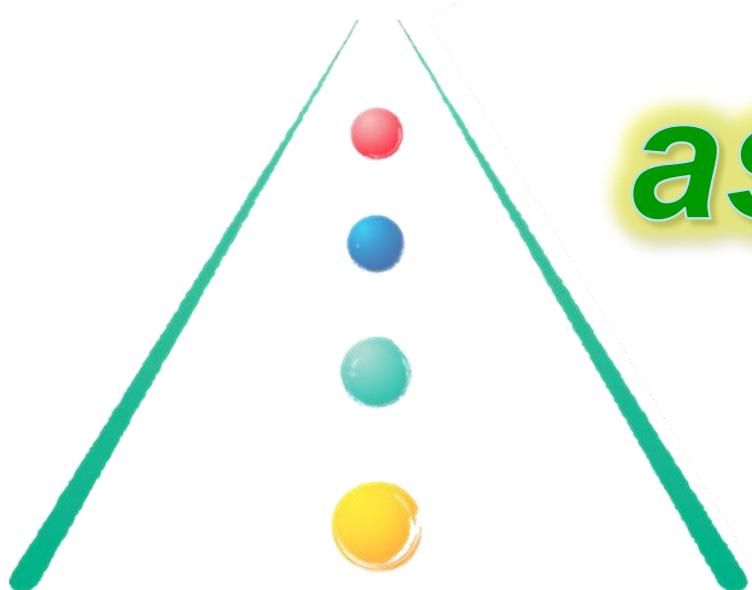


Let's "Go Anzen-ni !"

as **ONE TEAM**



UTAMAKAN KESELAMATAN **KAO**

Kirei—Making Life Beautiful

“Mottainai - Wastefulness – Never Today, Nor Tomorrow, Stop Pemborosan”

Keep Stability Individual Film Process On LSSG Product

Team : All In

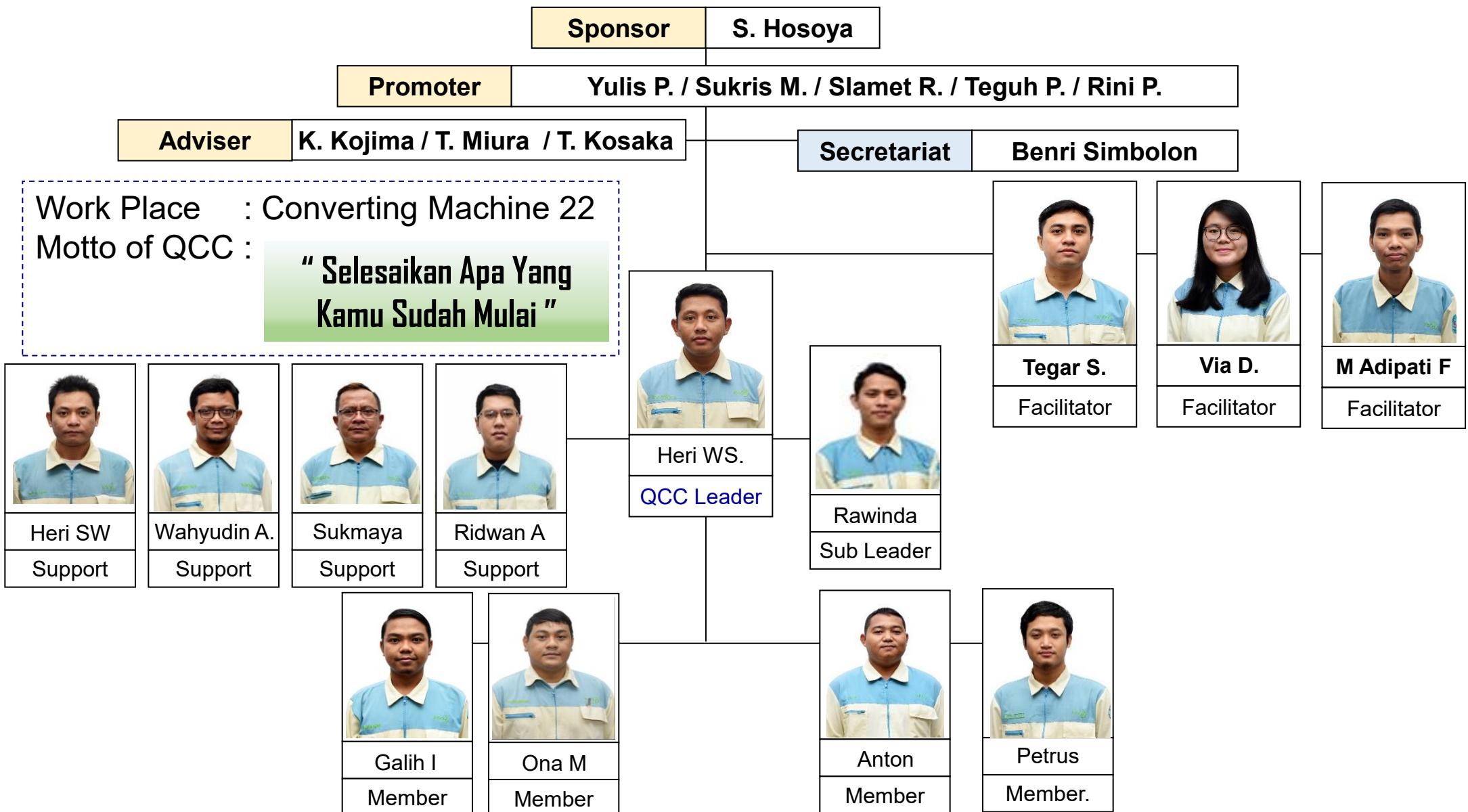
By : Heri Wahyu Setyawan

Date : Dec 13, 2024





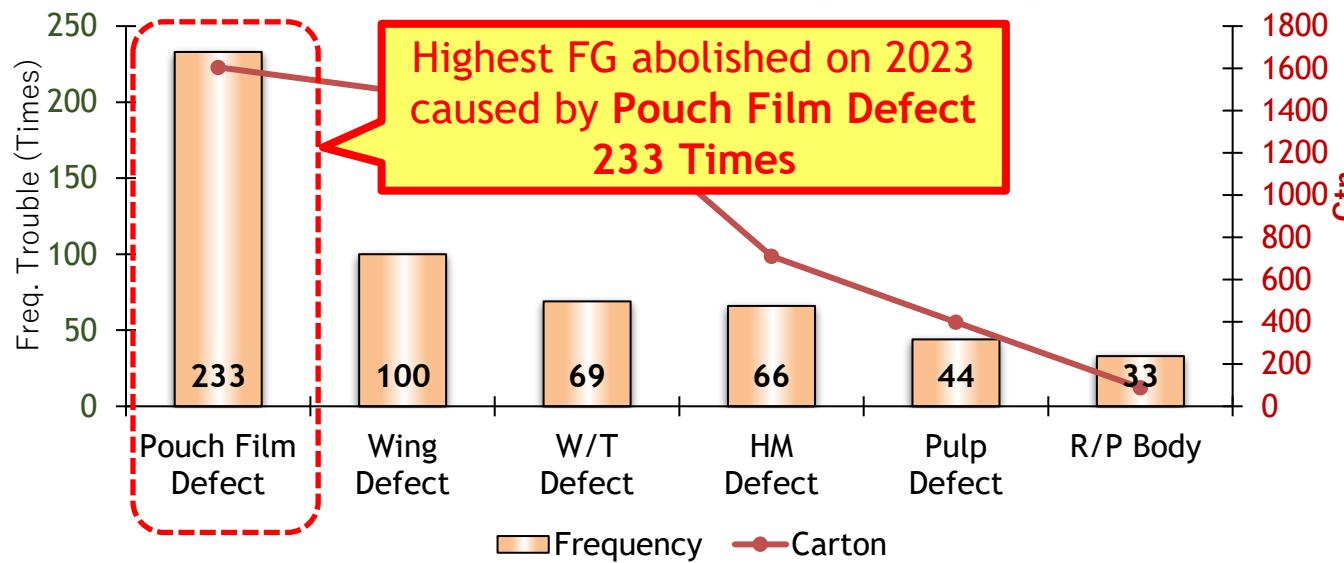
Introduction Team Name and QCC Member



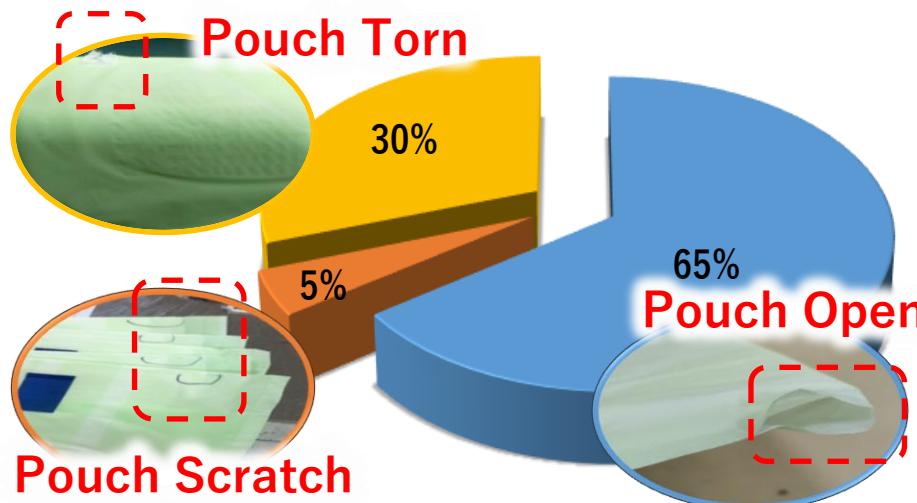


Background Data

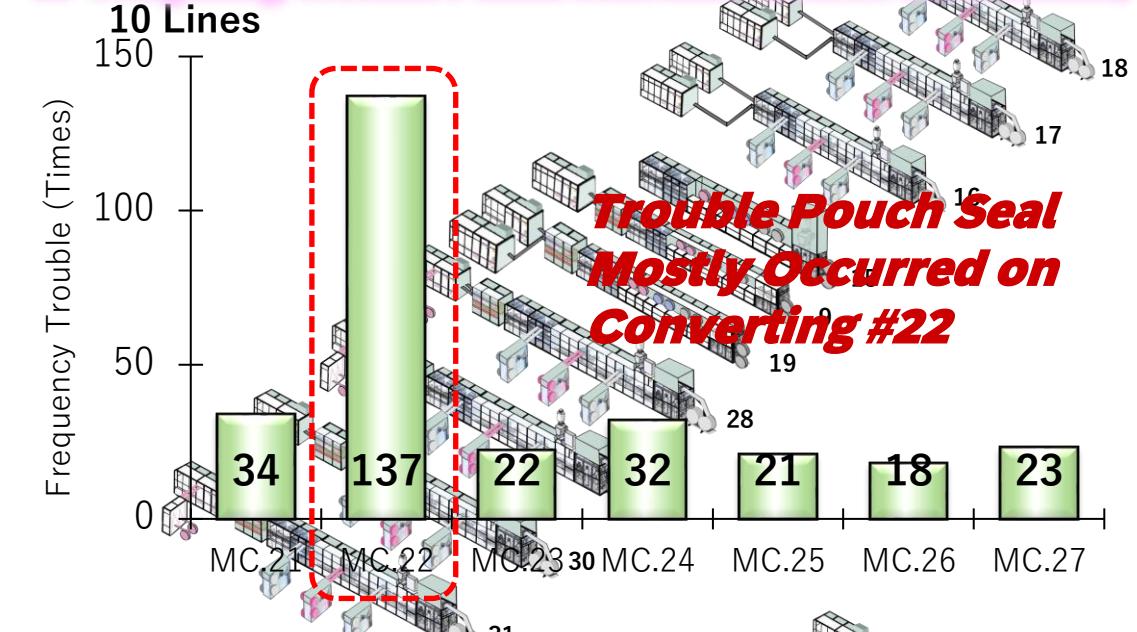
Internal Trouble HHC 2023 Blok Stock (Abolish)



