

Bottero
Glass Technologies

xparvision
heading for perfection

Partnership



Optimization by automation

Agenda

- > Our vision
- > Our partnership
- > Our project
- > Moving forward



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- > **Our vision**
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> **Our vision-1-**

- You are facing enormous challenges
 - ✓ customer demand better quality against lower costs
LOWER ENERGY USAGE, CARBON EMISSIONS AND USE OF RAW MATERIALS
 - ✓ competition from alternative packaging materials
- You are forced to maximize production efficiency and effectiveness



> **Our vision-2-**

- Main indicators for production efficiency and effectiveness are:

- ✓ pack to melt
- ✓ weight / volume
- ✓ speed of production
- ✓ customer complaints
- ✓ resorting



> **Our vision-3-**

- In the ideal world you would have
 - ✓ pack to melt of 100%
 - ✓ weight / volume of 30% better compared to today
 - ✓ speed of production of 30% higher compared to today
 - ✓ no customer complaints
 - ✓ no resorting
- In the ideal world your glass forming process is in full control and the output 100% predictable



> **Our vision-4-**

- A big step towards this ideal world can be made
- You simply need our partnership




Agenda

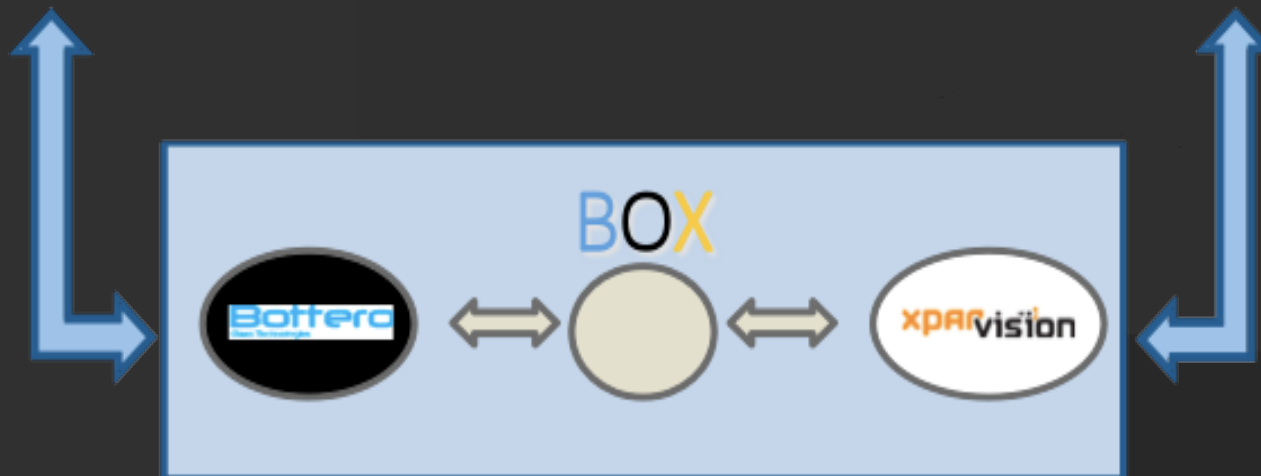
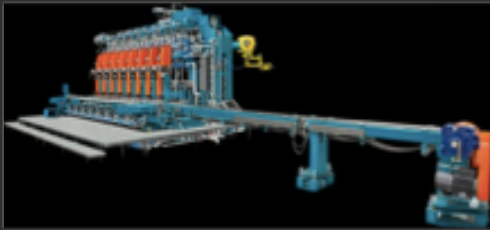
- > Our vision
- > **Our partnership**
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> Our partnership

- The aim of our partnership is to control and optimize the forming process, and to prevent critical defects from occurring, by automation
 - Our partnership is on R&D and industrialization of the
- 
- The logo consists of the letters 'B' and 'X' in a bold, sans-serif font. The 'B' is blue and the 'X' is orange. They are connected by a grey circular graphic element that forms a partial ring around the space between them.
- Bottero and XPAR remain to be independent companies

> Our partnership



Agenda

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> Our project

- Our first project aims for

- ✓ automatic control and optimization of ware spacing
- ✓ automatic control and optimization of glass distribution
VERTICAL HOMOGENEOUS GLASS DISTRIBUTION



> Our project

ADAPTIVE WARE SPACING

- Automatic control and optimization of ware spacing
 - ✓ achieve a stable ware spacing between all bottles



