WORLD BREWING CONGRESS
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#ElevateBeer

Establishing a Supplier Quality Program

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Lagunitas Brewing Company

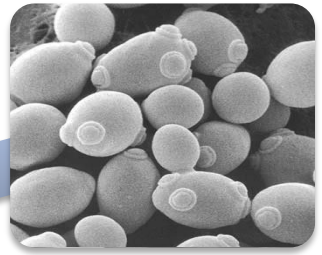
Suppliers

Maltster

Farmer

Municipal

Brewery



Laboratory

Quality

- What is it?
  - The ability to produce a product consistently to specification.
- What tools are required?
  - Sampling program
  - Specifications
  - Measurement equipment

Supplier Quality

- What is it?
  - A relationship between the supplier and brewery.
  - A set of procedures, specifications and expectations pertaining to the quality of products supplied by a vendor to the brewery.

- A well managed supplier quality program will maintain and improve the quality of materials produced by the supplier.
  - Supplier measures and the brewery trusts their measurements.
    - Based on auditing and communication

Why?

- Materials affect:
  - Machine efficiency
  - Staff morale
  - Cost of goods
  - Consumer perception of your brewery

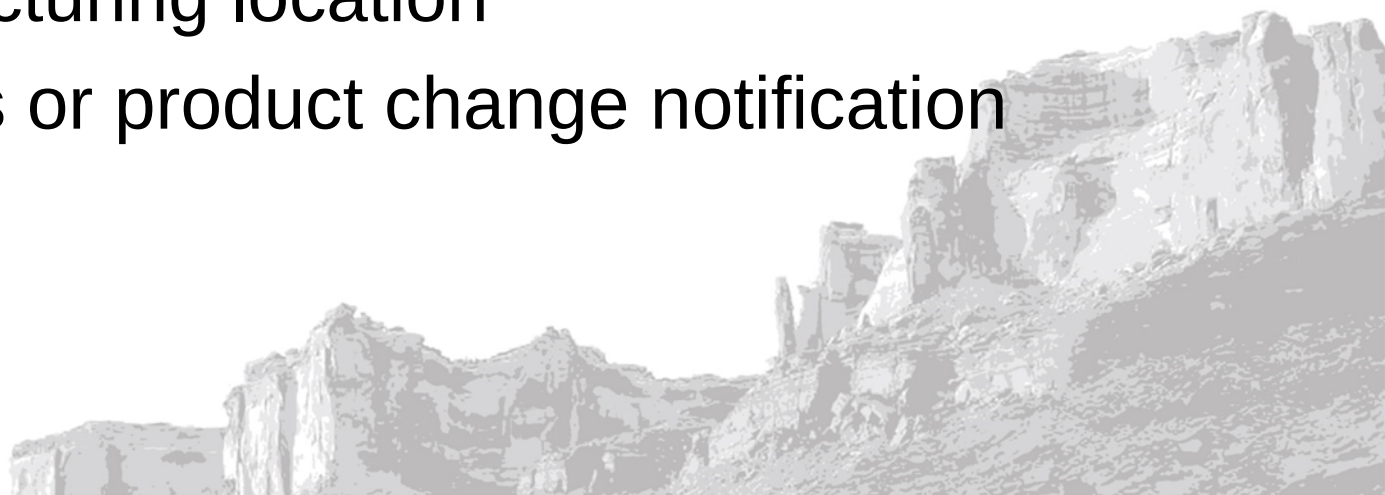
Partnership

- We, not you and I

- Not every problem is the manufacturers fault
- Open communication in both directions
  - Data driven and fact – based

Supplier Agreements

- Contracts between the brewery and vendor
  - Stipulates performance standards
  - Acceptable levels of defective material
  - Price
  - Manufacturing location
  - Process or product change notification