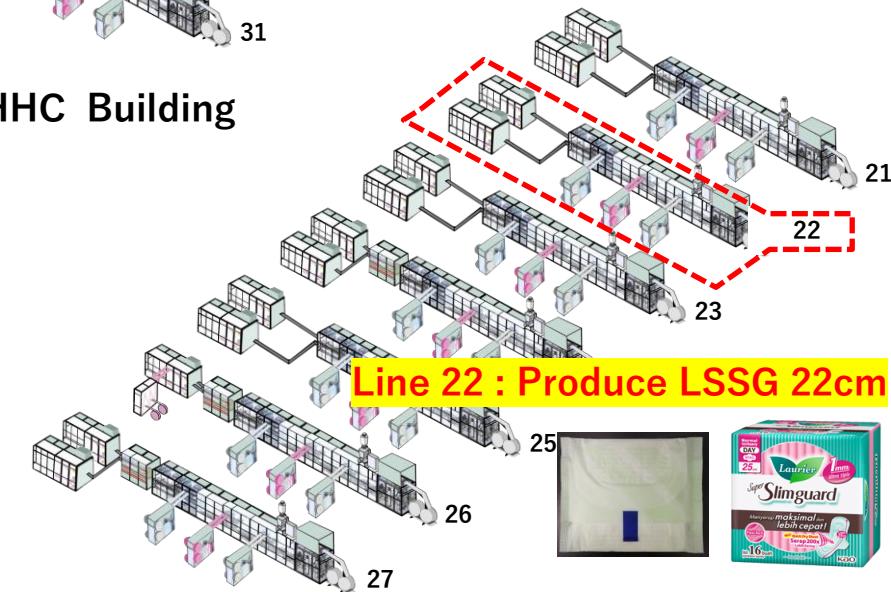
Trouble Pouch Seal



Frequency Trouble Pouch Seal 2023 (Based On Machine)



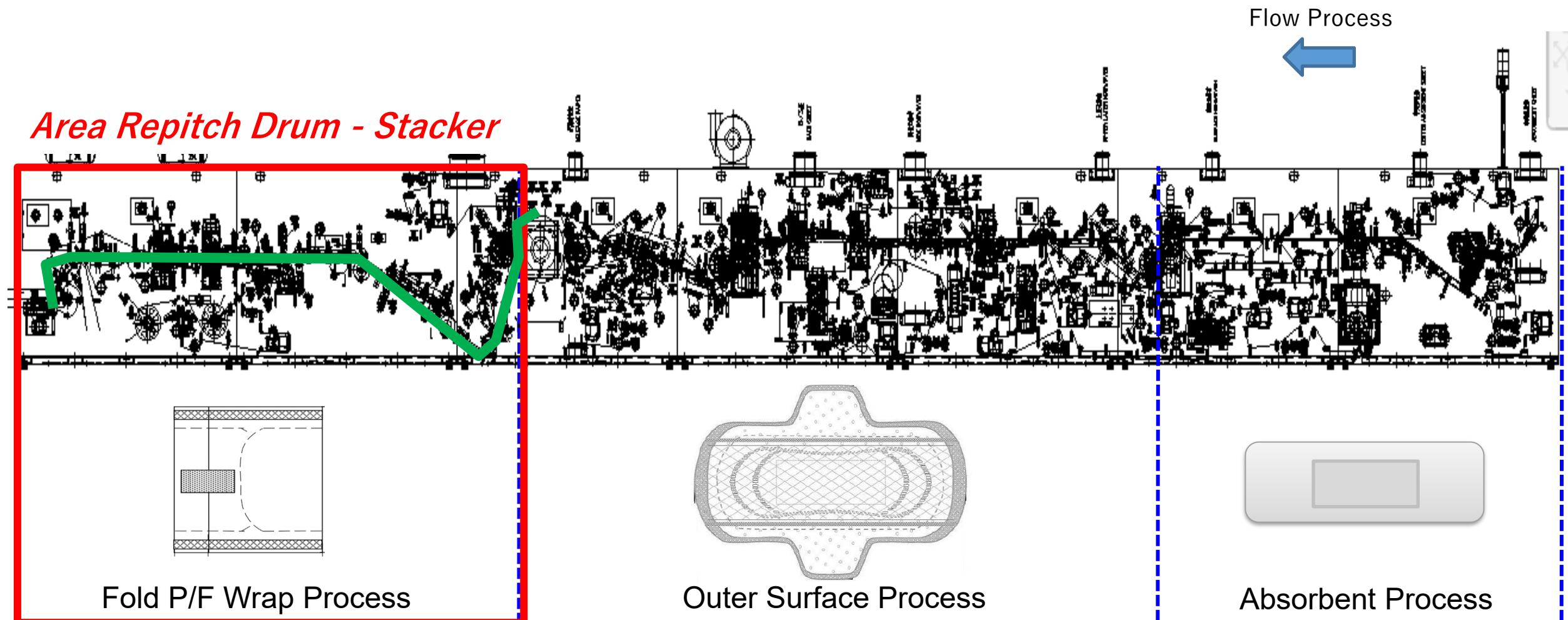
No.2 HHC Building 7 Lines





About Line No.22 (LSSG) process

Layout Area Machine & Trouble Pouch Seal MC 22



we have focused about Pouch Film Warp Process

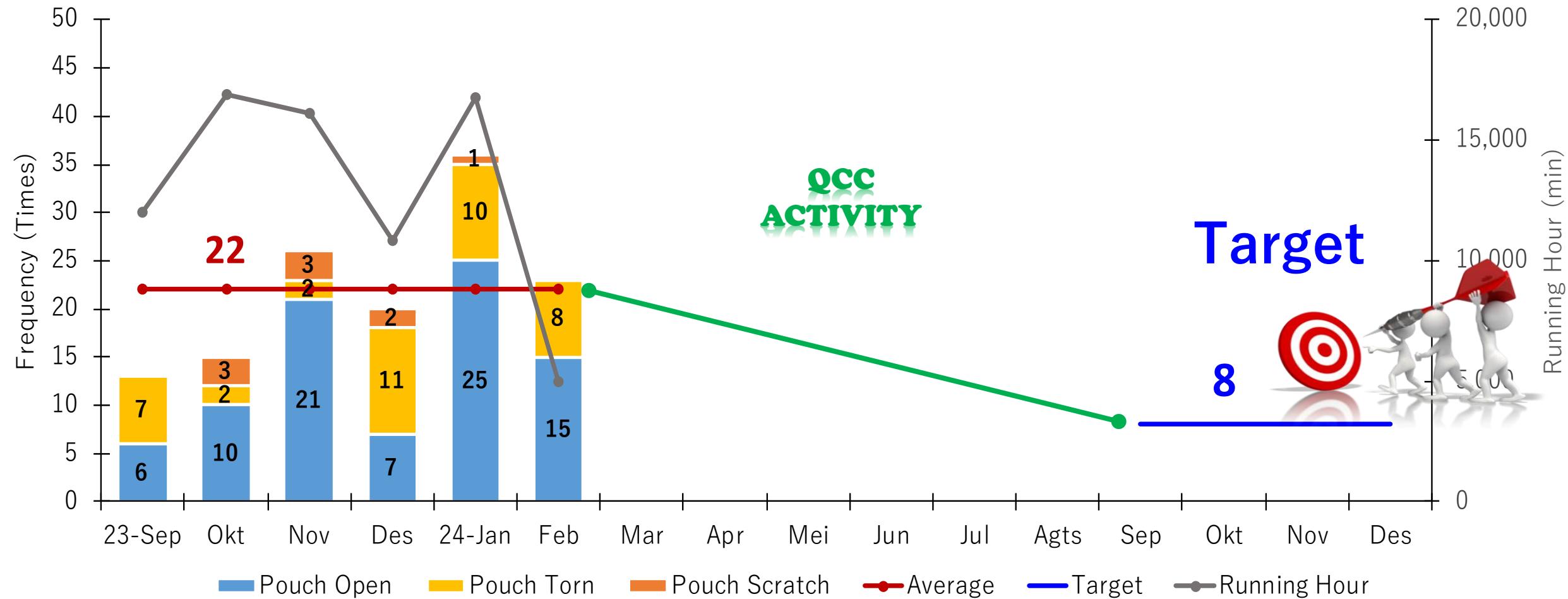


Theme & Setting Target

Based on Background Data, our team activity..

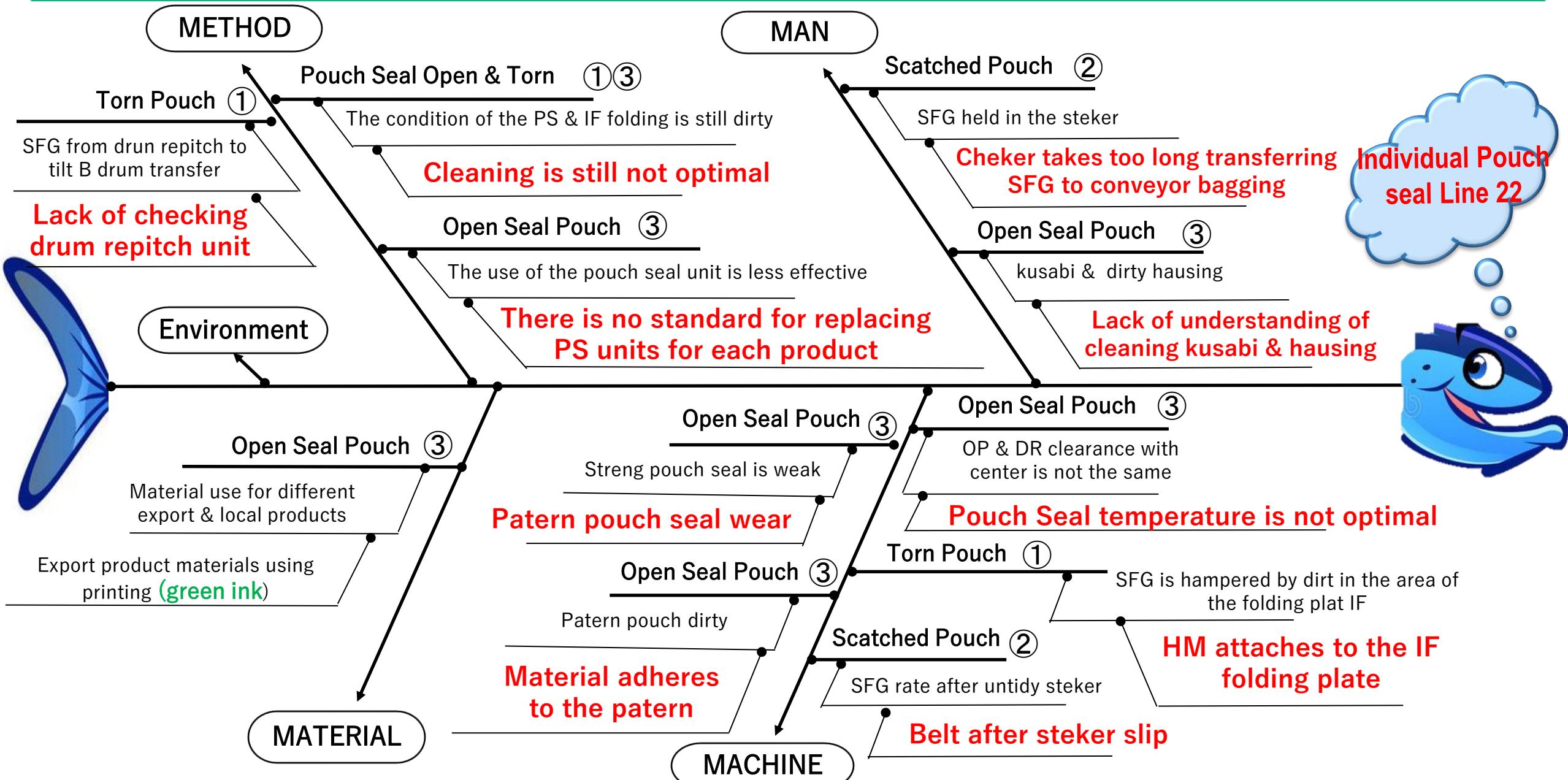
Keep Stability Individual Film Process On LSSG Product MC.22

By Reduce 60% Frequency Trouble Pouch Seal





Fishbone Diagram





Action Plan (5W + 1H)

Description	What	Why	How	Where	When	Who	Status
	Factor	Root Cause	Improvement	Location	Time	PIC	Time
Trouble Individual Pouch MC 22	Man	Lack of understanding of cleaning kusabi & housing	Refresh training	MC. 22	April - Mei 2024	Ona,Galih	Finish
		Cheker takes too long transferring SFG to conveyor bagging	Refresh Training		April – Juni 2024	Petrus	Finish
	Machine	Tilted SFG rate after drum repitch	Replace the seal pad repitch drum & adjust clearance repitch drum to transfer drum B		June' 2024	Heri ws, Anton	Finish
		SFG rate is not neat after steker	Replace the roll type & cover belt after the steker		April ' 2024	Heri ws	Finish
		SFG rate was less stable before pouch seal	Resetting servo speed and adding free roll before pouch seal		Mei - Juni ' 2024	Heri ws, Heri S	Finish
		SFG durability before steker	Additional Guide the press belt before steker		Mei - Juni ' 2024	Heri ws	Finish
		Pouch seal parameter are not optimal	Optimization of pouch seal & capture pouch seal parameter data		Juni-Juli '2024	Heri ws, Rawinda	Finish
		Pouch seal temperature is still not optimal	Trial heater with new spesifications		Mar - Apr '2024	Heri ws	Finish
	Method	Cleaning pouch seal is still not optimal	Rivew OPL cleaning pouch seal addition of cleaning tools		April '24	Rawinda	Finish
		Lack of checking the area of the repitch drum unit	Periodical addition of repitch drum pad seal check & OPL installation of repitch drum pad seals		July'24	Anton	Finish
		Pouch seal unit usage is still ineffective	creation of standard unit turnover for each product		Juli'24	Heri ws	Finish



