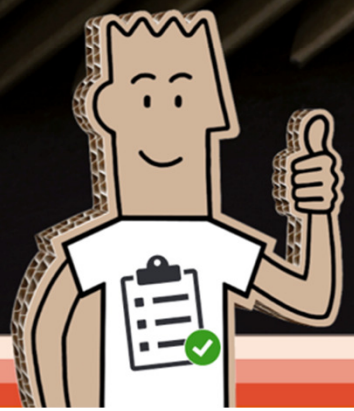
10:00

Welcome

Start

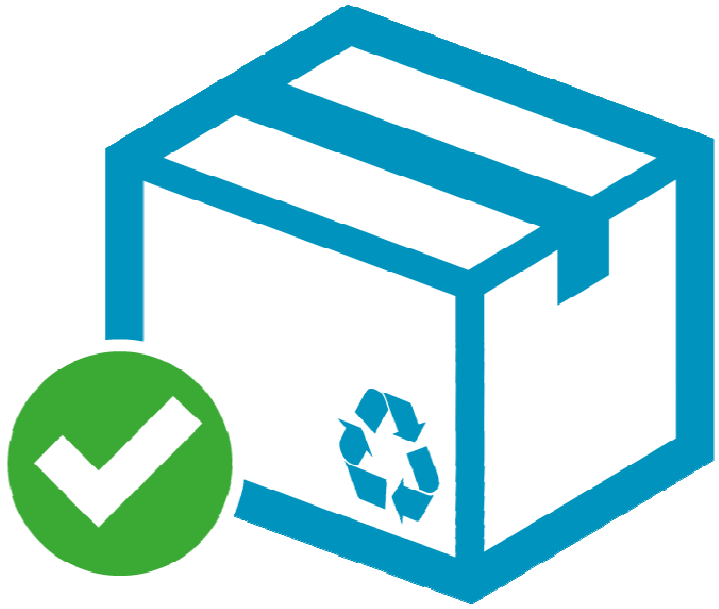


Workshop on

FEFCO standards for Converting

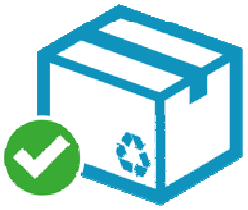
Technical specifications for equipment and processes

7th May 2015 – Brussels



FEFCO
Corrugated Packaging

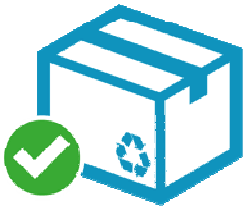
Introduction Speakers



• Richard Coward	Rigid Containers UK
• Jan Lindstrom	MarquipWardUnited
• Anello Meloro & Dominique Ravot	Bobst Group
• Ulrich Wolz & Ralf Schiffmann	Bahmüller & Göpfert
• Klaus Lüke	Klingele Papierwerke
• Mats Nilsson	Ducker Corrpal
• Wilbert Streefland	Technology Coaching

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Corrugated Packaging

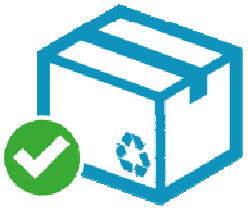
Agenda



Time	Subject	Presenter
9:00	Coffee and registration	-
10:00	Welcome	Angelika Christ Klaus Lüke
10:15	Equipment Testing and Standards	Wilbert Streefland
11:00	A practical Experience	Richard Coward Rigid Containers UK
11:30	Testing Printing Equipment	Jan Lindstrom, MWU
12:00	Coffee break	-
12:15	Characterization of Die Cutter for OEM acceptance test	Anello Meloro & Dominique Ravot, Bobst Group
12:45	Folding Equipment Testing method	Ulrich Wolz & Ralf Schifmann Bahmüller & Göpfert
13:15	Lunch	-
14:15	A practical experience: colour to colour register	Klaus Lüke Klingele Papierwerke
14:45	Breaking and Palletising	Mats Nilsson Ducker Corrpal
15:15	Coffee break	-
15:30	Machine Acceptance impact on your business & Test Results Map	Wilbert Streefland
16:00	Closure	

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Presentation structure of the Day



- **Introduction**
- **Experiences from the industry**
- **Supplier presentation by subject (group of standard's):**
  - **Printing**
  - **Die Cutting**
  - **Folding**
  - **Auxiliary equipment (Pre-Feeding, breaking, stacking)**

Each supplier presentation will be linked to a specific Standard Group

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FEFCO Standards for Converting

Technical specifications for equipment and processes

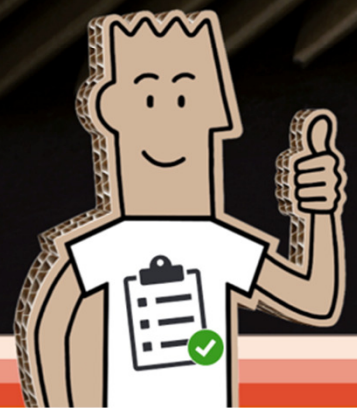


- Equipment Testing and Standards
- Speakers + 5min introduction
- Machine acceptance, the impact on your business & Test results map
- Do and Don’ts

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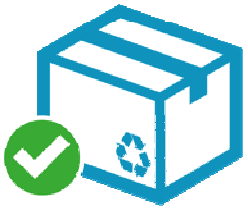
Equipment Testing and Standards

Wilbert Streefland
Technology Coaching BvbA



"Acceptance testing" =
Showing respect to your supplier and…
making sure you are ready for your customer

Equipment Testing and Standards





What is machine acceptance?



Why machine acceptance?



How is it done?



How do you agree targets?



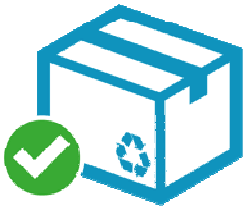
How is it implemented in the contract?



Cost justification

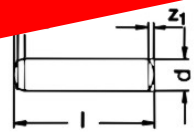
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An Example to start!



- A box with 50 Hardened Dowel Pins
- Manufactured according DIN6

100% of the Dowel Pins are: ø6 $^{0.012}_{0.004}$ mm



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What is machine acceptance?
The principle



If the **Product** produced **Passes** all agreed (known) checks then the **Proc** Performing **OK**

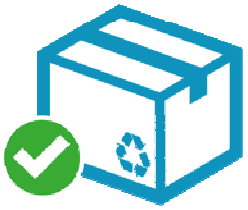
- **Targets need to be defined (quantitative)**
- **Test conditions➔ Worst Case**
- **Standard's for measuring procedure**
- **Test protocol (Checklist and time plan)**



- tools used?
- was it the raw material?
- Did the operators do a correct set-up?
- Did we miss something that needed checking?

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Equipment Testing and Standards





What is machine acceptance?



Why machine acceptance?



How is it done?



How do you agree targets?



How is it implemented in the contract?



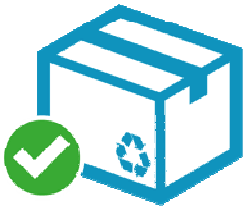
Cost justification



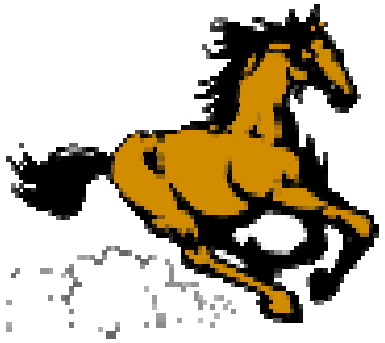
Check if performance is within target

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Why machine acceptance?



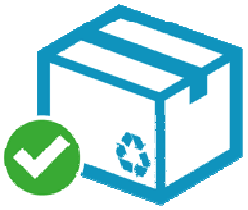
- A machine only generate profit if it runs
- Ready to run (after installation)
- Important:
  - The complete line needs to be ready to run
  - Operator training before the delivery
  - Tool and material supplier audits



It is not the price of the machine that is important but what you can earn with it per machine hour

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Equipment Testing and Standards





What is machine acceptance?



Why machine acceptance?



How is it done?



How do you agree targets?



How is it implemented in the contract?



Cost justification



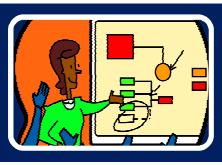
Check if performance is within target



Ready to run

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How is it done?



Process definition



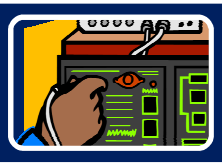
Define Quantitative Acceptance Indicat



Acceptance Indicat
(standard's)



T



Te



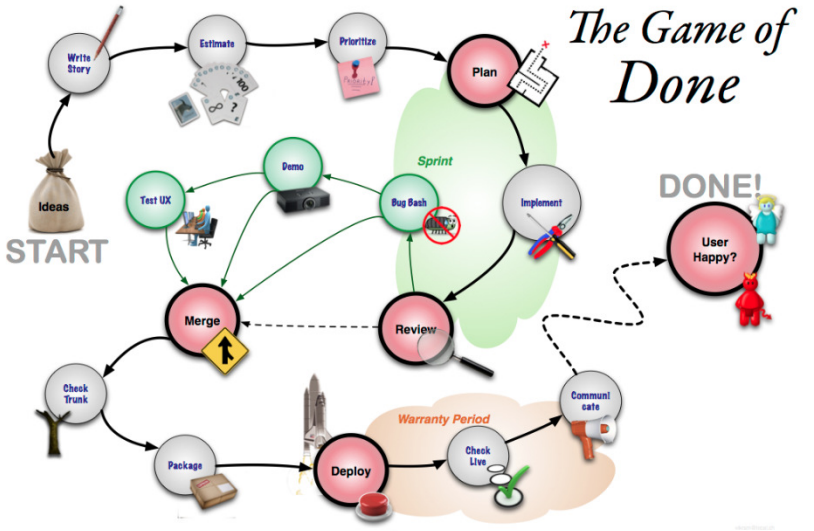
Report results

- **Test procedure are not democratic!**
- **They are the result of a factual (scientific) investigation on how to measure a performance property**

