XPArision heading for perfection

Efficiency for Survival

Billions to gain

Introduction to XPAR Vision

- Global container glass industry
- Hot End inspection and forming process control
- Development and implementation customer support

- Innovative & technology leader
- Decades of experience





IR-D

Hot end infrared camera solution for inspection, process monitoring and quality control





IGC

Hot end solution for monitoring and automated controlling the weight of the gob for process and quality control







Gob Assist

Hot end camera solution for monitoring and controlling the gob loading for process and quality control

BTC

Hot end sensor solution for monitoring and controlling the temperature of the blank mould, neck ring, plunger, gob and parison





reporting

XPA*vision*



Factual information is a pre-condition for

- developing **XPERT**

- automation





Billions to gain











Agenda

- (F)actual gains achieved with the use of XPAR Vision product portfolio
 - New technology creates new possibilities
- Future outlook re: forming process control
- Predict potential gain globally → what the container glass industry can/should contribute to "efficiency for survival"



XPAR IR-D: InfraRed Dual camera system













XPAR IR-D capabilities

Product focus

- Bird swing
- Thin spot
- Thin bottom, neck, wall
- Chocked neck
- Wedged bottom
- Freak
- Stuck ware
- Inclusion
- Shape
- Verticality
- Fin



Process focus

- Swabbing
- Loading
- Section performance
- Ware handling
- Cooling
- Speed
- Mould condition/design
- Gob temperature
- Section stop-start
- Job change



Improved ware spacing











Reduced held ware / blocked ware / resorting





50% - 80%





Reduced specific rejects produced → improved process performance, reduced sections stops, improved quality







■ Time gain due to fast intervention → improved process performance, reduced section stops, improved quality







Customers reclamations

Cost of poor quality

2% - 10%



Improved swabbing → consistency amongst operators





- Improved job change \rightarrow shorter ramp up time
 - Transport screen \rightarrow reject stuck ware
 - Overview screen \rightarrow react on alarm
 - Machine graph \rightarrow stabilize machine
 - Hand over

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XPAR IGC: Infrared Gob weight Control system





XPAR IGC capabilities

- Automated control of weight of all gobs operator independent
- Accurate weight control < 0.5% of the weight</p>



XPAR IGC gains

 Reduce weight variation: glass usage, defects, stable forming process

→ 0,2% – 0,3% accuracy

 \rightarrow reduced weight variation from 1% to 0,4%





XPAR GA/BTC

- GA: Gob Assist
- BTC: Blank side Temperature Control







XPAR GA capabilities

- Position into the blank mould
- Speed
- Length
- Shape
- Diameter
- Orientation
- Time of Arrival (T.O.A.)





XPAR GA capabilities \rightarrow gob lenght





Length, shape and diameter can be very different when they arrive at the blank



XPAR GA capabilities \rightarrow gob length



XDARvision

- Gob length strongly relates to friction
- Critical point of friction: the curve at the entrance of the deflector
- Effective remedies:
 - Lubrication/swabbing
 - Coating
 - Construction
- When to do what?



Other learnings

- Length → shape → diameter
- Friction relates strongly to speed and time of arrival
 - Low friction → high speed and early TOA
 - High friction → low speed and late TOA

Effect length on quality

- When the length is shorter it will have an impact on the shape. The gob will deform
- A shorter lenght, a bigger diameter and a lower speed will result in a change in the forming process in the blank
- Due to the change of the input (gob) the gob falls not as deep as normal in the blank
- The IRD controlchart will show more variation at several zones and the bottom intensity will increase while the intensity in the neck zone will decrease: the glass distribution changes







Effect length on quality







NUMBER : 4593863

ARTICLE : Carsberg 27,5cl

PACK RATE : 98.6%

The bottom intensity changes due to the shorter gob and will affect the Verticallity of the bottle



OPERATOR : XPAR Vision

XPAR GA gains

Lenght, shape, diameter (speed, ToA)

- Less uncontrolled sections stops
- Improved material life time
- Improved quality



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Position

- Improved material/coating life time
- Reduced swabbing
- Improved quality



XPAR GA gains

- Improved efficiency
- Improved quality
- Improved know how
- Reduced operator workload
- Improved safety





XPAR BTC capabilities

- Blank half's
- Neck ring's
- Plunger
- Gob
- Parison







XPAR BTC capabilities

Plunger temperature day/night

Left blank day/night: 5% difference gives different glass distribution !

Parison day/night: glass thickness bottom changes > 10%







XPAR BTC gains

High accuracy measurement

- Timing + Position
- New improvements are within reach
 - Controlled glass distribution
 - Improved quality
 - Light weight
 - No surprises





Better control leads to....

- Reduction of customer complaints
- Reduction of weight
- Increase of speed



Weight gains

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Relative glass thickness fluctuations in the same section plane of different, randomly taken glass bottles



Prof. Dr.-Ing. H. Hessenkemper, Glas- und Emailtechnik (TU Bergakademie Freiberg)

weight/volume Beer non returnable



Summary statement

(F)actual gains achieved with the use of XPAR Vision product portfolio

•	Improved ware spacing	1% - 4%
•	Reduced held ware / resorting	50% - 80%
•	Reduced specific rejects produced	2% – 10%
•	Time gain due to fast intervention	
•	Improved swabbing	1% - 2%
•	Improved job change	1% - 2%
•	Reduce weight variation	1%
•	$GA \rightarrow$ zero defects production	2% - 4%
•	BTC	TBD
	Customer complaints	!!
	Weight / speed gains	!!



Summary statement













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Miminizing human dependency



XPAVision

Minimizing human dependency: XPERT









Role of XPERT in the XPAR picture





Detect change from normal process



XDAVision

- Faulty bottles are detected automatically
- No input from user!



IR images







Good

Final blow too lateFinal blow too earl







.....and more to come!!!





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Billions to gain











Potential potential gain globally

- With what's available today \rightarrow 5%
- Within reach \rightarrow 25%
- Global market size 45 50 Billion
- Savings 2.5 \rightarrow 12.5 Billion





- Cut global energy consumption by 50%
- Reduce total carbon dioxide-equivalent emissions by 65 percent
- Increase recycled content to a global average of 60 percent
- Eliminate workplace accidents



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Efficiency for Survival

Thank you