

Productivity Improvement in High Pressure Die Casting

Presentation By:

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What is Productivity?

Productivity is the measure of how specified resources are managed to accomplish timely objectives as stated in terms of quantity and quality.

Productivity isn't everything, but in the long run it is almost everything

Productivity is usually expressed in one of three forms:

- ☐ Partial Factor Productivity,
- ☐ Multifactor Productivity,
- ☐ Total Factor Productivity.

❑ Partial Factor Productivity,

The standard definition of productivity is actually what is known as a partial factor measure of productivity, in the sense that it only considers a single input in the ratio.

The formula then for partial-factor productivity would be the ratio of total output to a single input

❑ Multifactor Productivity,

A multifactor productivity measure utilizes more than a single factor, for example, both labour and capital. Hence, multifactor productivity is the ratio of total output to a subset of inputs

A subset of inputs might consist of only labour and materials or it could include capital

❑ And Total Productivity.

A broader gauge of productivity, total factor productivity is measured by combining the effects of all the resources used in the production of goods and services (labor, capital, raw material, energy, etc.) and dividing it into the output

Facts :

One of the major causes of company's decline is low productivity.

Failure to meet targeted productivity can result to high costs per unit, hence higher prices, making your good, services, or commodities not competitive enough on the market.

Many businesses try very hard to remain competitive in the market. Therefore, it is important for businesses to implement strategies to make improvements in productivity levels.

Businesses can make productivity improvement by asking themselves questions

Productivity Improvement can also be achieved by implementing several latest technologies and smaller supporting equipments.

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Example:

Productivity Devices, Goods and its Benefits

Selection of Die Casting Machine

Parting Injection **U series**

U2W / U2PLUS/ U20 / U30

Courtesy: Hishinuma Machinery Co. Ltd

U20 & CX25F2

【Hsmc Data】

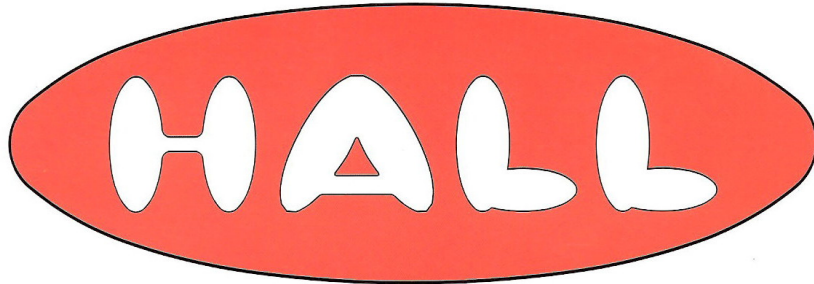


	U20	CX25	
Cycle time	5 sec	13 sec	38%
Production	720 shot / hour	276 shot / hour	260%
Cavity weight	24.263 g	24.202 g	100.25%
Shot weight	45.06 g	93.87 g	48%
Scrap weight	20.8 g	60.87 g	34%