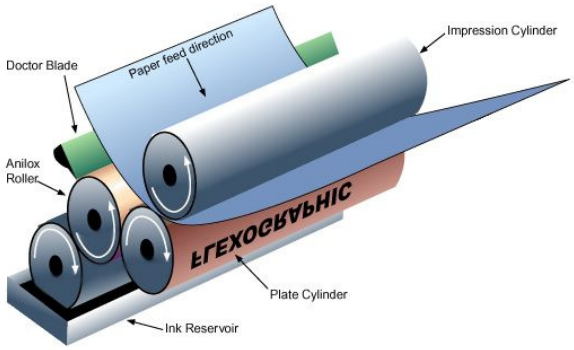
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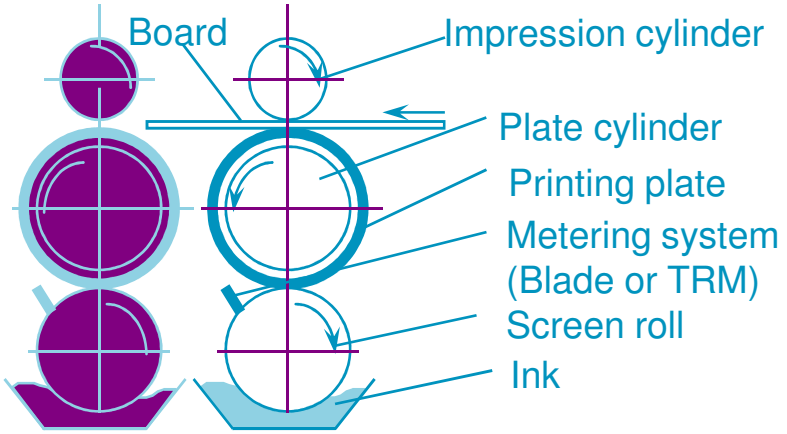
How is it done?

- Process definitions and variables quantifying what is “good product” for:
  - Printing
  - Die Cutting
  - Folding
- Measuring procedures (standard’s)
- Test protocol



What is Printing?





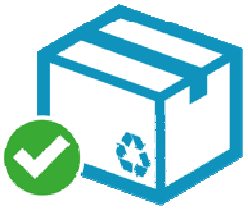
Printing is:

Getting the right	**amount**
of the right	**ink**
in the right	**place**
on the right	**paper**
against the right	**costs**

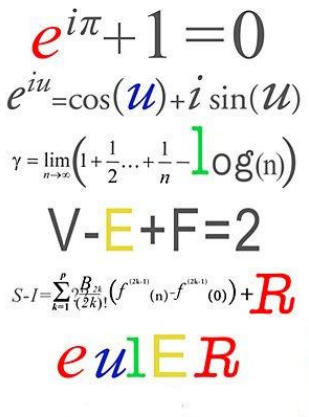


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Variables that influence the print appearance



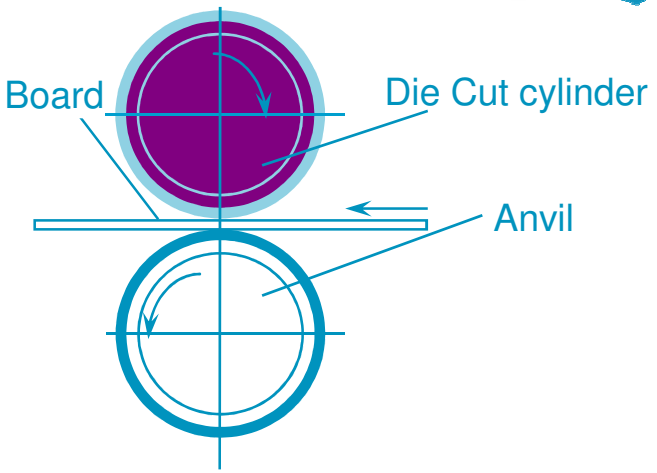
- Register
- Colour
- Cleanliness
- Edge Sharpness
- Mottling



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What is Die Cutting?





Die Cutting is:

Getting the right	**tools (Score, Knife, Rubber)**
with the right	**pressure**
in the right	**place**
on the right	**board**
against the right	**costs**



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Variables that influence the convertibility of the die cut product



- Register
- Dimension
- Score Depth
- Cleanliness (Waste)

$$e^{i\pi}+1=0$$

$$e^{iu}=\cos(u)+i\sin(u)$$

$$\gamma=\lim_{n\to\infty}\left(1+\frac{1}{2}\cdots+\frac{1}{n}-\log(n)\right)$$

$$V-E+F=2$$

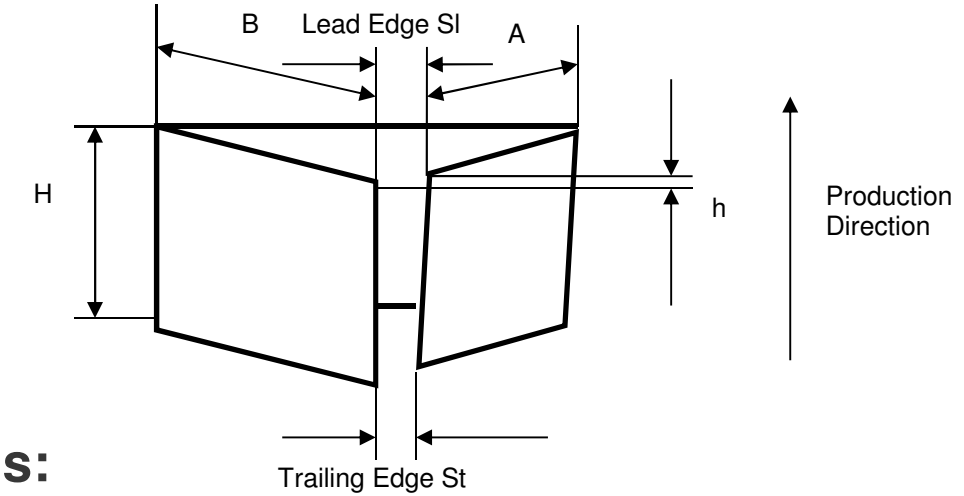
$$S-I=\sum_{k=1}^{p}\frac{B_{2k}}{(2k)!}\left(f^{(2k-1)}(n)-f^{(2k-1)}(0)\right)+R$$

$$euler$$

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What is Folding Gluing?





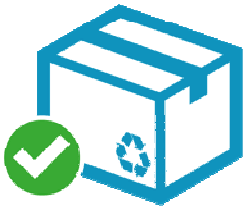
Folding Gluing is:

Getting the right panel size
of the right board
with the right amount of glue
in the right place
against the right costs



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Variables that influence the erection of a box



- Gap
- Fishtailing
- Dimension
- Score Depth
- Glue add on

$$e^{i\pi}+1=0$$

$$e^{iu}=\cos(u)+i\sin(u)$$

$$\gamma=\lim_{n\to\infty}\left(1+\frac{1}{2}\ldots+\frac{1}{n}-\log(n)\right)$$

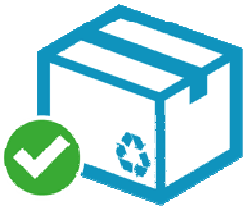
$$V-E+F=2$$

$$S-I=\sum_{k=1}^{n}\frac{B_{2k}}{(2k)!}\left(f^{(2k-1)}(n)-f^{(2k-1)}(0)\right)+R$$

$$eulER$$

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Measuring procedures (Standards)

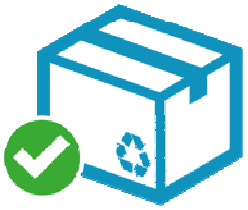


- Measuring procedures need to be defined for the key properties of the product produced
- Procedures might be needed for testing the good functioning of a process part that indirectly effects the performance of the end product E.g.:
  - Ink system cleanliness and screen roll ink film thickness will effect the colour and uniformity of the colour printed



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Test Protocol



- Planning
  - When will the test take place
  - What will be tested
  - What is needed for the test
- Order/prepare tools and equipment
  - Print plates
  - Cutting die
  - Ink
  - Board
- Plan the Start of the Test
- Plan the End of the Test
- Evaluation/Reporting

Day	Time	Timing	Topic	Equipment
1	30	8.00	Introduction RDC Machine Data Collection	
1	60	8.30	Measure run-out: ➢ Impression cylinders; ➢ Plate cylinder; ➢ Screen roll.	Photo camera; TIR measuring gauge: ➢ Clock 2 x; ➢ Stand; Filler gauges (Optional); Diameter measuring device (optional);
1	60	9.30	Measuring screen roll IFT All print stations in 3 positions: ➢ Operator Side; ➢ Centre; ➢ Drive Side Taking microscopic surface images if needed.	Reference ink; Pipette; Doctor blade; Reference areas; Scanner; Digital USB Microscope; Screen roll Microscope
1	30	10.30	Measuring ink loss during colour change One print station.	Scale Under 30 kg; Scale 0.01 g; 50 ml Tip Pipette; Cups;
1	45	11.00	Set-Up - Ink (Data sheet!!); - Stereo (Cleaning!!). Starting with Black plate station 1 and Cyan plate in station 3 - Board; - Die Cut tool. The set-up is started from the moment all parties agree. No plates or inks are in the machine. The set-up is finished when the first sellable sheet comes from the machine. Used sheets are counted and time is measured	Ink: Process colours: Black station 1, Black Station 2, Cyan Station 3, Black Station 4, Black Station 5 TC Press Assess Test form Viscosity Cup; Stop Watch; Board A;
1	15	11.45	Print samples at 90% of maximum speed.	
1	15	12.00	Measure and calculate register offset	
1	45	12.15	Break	
1	30	13.00	Print Samples at 90% of maximum speed. Mark 10 consecutive printed samples for: ➢ Colour to colour register; ➢ Lead edge to first colour; ➢ Colour variation; ➢ Bar code evaluation Black station	Board A
1	15	13.30	Take wet samples of ink for printing on banded screen roll at ink supplier to determine wet ink film thickness transferred.	100 ml Sample bottles
1	15	13.45	Include die cut tool end offset lead edge print plates to get die cut tool in register with print plates.	
1	15	14.00	Print using station 1, 3 and die cut samples at 90% of maximum speed. Mark 25 consecutive printed samples	Board A
1	15	14.15	Count Waste between produced	

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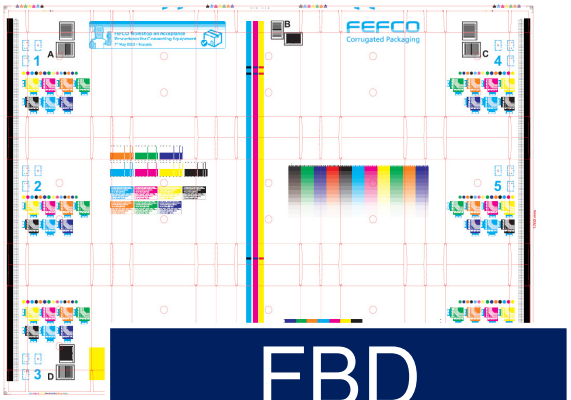
Acceptance Test Form



Print



RDC



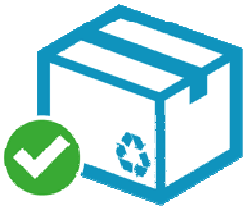
FBD



FFG

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Equipment Testing and Standards





What is machine acceptance?



