WAK Plastics Machinery WWW.WAKSITE.COM

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INDUSTRY TRENDS & TECHNOLOGY

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INSIDE THIS ISSUE:

Automated Assemblies Corporation

Robots can mean the difference between making parts and making profits

ADVANTAGE MAKING WATER WORK™

Rapid

INCREASING PROFITS THROUGH AUTOMATION

Instant Gratification Cannot Come Fast Enough:

The old expression, the molder is only making money when the mold is closed, has not changed. The goal of removing the parts from the mold as fast as possible remains the challenge of most robot applications. Saving a fraction of a second or more on every molding cycle quickly adds up to increases in part counts, additional mold machine availability and additional margin dollars. It is real simple to calculate the savings. Let us use the following 'typical' example.

Improving the cycle time from 12 seconds to 10 seconds is equivalent to adding 16.7% additional mold machine capacity at no additional cost. The additional mold machine capacity is 16.7% of 7446 hours (3 shift, 7 days/week, 85% utilization) or 1,241 hours. That is equivalent to $62,174 a year at a charge rate of $50 per hour. Assuming the price of a robot that can provide this level of performance is approximately $35,000 then the pay back period is about 6 months. In fact, these savings are realized every year that the robot is in service. Treating the purchase of a robot the same as any other piece of capital equipment (i.e. injection molding machine) then $8,882 per year can be capitalized over a seven year period.

...And this example did not even include other real savings such as additional margin dollars, labor savings, increased productivity with shorter delivery times, market/sales competitive value and more. With results like this the standard question of can I afford a robot? now becomes can I afford not to have a robot?.

Realizing results like this requires the application of robots with the most advanced drive systems. Closed loop servo motor control is essential. The robot controls must monitor the position of each axis at all times while anticipating and planning the path of the robot as it moves from location to location. The high speed forward processing and trajectory planning capabilities of the controller manage the motion profiles. The motors and mechanical drive systems actually move the robot.

The fastest vertical axis on a top entry part removal robot demonstrated to date is configured with a high performance servo motor directly coupled to a helical gear and rack. The servo motor package must have very high torque capabilities while being configured in the smallest and lightest package. Don't forget the robot must carry the motor within its structure. The motors and drives must also be sized to dissipate the heat that results from high-speed motion and aggressive duty cycles. The traverse axis and the horizontal axis must also be configured for the highest levels of performance. Servo motors with real time position feedback are coupled to timing belt and pulley drives via high efficiency gearboxes. This drive belt configuration is lighter in weight than rack or screw drives which is important due to the overall lengths of these strokes.

THE CHALLENGE OF DOING BUISNESS IN TODAY'S MARKET

If you're in the molding business, particularly the automotive markets, it will come as no news to you that someone keeps "moving your cheese." The ever present price cuts requested by the Big Three are alive and well, as noted by GM's recent push to get suppliers to commit to price cuts. And the slowing of the economy has presented a continuous source of challenges for virtually every molder in today's market.

More than ever, companies in every market segment are looking for creative ways to reduce costs and manage their cash flow. A focus on business basics was never more important than it is today.

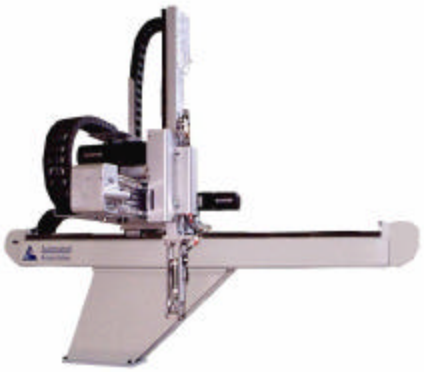
All is not lost, however. Many companies are flourishing, in spite of the market pressures. What are they doing? In most cases you'll find that they are focusing on the business basics. In addition they are working with their suppliers to continue to reduce cost while improving productivity. Often, this involves automation, but just as often a common sense approach to production issues yields surprising results. The old engineering adage of *doing with one dollar what any man can do with two* was never more important than it is today.

How can your suppliers help you be more profitable? Perhaps it's time to call them to the table and ask them for a second look at issues facing you today. Often, they can provide insight to issues never considered before.

Models Starting at $33,900

- For Presses 50 tons to over 750 tons
- Optional low profile telescoping vertical arm on 260, 360, & 460
- Heavy duty linear bearings on all axes
- 39 lb. Payload (includes chuck, EoAT & shot)
- Horizontal 90° Pitch (chuck) included
- Modular design to “mix and match” strokes
- Optimized three axis servo controller
- Flexible “walk through teach” programming
- Coordinated motion
- Bight screen with wide viewing angle, color Graphical User Interface standard
- 250 on-board mold memories with 10 canned pre-programmed sequences
- Four sequences with 50 steps each (Sample, Takeout, Unload, Reject)
- Timer and Clobal speed changes on the fly
- 14 user input/outputs
- Full compliment SPE interface (robot side)
- Standard mounting base and hardware
- Safety guard interface with connector

AZ-260, 360, 460, & 560



AZ-100 Series Servo “Express”	Vertical (inches)	Traverse (inches)	Reach (inches)
AZ-260, 360, 460	26, 36, 46	56, 74, 84, 100*, 120*	20, 30, 40*
AZ-560	56	56, 74, 84, 100*, 120*	20, 30, 40*

For more information, please call:

WAK Plastics Machinery at the phone numbers listed blow.