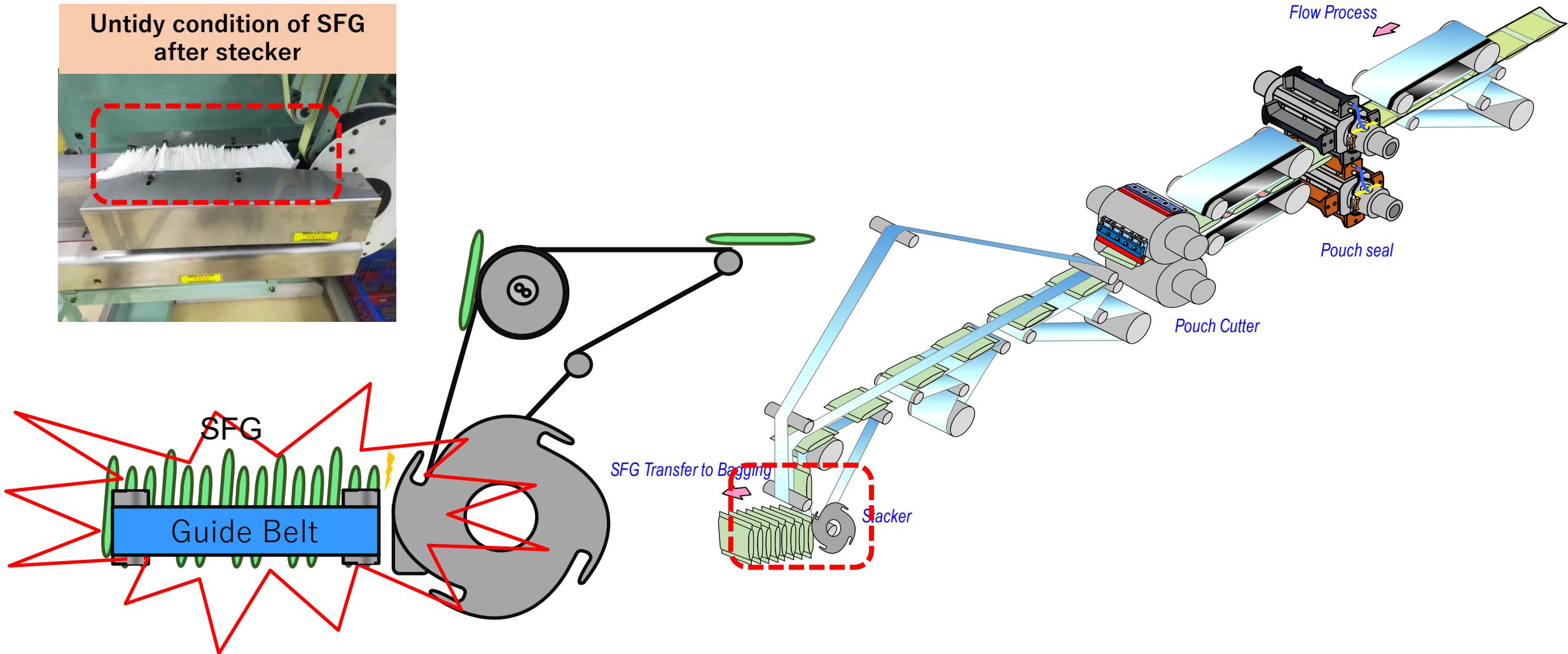
Action Plan (Time Schedule)

Activity		2024											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Plan	Theme Selection	●	●										
	Problem Identification	●	●	●	●	●	●	●					
	Problem Classification	●	●	●	●	●	●	●					
	Problem Evaluation	●	●	●	●	●	●	●					
Do	Factor Analysis	●	●	●	●	●	●	●					
	Countermeasure Study & Implementation		●	●	●	●	●	●					
Check	Result Confirmation							●	●	●	●		
Action	Standardization							●	●	●			
	Next Plan										●	●	→

●————● Plan

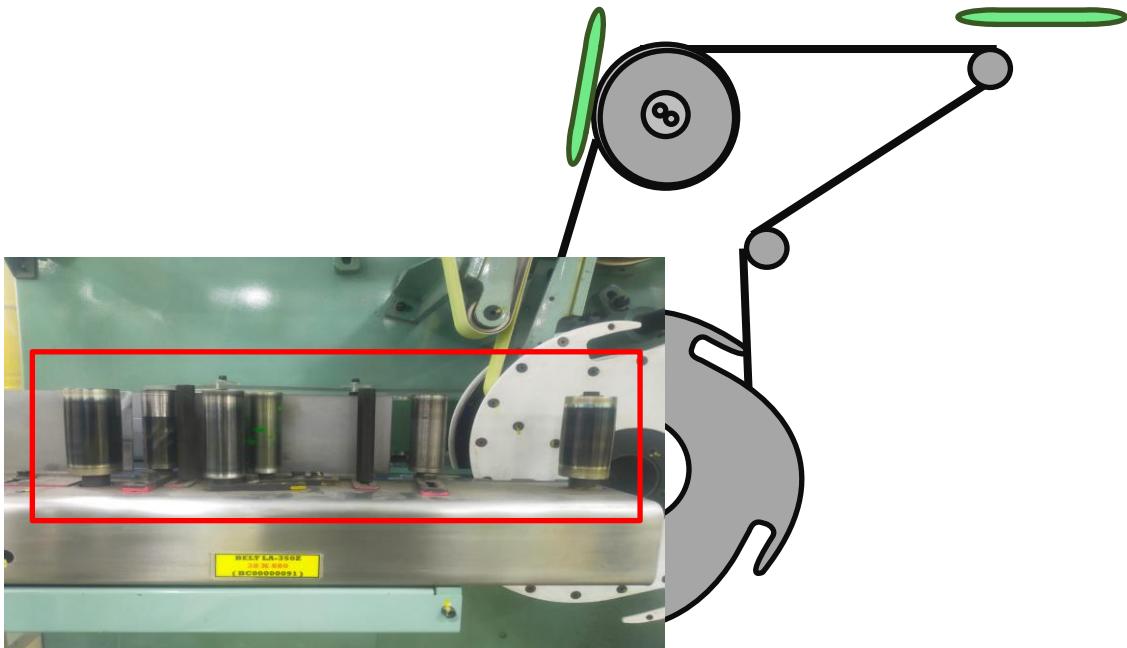
●————● Actual

SFG pouch caught by stacker propeller.

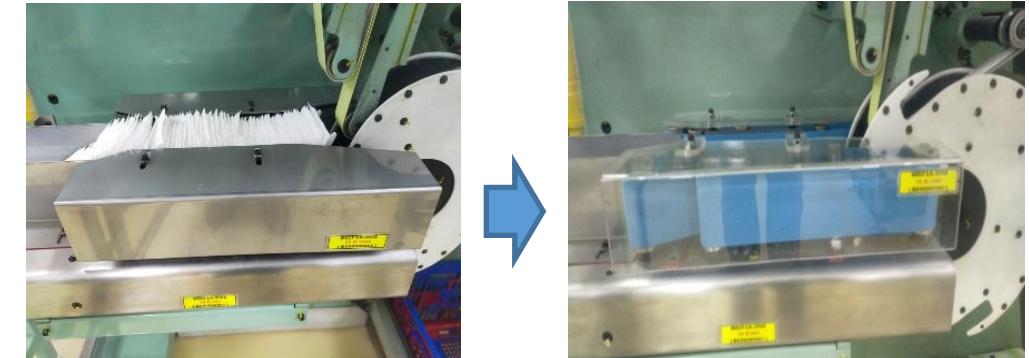


SFG rate is unstable after stecker due to belt slig rotation and rocking

Roll Modification For SFG Transfer Belt After Stacker

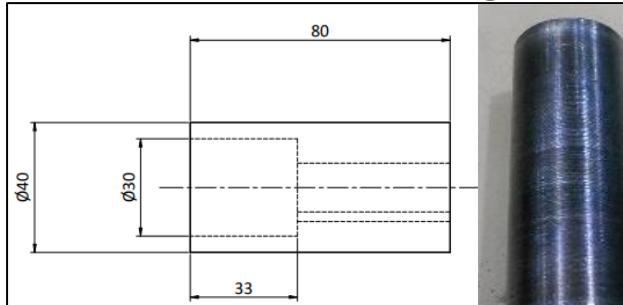


Modification : Transparent Cover

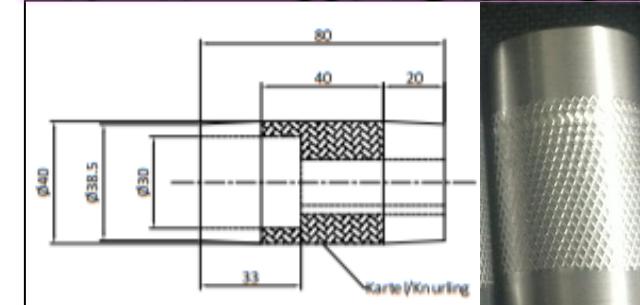


Easy patrol activities when belt slip and bearing roll are damaged

Before : Roll Flat (Original)



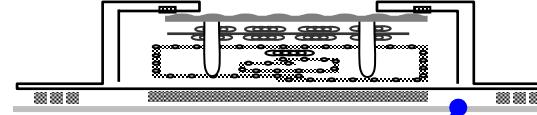
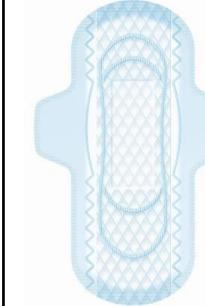
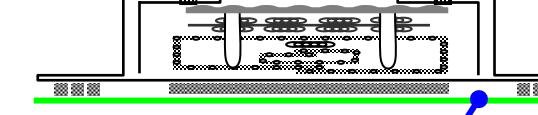
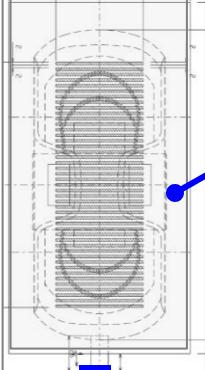
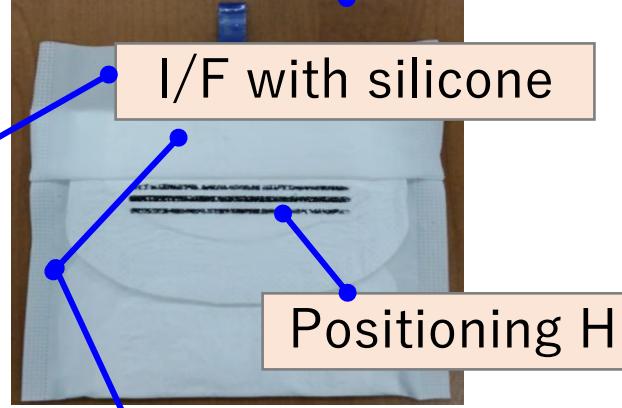
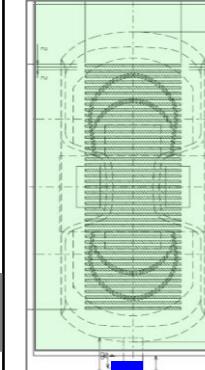
Modification : Roll Crown With Grib



After roll change the condition of pouch seal scratch is decrease & the flow SFG stable



Review Specification I/F LSSG Domestic VS Export

Spec	LSSG Domestic	LSSG Export
Product structure	 	 
Individual Folding	 	  <p>Sometimes side are open, Sometimes center are open.</p>
Structure	<p>2 Layer 30 μ m</p> 	<p>3 Layer 30 μ m</p> 

Basically, green I/F is more difficult than white I/F. **Addition of Green ink**
Seal conditions become more difficult due to changes in ink components.