Why machine acceptance?



How is it done?



How do you agree targets?



How is it implemented in the contract?



Cost justification



Check if performance is within target



Ready to run



Test program with quantitative targets

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How do you agree targets?

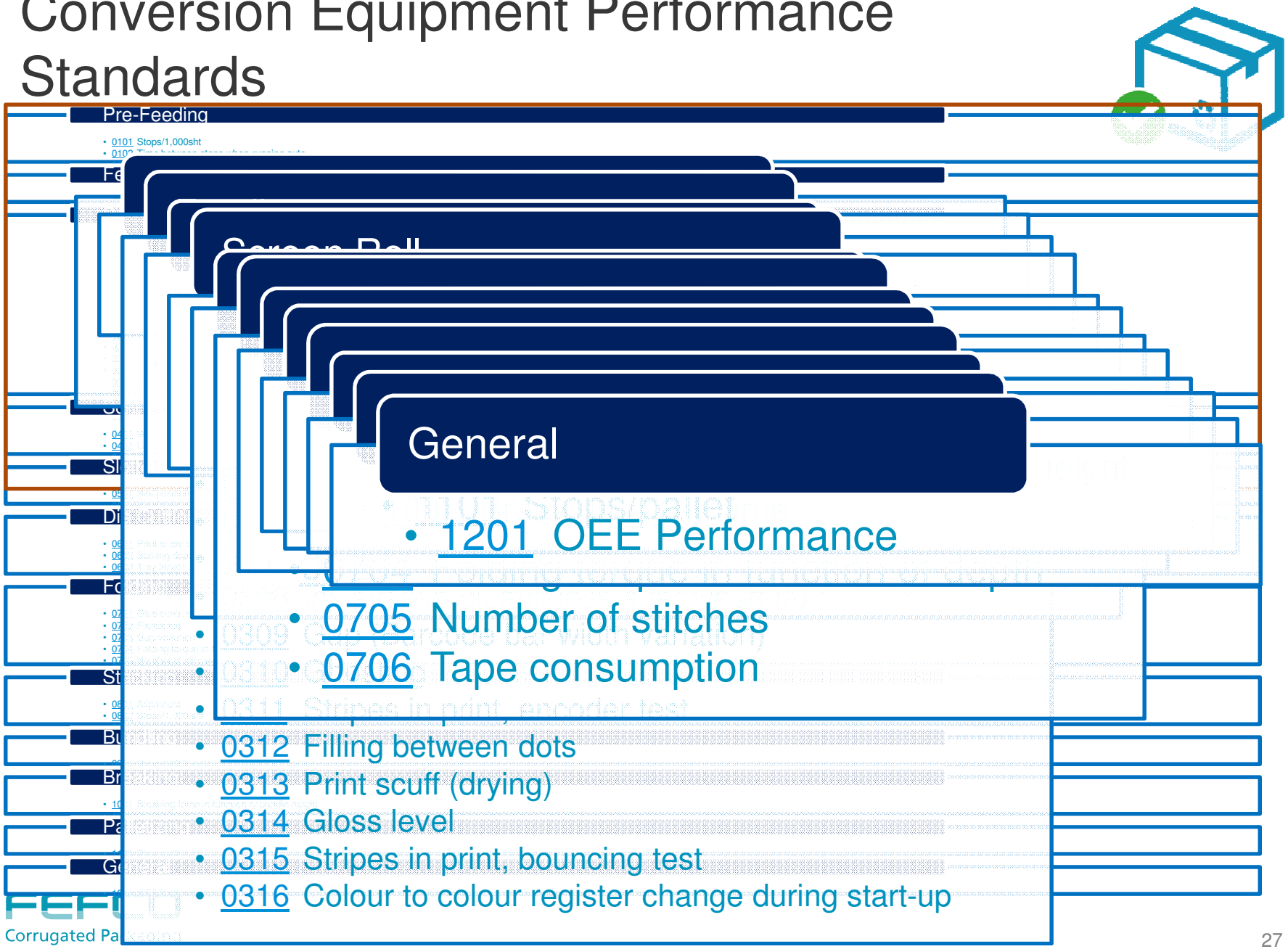


List of standards by group

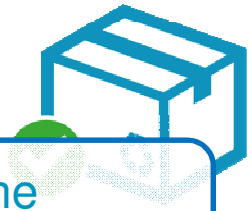
Procedure to agree targets

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Conversion Equipment Performance Standards



Setting Targets by using the Standards

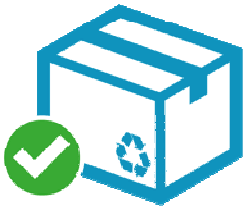


1. • Define what is needed in relation to market demands for to the product manufactured
2. • Select Standards that appl… …t that manufacture the product
3. • Set qua… …ed on tests
   • Don't ove…
   • Check if th…
4. • Agree targ… with supplier
5. • Add targets to supply contract with reference to the standard used for measuring

Targets need to be:
- **Reasonable**
- **Achievable**
- **Measurable**

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Equipment Testing and Standards





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Cost justification



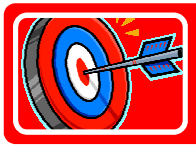
Check if performance is within target



Ready to run



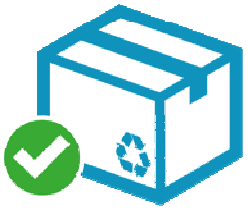
Test program with quantitative targets



Define realistic values for key acceptance indicators

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Equipment life cycle



Selection
- Testing of different potential candidates

Purchasing
- Accepting (Before shipping)
- Accepting (After installation)

Production
- Regular performance check

Maintenance
- Before maintenance
- After maintenance

Upgrade
- Before upgrade
- After upgrade

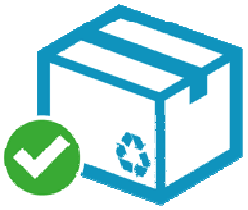
Selling
- Proof of machine state

Second hand buying
- Current status of the machine

"The best service is NO service!" You must have supplied a "quality" product if you never need to send a service engineer

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Contract Acceptance Specification List



Process part	StandardID#	Standard name	Recommended target
Pre-feeding	0101	Stops/1000 sheets	< 1 Stop/1,000sht downtime < 3%
	0102	Time between stops when on running auto mode	Time between stops: > 1,800 sec (30 min.) Uptime: > 97%
	0103	Waste sheets	% Waste sheets: < 1 % (10 sheets per 1,000 sheets)
Feeding	0201	Feed to first register PD/CPD variation	σ < 0.33

Printing	0301	TIR (screen roll, plate cylinder, impression cylinder)	SRoll: < 0.035 PCyl.: < 0.050 IMCyl.: < 0.025
	0302	Colour to colour register variation	σ < 0.25
	0303	Colour variation	σ ΔE < 0.5
	0304	Colour change during start-up	< 2 shts (Δ E > 2)
	0305	Ink consumption	Uncoat.: 5-8 µm Coated: 2-3 µm
	0306	Ink loss during colour change	<0.5 dm^3
	0307	Water addition during colour change	<0.1 dm^3
	0308	Ink system cleanliness after wash-up	25 dm^3 water, DE<0.8
	0309	Gap (barcode bar width variation)	< 0.015 mm σ BWG < 6%
	0310	Ghosting	0 repeats
	0311	Stripes in print, encoder test	Constant ratio
	0312	Filling between dots	-10% < Filling between dots < 100%
	0313	Print scuff (drying)	DE < 1.0
	0314	Gloss level	Uncoated: > 12% Coated + Lacquer: > 80%
	0315	Stripes in print, bouncing test	Δ E centre/LE-TE < 1.0
	0316	Colour to colour register change during start-up	0 sheets (Δ Reg. > 0.5 mm)

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Contract Acceptance Specification List



Screen roll	**0401**	Wet ink film thickness	Uncoated: 11µm Coated: 5 µm
	0402	Line count	11µm➔ 100 l/cm 5 µm ➔ 180 l/cm 3 µm ➔ 280 l/cm
	0403	Cell wall thickness	100 l/cm➔ 8 µm 180 l/cm➔ 5 µm 280 l/cm➔ 3 µm
Slotter/ scorer	0501	Slot position relative to centre line	± 1.5 mm σ< 0.5 mm
	0502	Slotting depth variation centre score	± 1.5 mm σ< 0.5 mm
Die Cutting	0601	Print to die cut register variation	σ < 0.5
	0602	Scoring depth variation	σ < 0.10 mm
	0603	Tray length variation	σ < 0.25 mm
	0604	Waste removal	99.9%
Folding	0701	Glue consumption	1.0-1.5 ± 0.2 g/m
	0702	Fishtailing	σ < 0.9
	0703	Gap variation	σ < 0.9
	0704	Folding torque in relation to depth	Board grade dependent
	0705	Number of stitches	Stitches #/m: x ± 1/m
	0706	Tape consumption	1 ± 0.05

Stacking	**0801**	Alignment	Max. Ds < 5 mm
	0802	Stops/1000 sheets	<1 Stop/1000 sht downtime < 3%
	0803	Exact sheet count	± 1 Sht/pallet Avg. >= Target sht/pallet
Bundling	0901	Stops/100 bundles	< 1 Stop/100 bundles downtime < 3%
Breaking	1001	Breaking force in relation to bundle height	> 40 sheets bundle depending on board grade in < 15 sec
	1002	Breaking cycle time	Breaking cycle time < Stack Height/ Machine speed
Palletizing	1101	Stops/pallet	< 0.5 Stop/1,000 sheets downtime < 3%
General	1201	OEE (overall equipment effectiveness) performance	OEE>92%

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Equipment Testing and Standards





What is machine acceptance?