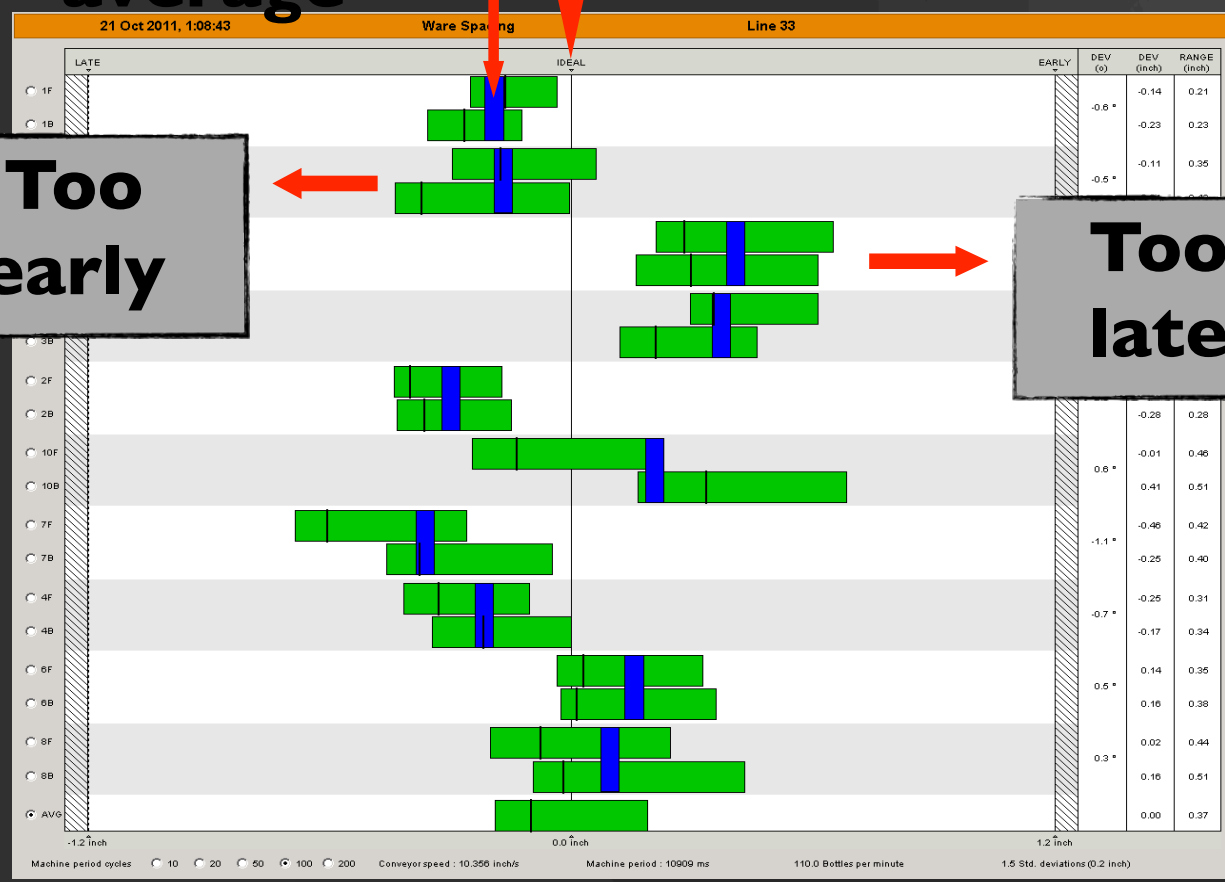


Ideal

Section
average

Too
early

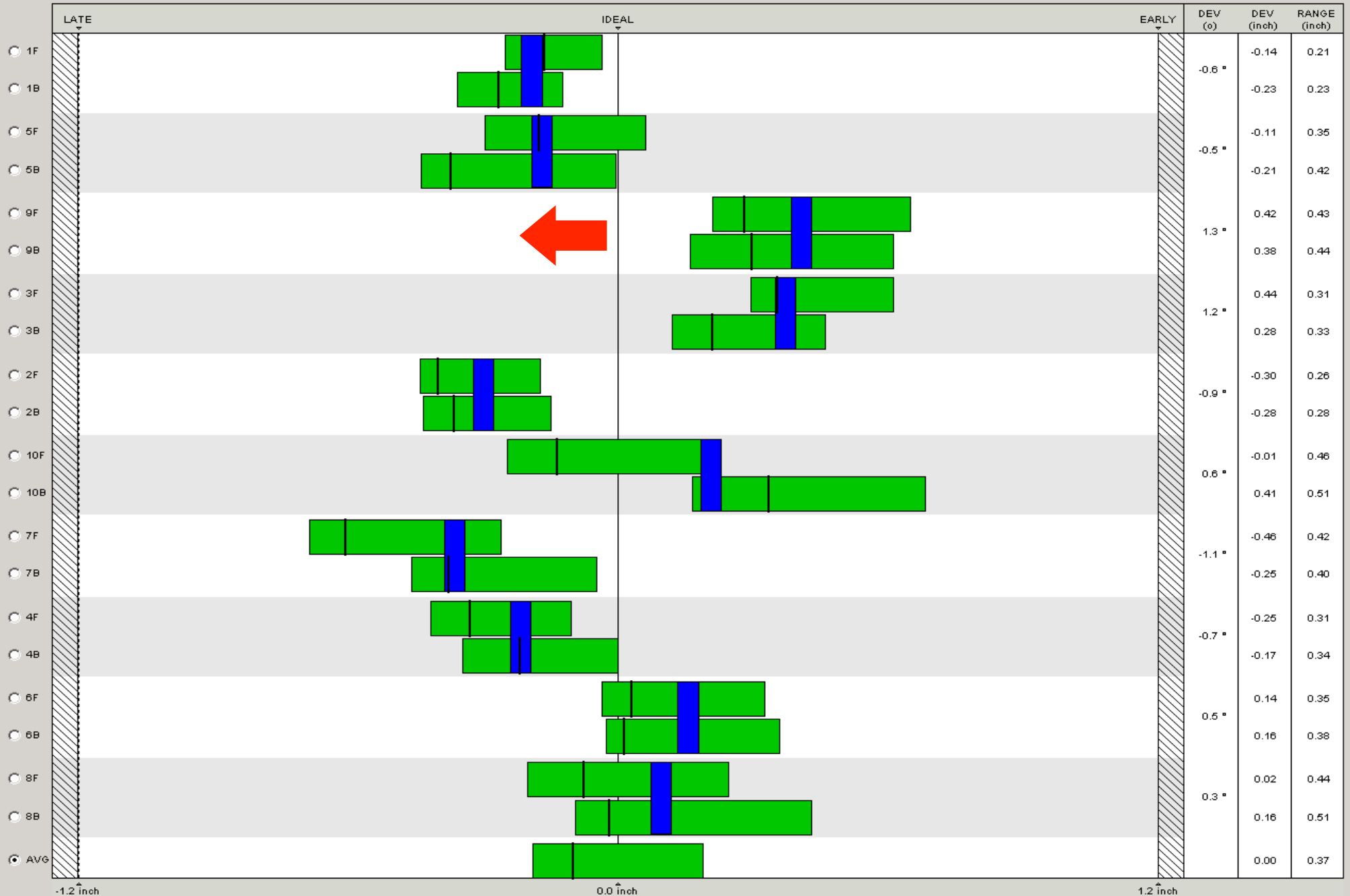
Too
late



21 Oct 2011, 1:08:43

Ware Spacing

Line 33

Machine period cycles ☐ 10 ☐ 20 ☐ 50 ☒ 100 ☐ 200

Conveyor speed : 10.356 inch/s

Machine period : 10909 ms

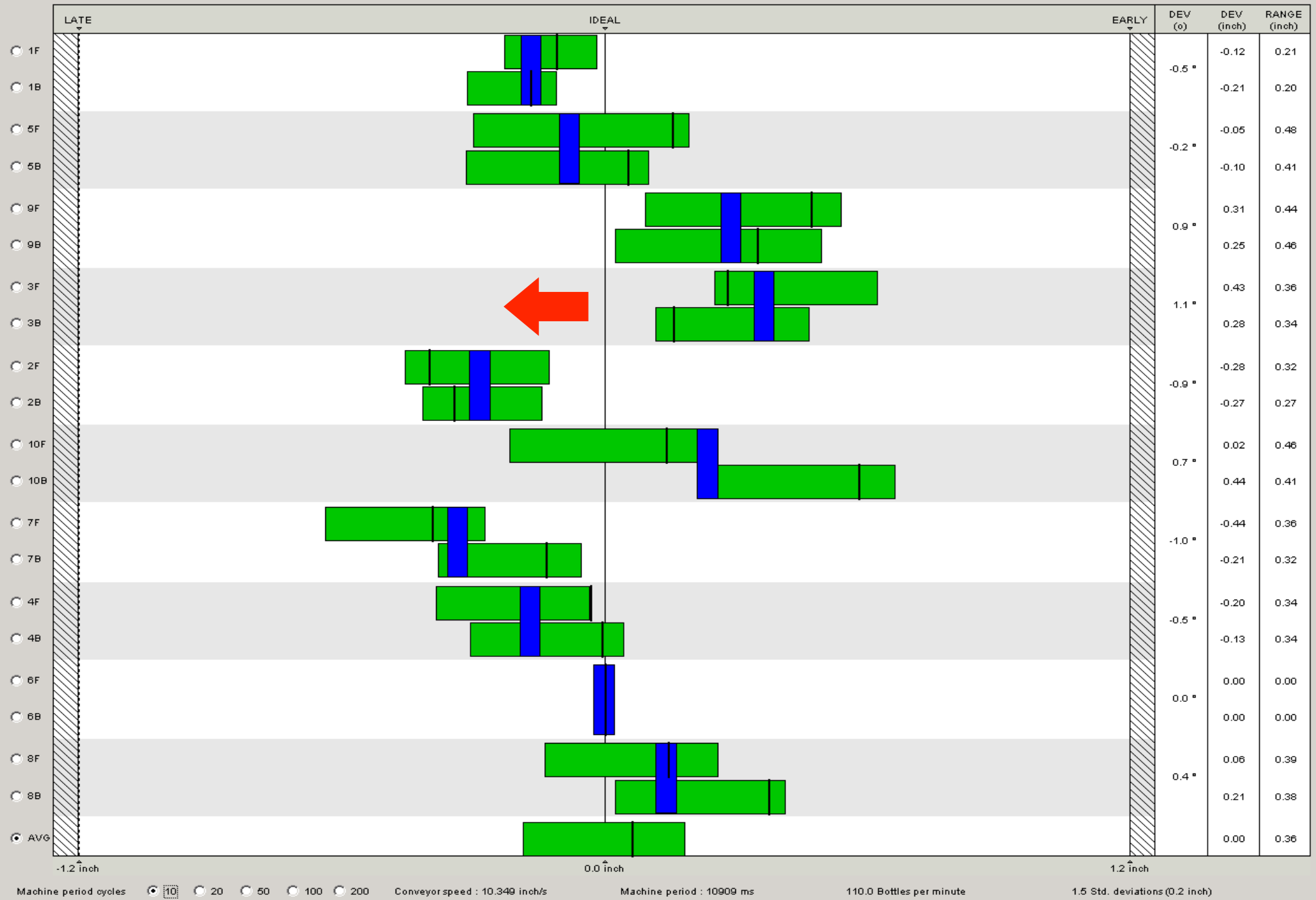
110.0 Bottles per minute

1.5 Std. deviations (0.2 inch)

21 Oct 2011, 1:11:41

Ware Spacing

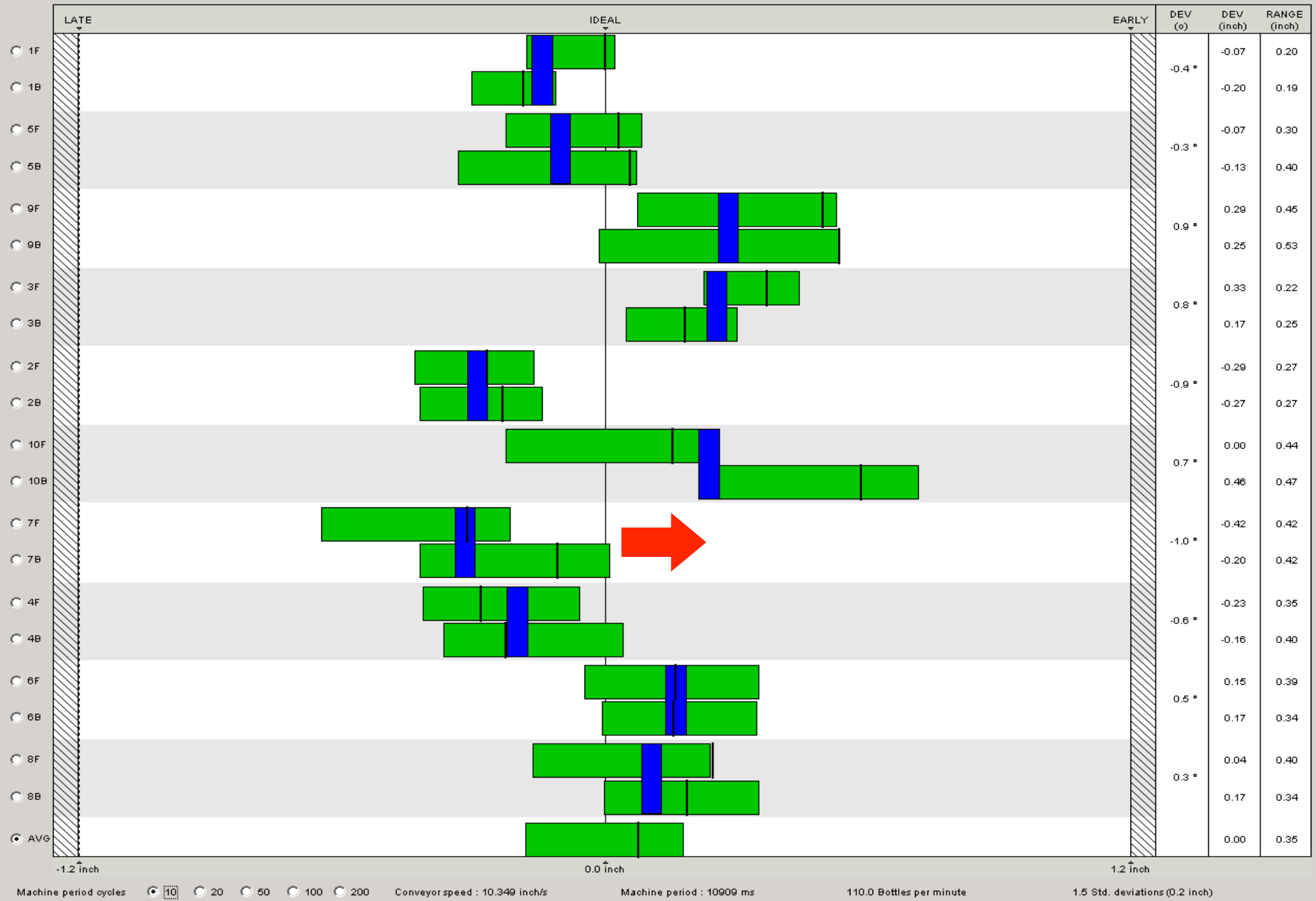
Line 33



21 Oct 2011, 1:13:21

Ware Spacing

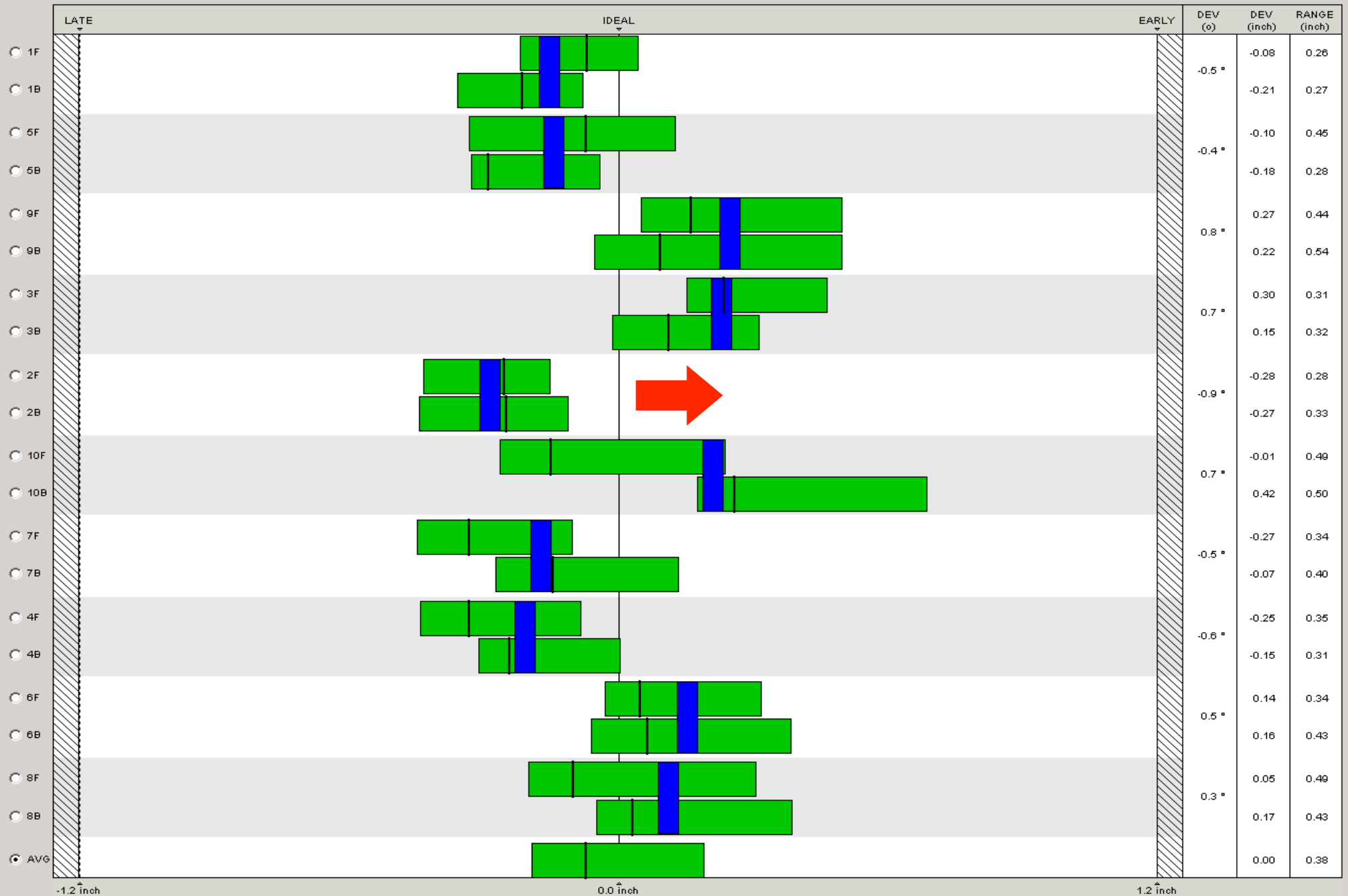
Line 33



21 Oct 2011, 1:15:30

Ware Spacing

Line 33



Machine period cycles

10

20

50

100

200

Conveyor speed : 10.355 inch/s

Machine period : 10909 ms

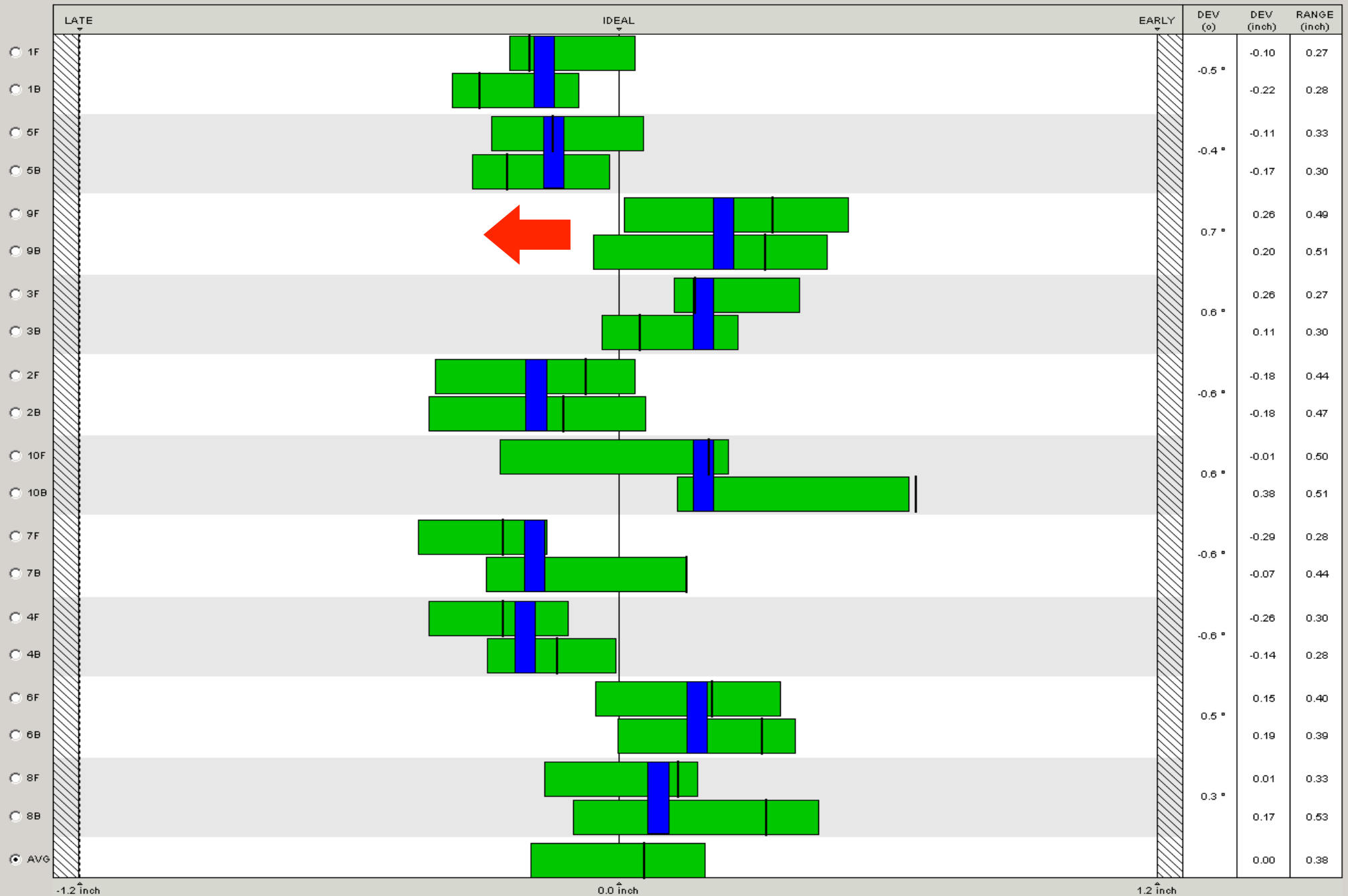
110.0 Bottles per minute