Background: Seal Open Issue

History of LSSG Individual Film in MC 22

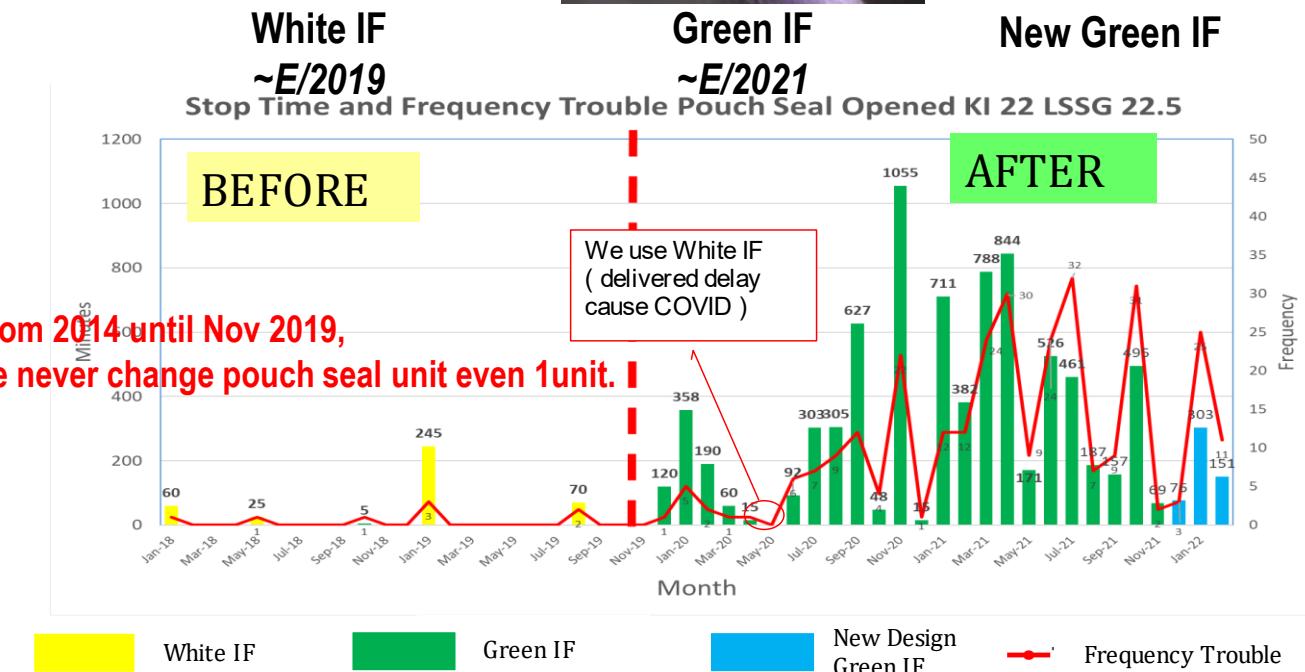
From 2014 – November 2019: use white individual film (ASM 22-255-2500WH) from Swanson Malaysia.

From November 2019 – Now: use green Individual Film (ASM 22-255-2500 FG-P) from Swanson Malaysia. As of E/2021, change to new design graphic.



Seal pattern easily get dirty from green ink, and it cause seal open.
MC need to frequently stop to clean seal pattern.

**After change to green IF, appear pouch seal open issue.
Frequency & stop time of KI 22 increase significantly.**



Replacement Unit Pouch Seal

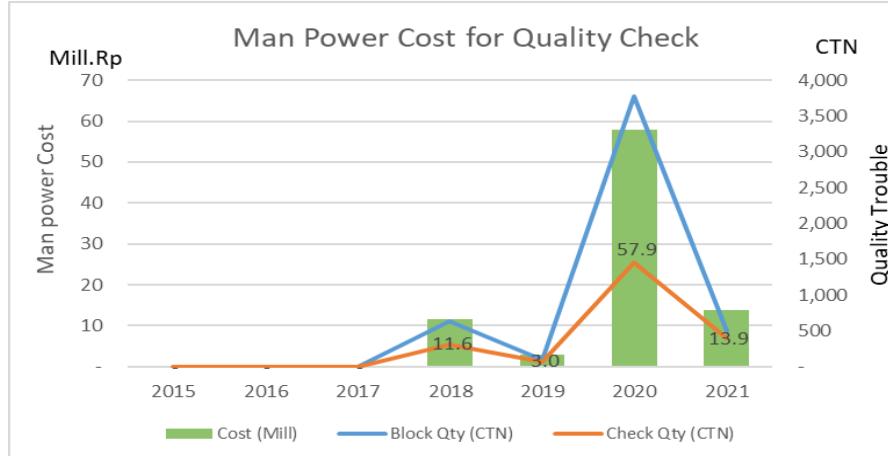
Individual Film	Replacement Pouch Seal	Cost Grinding (MRp)	Total Cost (MRp)
White (2015 - Jan 20)	0	10	0
Green IF (Jan 20-Nov-21)	18	10	180
Green IF New Design (Dec 21- Feb-22)	5	10	50

Based on data above, after change green I/F, stop time, frequency (pouch seal open) and Replacement unit **more higher** than white I/F



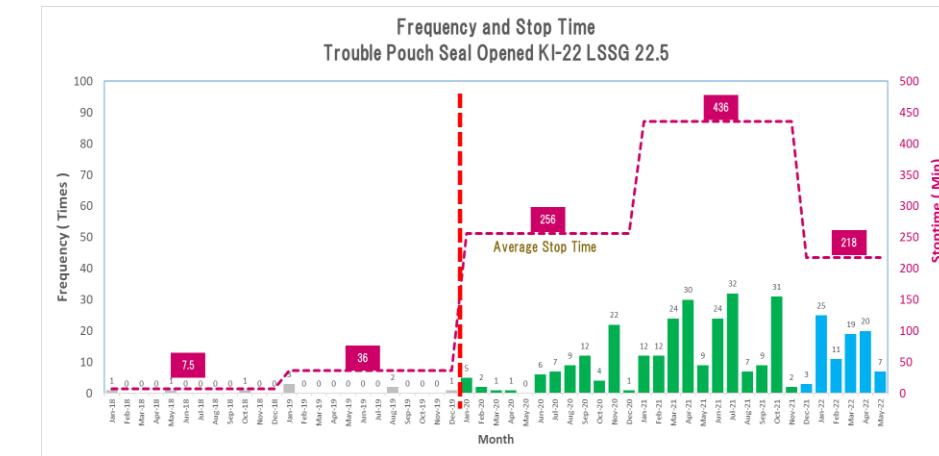
Confirmation With Data

1) Quality trouble (sort product)



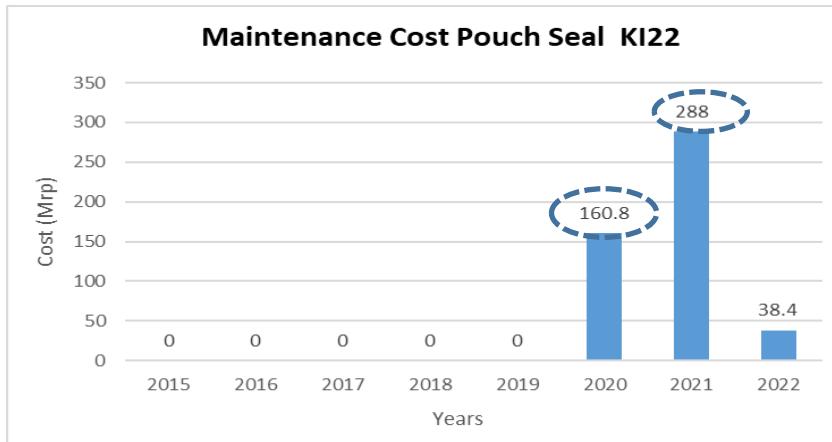
Due to trouble pouch seal open we need to check by sorting the product & Trend trouble increase when using I/F Green

2) Productivity (Stop time)



Frequency & stop time significantly higher than when we use white IF (almost zero).

3) Cost (Parts replacement & maintenance)



After change to green IF (start 2020) maintenance cost increased a lot due to some activity to avoid quality trouble: part replacement & reconditioning (refer to before 2020)



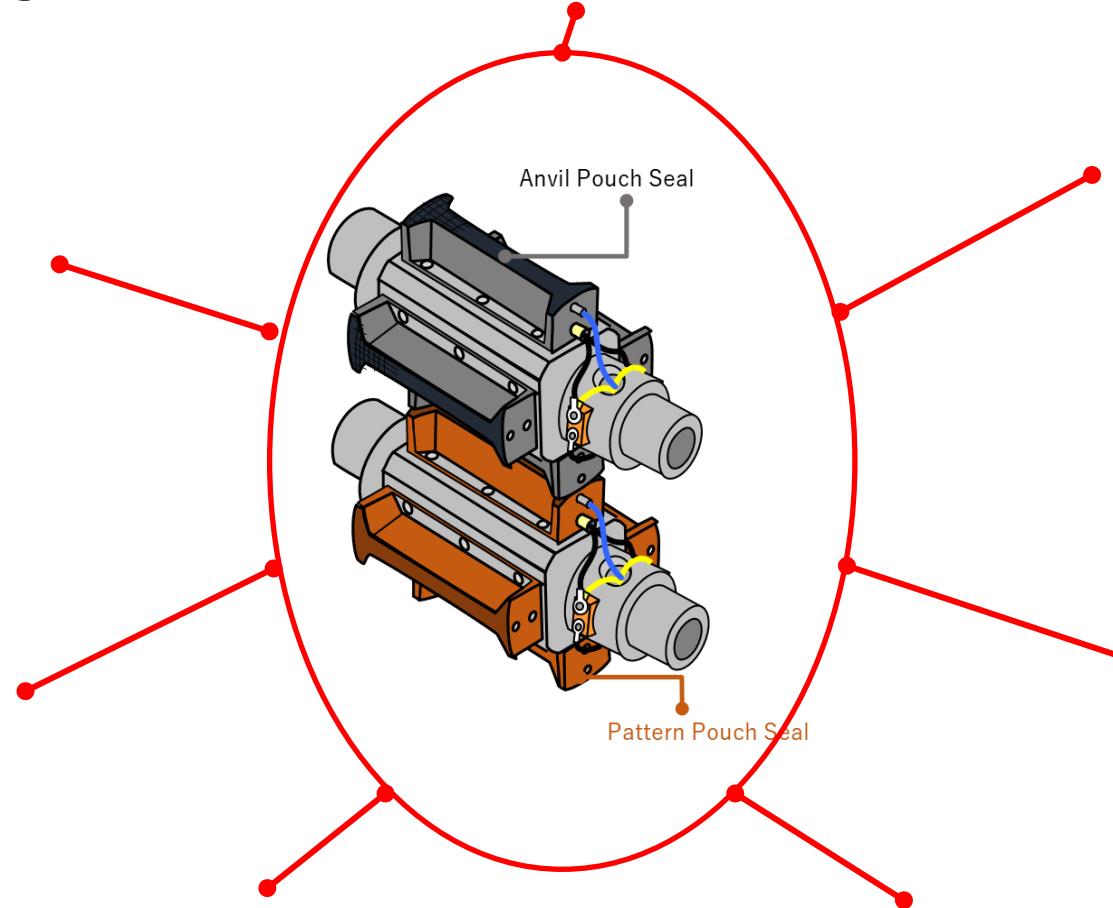
Some of the activities that have been carried out

1. Kanuc Treatment Hardening



*minimal Harden standard. 62 HRC

2. Adjust Temperatur Setting



3. Re-setting Auto tuning



4. Replace temp Control



7. Replace Thermocouple

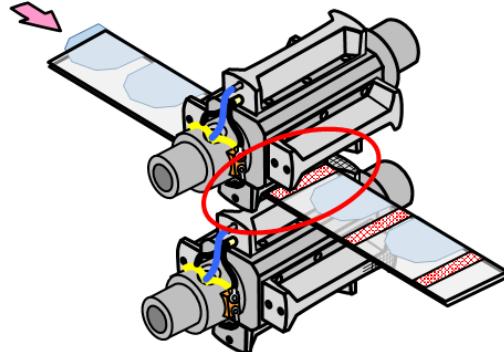


6. Increase GSM 22 → 24

5. Periodical Cleaning

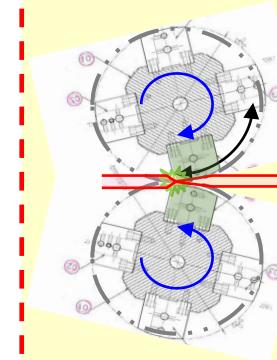
From these activities, the results obtained are still not maximized.
Next we do a more analysis deeply