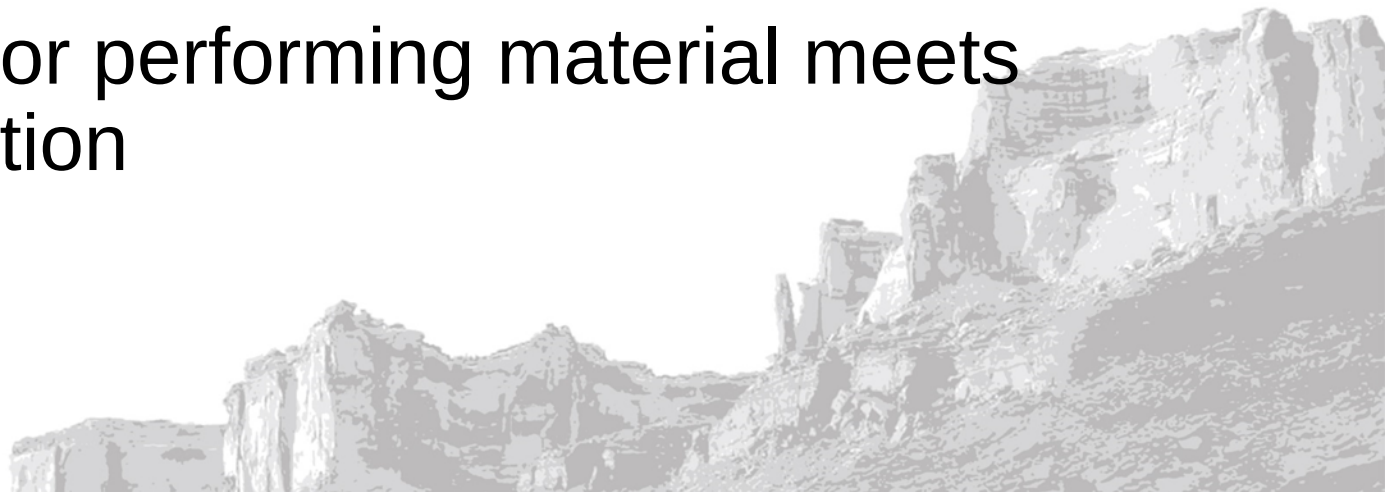


Qualification

- Audit supplier site or process
- Develop a material specific qualification plan
  - Verify artwork (if applicable)
  - Ensure the material meets or exceeds current standard
  - Trial run(s) to verify material performance
  - Review findings
- Vendor approval
  - Approval is only for material produced by the audited and qualified site
  - New sites for production should be qualified separately
    - Different machines, processes, staff or raw materials can affect quality and material performance

