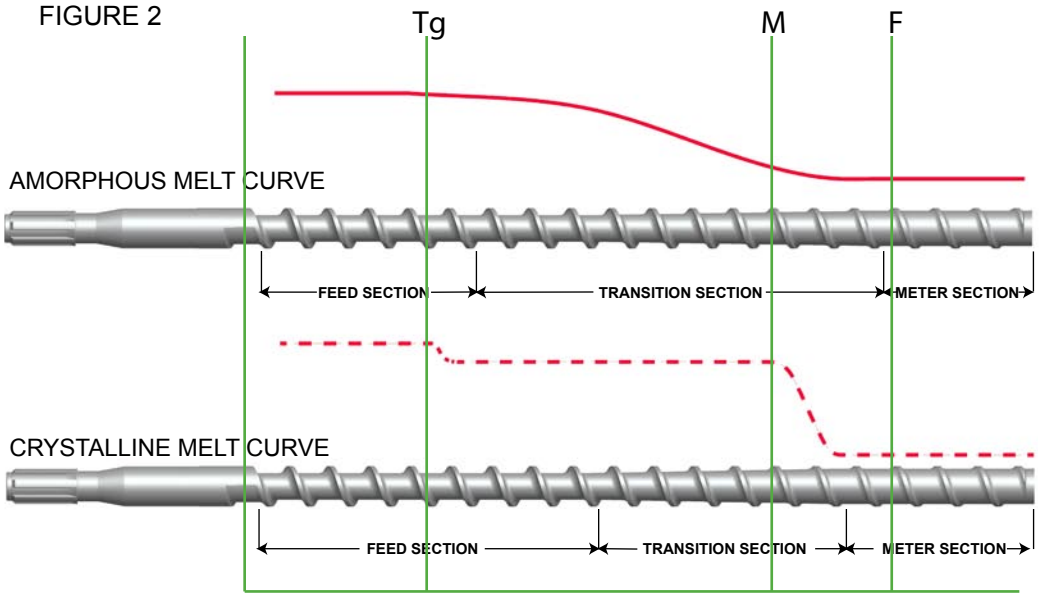
In contrast, the higher crystalline resins are processed more effectively by screws with shorter transition zones, shallower channel depths and high compression ratios.

Figure 2 illustrates the melt curve of both amorphous and crystalline resins compared to the screw profiles.

Westland has found during inspections on production screws a certain sector that has maintained 700°F +. One would typically never impose those types of temperatures for most resins being processed today, unless processing a high temperature resin. These hot areas are developed because the melt profile and screw profile were not matched when the resin transitioned from a solid state to a molten state.

MELTING CHARACTERISTICS

FIGURE 2



Tg = Glass Transition Temperature M = Melting Point F = Fluid Flow State

Barrel Heat Profiles

Westland will often ask customers for a process inquiry sheet when a customer is experiencing an issue with a process. Some of the variables considered are: what is the residence time versus stroke % of shot size on the machine; heat profile; and screw profile. The question to answer is … is enough heat being imposed as required by the resin being processed in the residence times established by the cycle? Heat profile plays a big role in minimizing these blockages.

With an ascending profile, the melting zone is shifted towards the discharge end of the screw (meter end). In other words, the temperature is lower in the feed zone and higher in the discharge zone.

Running a flat, hump or reverse heat profile will move the melting zone back toward the feed port of the barrel.

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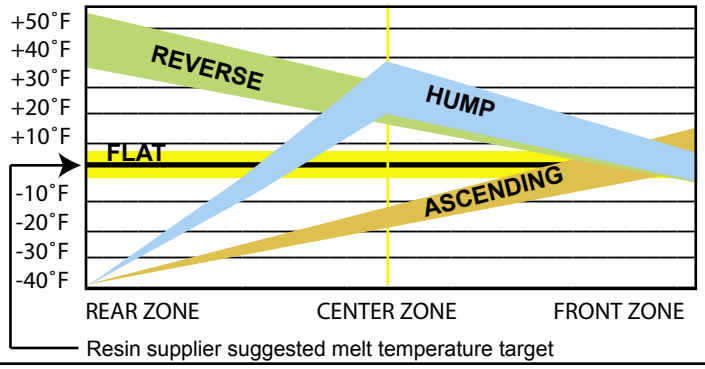
FIGURE 3



Even though an ascending profile is commonly recommended by resin makers, hump or reverse profiles have been found superior in most situations.

DO YOU KNOW: As published on the Department of Justice, FBI website: "Other than current Top Tenners, over the past 20 years, nearly 60 percent of "Top Tenners" were caught within a year of being placed on the list, with more than half of those fugitives being apprehended within a month of being placed on the list."
For more info, visit: http://www.fbi.gov/wanted/topten and click on the link: 60th Anniversary Booklet.

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Figure 3 illustrates the affect of different heat profiles in melting resins. (This graphic was originally published in Volume 4 Issue 2 of the Westland Processor. That issue provides more in-depth information on barrel heats.)

Heat profiles can help in establishing consistency in the melt quality especially if the screw is specifically designed to the melt profile (curve) of the resin. This will develop a wider process window.

Custom molders, in many cases, cannot design screws to be process or resin specific. In those cases, the spectrum of resins should be evaluated and the screw designed for the more amorphous resins. Shear can always be added to a process by several process variables, ie: back pressure and barrel heat. However, shear cannot always be taken away from the process.

In these cases, it is critical to understand the screw profile and how to manipulate the way the resin transitions from a solid to a molten with the heat profile.

Just as criminal investigators meticulously profile a crime scene in order to gather the needed information for prosecution, great care must be taken when you consider your melt, screw and heat profiles. With all the variables involved in processing, as stated before, special attention must be paid in order to obtain a homogeneous and isothermal melt quality.

To learn more about resin melt curves plus screw profiles and heat profiles, contact one of Westland's sales engineers at 800-247-1144. Put them to the test ... identifying ways to improve your process and profit.

Is Your Process Just Good Enough?

Are You Running With Worn Screws And Barrels?

Send your components to Westland for a complete and thorough inspection.

We will quote you the repairs needed to bring your process and profits back up to speed!