Strength Pouch Seal Weak

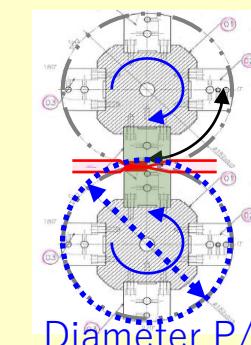


Mekanisme Pouch seal

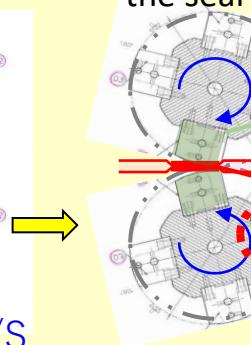
1. Entry Seal



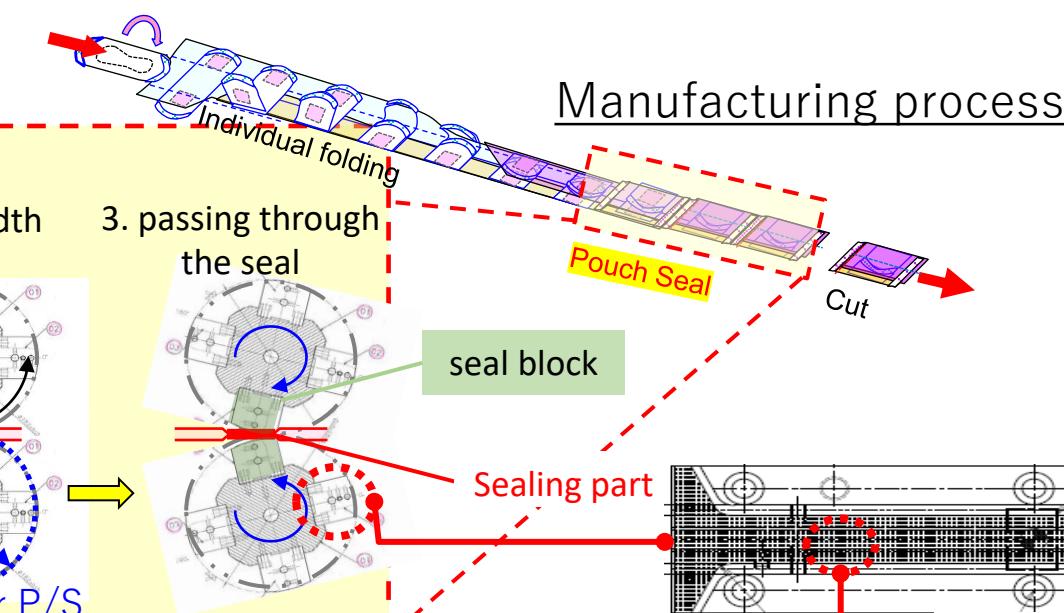
2. Seal width



3. passing through the seal



Diameter P/S



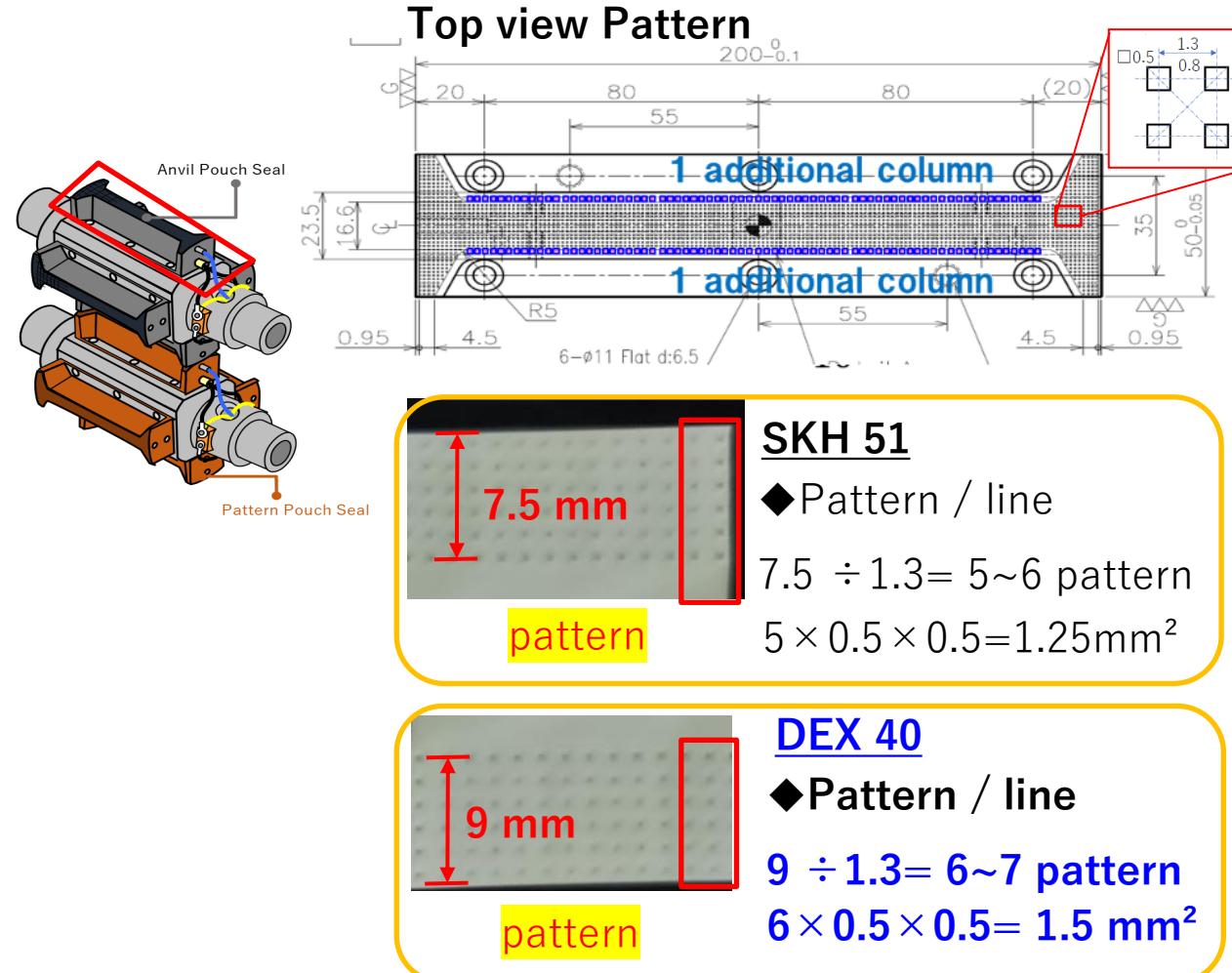
Peak Pattern decrease 0.03mm/month/grinding



Peak Pattern Pouch Seal wears out quickly(lifetime ± 40 days) , causing the pouch seal to not maximally seal the SFG.(Seal Weak)

Change Specification Pouch Seal Unit

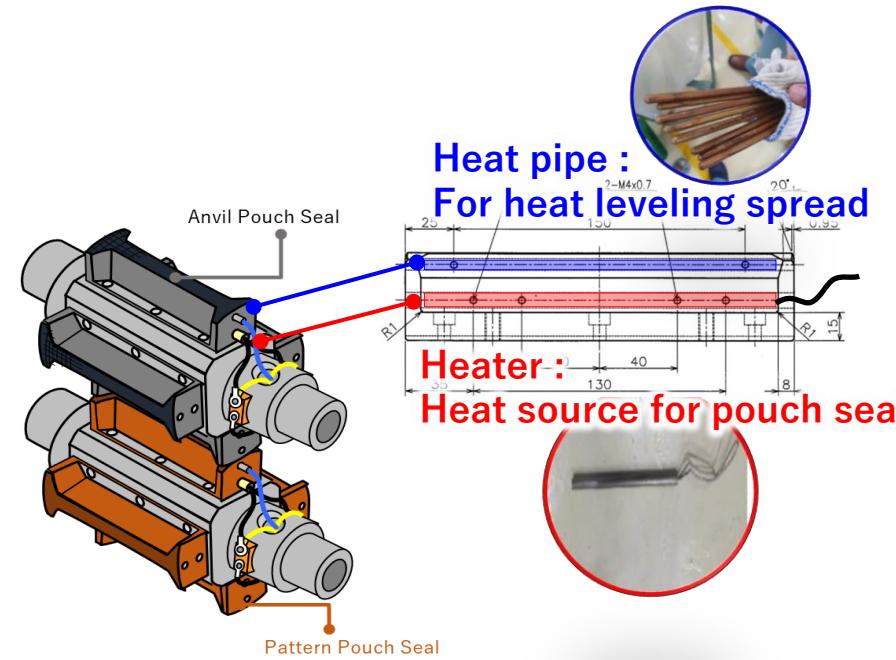
Spesification	Previous SKH 51	Improvement DEX 40
Material Supplier	Hitachi Metal	Daido Metal
Material	(High Speed Tool Steel)	(Powder High Speed Tool Steel)
Hardness	61	65
Clearance	- 39 μ	- 70 μ
Coloum	5-6 patern	6-7 patern
Pattern Width	15mm	18mm
Lead Time	40 Days	2 Months



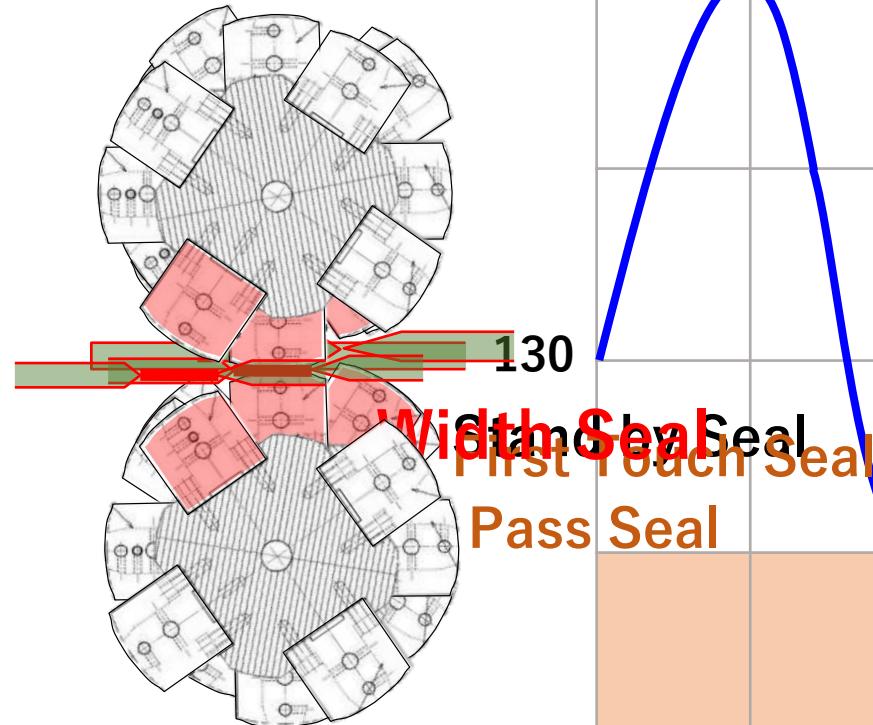
With wider & harder pattern specifications, SFG seal results are stronger & longer lifetimes **But there are other factors that cause the seal to open.**

Individual Pouch Seal Open

Temperatur Pouch Seal late Heat - Up

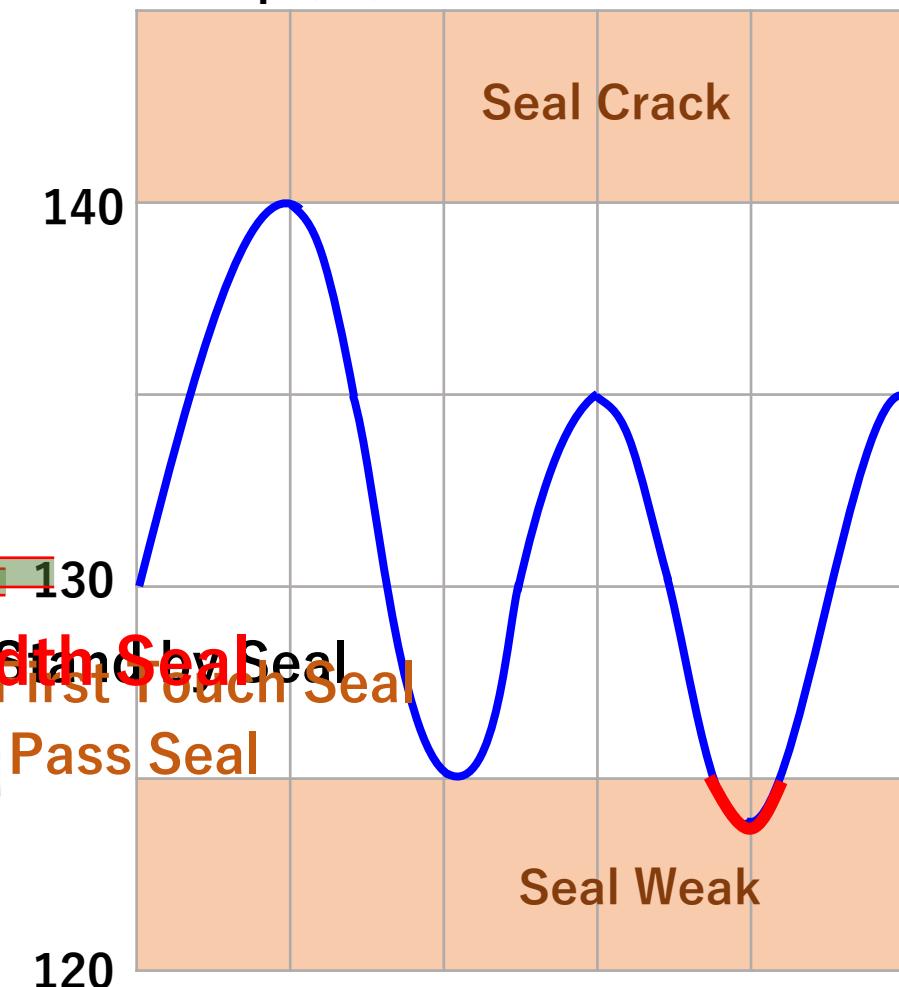


Initial :
Heater 300W 200 V Ø 8 X 220 mm
8 sets (Upper - Below)