Why machine acceptance?



How is it done?



How do you agree targets?



How is it implemented in the contract?



Cost justification



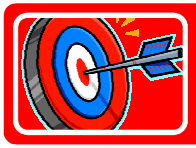
Check if performance is within target



Ready to run



Test program with quantitative targets



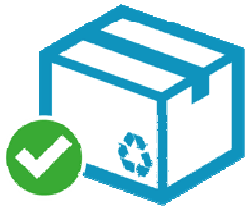
Define realistic values for key acceptance indicators



Acceptance indicators are part of the contract

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Cost justification

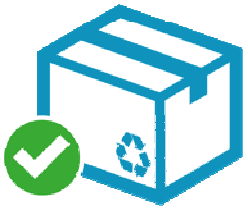


- Equipment testing costs money!
- There is no relation between the cost of testing and the price of the equipment tested
- The cost for testing needs to be in relation to the loss of profit when not producing

Production equipment can only contribute to profit when producing acceptable product!

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Equipment Testing and Standards





What is machine acceptance?



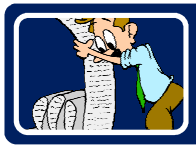
Why machine acceptance?



How is it done?



How do you agree targets?



How is it implemented in the contract?



Cost justification



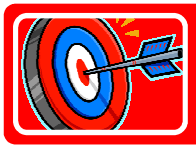
Check if performance is within target



Ready to run



Test program with quantitative targets



Define realistic values for key acceptance indicators



Acceptance indicators are part of the contract

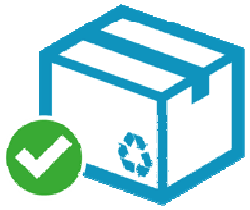


Only a running machine can earn money

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FEFCO Standards for Converting

Technical specifications for equipment and processes



Equipment Testing and Standards

- Ready to run supply allows to earn money from day one

Speakers + 5min introduction

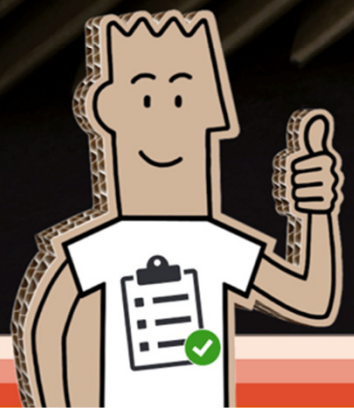
Machine acceptance, the impact on your business & Test results map

Do and Don’ts

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A practical experience

Richard Coward
Rigid Containers UK

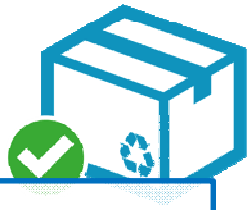


Printing Equipment Acceptance Test

- List of standards in group
- Example
- Jan Lindstrom, MarquipWardUnited



Standards related to Printing Equipment



Feeding

- 0201 Feed to first register PD/CPD variation

Printing

- 0301 TIR (Screen Roll, Plate Cylinder, Impression Cylinder)
- 0302 Colour to colour register variation
- 0303 Colour variation

0308 Ink system cleanliness after wash-up

- 0311 Stripes in print, encoder test
- 0312 Filling between dots
- 0313 Print scuff (drying)
- 0314 Gloss level
- 0315 Stripes in print, bouncing test
- 0316 Colour to colour register change during start-up

Screen Roll

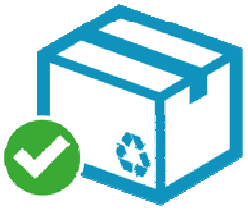
- 0401 Wet ink film thickness
- 0402 Line count
- 0403 Cell wall thickness

General

- 1201 OEE Performance

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Ink System Cleanliness (0308) Procedure



Clean ink system (3 wash cycles)

Circulate Black ink (5 min)

Clean ink system:

- Short wash
- Medium wash
- Long wash

Circulate Varnish

- Print full tone sample

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Ink System Cleanliness (0308) Result



Rubber roll system
Left: Varnish after 15 min wash
Centre: Varnish after 7 min wash
Right: Pure varnish

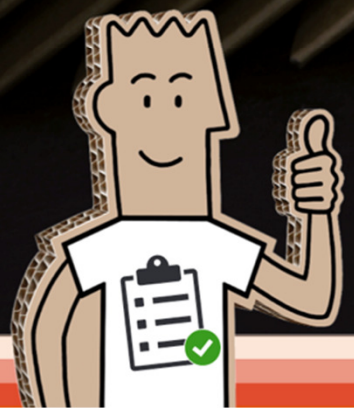


Chamber blade system
Left: Varnish after 15 min wash
2nd left: Varnish after 10 min wash
3rd Left: Varnish after 5 min wash
Right: Pure varnish

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Testing Printing Equipment

Jan Lindstrom
MarquipWardUnited



12:00

Coffee Break

We continue 12:15



12:15

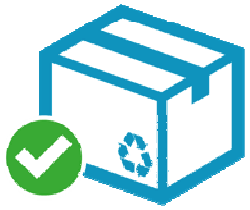
Die Cut Equipment Acceptance Test

- List of standards in Group
- Example
- Anello Meloro & Dominique Ravot, Bobst Group



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Standards related to Die Cutting



Feeding

- 0201 Feed to first register PD/CPD variation

Die Cutting

0302 Colour to colour register variation
0601 Print to die cut register variation

General

- 1201 OEE Performance

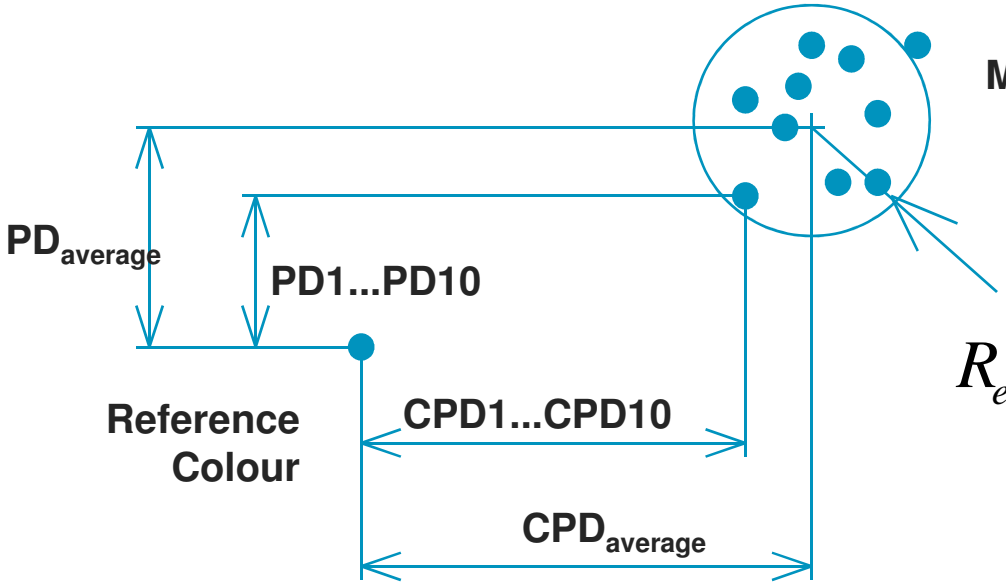
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How do we measure colour to colour register (0302, 0602)

Machine Register



- Definition of colour to colour/print to die cut registration.



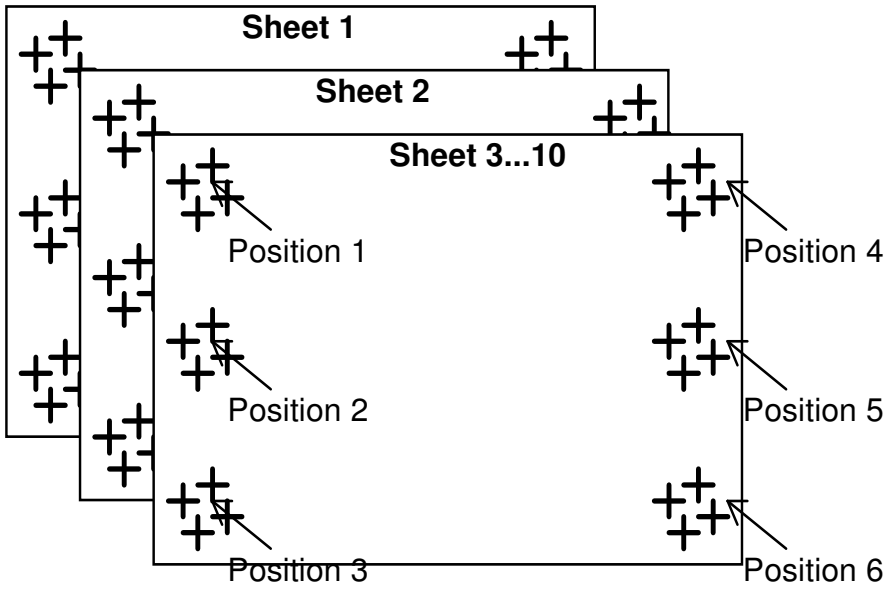
$$R_{error} = \sqrt{\sigma_{PD}^2 + \sigma_{CPD}^2}$$