Cycle Time Improvements Translate to Improved Profits

Cycle Time Improvement	Hourly Machine Rate						
	$30.00	$35.00	$40.00	$45.00	$50.00	$55.00	$60.00
10.00%	$22,338	$26,061	$29,784	$33,507	$37,230	$40,953	$44,676
15.00%	$33,507	$39,092	$44,676	$50,261	$55,845	$61,430	$67,014
20.00%	$44,676	$52,122	$59,568	$67,014	$74,460	$81,906	$89,352
25.00%	$55,845	$65,153	$74,460	$83,768	$93,075	$102,383	$111,690

West Michigan
616.844.0093

Central Michigan
616.642.6080

Detroit Area
586.677.9025

2. Gloss Issues

Most gloss issues boil down to a part either being too glossy or not glossy enough. In addition, often there are gloss differences on the surface of a molded part.

Figure 1. shows gloss differences near ribs. Figure 2. shows gloss differences due to wall thickness variations. Figure 3. has gloss differences near weld lines.

Cause: Gloss is simply the appearance of a part surface when exposed to light. As light hits the surface of a part, a portion of that light is reflected. The rougher a part surface (textured), the less light is reflected from that surface. The smoother or more polished the surface, the more light is reflected. Texturing adds projections to a part surface and gloss differences can be caused by different variations in the surface of the molded part. Variations that impact gloss include cooling conditions, shrinkage, and post mold shrinkage (stressing).

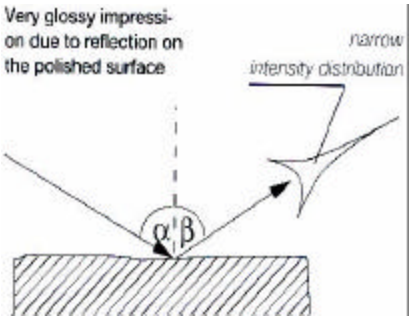
On a microscopic level, the following shows the light reflection tendency of a polished part versus a textured part:

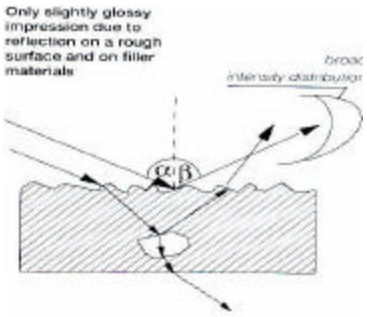
(Following any changes to the machine, mold, or material, mold a new part and go through the diagram again)


1.


2.


3.





Corrective Action:

1. Not enough gloss on the part? ——— YES ———

Polished Surface:
1. Increase mold surface temperature
2. Increase melt temperature
3. Increase injection speed
4. Improve polish of the mold surface

NO

Textured Surface:
1. Reduce mold surface temperature
2. Reduce melt temperature
3. Reduce injection speed
4. Apply finer mold surface texture

2. Gloss difference on polished surfaces? ——— YES ———

Improve Melt Temperature consistency:
1. Reduce melt cushion
2. Increase back pressure and adjust screw speed
3. Increase nozzle temperature
4. Apply even surface polish
5. Check the injection unit of the molding machine (burned out heaters, worn screw/barrel, etc.).

NO

See Next Page

2. Gloss Issues Continued

Corrective Action:

3. Gloss difference at ejectors or slides? — YES →
Avoid pressure spikes in the mold:
1. Optimize transfer position / time
2. Reduce holding pressure
3. Reduce holding pressure time
4. Insure uniform mold temperature
5. Change ejector design or system

NO ↓

4. Gloss differences at perforations? — YES →
1. Modify perforation geometry
2. Consider moving gate location

NO ↓

5. Gloss differences at weld line? — YES →
1. Increase mold surface temperature
2. Increase injection speed
3. Consider moving the gate location

NO ↓

6. Gloss differences at corners of the molded part? — YES →
Uniform temps at the corners of the molded part
1. Reduce temp of the moving half of the mold
2. Change geometry of the corners (round off)
3. Change thermal design of the mold

7. Gloss differences at ribs? — YES →
1. Optimize holding pressure time
2. Increase holding pressure
3. Change geometry of the molded part
4. Change thermal design of the mold

NO ↓

8. Gloss differences at wall thickness variations? — YES →
1. Optimize holding pressure time
2. Increase holding pressure
3. Adapt injection speed profile to geometry (fill pattern) of the part
4. Try to obtain uniform wall thickness

NO ↓

1. Change color of material
2. Reduce glass fiber content
3. Reduce filler material content