Setting Standard Temp (145°C)

Actual Temp (°C)



With the current heater power (300 watts),
When Temperature adjustment (Heat Down), Heater is too late to Heat Up
So it is at the Weak Seal temperature → Trouble Seal Open Occure



2nd - 2 Countermeasure: Additional Heater Power

Kalor Theory

$$Q = M \cdot C \cdot \Delta T$$

$$Q = 0.00142 \times 2300 \times 10 \quad \Delta T = \text{Temperature Rise } (^{\circ}\text{C})$$

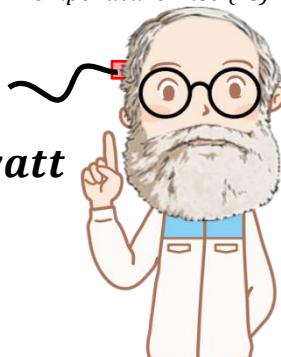
$$Q = 32.66$$

$$P = \frac{Q}{T} = \frac{32.66}{0.17} = 192 \text{ watt}$$

$$P_{\text{total}} = P_{\text{initial}} + P_{\text{addition}}$$

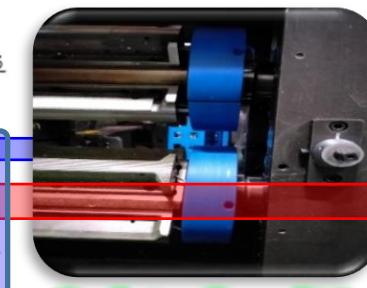
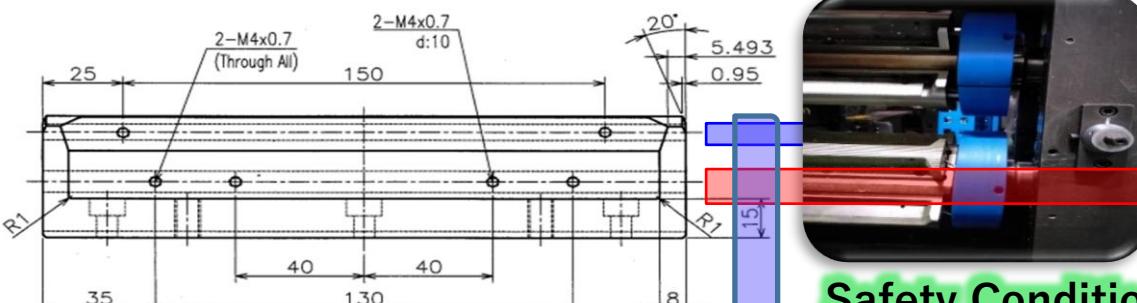
$$= 300 + 192$$

= 492 watt (New Heater Necessity)



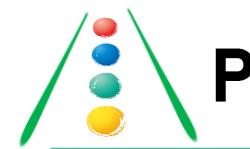
Fix Countermeasure

Heater 500 W 220 V Ø 7.9 X 195 mm 8 sets (Upper – Lower)



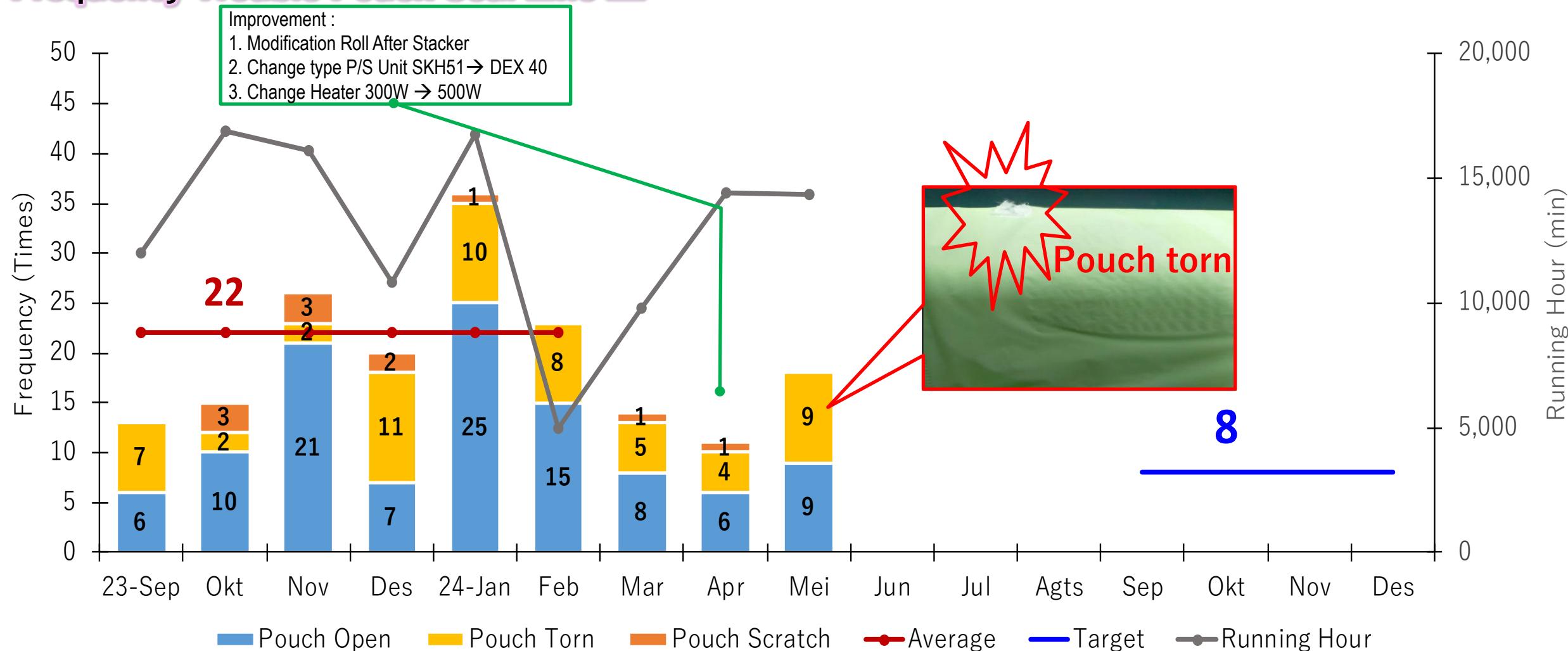
Safety Condition
installed Cable Cover

With heater power (500 watts)
Temperature capability (Heat Up) Faster
so that the Pouch Seal still keep condition in the
Standard temperature



Progress QCC Activity

Frequency Trouble Pouch Seal Line 22



Trouble Pouch Seal Open & scratched has decreased, but trouble Pouch Seal torn is still high.
We do PDCA analyzis again

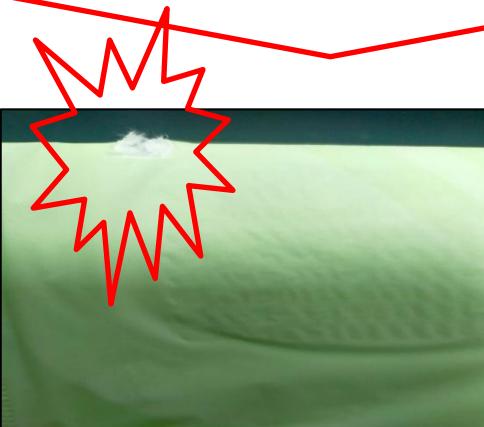
**HM body not center attached to SFG,
the effect is:**



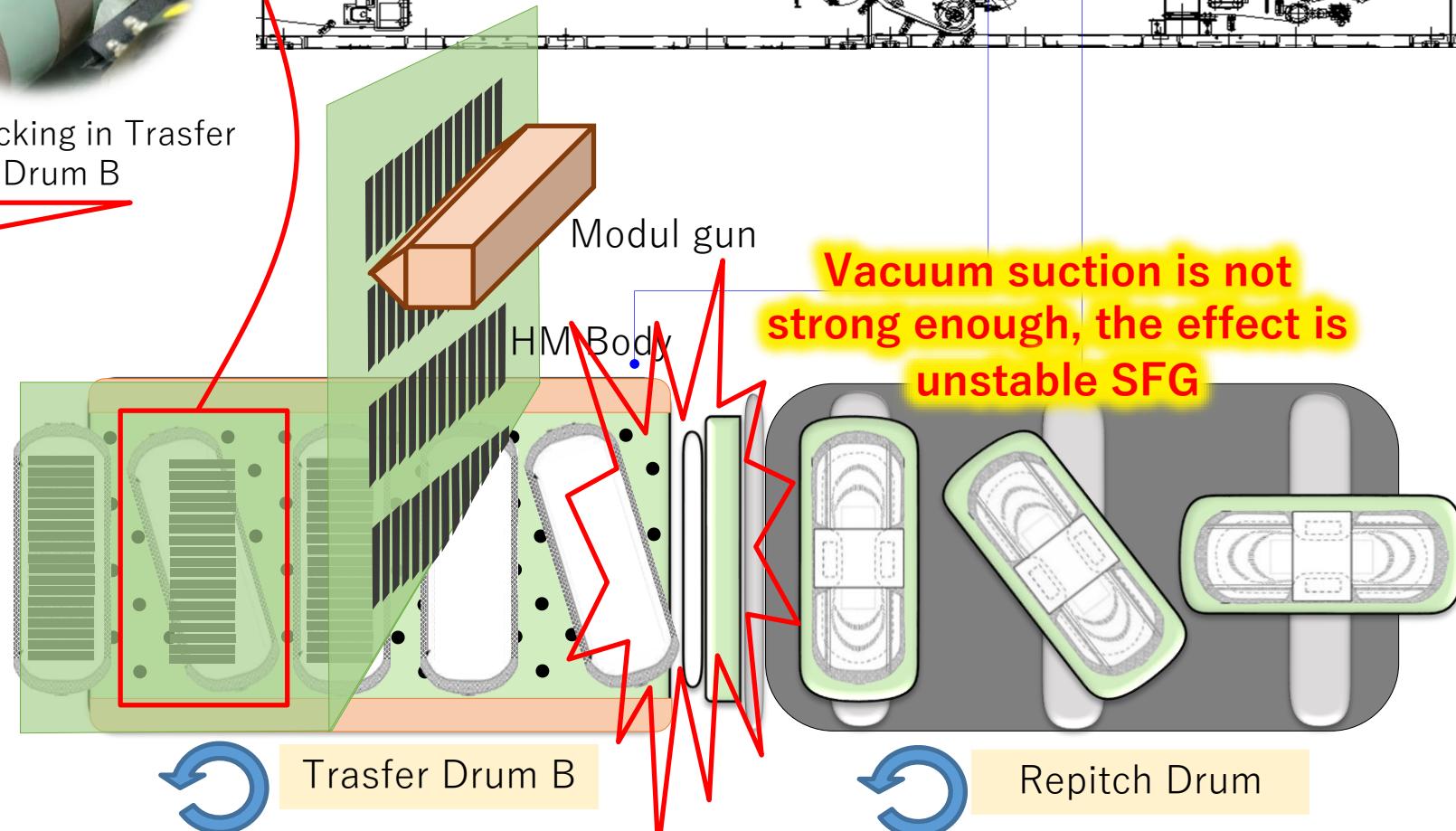
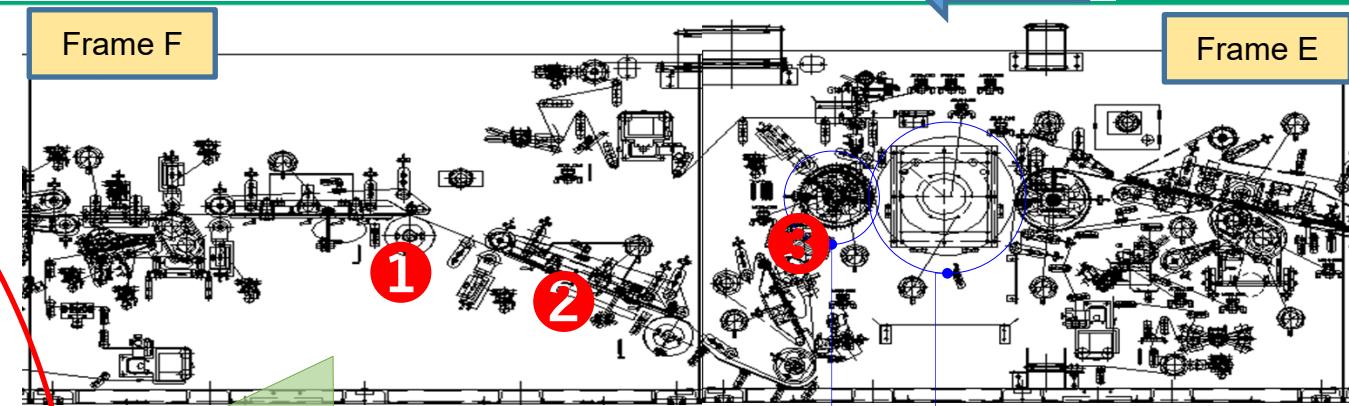
HM Sticking roll
folding IF