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Machine Register

How do we measure colour to colour/print to die cut register (0302, 0602)

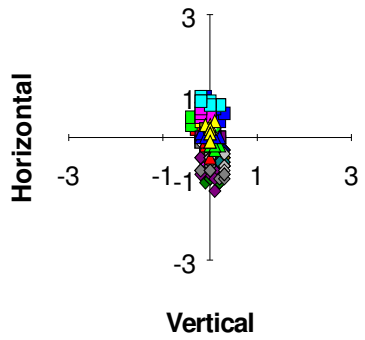
- Measured Data



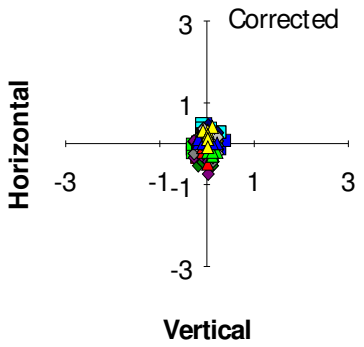
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Method for offsetting measured colour to colour (print to die cut) registration data (0302, 0602)

Total colour to colour registration spread area
print process



Residual colour to colour registration spread area
Process after correcting systematic errors



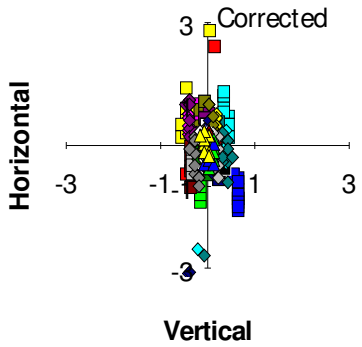
Test Results 1993

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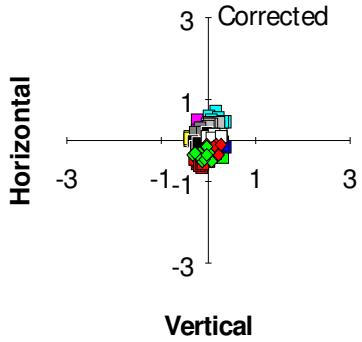
Colour to colour register, results (0302, 0602)

Target: Selection of the printing machine with the smallest colour to colour residual spread area.

Machine A



Machine B



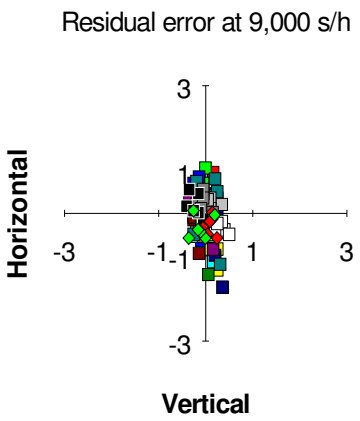
Machine B has been purchased 2 times!!

Test Results 1993

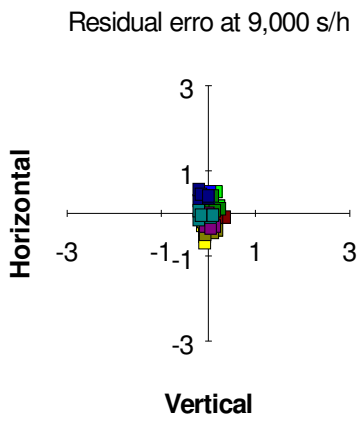
Colour to colour register, results (0302, 0602)

Comparisons of 2 identical machines

Machine B1



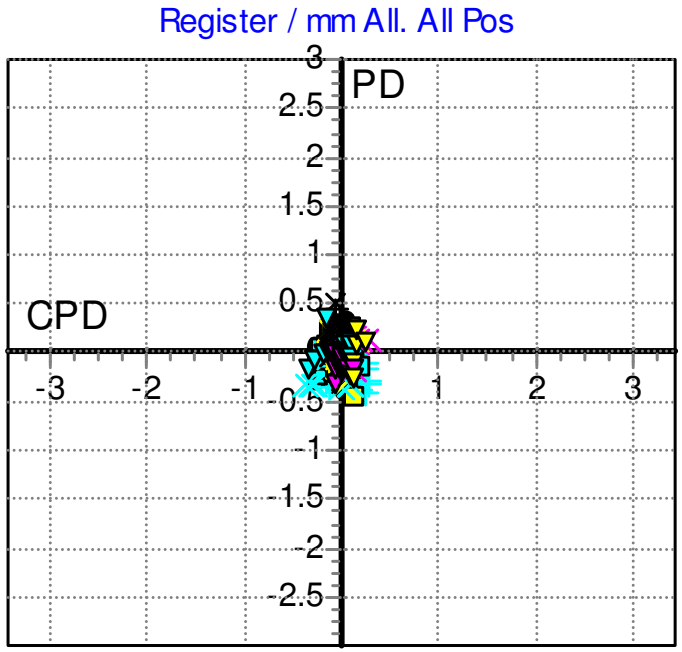
Machine B2



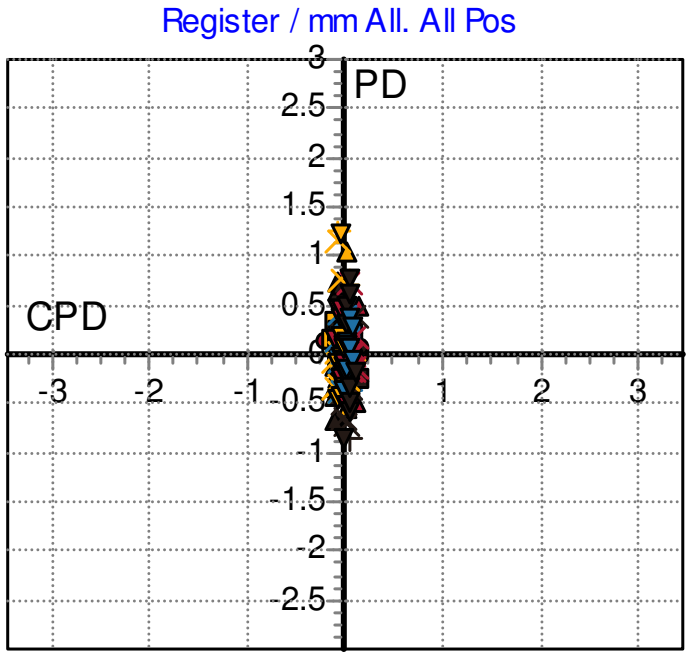
Test Results 1994

RDC 1993-2008, 15 years between tests (0302, 0602)

- 22 Augustus 1993
- σ = 0.21 mm



- 28 November 2008
- σ = 0.32 mm

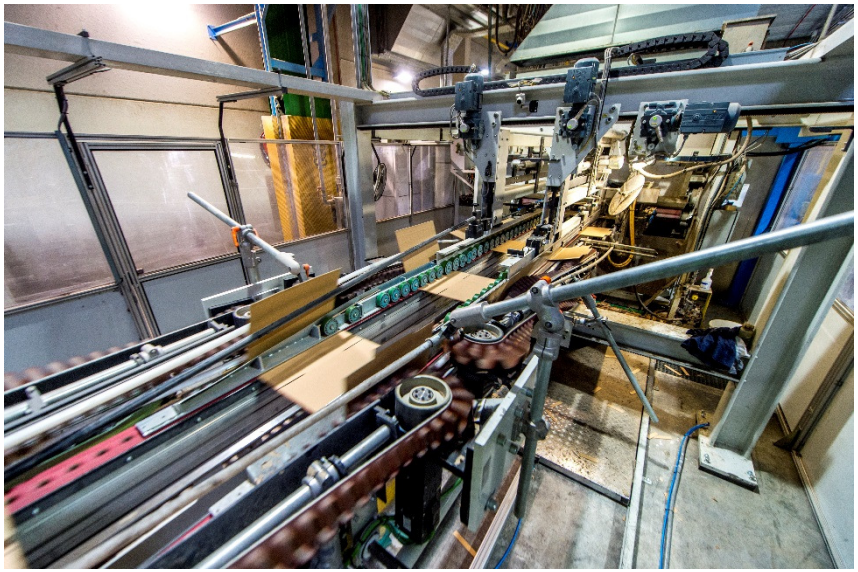


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12:20
Characterization of FBDC and RDC for OEM acceptance test
Anello Meloro &
Dominique Ravot
Bobst Group
52

Folding Equipment Acceptance Test

- List of Standards in Group
- Example
- Ulrich Wolz & Ralf Schifmann, Bahmüller & Göpfert,



Standards related to Folding



Feeding

- 0201 Feed to first register PD/CPD variation

Slotter/Scorer

- 0501 Slot position relative to centre line
- 0502 Slotting depth variation centre score

Folding

0701 Glue consumption

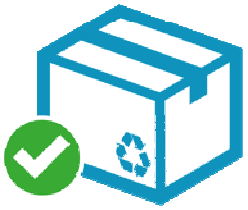
- 0706 Tape consumption

General

- 1201 OEE Performance

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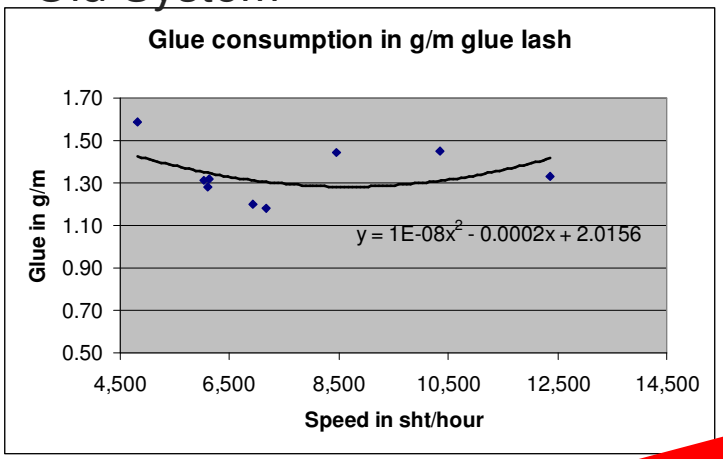
Glue consumption (0701)