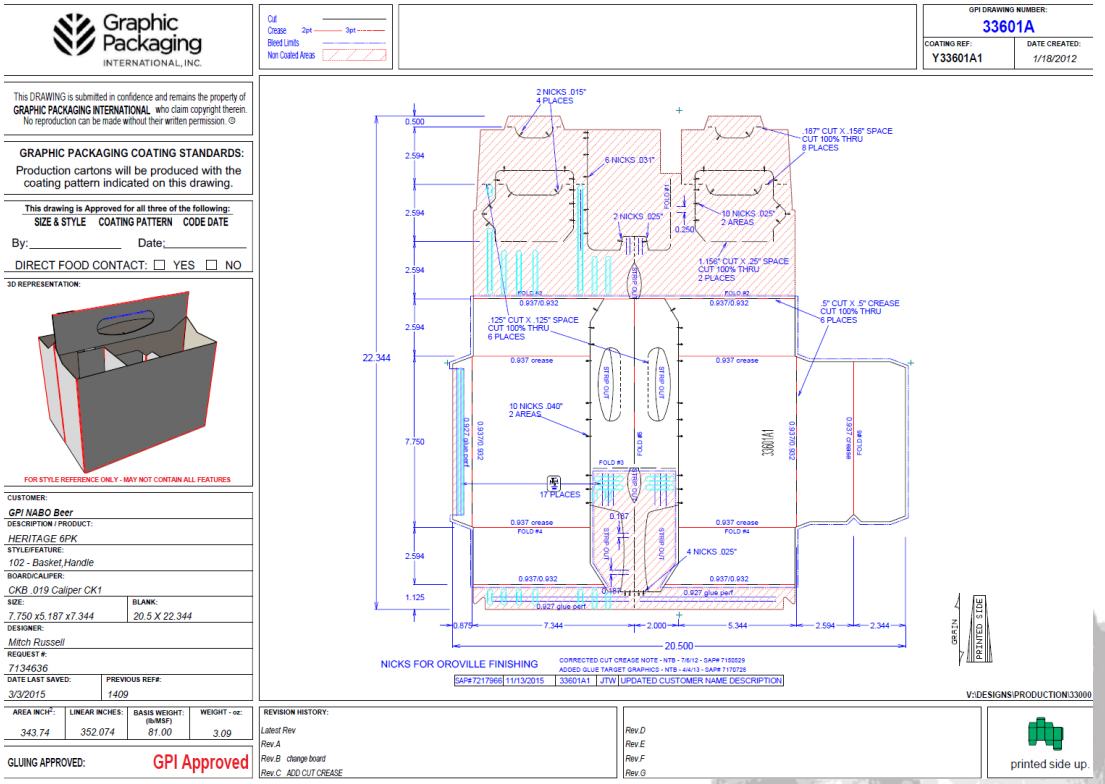
Specifications

- What is the material?
  - Is a food contact surface?
- Established by the brewery or the vendor
  - Dimensional
  - Performance
- Create reference documents
- Verify poor performing material meets specification



Supplier Specification

Attribute	Specification
Material Thickness	0.019 in ± 0.002 in (0.483 mm ± 0.051mm)
Flat Height	9.938 in ± $^{1}/_{8}$ in (252.4 mm ± 3.2 mm)
Flat Length	10.344 in ± $^{1}/_{16}$ in (262.7 mm ± 1.6 mm)
Erected Height	7.344 in ± $^{1}/_{8}$ in (186.5 mm ± 3.2 mm)
Erected Length	7 $^{3}/_{4}$ in ± $^{1}/_{16}$ in (196.85 mm ± 1.6 mm)
End Panel Alignment	Maximum of $^{1}/_{16}$ inches (1.6 mm)
Cutting	No Cracking on Scores in excess of $^{1}/_{4}$ inches (6.4 mm)
Handle Tear Weight	Minimum of three (3) times weight of a six (6) pack. This about 22 lbs of force (97.9 Newtons).

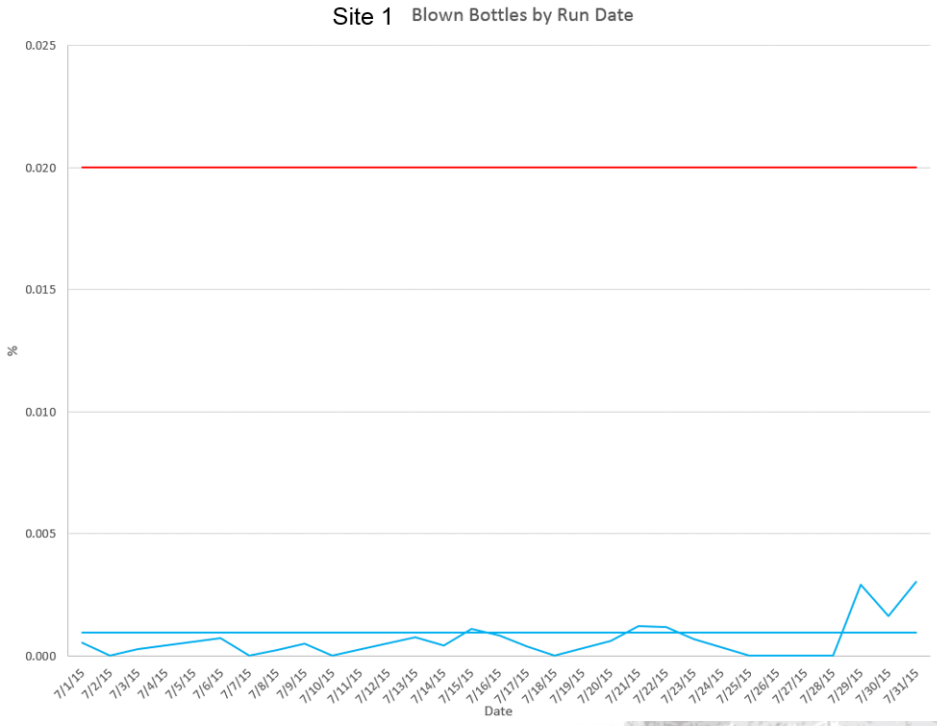


Point of Contact

- Have a point person for communication with vendor.
  - Too many people in the mix creates confusion
- We have separated this out from packaging.
  - Packaging's job is to run
  - Quality and packaging handle material quality issues jointly
    - Quality takes the lead on contacting vendor
    - Packaging in the loop all the way

Baseline

- Measure and document
  - Historical data is invaluable for troubleshooting
  - Shows commitment to vendor and quality
- Do not wait until there is a problem.