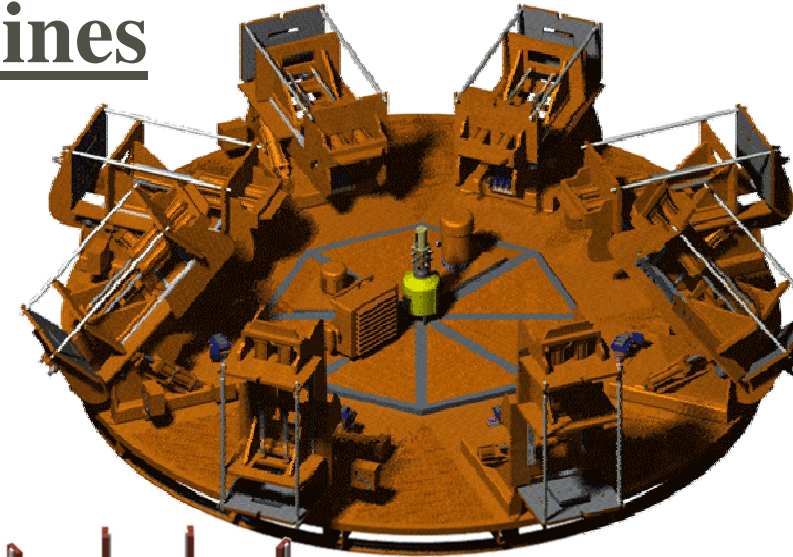
Courtesy: Hishinuma Machinery Co. Ltd

Gravity Casting Tilt Pour Machines

Multiple Castings in One Cycle Time

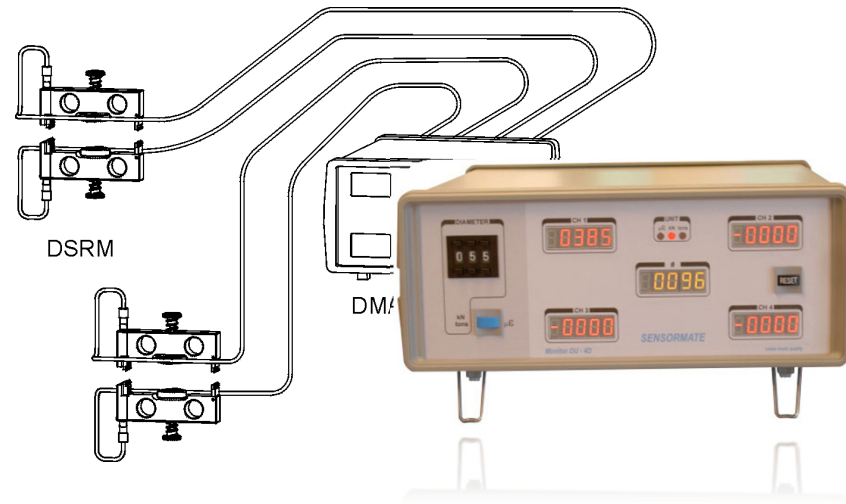
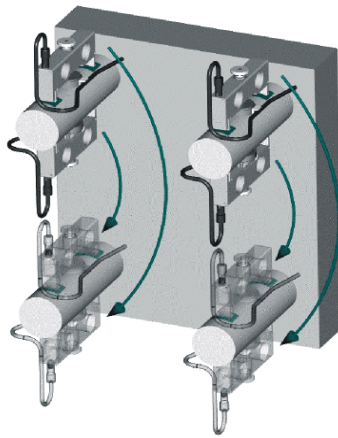


Rotary Table / Carousel

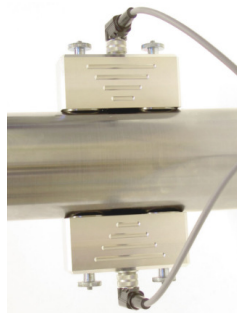
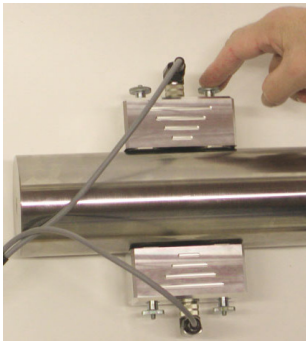