1.5 Std. deviations (0.2 inch)

21 Oct 2011, 1:16:43

Ware Spacing

Line 33



Machine period cycles

☒ 10☐ 20☐ 50☐ 100☐ 200

Conveyor speed : 10.355 inch/s

Machine period : 10909 ms

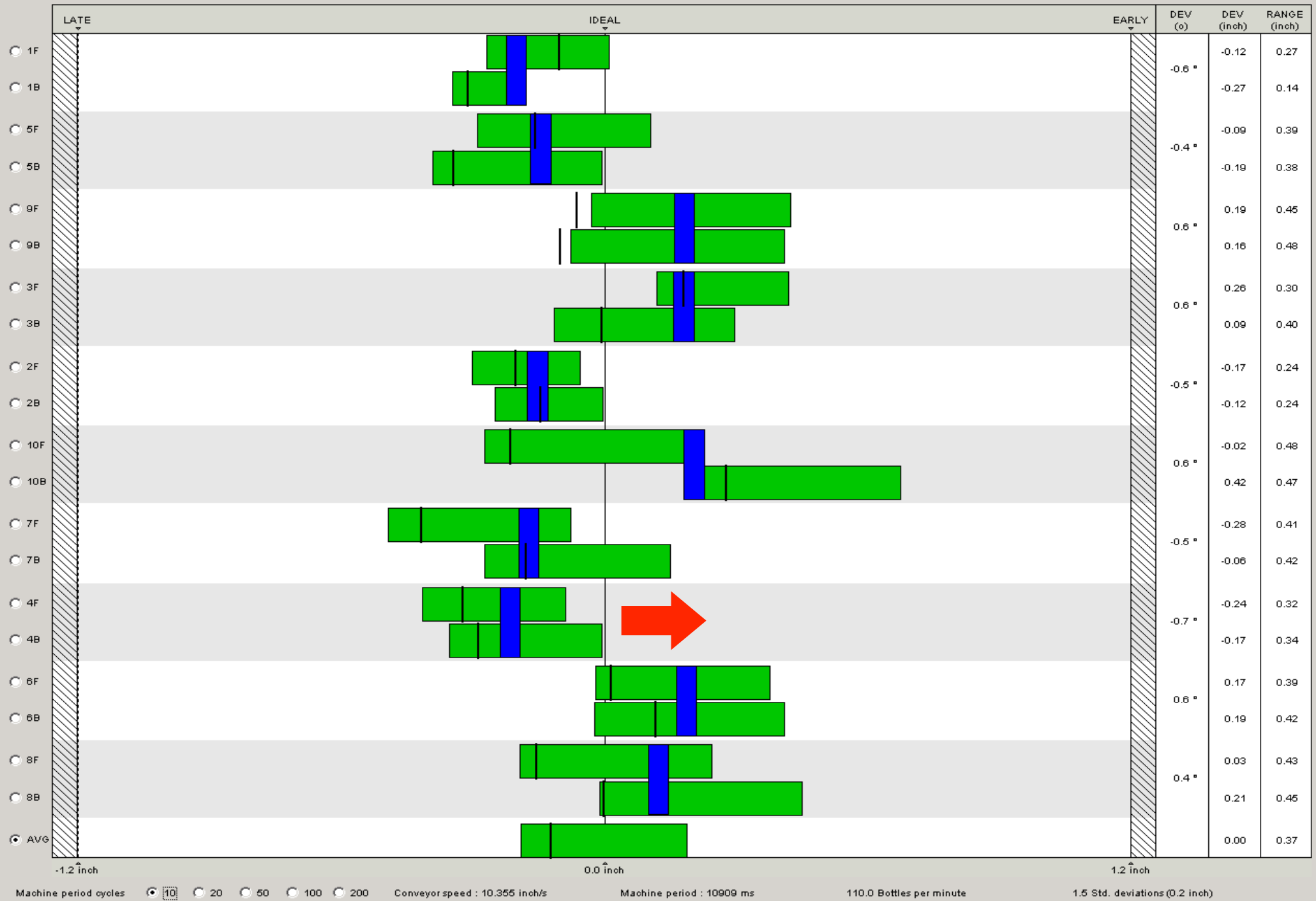
110.0 Bottles per minute

1.5 Std. deviations (0.2 inch)

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Ware Spacing

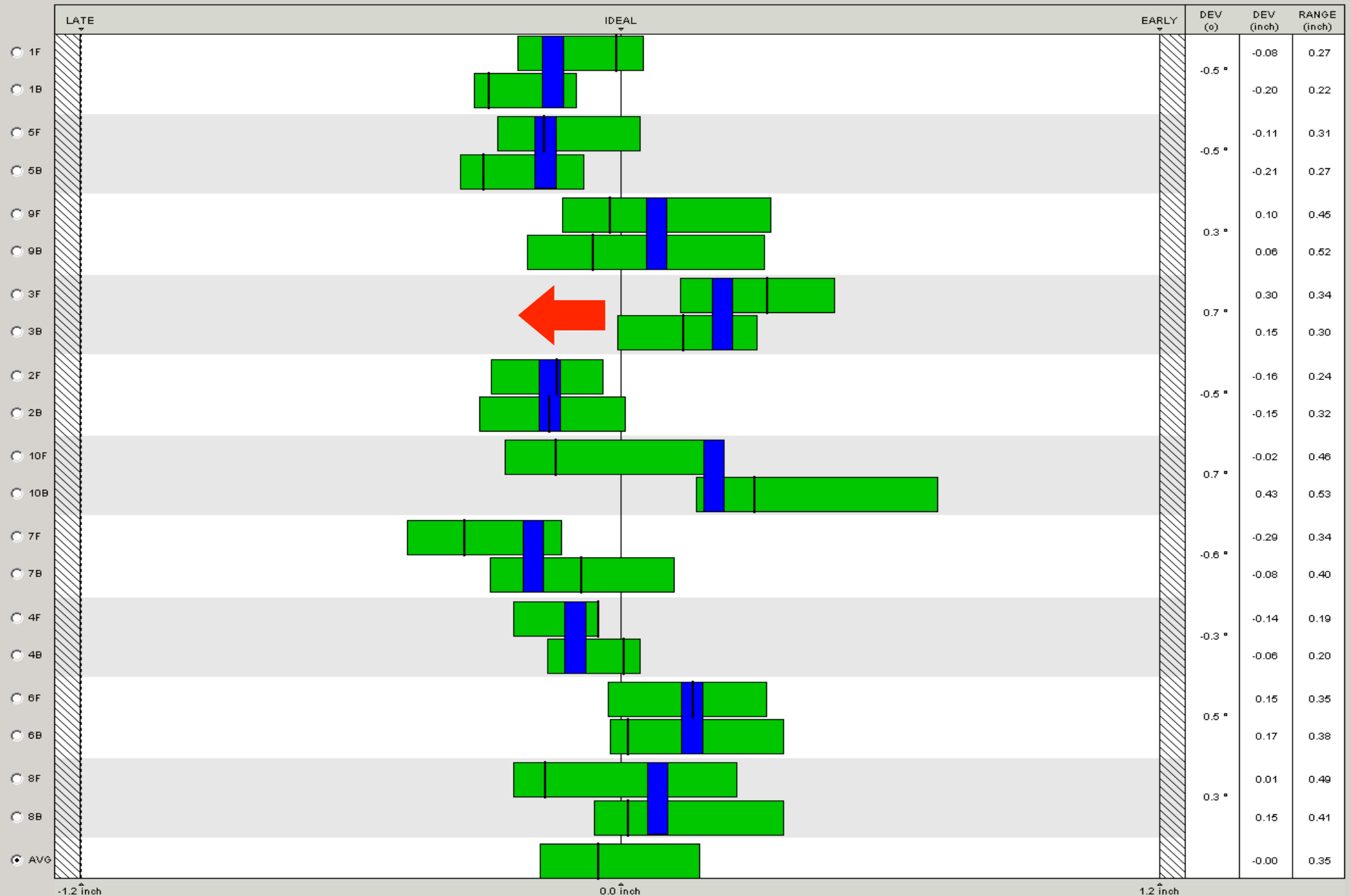
Line 33



21 Oct 2011, 1:20:48

Ware Spacing

Line 33



Machine period cycles

☒ 10☐ 20☐ 50☐ 100☐ 200

Conveyor speed : 10.355 inch/s

Machine period : 10909 ms

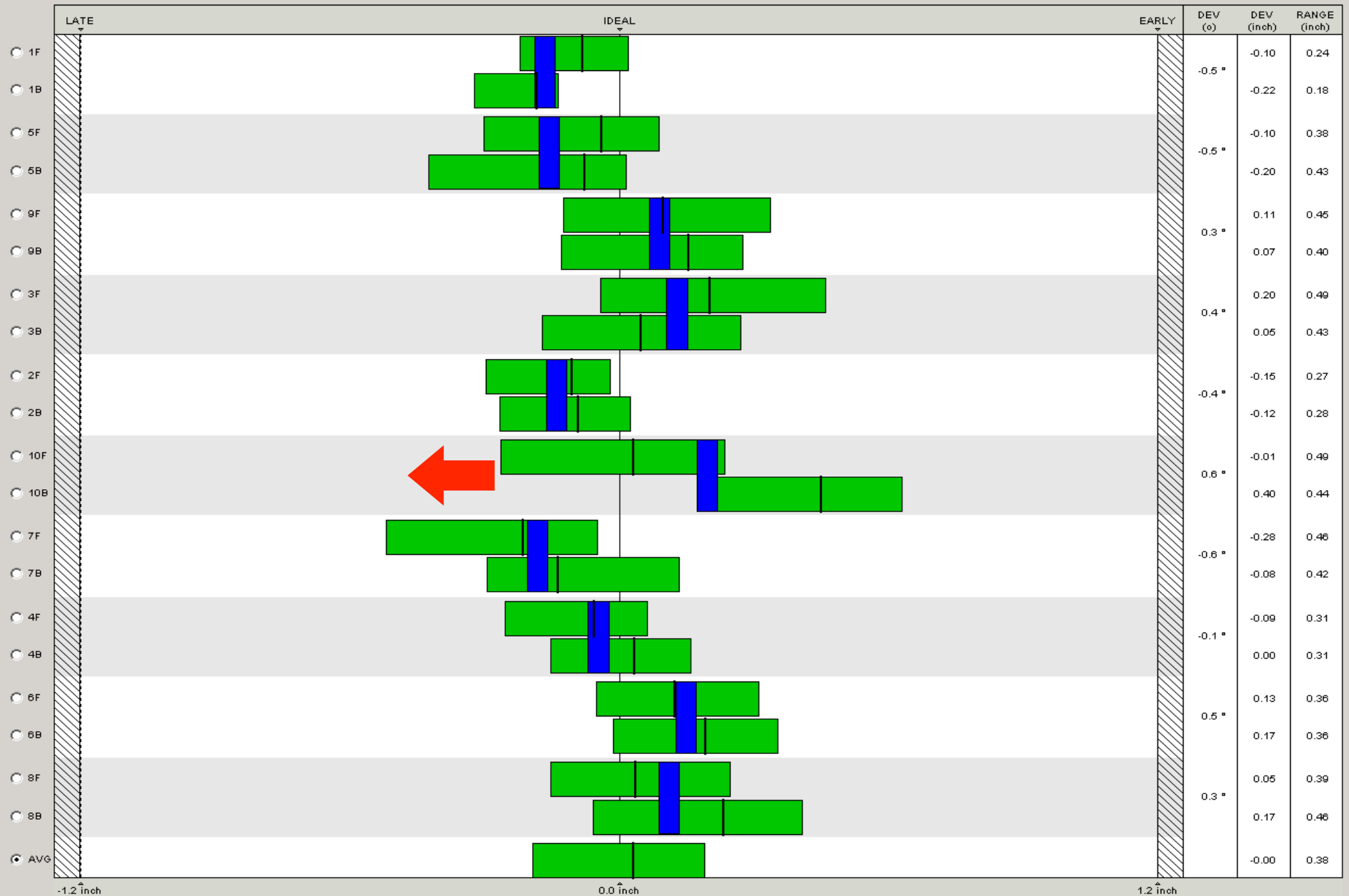
110.0 Bottles per minute

1.5 Std. deviations (0.2 inch)

21 Oct 2011, 1:22:35

Ware Spacing

Line 33



Machine period cycles

10

20

50

100

200