Defects

- Ask vendor for terms and common lists of defects
  - Understand severity of defects
  - Speak the same language

Overpress

Chipped Bead

Birdswing

Defective Material

- Save samples
- Take pictures
- Determine defect rate
- Note the manufacturing date/lot number

- Notify the vendor

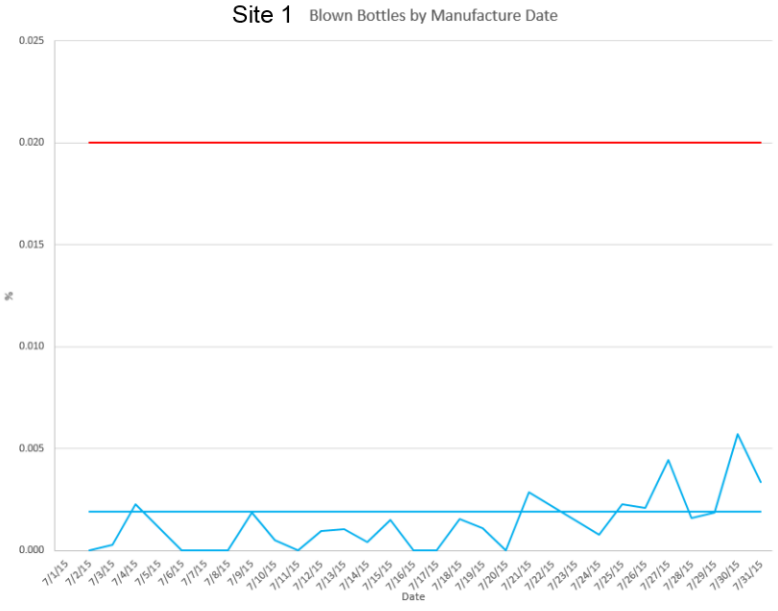
Defective Material

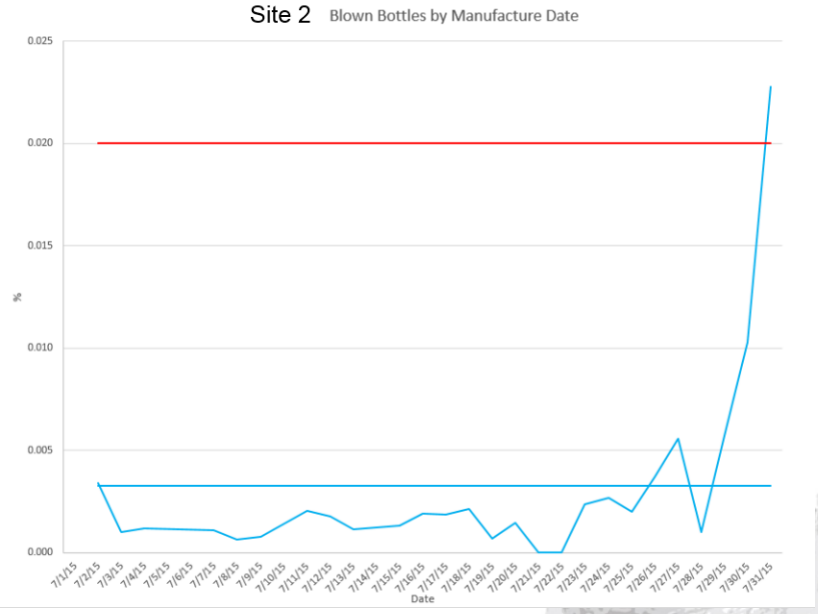
Date	Reaction lvl	Trend #	Material	MFG	Brand	Finding	Defect Type	Defect Rate	Defect Amnt	MFO #	MFG Date	Chief Compliant	Notes
	Low - MFG notified	1	Cartons			Missing print	Print		2 cartons			Several cartons were missing red ink.	No load tag data. Found after production.
	Med - MFG notified	2	Cartons			Cartons glued together, Cartons cut short at mfg joint by 6 inches	MFG Joint		6 cartons		1/22/2016	Several cartons were cut short during the mfg process. This also caused some of the carriers to be glued together.	Caused from improper splicing during corrugate mfg.
	Med - MFG notified	3	Cartons			Moon shapes missing from kraft	Moon Shape		10 cartons		12/12/2015	Several cartons were received that had large moon shapes missing from the bottom flaps.	Caused from cutting out damaged portions of kraft and miscommunication at corrugate machine.
	Low - MFG notified	5	Carriers			Missing glue/improper opening	Construction		1000 carriers		1/16/2016	Glue did not take in one location. Upon opening, this caused the vanes to become loose and tear. Caused issues at the 6 pk erector and drop packer.	This missed the automated QA check point because glue was applied to the location of interest. The glue did not take, allowing the carrier to fail upon opening.
	Med - MFG notified	6	Carriers			Missing glue/improper opening	Construction		1000 carriers		1/15/2016	Glue did not take in one location. Upon opening, this caused the vanes to become loose and tear. Caused issues at the 6 pk erector and drop packer.	This missed the automated QA check point because glue was applied to the location of interest. The glue did not take, allowing the carrier to fail upon opening.
	High - MFG notified	7	Cartons			Missing kraft	Misalignment		700 cartons		3/23/2016	1/4 inch strip of kraft missing from bottom of cartons.	mfg run the same day as this. Defect located on inside of pallet so hard to detect.