Courtesy: CMH Manufacturing, USA

Regular Maintenance Of Die Casting Machine Tie Bars

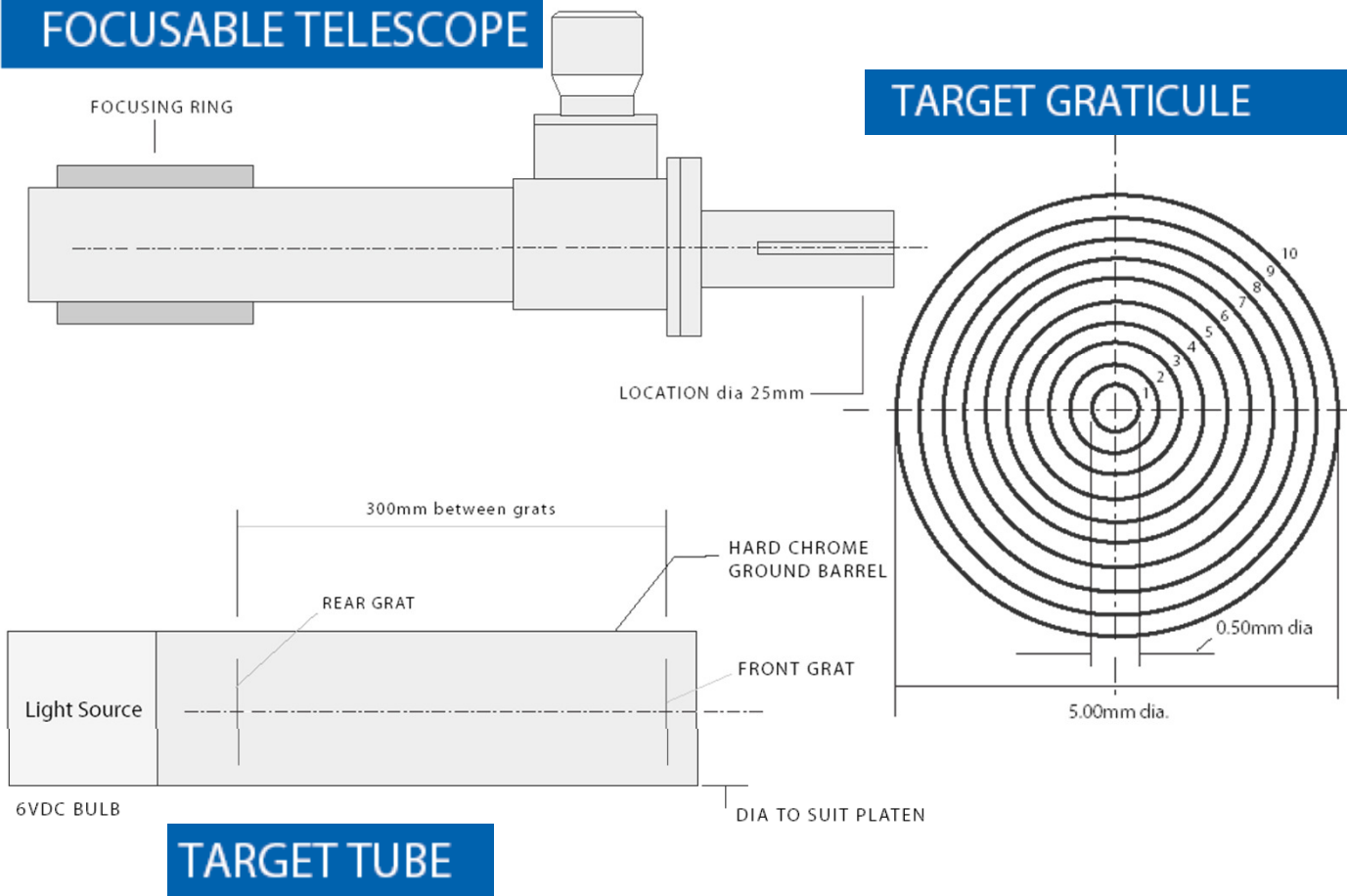


Strain Measurement Devices



Regular Maintenance Of Die Casting Machine Injection System

FOCUSABLE TELESCOPE



alignment
telescope

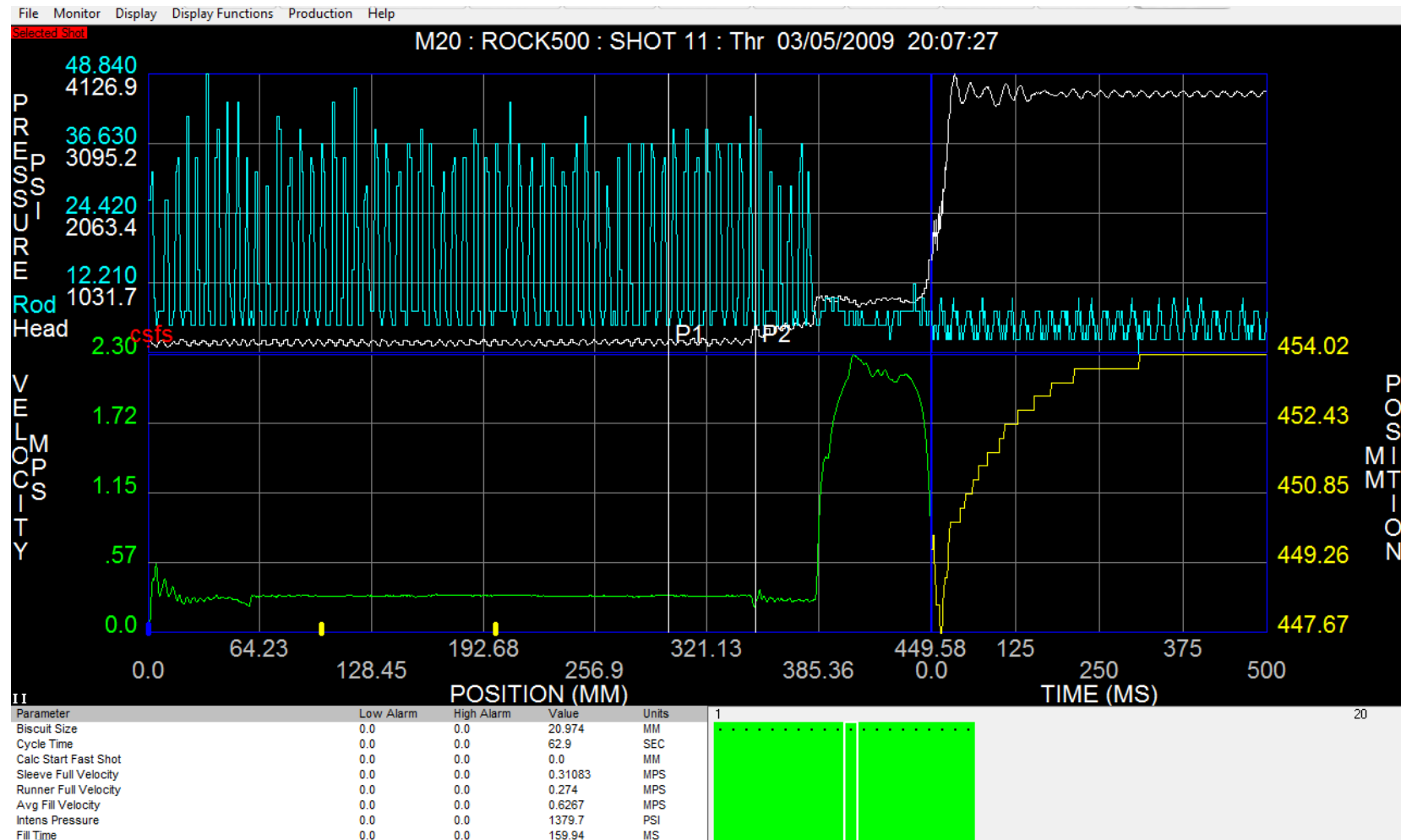