Conveyor speed : 10.355 inch/s

Machine period : 10909 ms

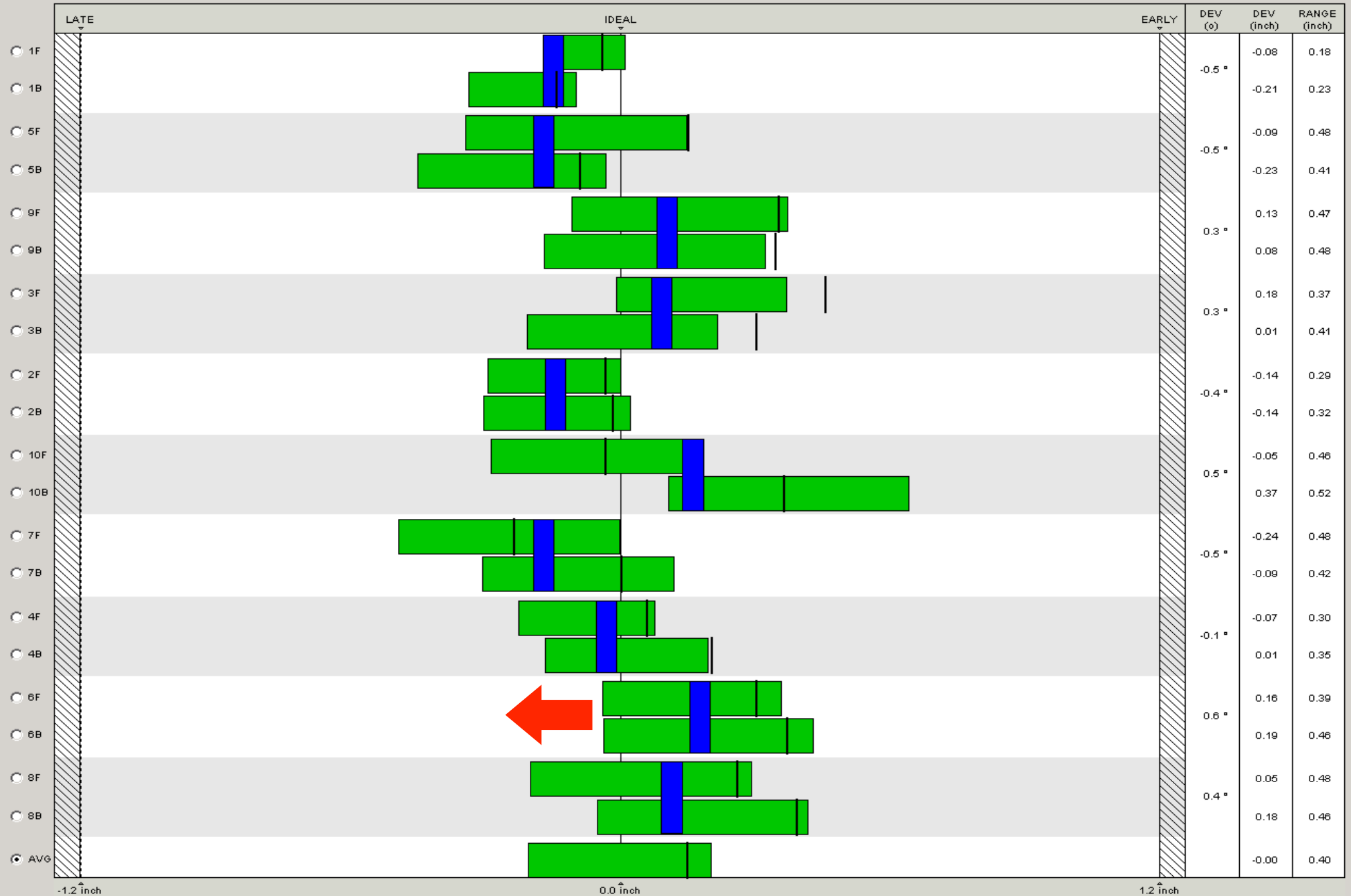
110.0 Bottles per minute

1.5 Std. deviations (0.2 inch)

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Ware Spacing

Line 33



Machine period cycles

10

20

50

100

200

Conveyor speed : 10.355 inch/s

Machine period : 10909 ms

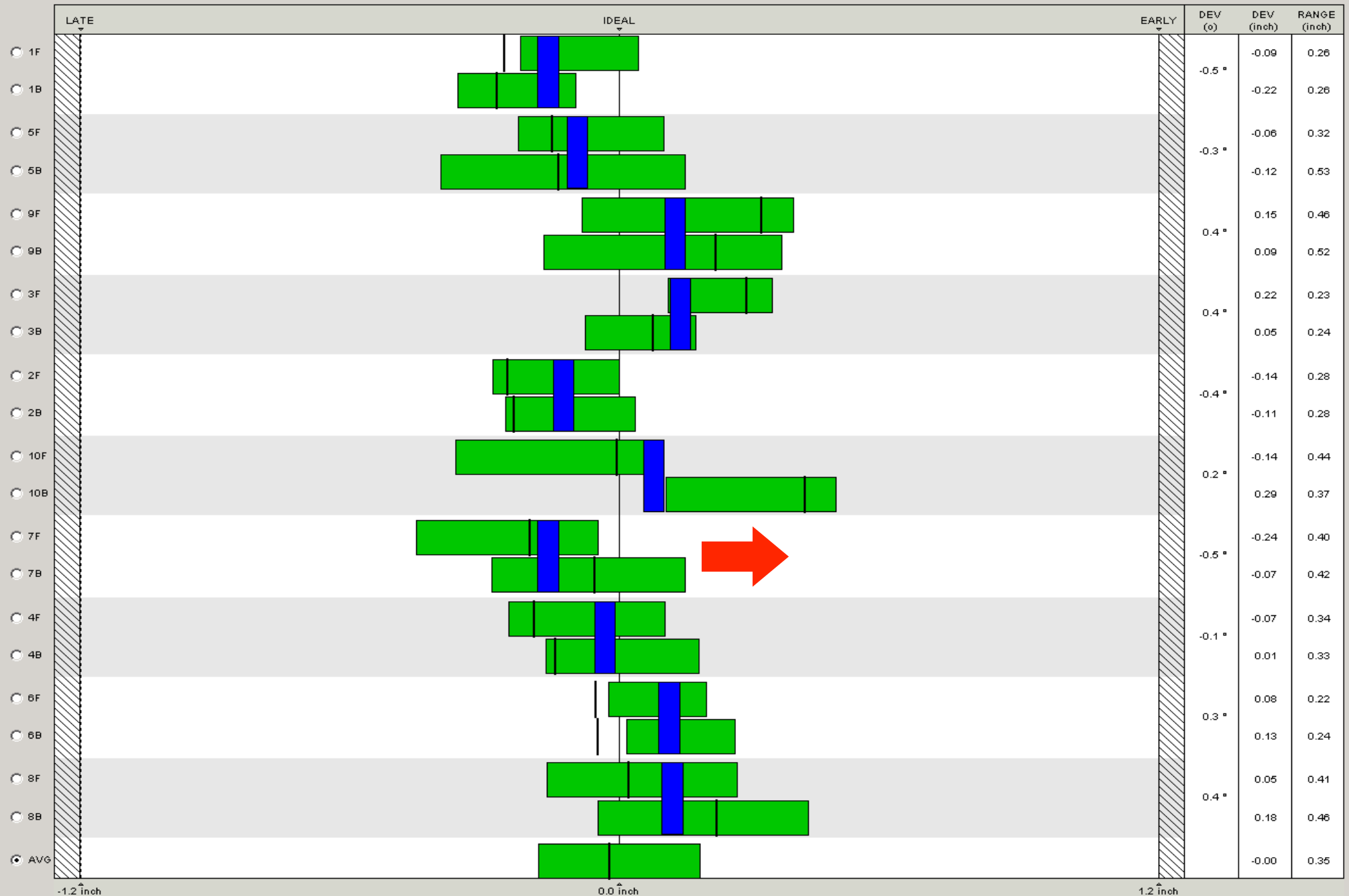
110.0 Bottles per minute

1.5 Std. deviations (0.2 inch)

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Ware Spacing

Line 33



Machine period cycles

10

20

50

100

200

Conveyor speed : 10.353 inch/s

Machine period : 10909 ms

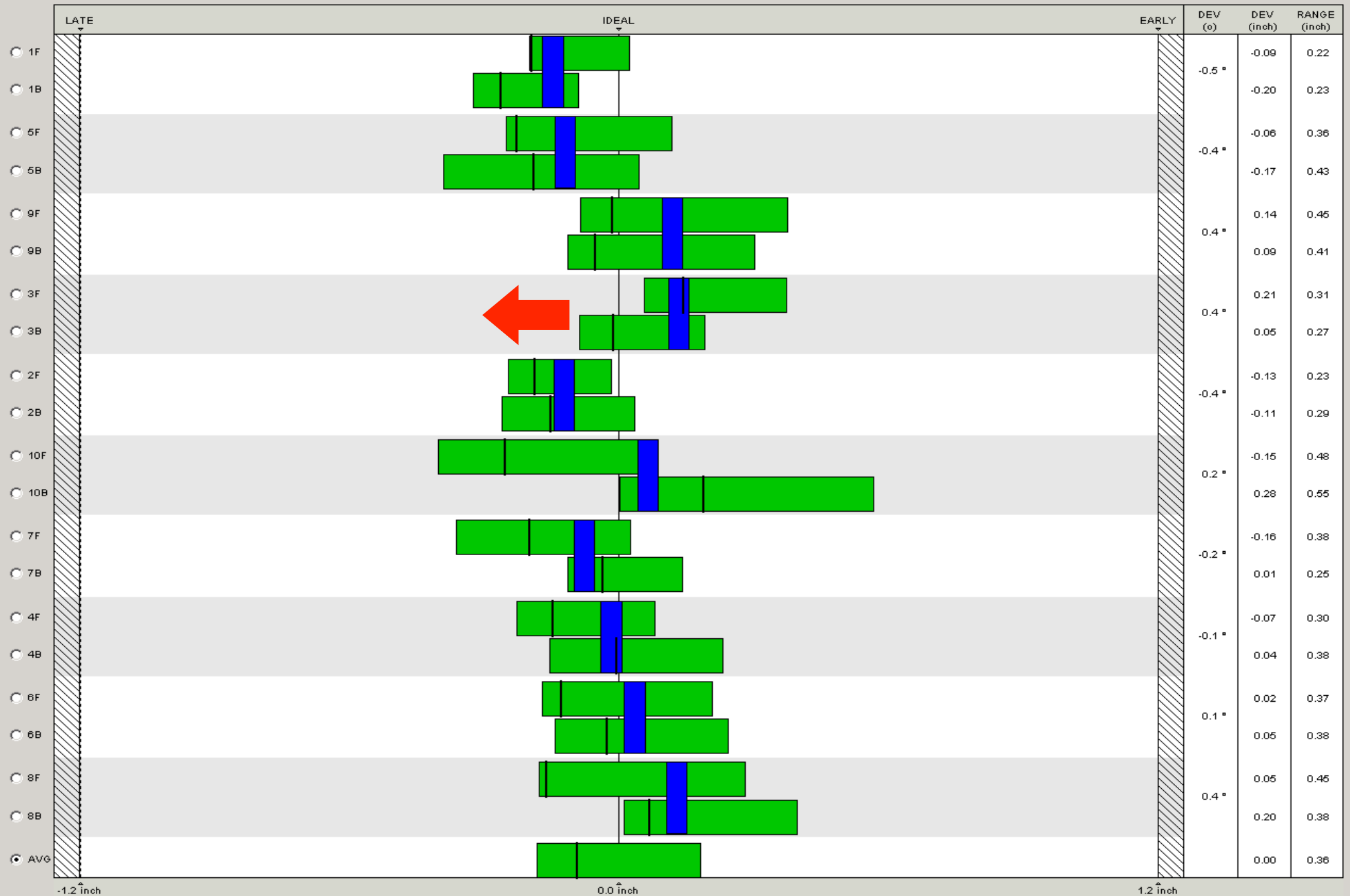
110.0 Bottles per minute

1.5 Std. deviations (0.2 inch)

21 Oct 2011, 1:28:57

Ware Spacing

Line 33