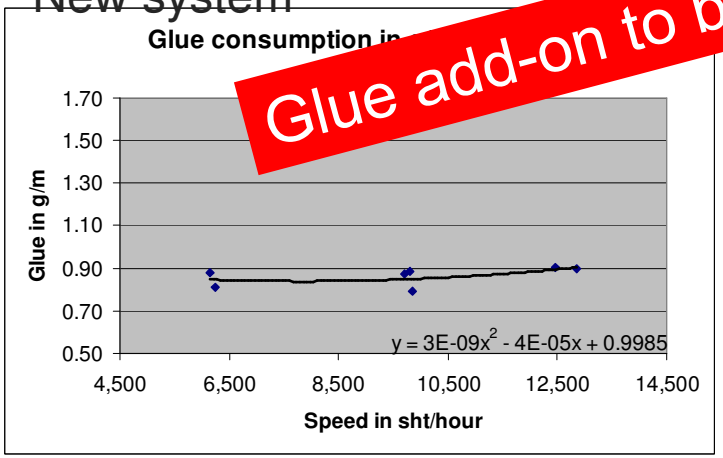
- Sheet detection sensor is positioned on the machine
- Glue container is positioned on scale
- Glue container weight is measured every time a sheet passes (Up to 50,000 sheets/hour is possible)
- Glue consumption slope is calculated from all glue consumption data points recorded
- Glue consumption is normalised over glue lash length
- Normalised glue consumption is presented in function of machine speed

Glue consumption (0701)

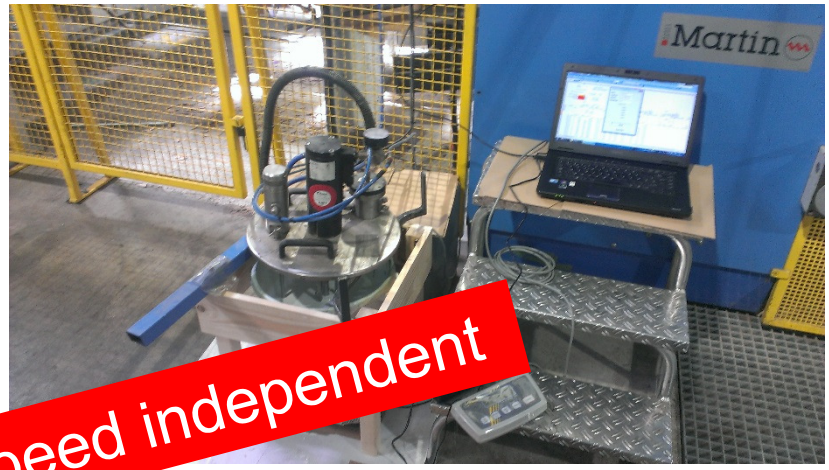
Old System



New system

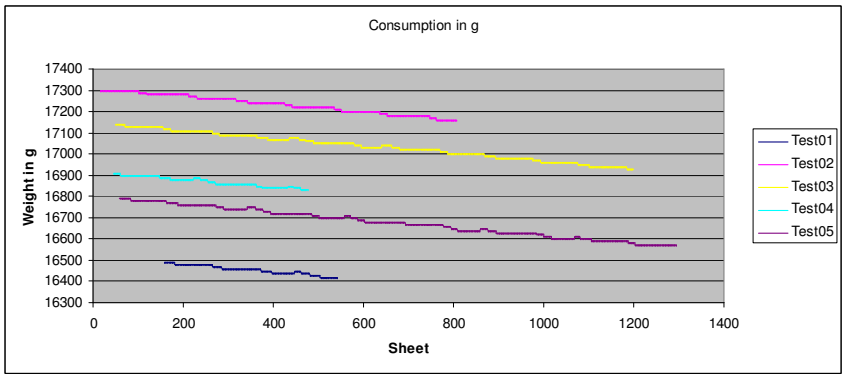


Test Setup



Glue add-on to be speed independent

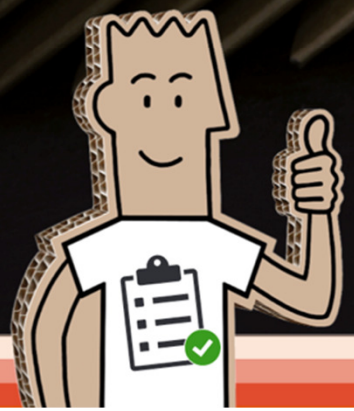
Raw Data



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Corrugated Packaging

Folding Equipment Testing method

Ulrich Wolz &
Ralf Schiffmann
Bahmüller & Göpfert



13:15

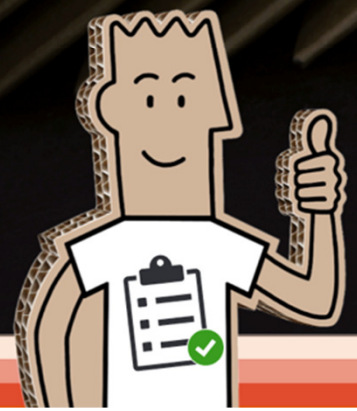
Lunch

We continue 14:15



A practical experience: Colour to colour register

Klaus Lüke
Klingele Papierwerke



Auxiliary Equipment Acceptance Test

- List of standards in group
- Example 0101 stops/1,000 sheets
- Mats Nilsson, Dücker Corrpal



Standards related to Auxiliary Equipment



Pre-Feeding

- 0101 Stops/1,000sht
- 0102 Time between stops when running auto
- 0103 Waste sheets

Stacking

- 0801 Alignment
- 0802 Stops/1,000 sht
- 0803 Exact sheet count

Bundling

- 0901 Stops/100 bundles

0101 Stops/1000 sheets

Palletizing

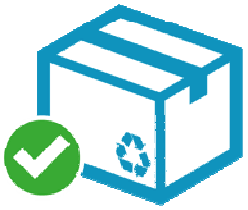
- 1101 Stops/pallet

General

- 1201 OEE Performance

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Stops/1,000 Sheets (0101)



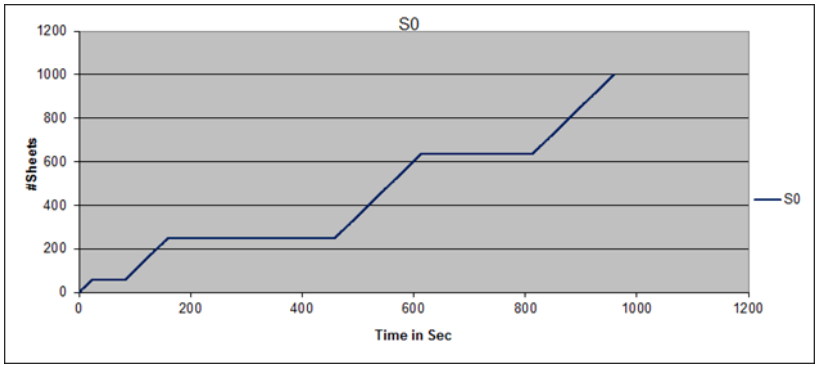
- A practical example on how to collect the data
- The target is to detect sheets and/or bundles in the machine and record the actual time when passing
- A source for the the time being too long (stop) can be recorded
- ➔Data Collection Spreadsheet ➔
- ➔ What about Wireless?➔

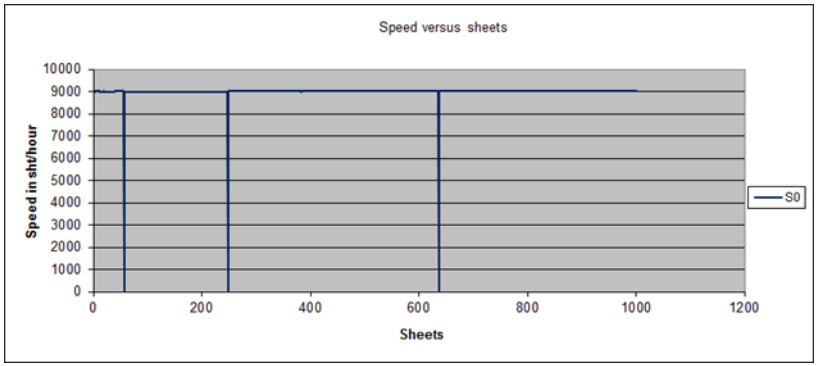


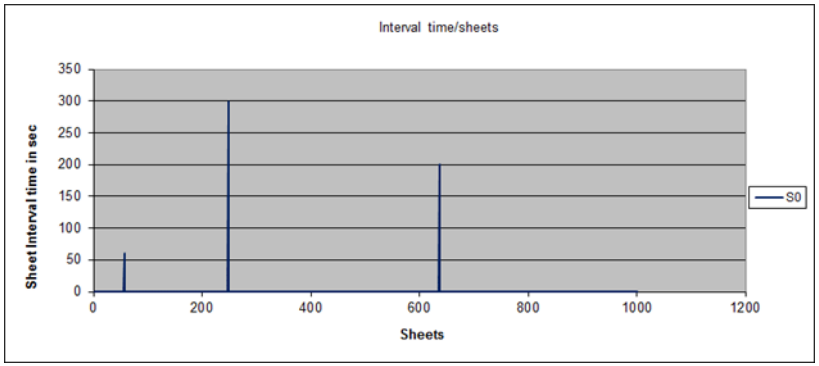
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Stops/1,000 Sheets, Results