Courtesy: OTI, UK

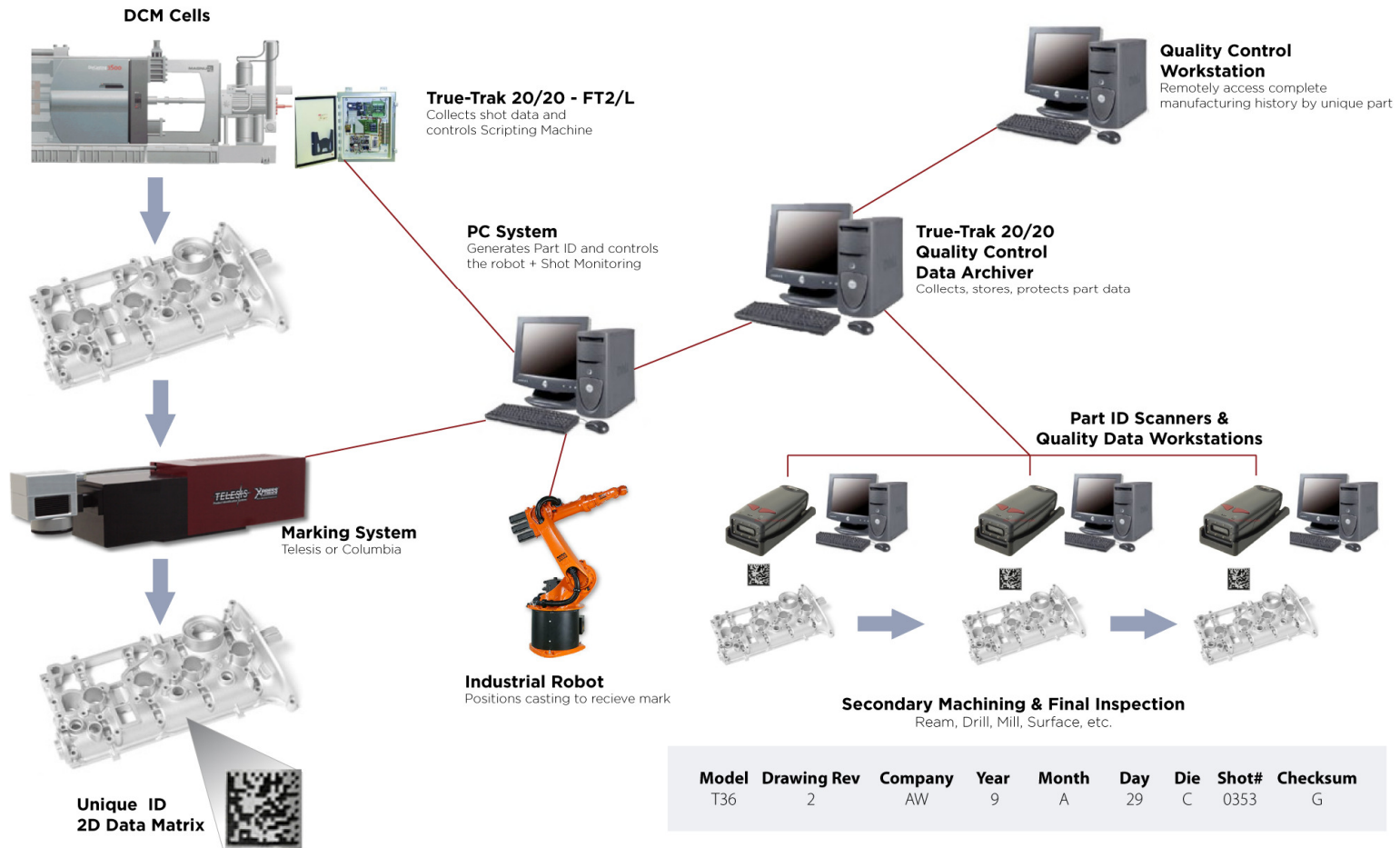
Process Monitoring System



Visi-Trak – Shot Monitoring System



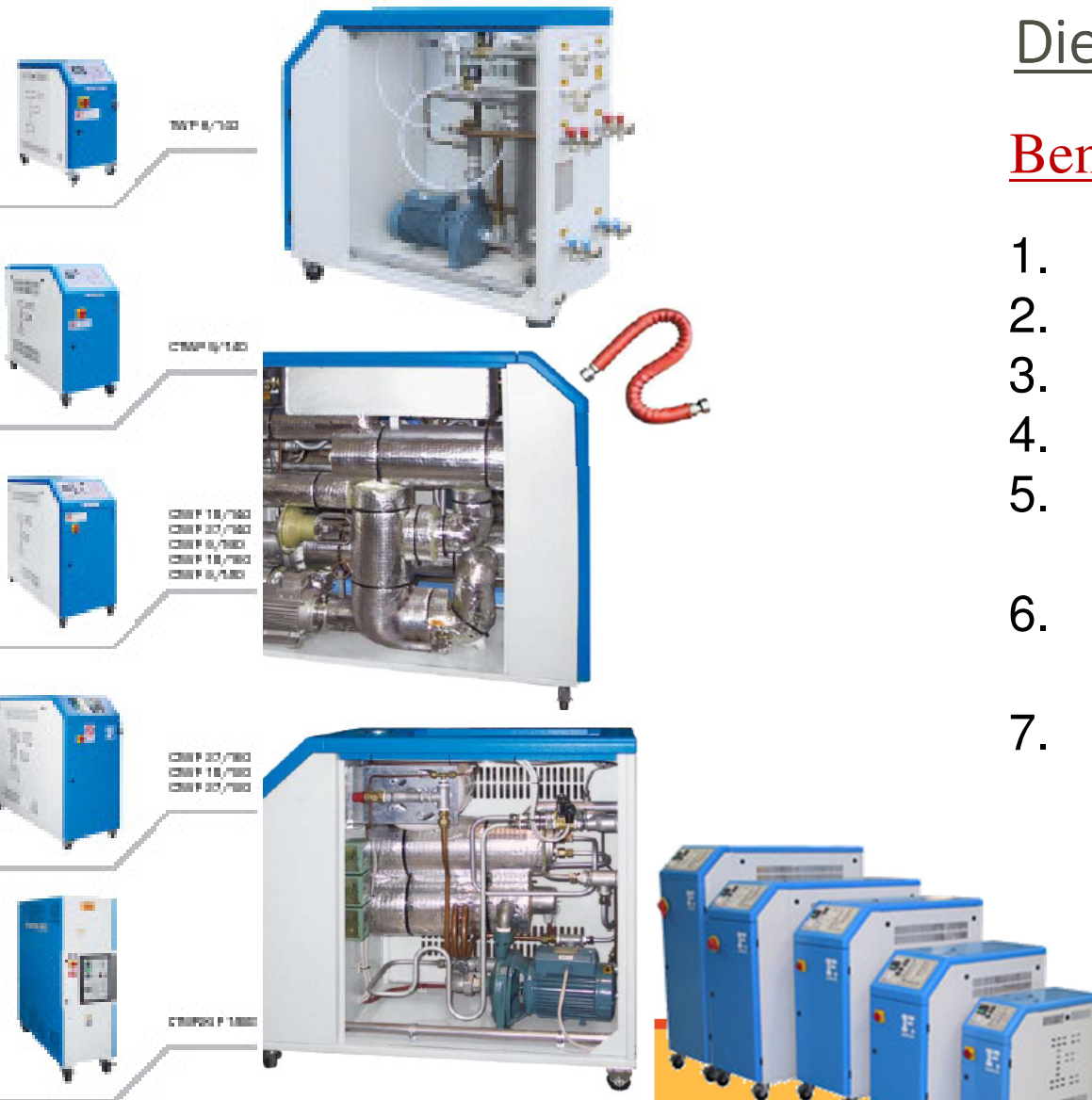
Capability to track each and every casting part with its complete shot profile and its history from manufacturing stage to end of product delivery.



Die Temperature Controller

Benefits

1. Save cost on die preheat.
2. Improved die life.
3. Less maintenance work.
4. Avoid casting defects.
5. No heat check marks on casting and die.
6. Save cost on heat treatment / die stress relieving.
7. Optimized die temperature.