Machine period cycles

☒ 10☐ 20☐ 50☐ 100☐ 200

Conveyor speed : 10.353 inch/s

Machine period : 10909 ms

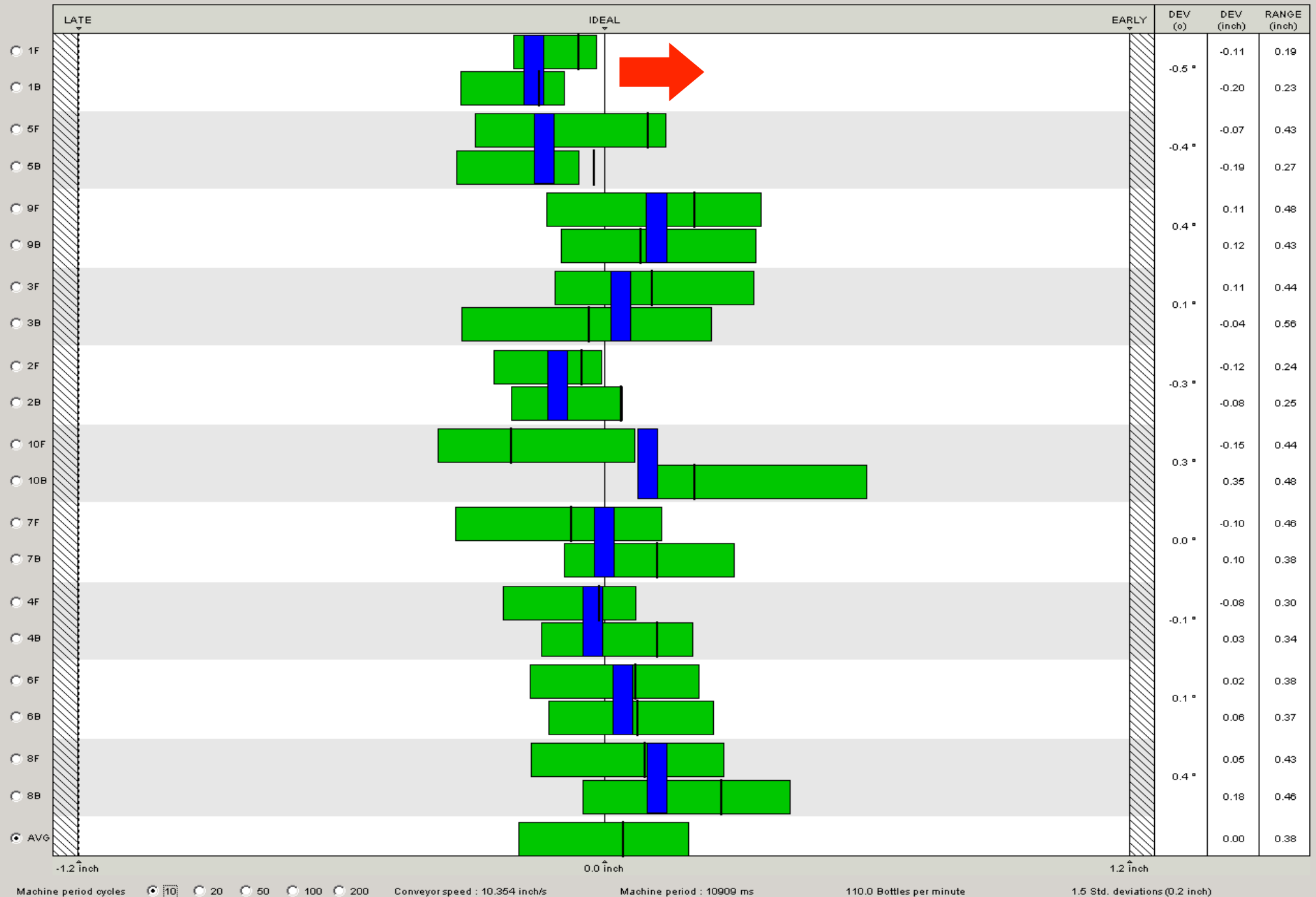
110.0 Bottles per minute

1.5 Std. deviations (0.2 inch)

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Ware Spacing

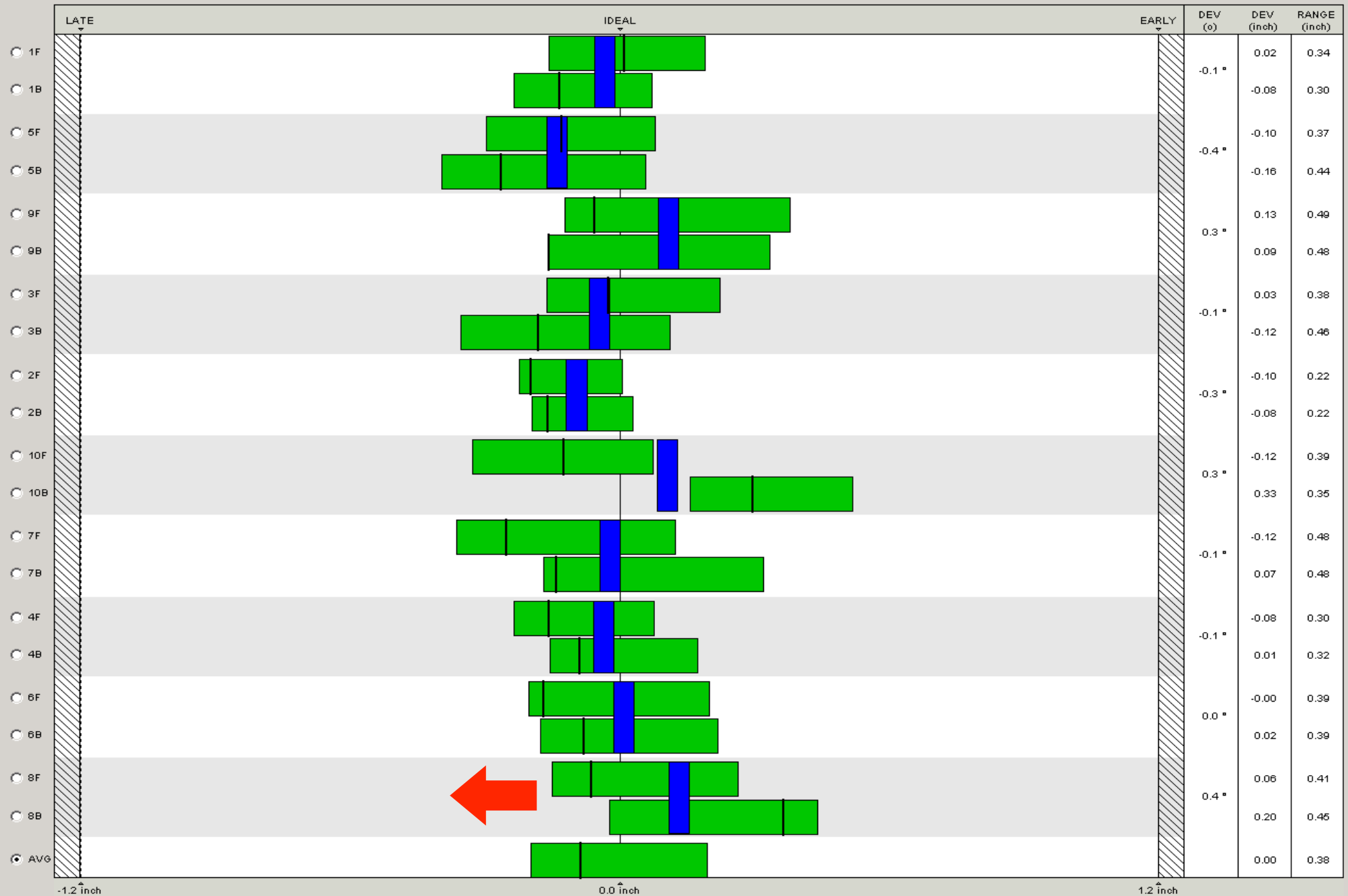
Line 33



21 Oct 2011, 1:33:23

Ware Spacing

Line 33



Machine period cycles

10

20

50

100

200

Conveyor speed : 10.354 inch/s

Machine period : 10909 ms

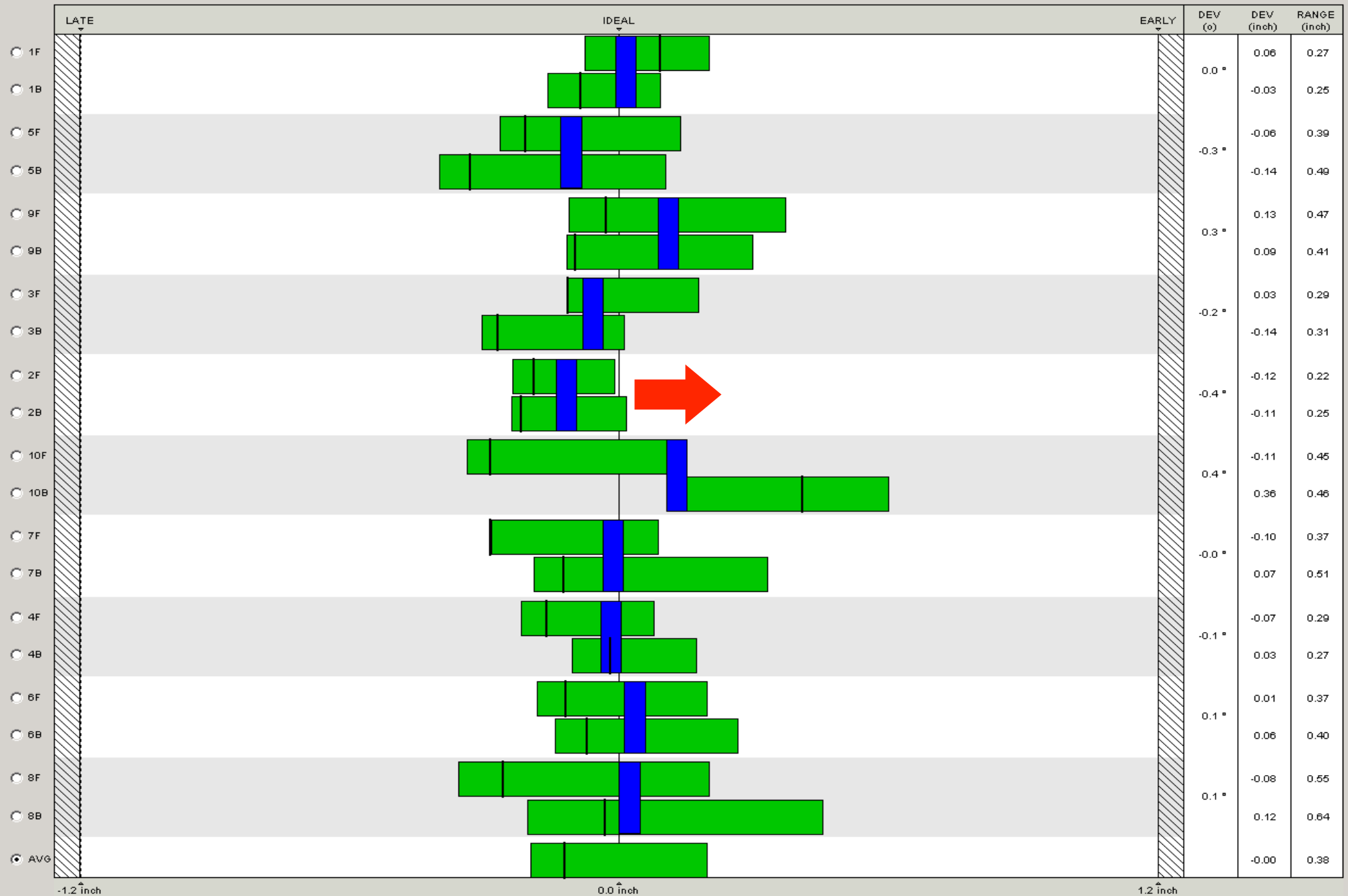
110.0 Bottles per minute

1.5 Std. deviations (0.2 inch)

21 Oct 2011, 1:35:33

Ware Spacing

Line 33



Machine period cycles

10

20

50

100

200

Conveyor speed : 10.357 inch/s

Machine period : 10909 ms

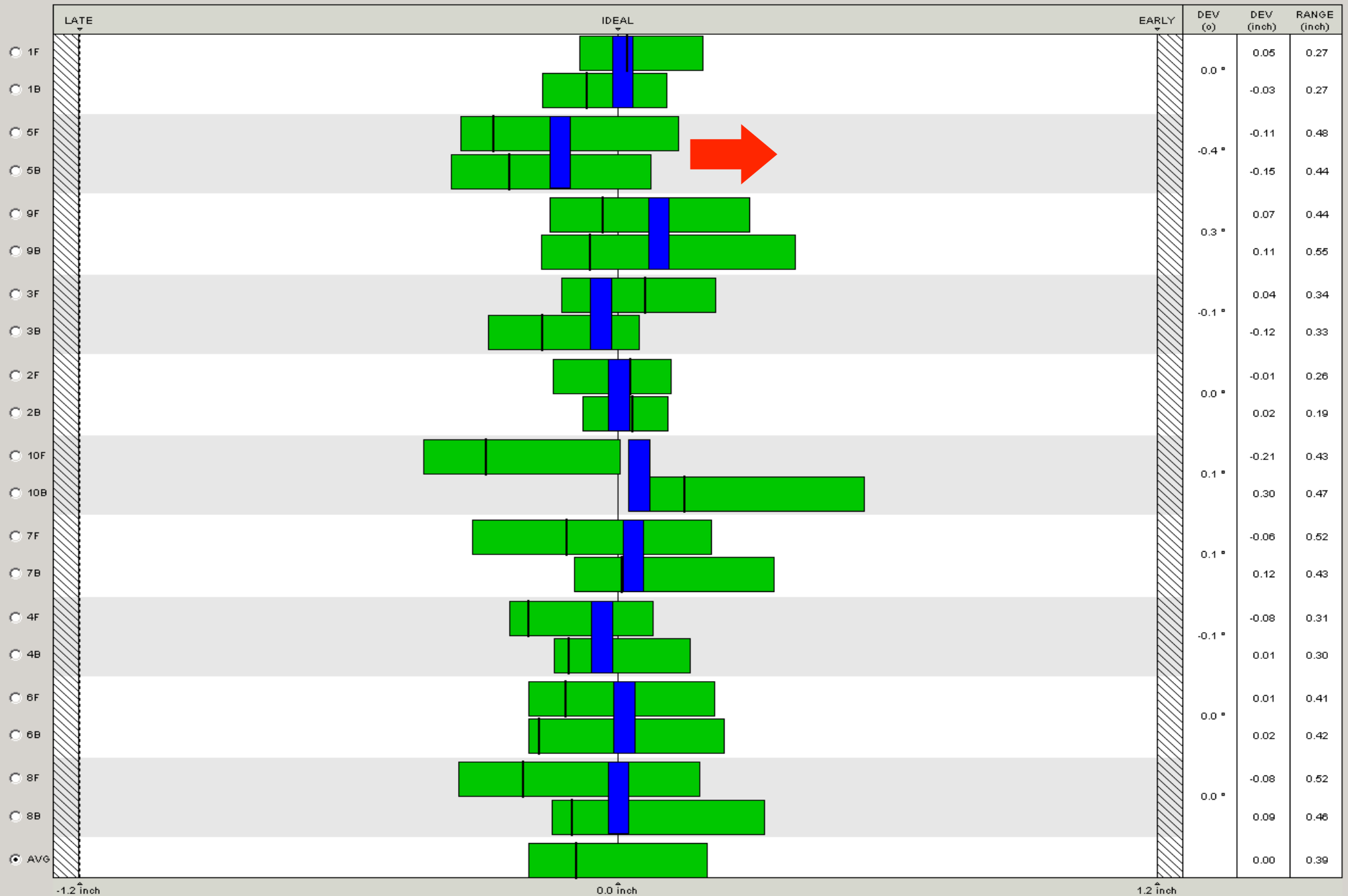