HM Sticking Plate
folding IF

HM Sticking in Transfer
Drum B



**Pouch torn cause of
pull by HM**



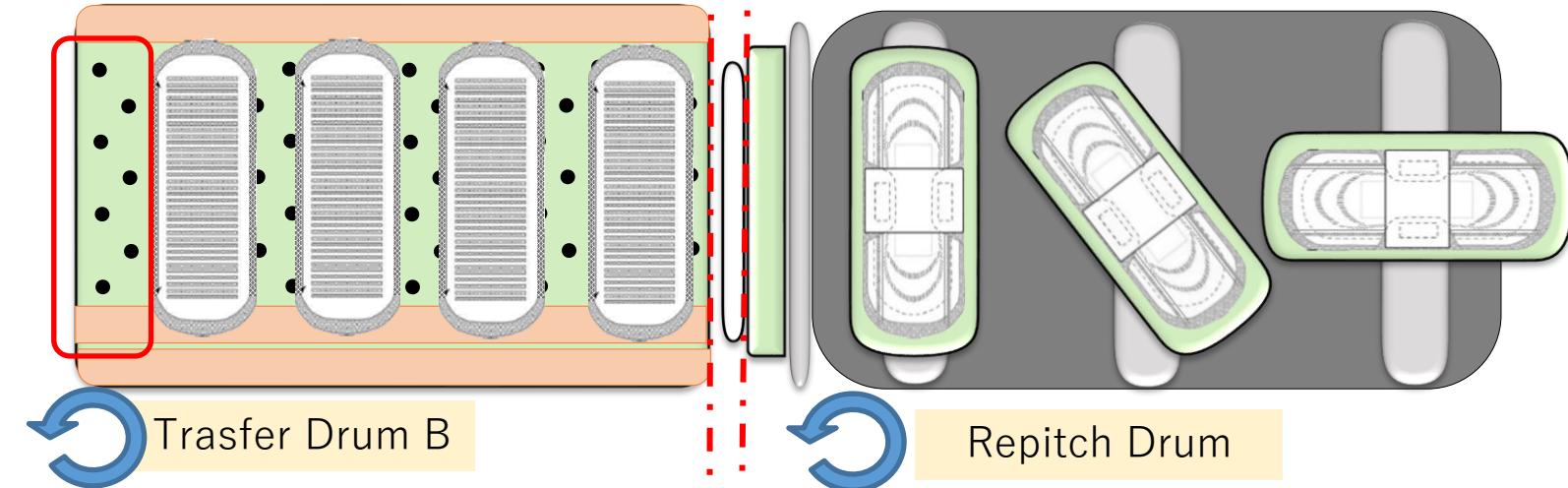
Maximize Vacuum System Repitch Drum

- 1** Reduce the vacuum hole to make the vacuum suction stronger

New Condition : 7 line



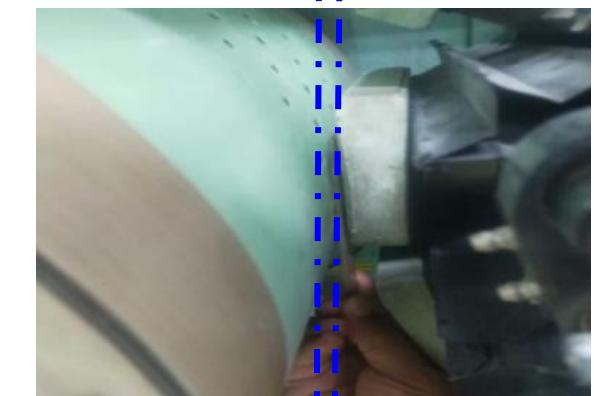
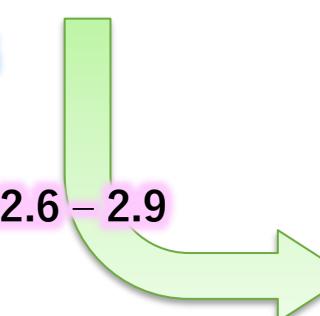
Previous : 8 line of vacuum holes



- 2** Re-Setting Thickness
Repitch Drum dengan Transfer Drum B

QA data :

Standard Thickness Product(mm) : 2.3 - 2.6 – 2.9

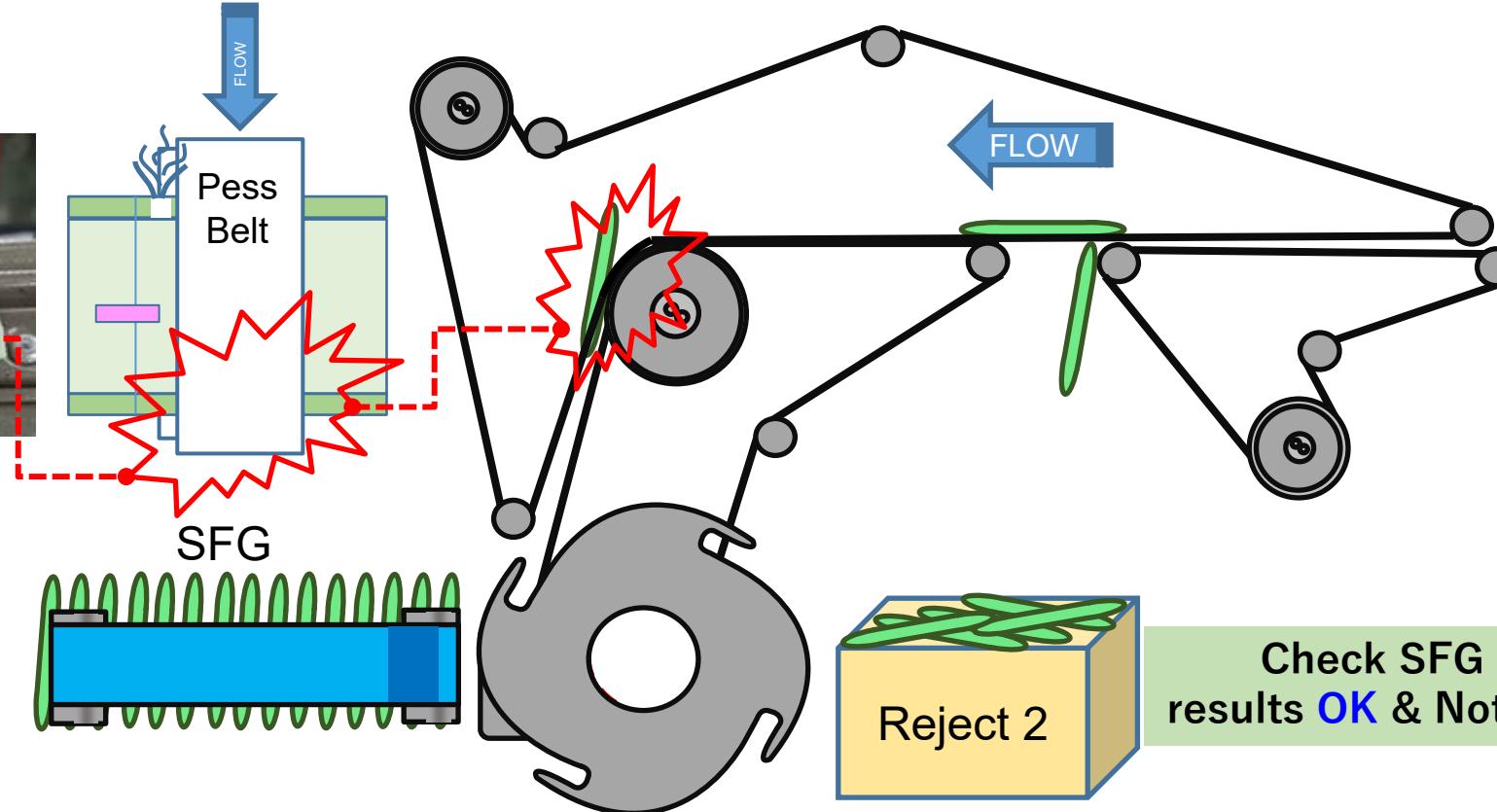


With the new standard setting,

The flow SFG in transfer drum B is more stable, the effect is that the HM body is center sticks to the SFG

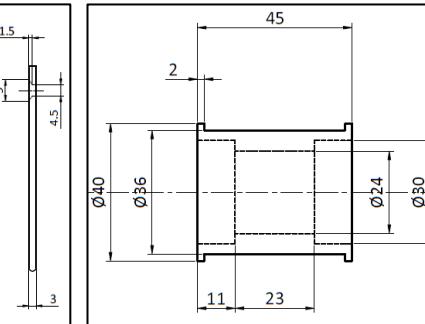
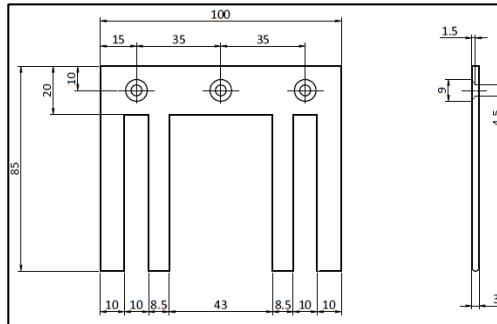


Clearence Belt Transfer SFG Over Press



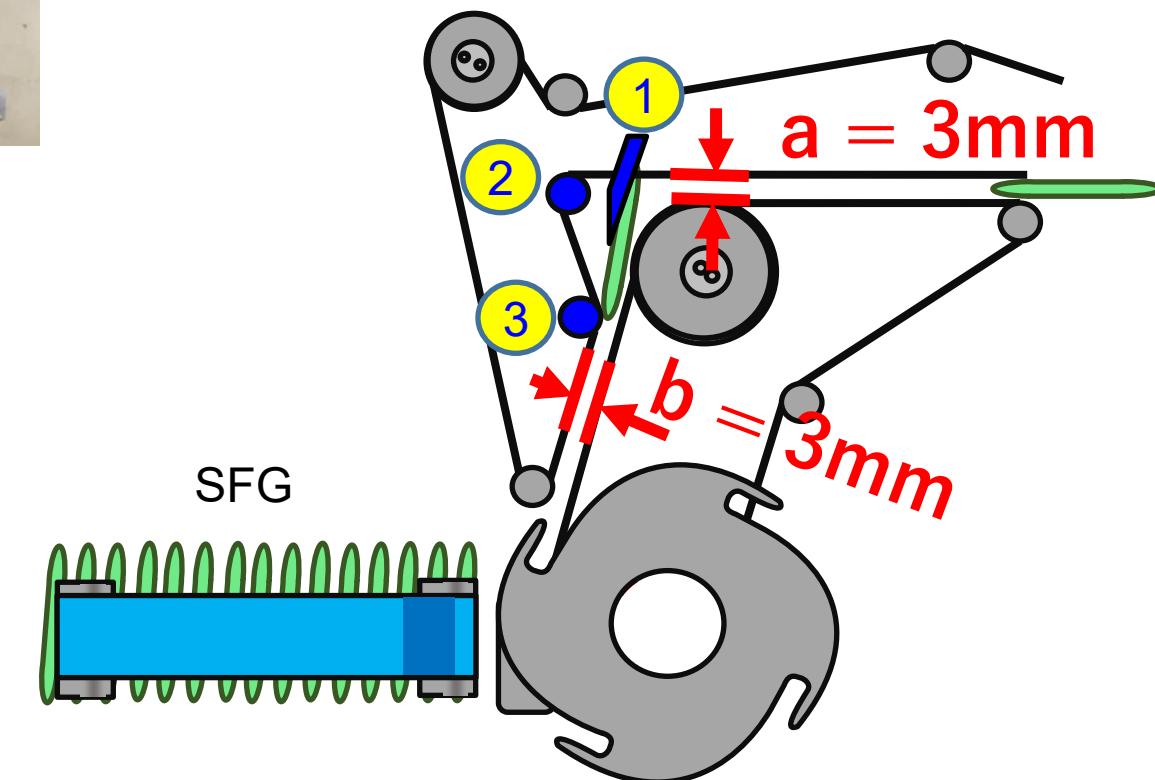
Conveyor belt design with press belt type has no clearance (0) when SFG through the turn roll SFG get the over press, the effect is in pouch seal torn