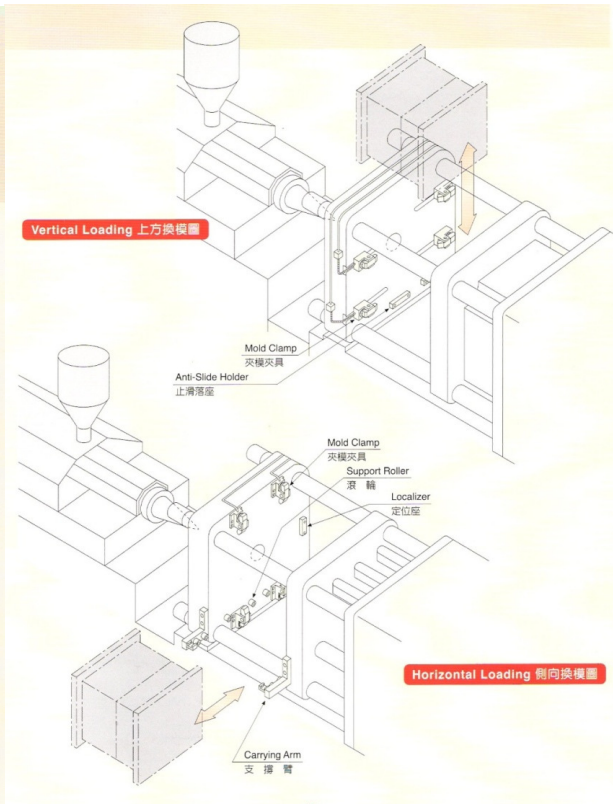
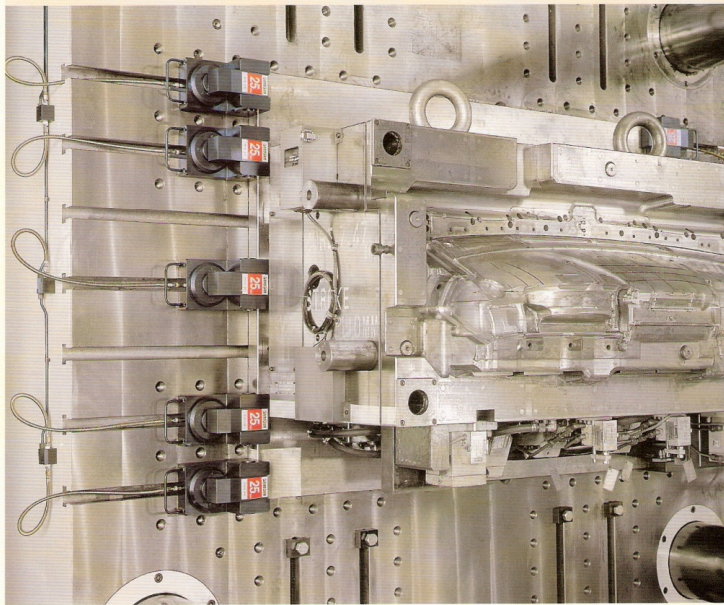
Quick Die Change System

Manual Die change time is 30mins to 75mins.

With Quick Die Change System in less than 15mins.

QUICK MOLD CHANGE SYSTEM

It's An Era For Making High Frequency Mold Change With Multiple Patterns And Small Quantity. In Order To Save Time For The Mold Change And Ensure The Safety Of The Operation, It Is Just In Time To Apply The Quick Mold Change System.



Plunger Tip

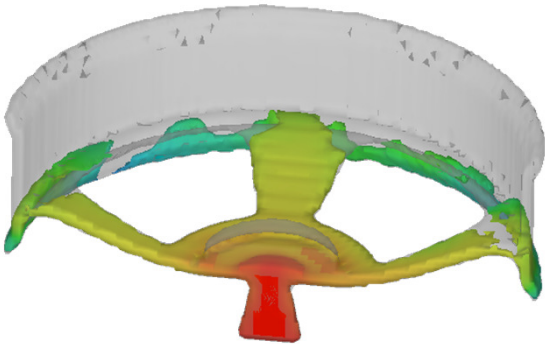


	<u>CAST IRON</u>	<u>BERYLLIUM COPPER</u>
COST OF EACH TIP FOR 60 DIA	400	5500
SHOTS	1000	40,000
Plunger tip change over time after	500 min (8 ½ hrs.)	20,000 min (333½hrs.)=19 days
CYCLE TIME (Approx.)	30 sec	30 sec
Appox. Cost of Component	Rs. 10	Rs. 10
If company works 18 hrs. per day	2 tips/day	1 tip/ 19 days
For 19 days	38 tips	1 tip
For changing of each tip to load and unload and heating of dies it takes up to 30 min		
Production loss due to change of 38 tips = 2280 Components (Shots)	2280 * Rs.10 = Rs. 22800	-
For die heating (Rs.100/change of tip)	Rs. 3800	-
Manpower(4000/month) Rs. 10 for 30 min	Rs. 380	
Cost for 38 tips	Rs. 15200	One Tip Rs. 5500
TOTAL	Rs. 42180	-5500
	Savings	Rs. 36680

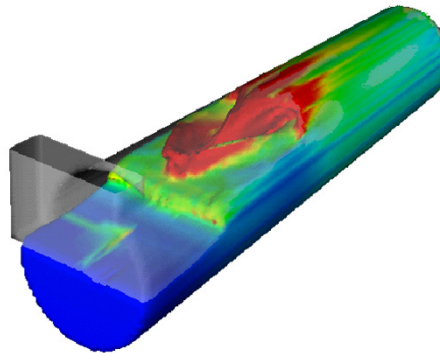
Courtesy: Hildreth Manufacturing LLC, USA