110.0 Bottles per minute

1.5 Std. deviations (0.2 inch)

21 Oct 2011, 1:37:18

Ware Spacing

Line 33

Machine period cycles ☒ 10 ☐ 20 ☐ 50 ☐ 100 ☐ 200

Conveyor speed : 10.357 inch/s

Machine period : 10909 ms

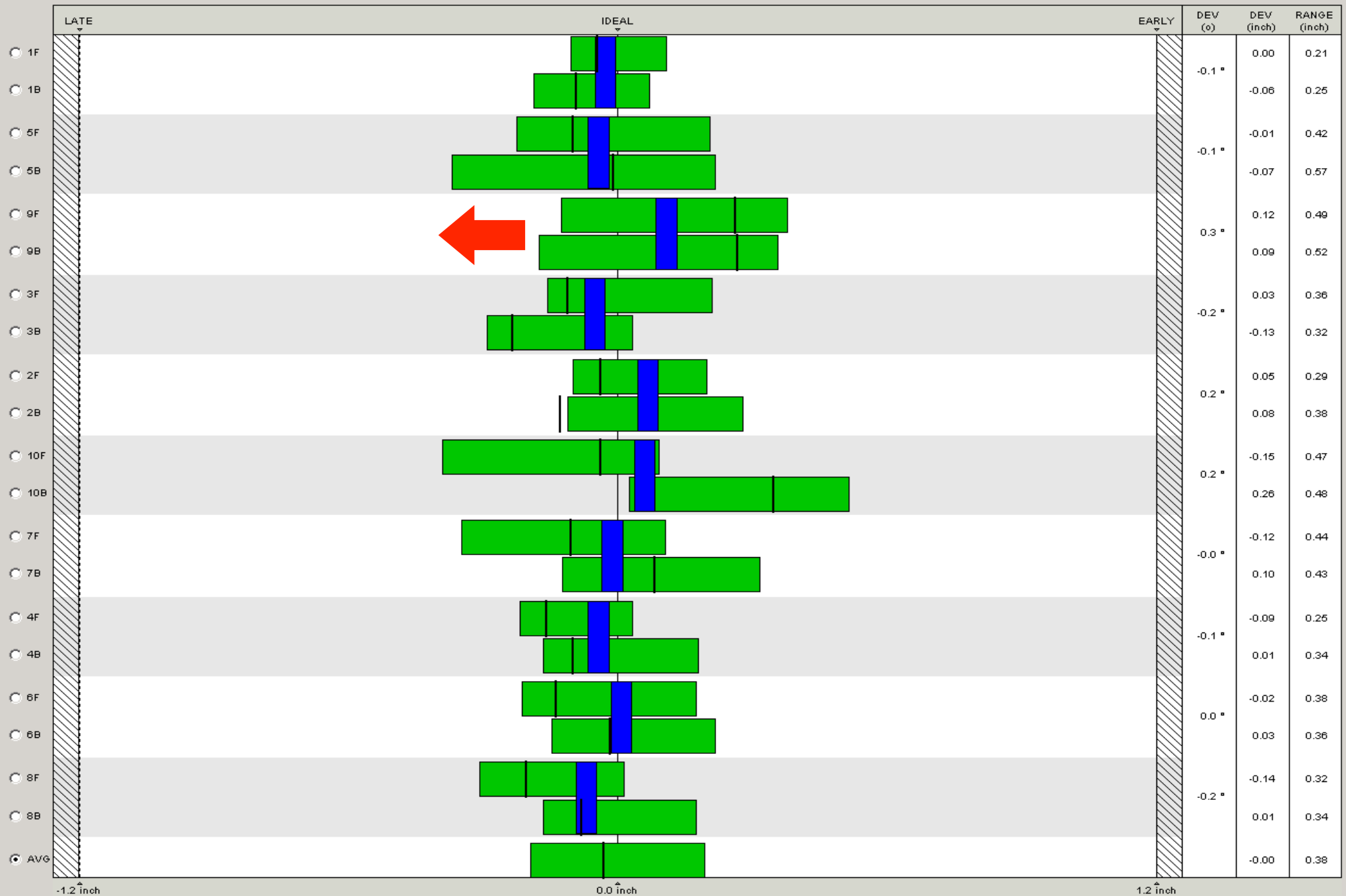
110.0 Bottles per minute

1.5 Std. deviations (0.2 inch)

21 Oct 2011, 1:39:57

Ware Spacing

Line 33



Machine period cycles

10

20

50

100

200

Conveyor speed : 10.357 inch/s

Machine period : 10909 ms

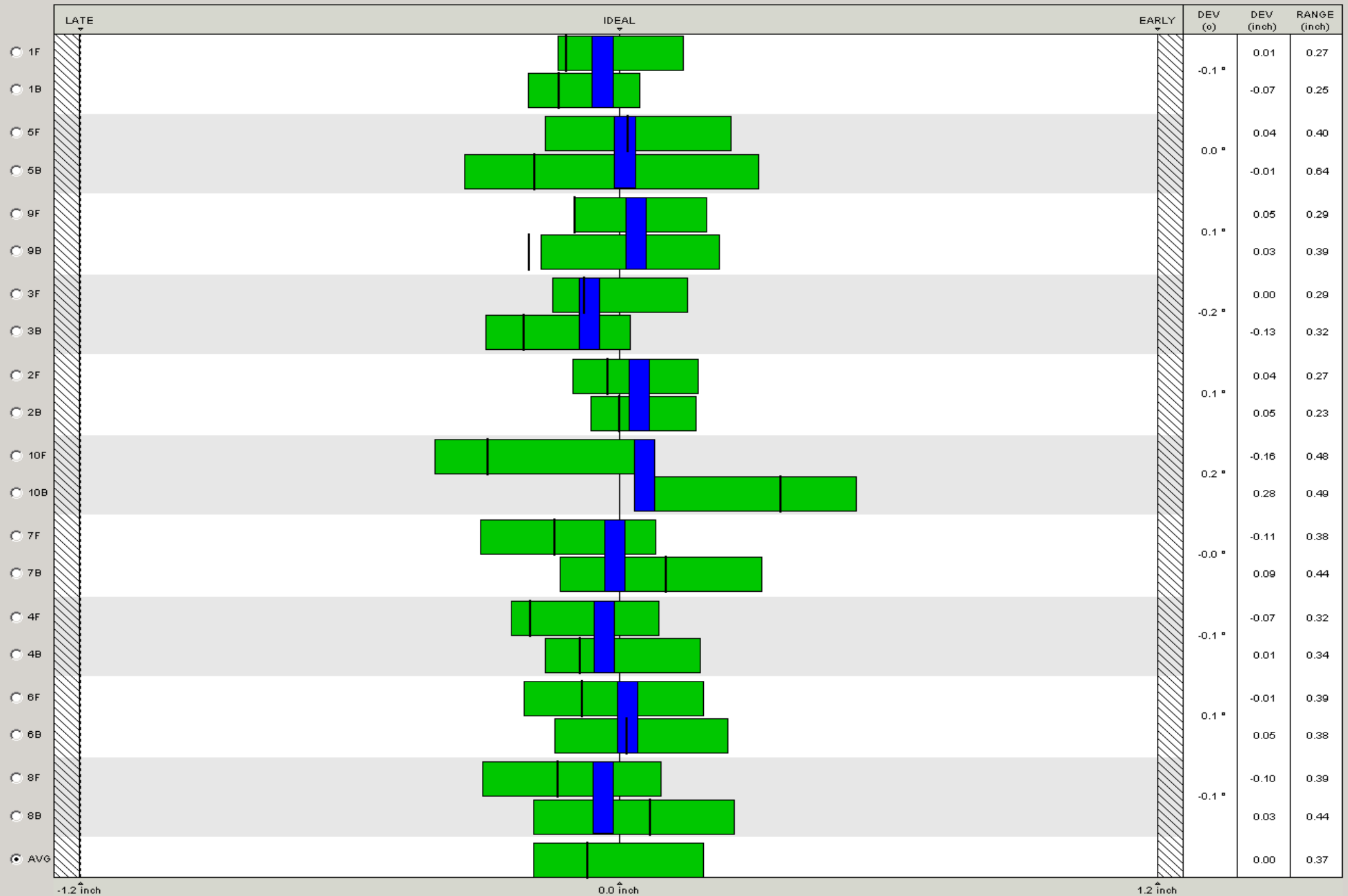
110.0 Bottles per minute

1.5 Std. deviations (0.2 inch)

21 Oct 2011, 1:41:37

Ware Spacing

Line 33

Machine period cycles ☒ 10 ☐ 20 ☐ 50 ☐ 100 ☐ 200

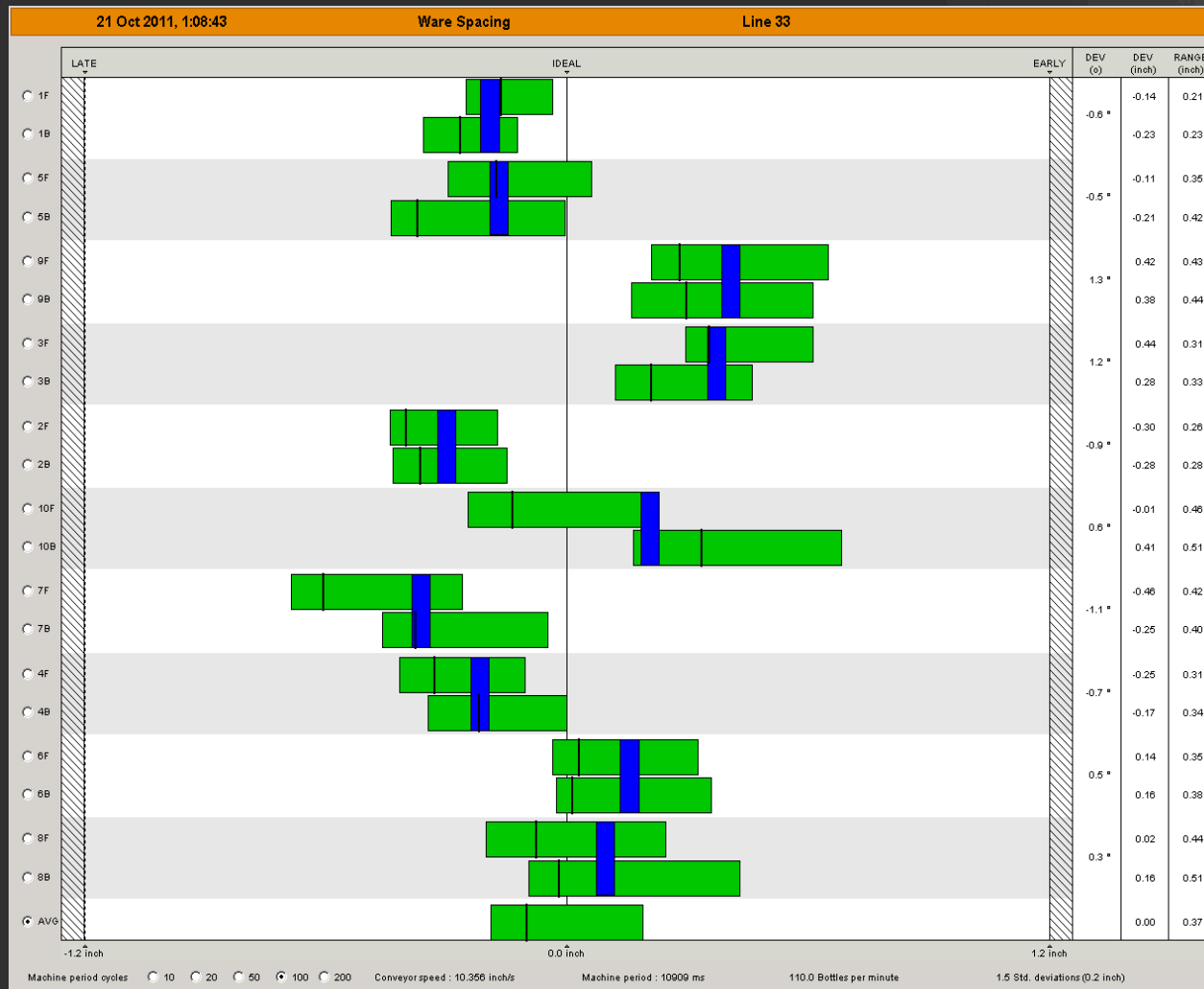
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Machine period : 10909 ms