	High - MFG notified	8	Cartons			Moon shapes missing from kraft	Moon Shape		12 cartons		3/31/2016	Moon shape cut outs on top flap.	Caused from cutting out damaged portions of kraft and miscommunication at corrugate machine.
	High - MFG notified	9	Cartons			Delamination	Delamination		20 cartons	54875011		Major delamination of the outer kraft.	
	High - MFG notified	10	Carriers			Missing glue/improper opening	Construction		>500 carriers		1/16/2016	Bottom vane is getting stuck during unfolding.	Glue pattern is not "sticking" causing the vane to tear/come out of place.
	Low - MFG notified	11	Cartons			Cartons are warped and stuck together	Warped				2/22/2016	Stacks or cartons are slightly warped and stuck together.	After performing in-lab testing, the cases were "glued" together by water damage. Unable to determine when water damage
	High - MFG notified	12	Cartons			Missing kraft	Misalignment		300 cartons		3/24/2016	1/4 inch strip of kraft missing from top of cartons.	mfg run the same day as this. Defect located on inside of pallet so hard to detect.
	High - MFG notified	13	Cartons			Delamination	Delamination		15 cartons		3/23/2016	Major delamination of the outer kraft.	
	High - MFG notified	14	Cartons			Cut short at mfg joint	MFG Joint		20 cartons		3/23/2016	Cut short at mfg joint.	
	High - MFG notified	15	Cartons			Stuck together	MFG Joint		30 cartons		3/23/2016	Cartons were stuck together from over glue at mfg joint.	
	High - MFG notified	16	Cartons			Warped	Warped		40 cartons		3/23/2016	Cartons were considerable warped and unable to run at the case erector.	
	High - MFG notified	17	Cartons			Ripped bottom flap	Damaged		350 cartons	55414011	4/20/2016	Bottom flap is ripped and folded upwards. Unrunnable cartons. Some yielded print issues.	Issue cause before/at the convertor. As the blanks are being flips, the aligner is denting the blank to try to get it "square".
	High - MFG notified	18	Cartons			Cut short at mfg joint	MFG Joint		30 cartons	55684011	4/30/2016	Cut short at mfg joint.	Defect is made at end of run at the corrugator. These should be pulled off the line by operators.

Case Study

- End of July saw a serious increase in blown bottles on the filler.
  - Broken glass collected and examined by supplier
  - No assignable cause
- Problem persisted for almost a month
  - One brewery hit harder than the other
  - Transit distance for glass might have contributed to increased breakage rates.