Casting Simulation Software

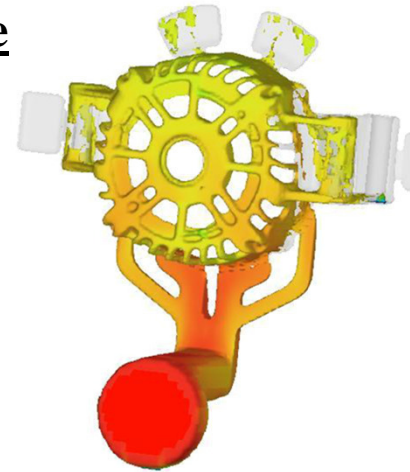
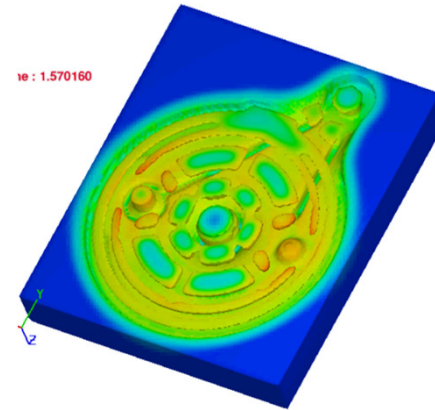
Low Pressure Die Casting



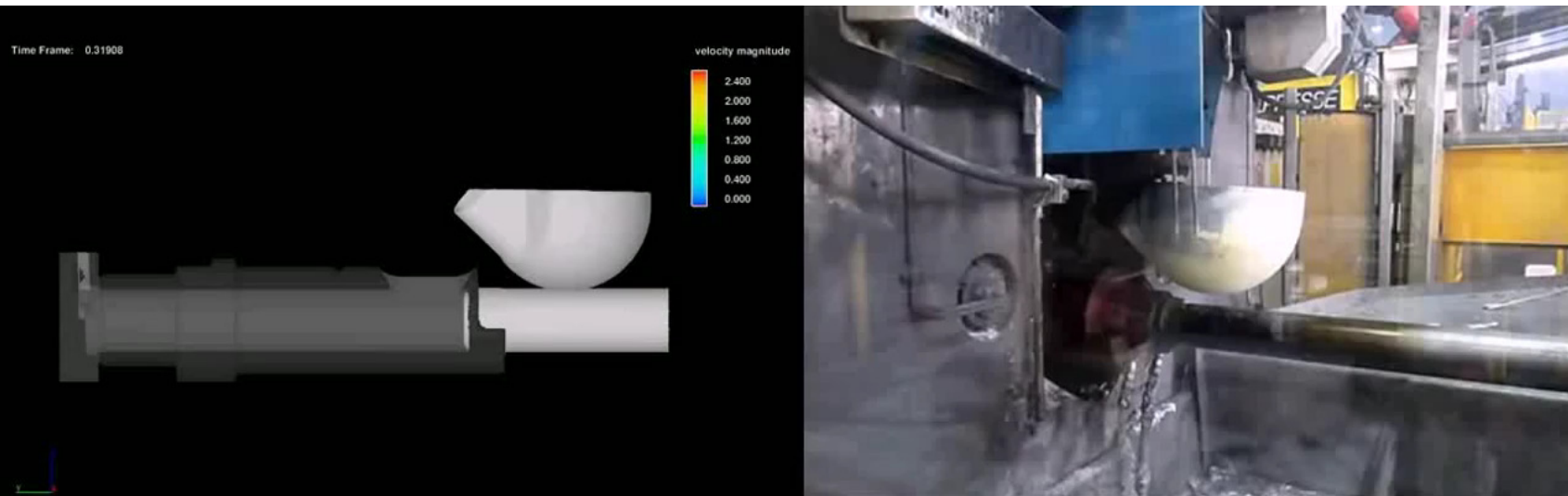
Shot Sleeve



Die Temperature



Complete Process Simulation & Validate



Courtesy: FLOW-3D

Casting Simulation Software



	Projected Area in Cm2	Shot Weight (Grams)	HPDC Machine
Existing Design	240	767	250 Ton
Modified Design	130	570	150 Ton
Percentage Improvement	-46 %	-26 %	