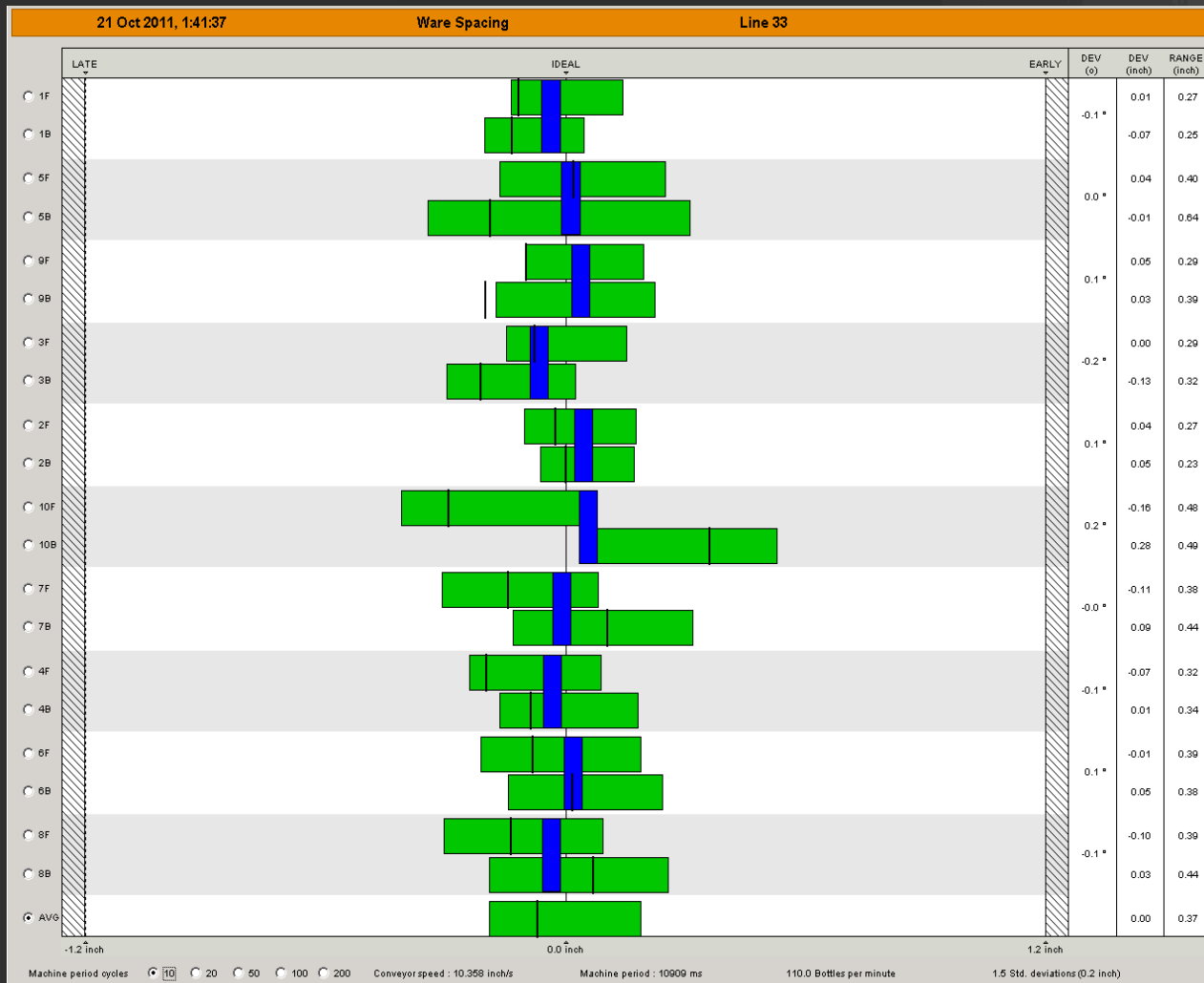
110.0 Bottles per minute

1.5 Std. deviations (0.2 inch)

WITHOUT CONTROL



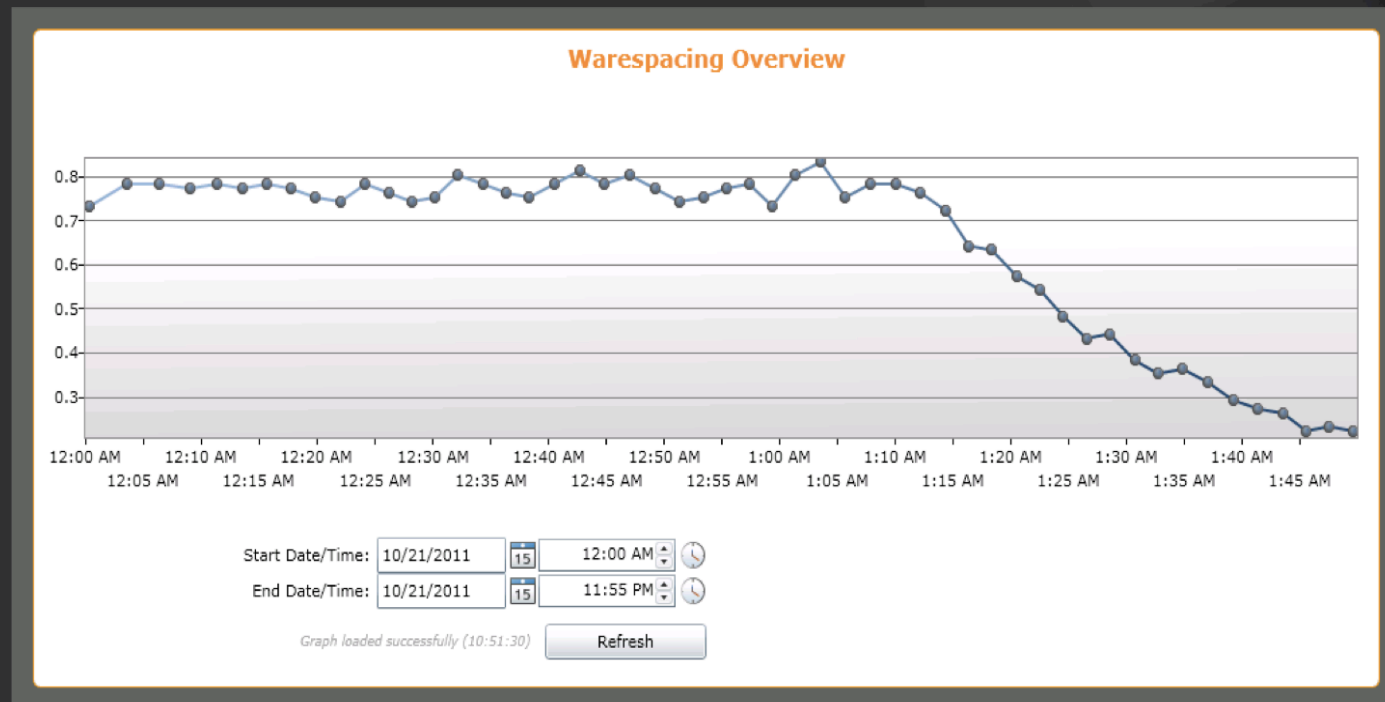
WITH CONTROL



> Our project

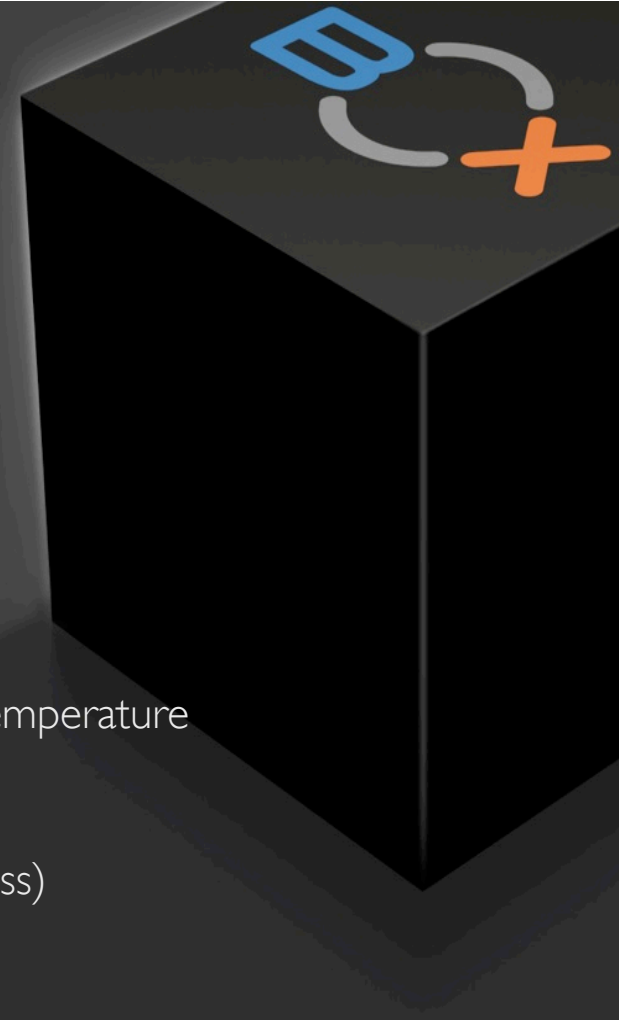
ADAPTIVE WARE SPACING

- Automatic control and optimization of ware spacing
 - ✓ achieve a stable ware spacing between all bottles

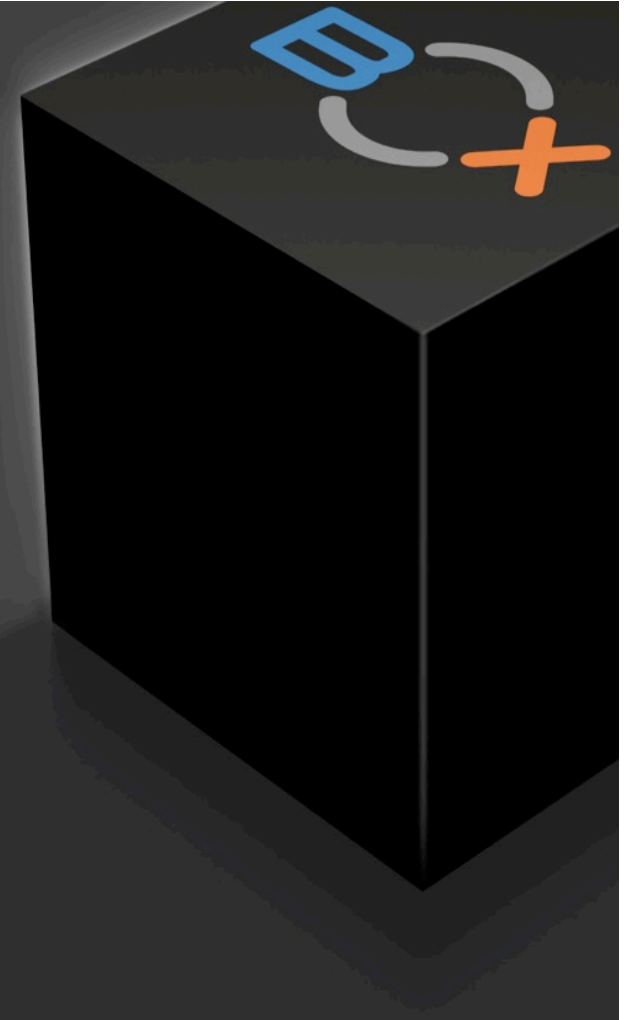
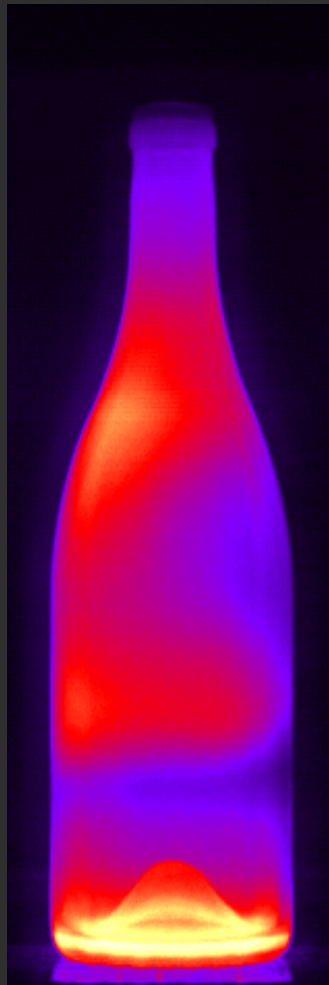


GLASS DISTRIBUTION

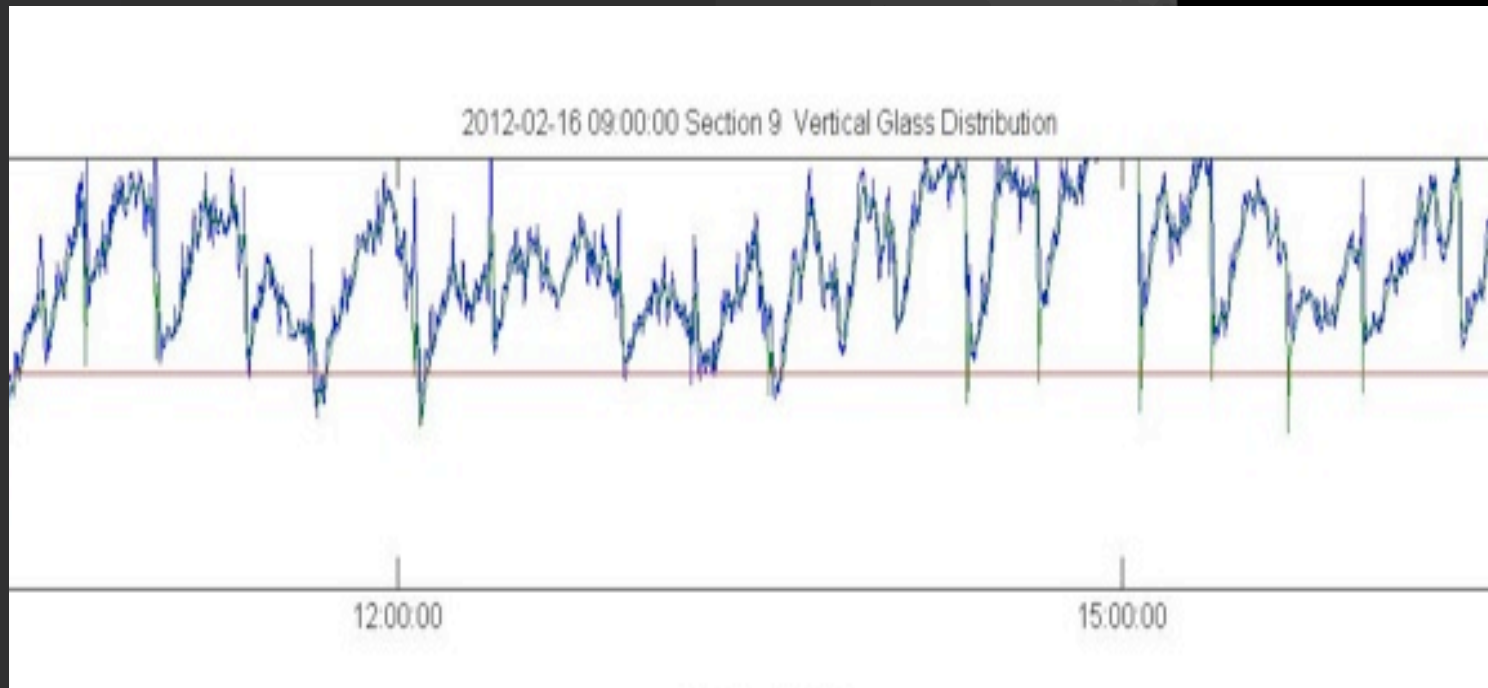
- Automatic vertical homogeneous glass distribution
 - ✓ achieve a stable vertical glass distribution across all cavities
 - ✓ make vertical glass distribution independent from ambient temperature fluctuations (day/night, summer/winter)
 - ✓ make vertical glass distribution independent from feeder (glass) temperature fluctuations