- Time Graph
- Speed Graph
- Time interval graph



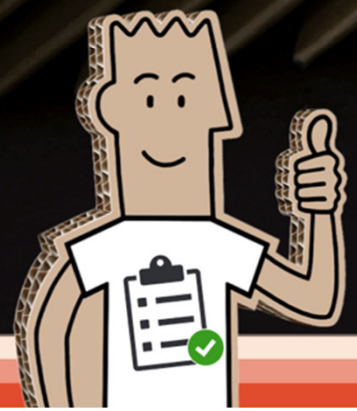


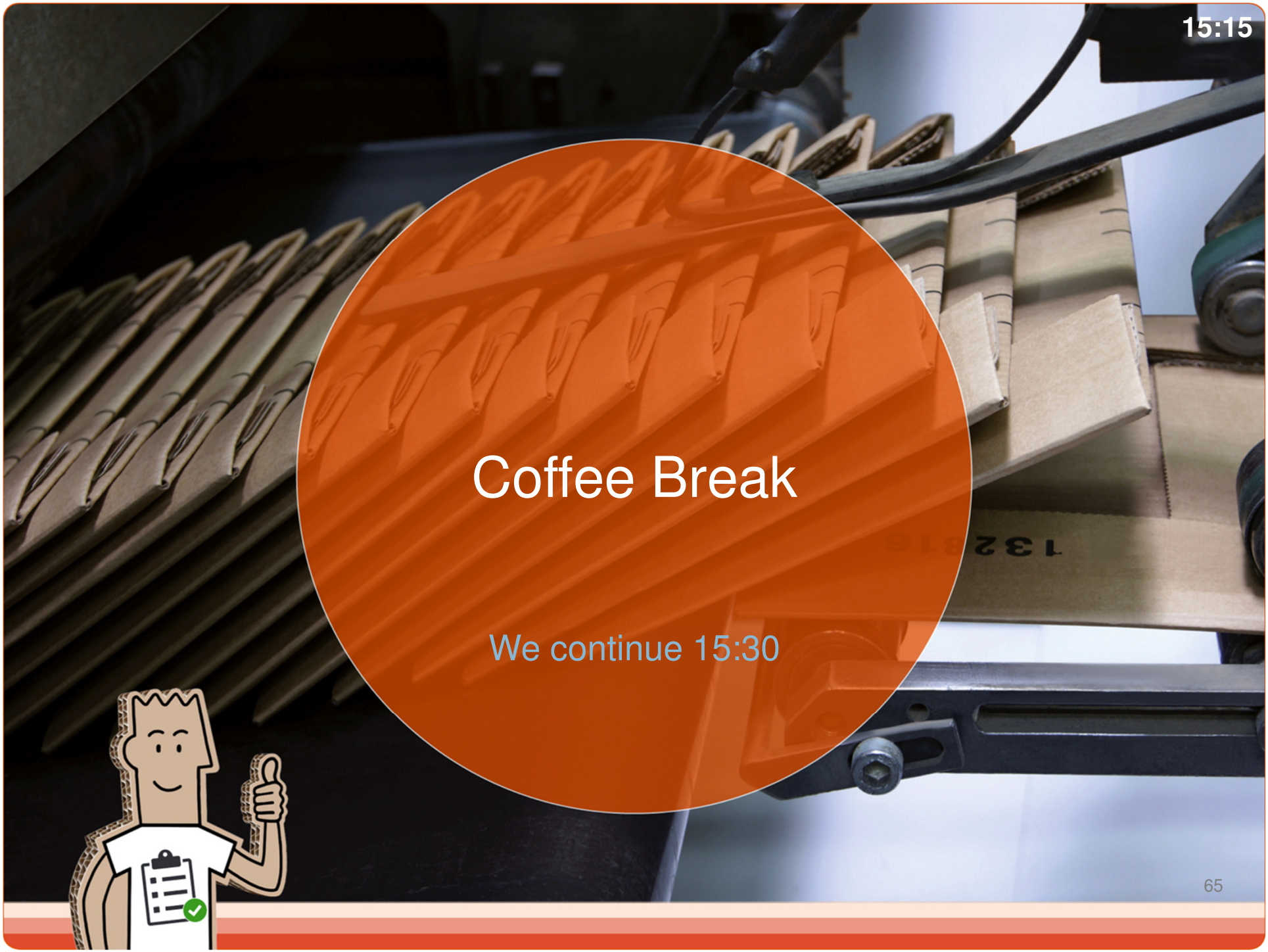


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Breaking and Palletising

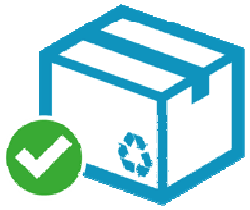
Mats Nilsson
Dücker Corrpal




15:15
Coffee Break
We continue 15:30

FEFCO Standards for Converting

Technical specifications for equipment and processes



Equipment Testing and Standards

- Ready to run supply allows to earn money from day one

Speakers + 5min introduction

- We agree it is important and can be done

Machine acceptance, the impact on your business & Test results map

Do and Don’ts

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Corrugated Packaging


15:30
Impact of machine testing on your business & Tests Results Map
Wilbert Streefland
Technology Coaching BvbA
67

Impact of machine testing on your business & Tests Results Map

- Machine mapping using key standards
- Business impact (Standard 1201 OEE Performance)



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Machine mapping using PressAssess test results

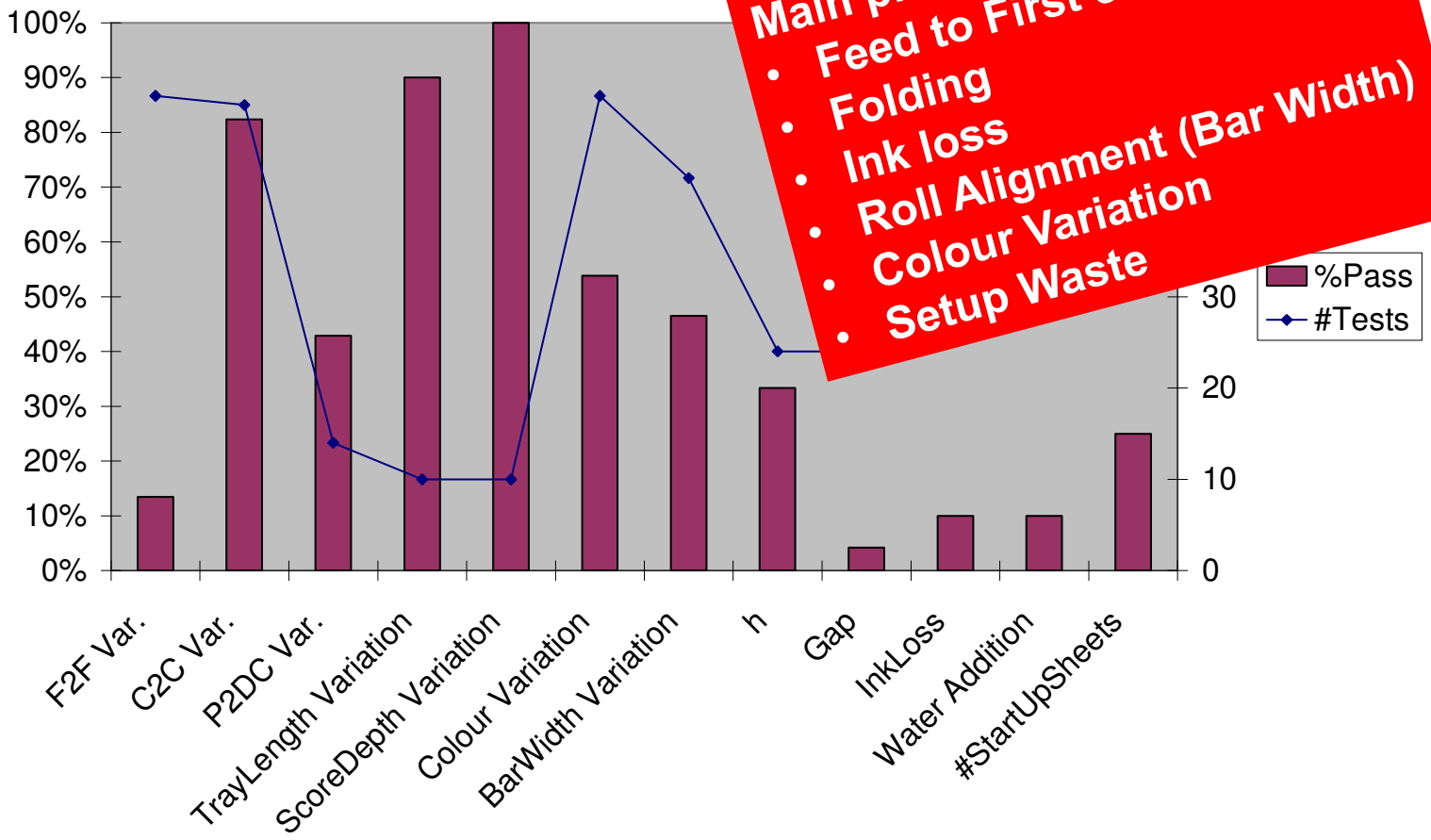
Machine Mapping



- 32 Machines
- 53 Tests
- Machine ID list
- Mapping Elements:
  - 0201: Feed to first colour
  - 0302: Colour to colour register variation
  - 0601: Print to die cut register variation
  - 0603: Tray length variation
  - 0602: Scoring depth variation
  - 0303: Colour variation
  - 0309: Barcode Bar Width gain variation
  - 0702: Fishtailing (h)
  - 0703: Gap Variation
  - 0306: Ink loss
  - 0307: Water addition during colour change
  - 0305: Colour change during start-up
- Only results will be shown of machine if data is available

FEFCO
Corrugated Packaging

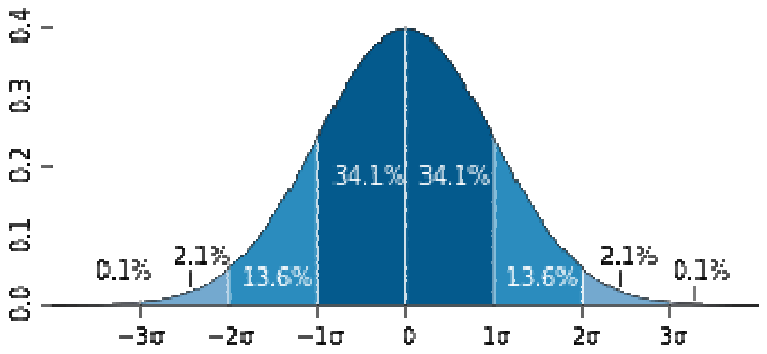
Overview machine Pass/Fail



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The impact of changing target