Water-Free Electrostatic Spray Technology for High Pressure Die Casting

Aoki Science Institute Co., Ltd.
Japan

Lubrolene®

Water Based & WFR Effect

With Water Base

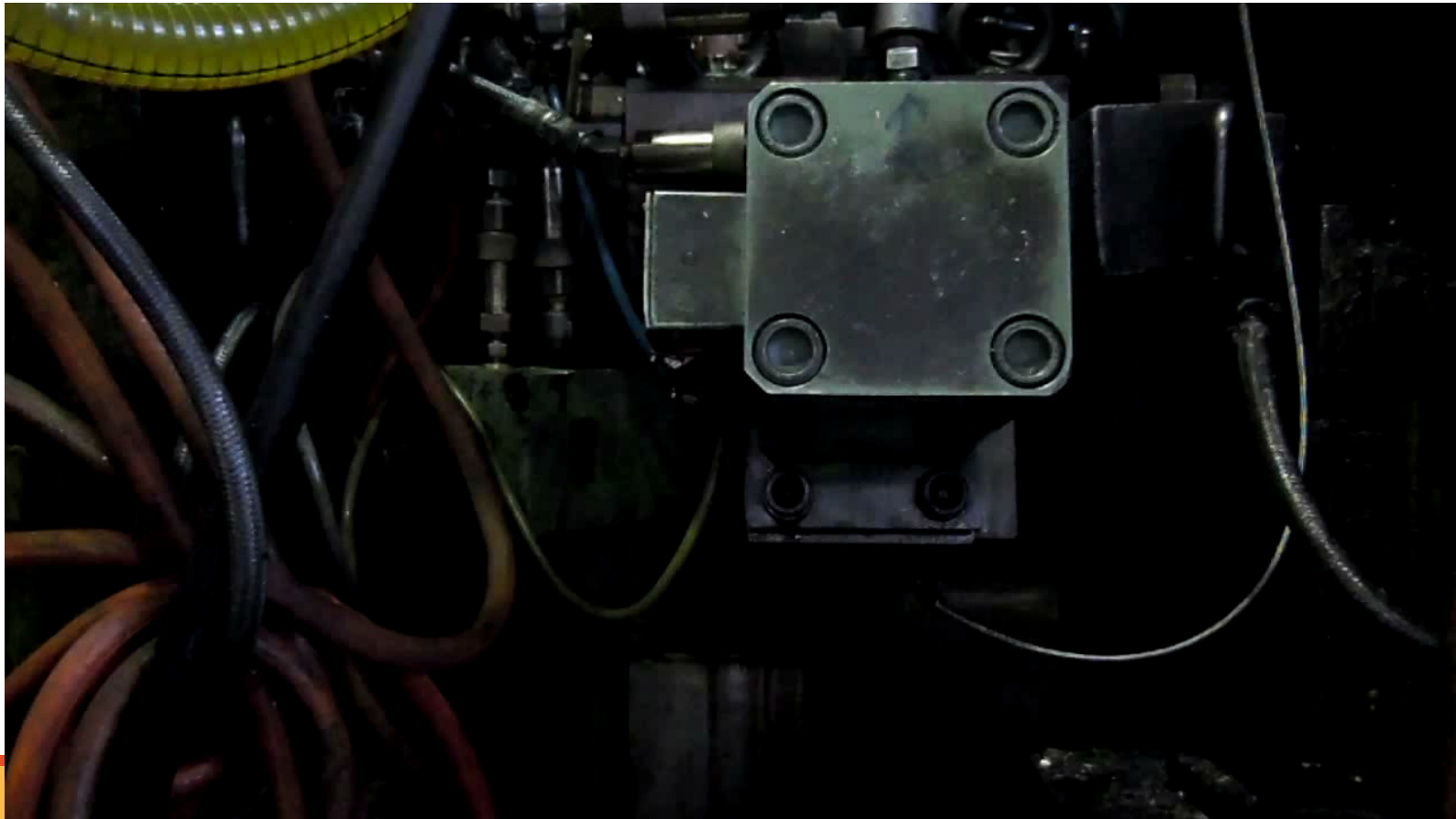


With WFR



Water Based & WFR Effect

With WFR on Toshiba 350 Ton M/c



Quick Economics

1	Water Treatment				
2	Waste Water Disposal				
3	Die Life		Cost per die	Approx. 70,00,000	Min 3 time More
4	Compressed Air				
5	Reduce Metal Temperature				
	A. Avoid turbulence				
	B. Control Porosity				
	C. Energy Saving in Metal melting				
6	No Fumes				
7	Maintain Clean Environment				
8	No Human Health or Environment Hazardous				
9	With Electrostatic ensure complete die area is with die coat				
800 Ton m/c					
	15 Kg * Rs. 3000				Rs.45000
	2ml / shot	15 kg = 15000ml	7500 sprays	Rs.45000/7500Sprays	Rs.6 / shot

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質問？
问题吗？
domande?
सवाल? Questions?
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Thank You

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Questions about the Business itself:

- ***Research and Analysis*** – Has the business done any research on the targeted markets and analyze the result on the approaches best fit?
- ***Smart Investment*** – Has the business calculated the amount of financial resources available to allocate to research and analysis, production cost, [labour cost](#), and marketing?
- ***Productive Risks*** – Are there any risks that the company should know of during production?
- ***Innovation and Originality*** - Is your product something original and in a new market?