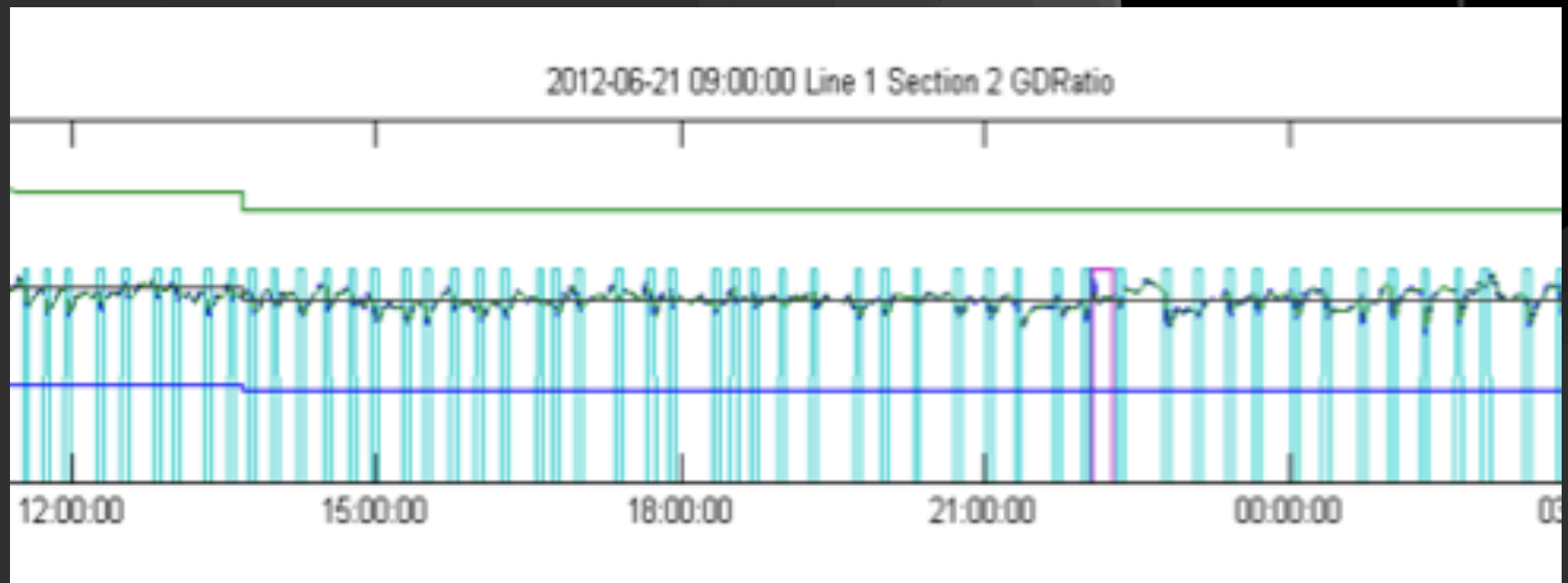
VERTICAL GLASS DISTRIBUTION



WITHOUT CONTROL

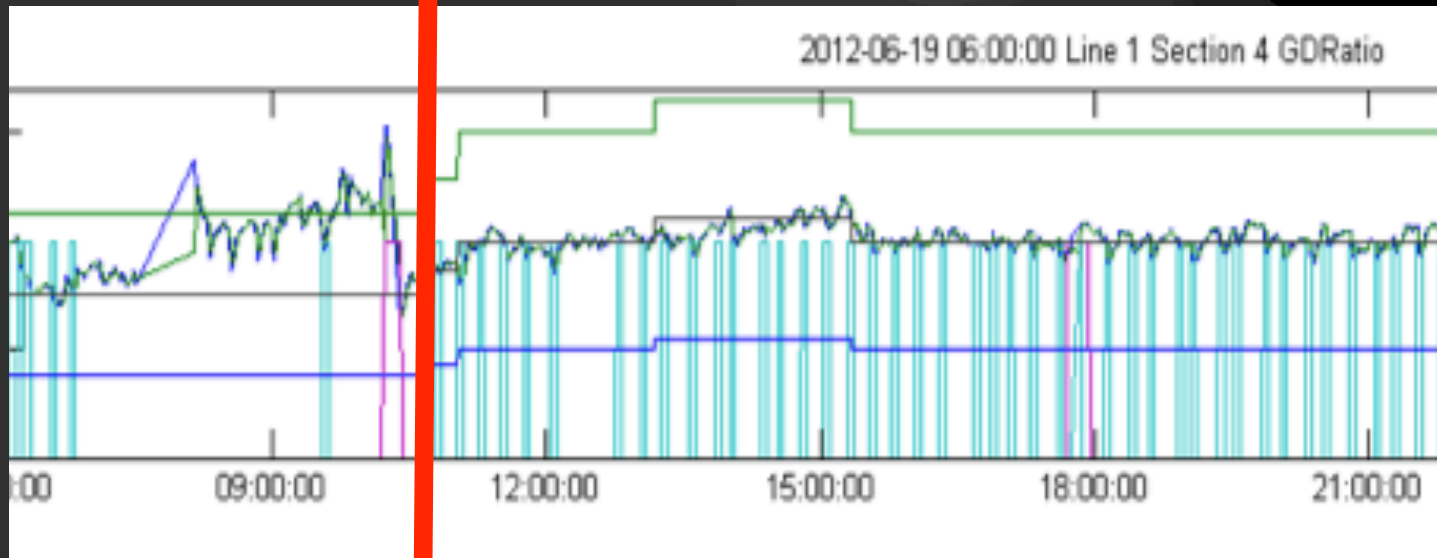


WITH CONTROL



WITH(out) CONTROL

BOX OFF *BOX ON*



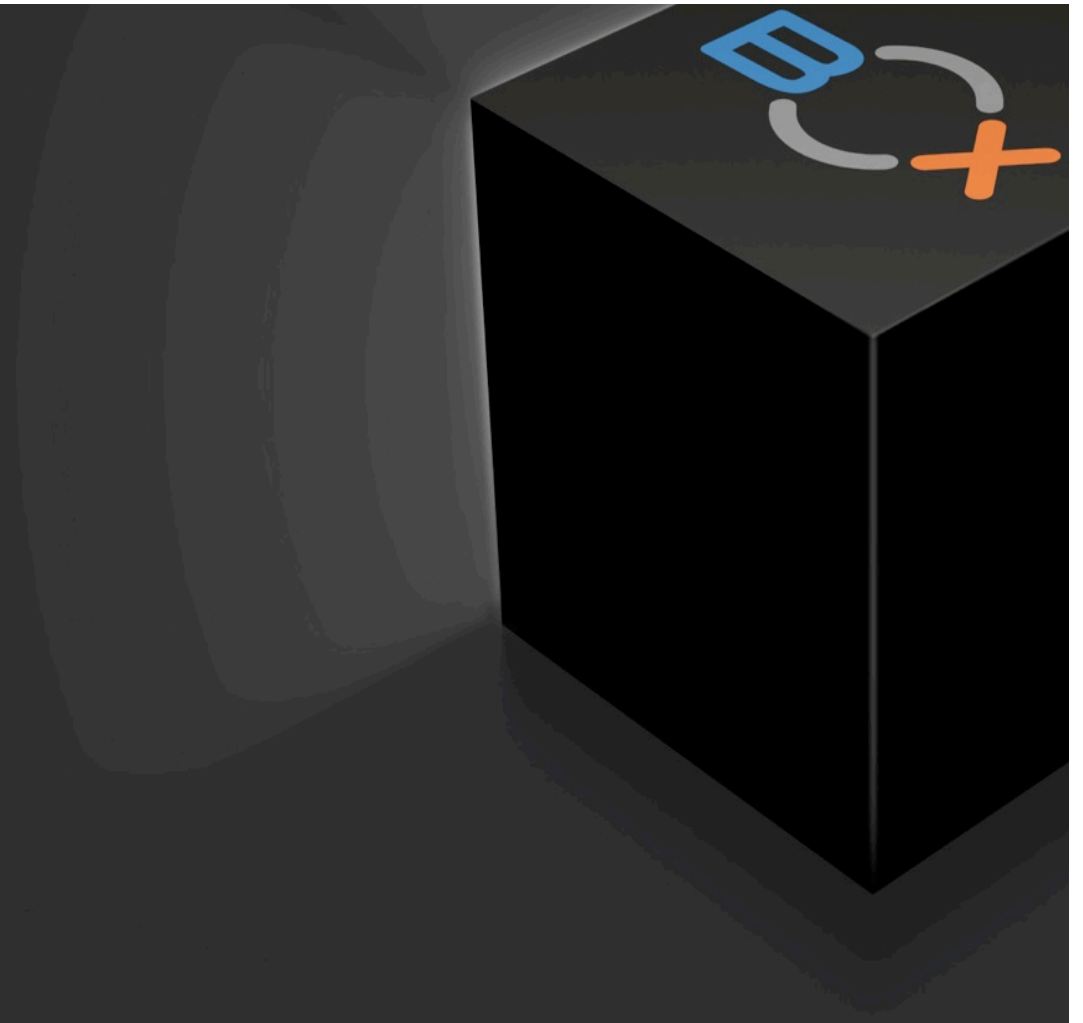
> **Our project RESULTS**

- Automatic stable ware spacing and glass distribution
- Reduction of forming process variation
 - ✓ higher pack to melt
 - ✓ better weight / volume
 - ✓ higher speed
 - ✓ less customer complaints
 - ✓ less resorting
- More control and predictability
- By closed loops between Bottero and XPAR technologies



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> **Moving forward**

- Besides ware spacing and glass distribution we
- are working on more possibilities for automatic control and optimization
- The aim of our partnership is to control and optimize the forming process, and to prevent critical defects from occurring, by automation



> **Moving forward**

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> Customers experiences

Keys to Improvement:

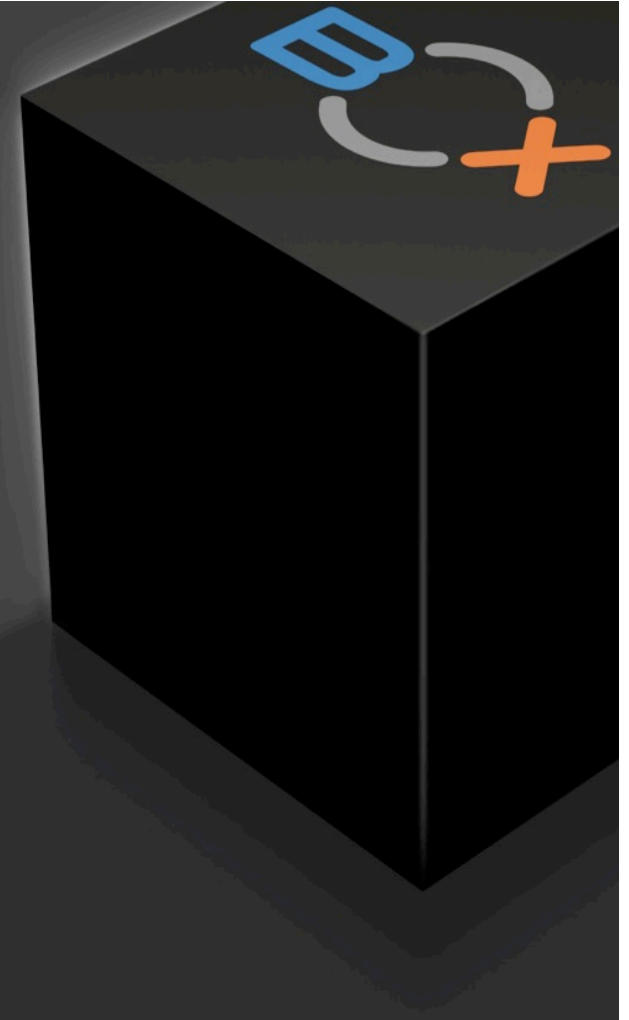
- Reduce/Eliminate Variables
- Building decisions off real data feedback not Perception
- Minimize wasted time & effort for operators
- Maintain competitive Edge in marketplace
- Lead in the industry, not follow



> **Customers experiences**

Ware spacing

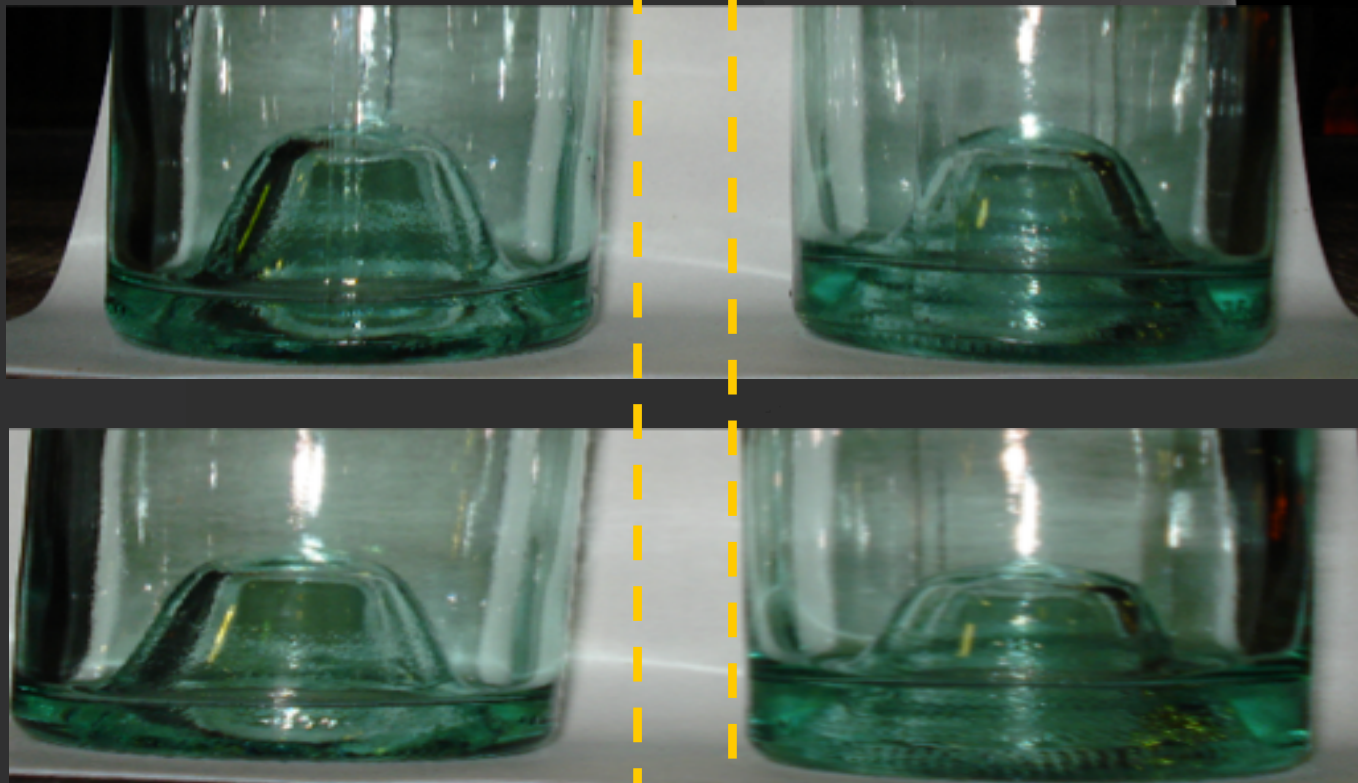
- Overall Impression:
 - No human intervention needed
 - Excellent feedback from operators
 - Eliminates Wasted effort
 - Improved Production



> Customers experiences

Glass Distribution

WITHOUT CONTROL



Before Temperature variation

After Temperature variation

Cav. A

Cav. B

> Customers experiences

Glass Distribution

WITH CONTROL



Before Temperature variation

After Temperature variation

Cav. A

Cav. B

> Customers experiences

Benefits

- Minimizes Operator Intervention
 - Less human intervention= Better Consistency
- Very little training required
- Easy to use
 - Ware Transfer system “Just Works”





Thank you