July 2015


Site 1
Blown Bottles by Manufacture Date
0.025
0.020
0.015
0.010
0.005
0.000
%
Date


Site 2
Blown Bottles by Manufacture Date
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0.020
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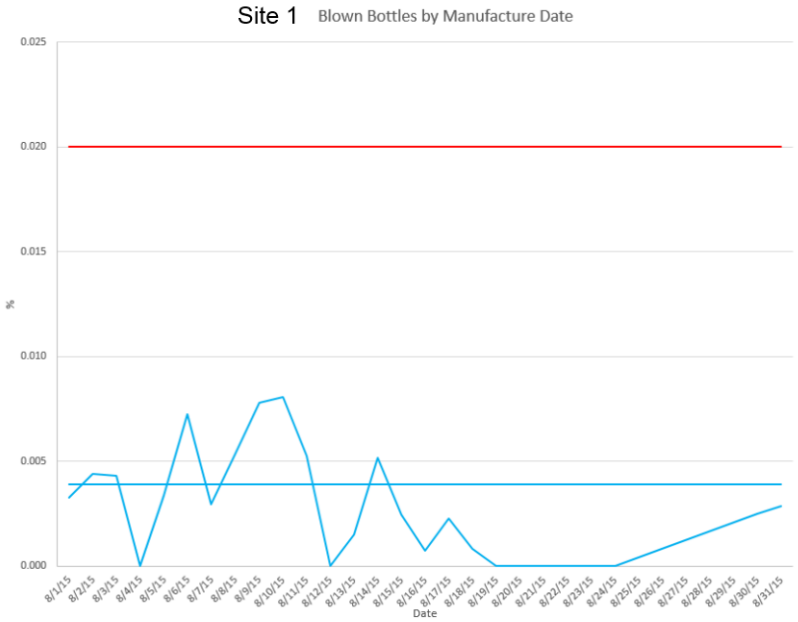
Date

August 2015


Site 1
Blown Bottles by Manufacture Date
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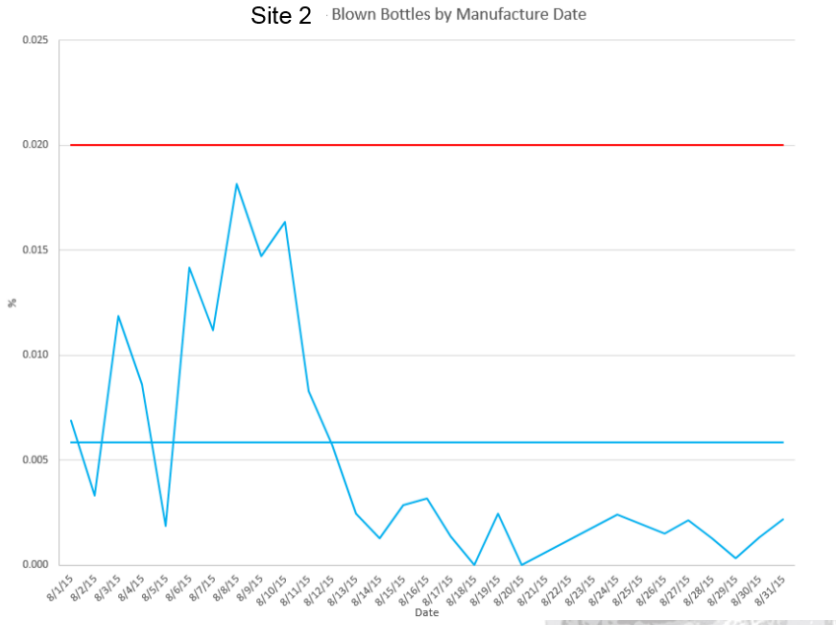
Site 2
Blown Bottles by Manufacture Date
0.025
0.020
0.015
0.010
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%
Date

Case Study

- Data tracking for over a year
  - Supplied historical data to supplier as validation of quality shift
  - Tracked all glass by production date and time it was used on line
  - Tracked all blown glass by production date and time
- Visual representation of data helps tell story
- Supplier corrective action
  - Increased squeezer pressure
  - Rebuilt furnace

Questions?

- Thank you to:
  - Lagunitas Brewing Company

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