- A target is always absolute thus 100% of the products produced meet the target! (Dowel Pins Case)
- The standard deviation (σ) of the data collected is calculated **(if the data is normal distributed!)**
- 3 in 1,000 products fail if: 3*σ = target



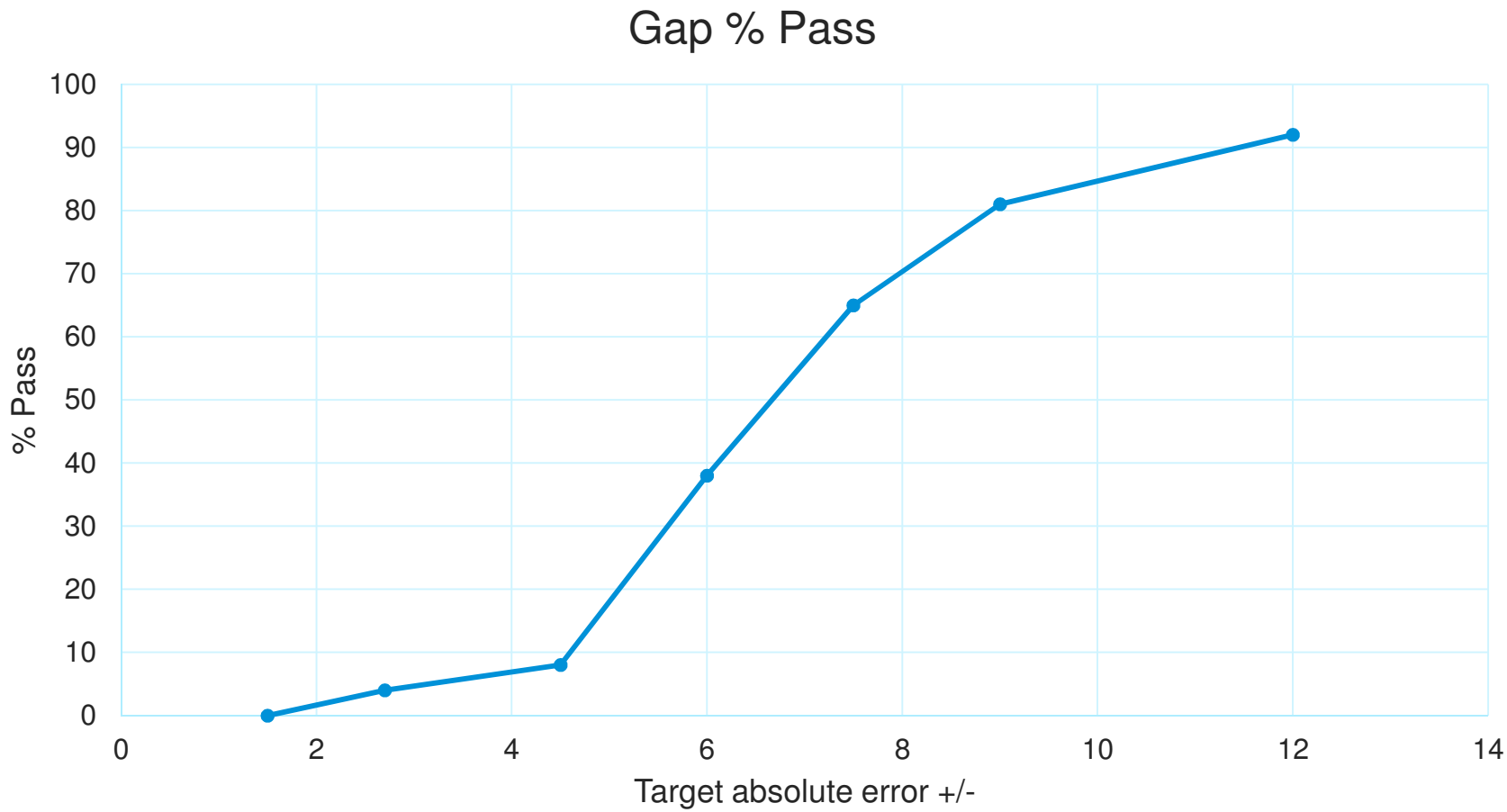
- σ represents 68.3 %
- 2 * σ represents 95.4 %
- 3 * σ represents 99.7 %

What happens to the number of passes for the "gap" tests when changing the target?

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Impact of Varying gap (0703) target?

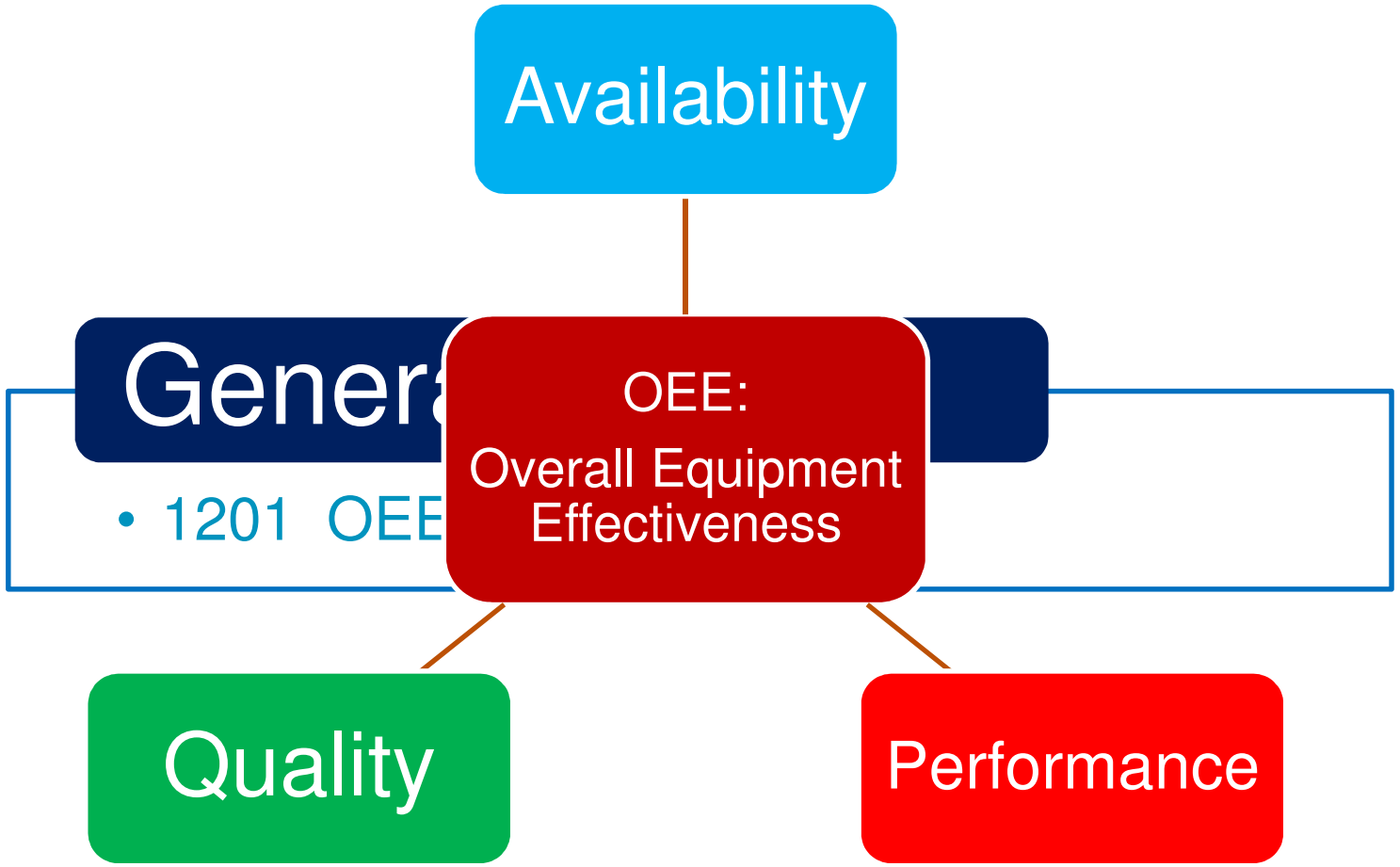




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Standards related to Business impact





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Business Impact

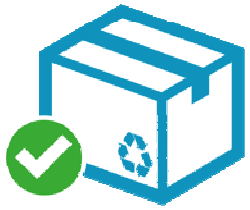


Acceptance testing:	Supports OEE
	Reduces machine start-up time after installation
	It is possible to monitor machine performance relative to new
	Avoids discussions if the machine performance is according the contract or not
	Avoids penalties
	Allows considering a bonus system if performance exceeds expectation

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FEFCO Standards for Converting

Technical specifications for equipment and processes



Equipment Testing and Standards

- Ready to run supply allows to earn money from day one

Speakers + 5min introduction

- We agree it is important and can be done

Machine acceptance, the impact on your business & Test results map

- Focus on earnings per machine hour

Do and Don’ts

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Do and Don’ts

Do

- Set a clear target
- Set specification
- Agree in contract on what is tested
- Test what is agreed

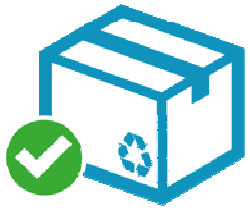
Don’ts

- Focus only on machine prices
- Use 2*σ as a target

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FEFCO Standards for Converting

Technical specifications for equipment and processes



Equipment Testing and Standards

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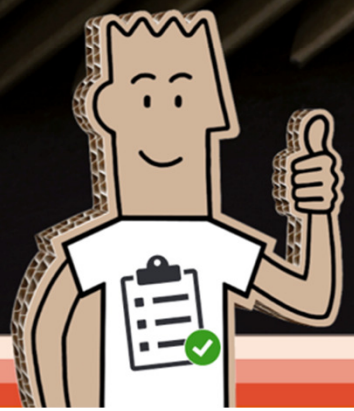
Do and Don’ts

- Implement testing using the FEFCO standards for conversion

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Thank you for your attention

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