Setting Clearance belt for minimize friction of SFG

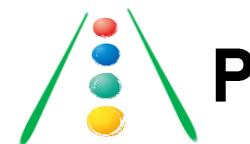


QA data :
 Standard Thickness
 Product after folding (mm)
 : 4.5 – 4.8 – 5.1

Trial Setting Clearance Press Belt			
Clearance (a)	Clearance (b)	Hasil	Keterangan
5 mm	5 mm	NG	Laju SFG berantakan
4 mm	4 mm	NG	Laju SFG berantakan
3 mm	3 mm	OK	Laju SFG stabil
2 mm	2 mm	OK	Laju SFG stabil
1 mm	1 mm	NG	Indikasi SFG lemah

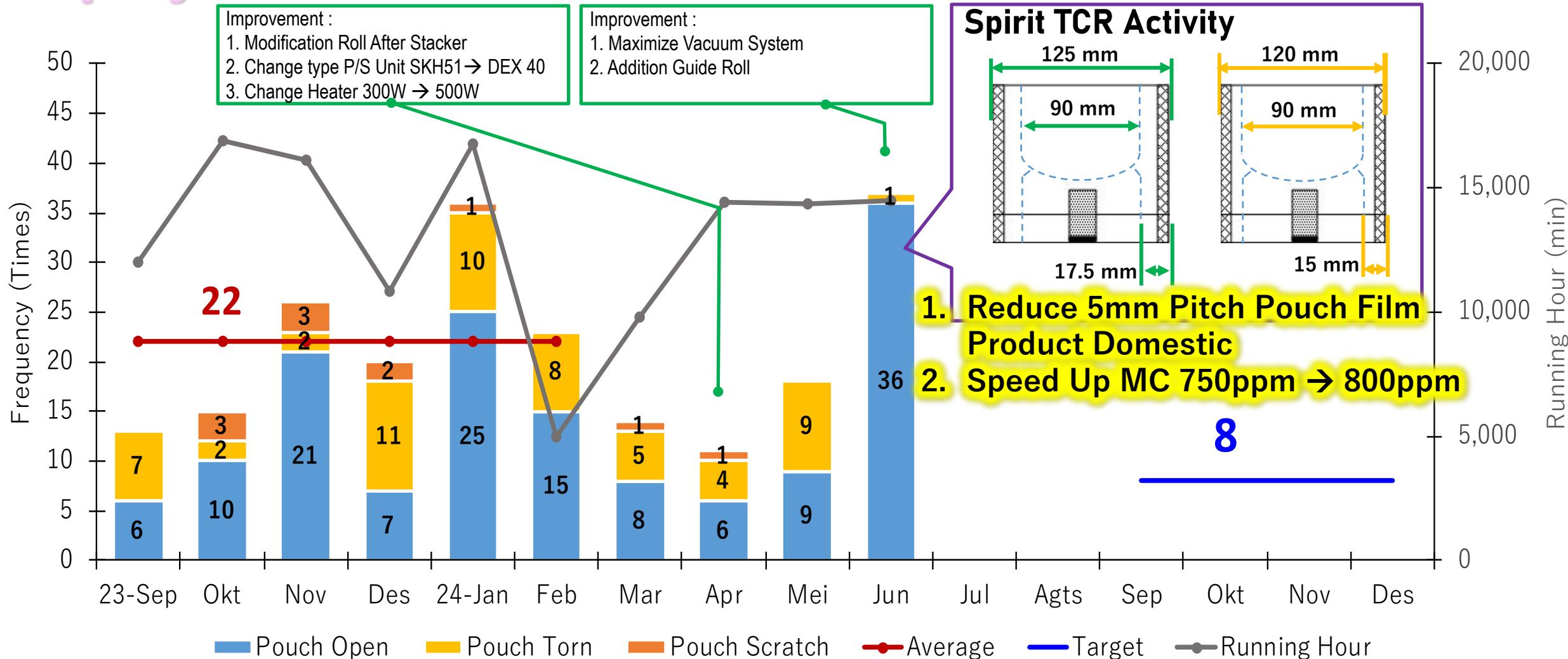


After setting Clearance belt a & b = 3mm,
 We can reduce trouble Pouch Torn cause friction of belt



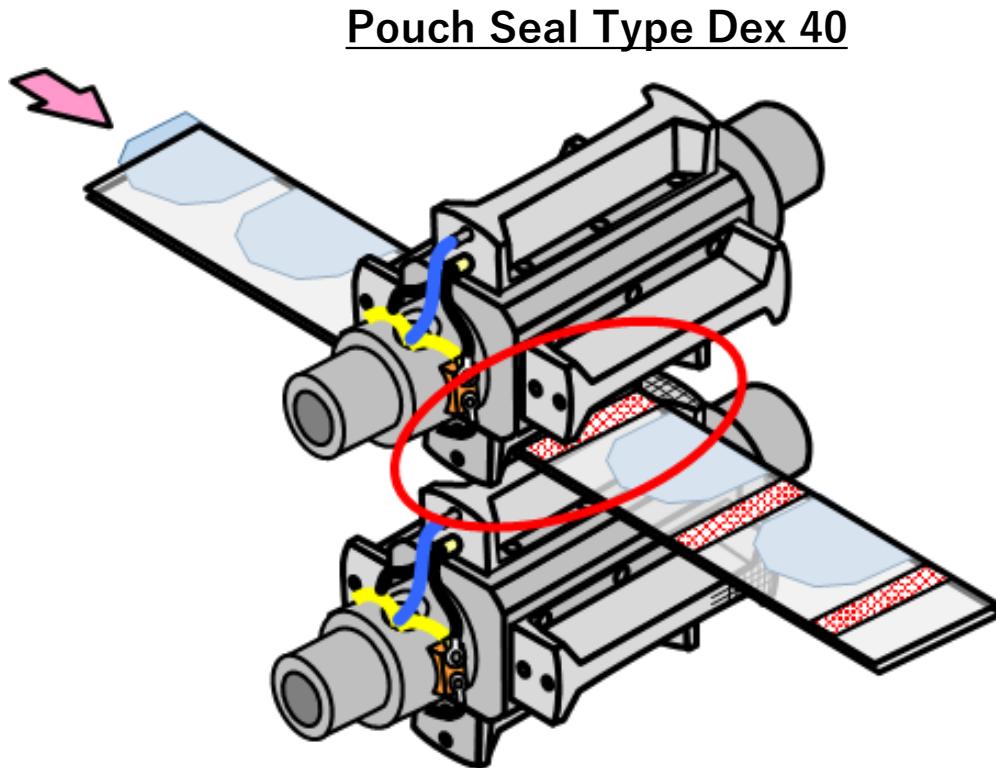
Progress QCC Activity

Frequency Trouble Pouch Seal Line 22



Pouch torn trouble decreased drastically, but Pouch open trouble increased.
To fully support this TCR activity, we continue some Countermeasure

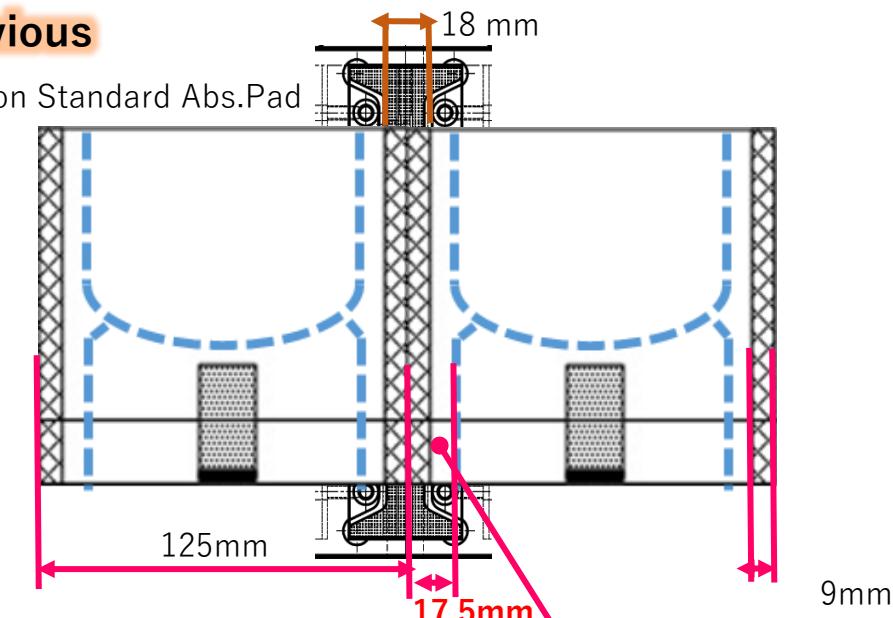
ABS. Tissue bites into pouch seal cause pouch seal opening



As the SFG width decreases ($125\text{mm} \rightarrow 120\text{mm}$), the SFG seal area is smaller ($17.5\text{mm} \rightarrow 15\text{mm}$)

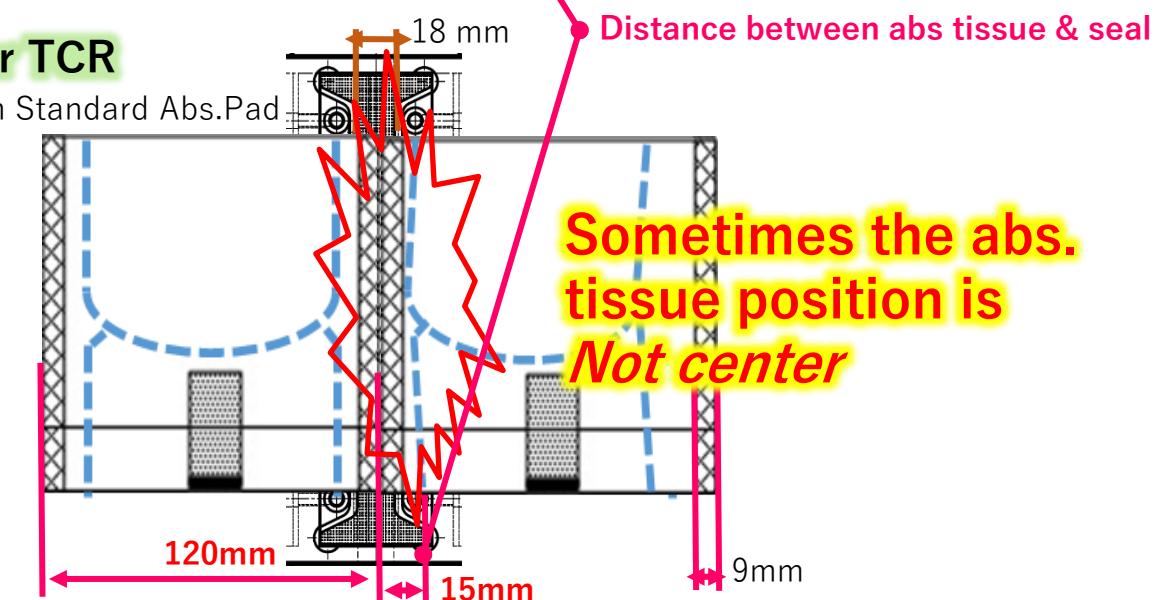
Previous

Position Standard Abs.Pad



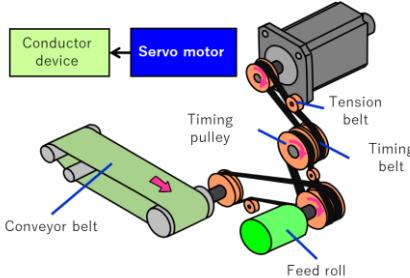
After TCR

Position Standard Abs.Pad



Additional Roll Before Pouch Seal

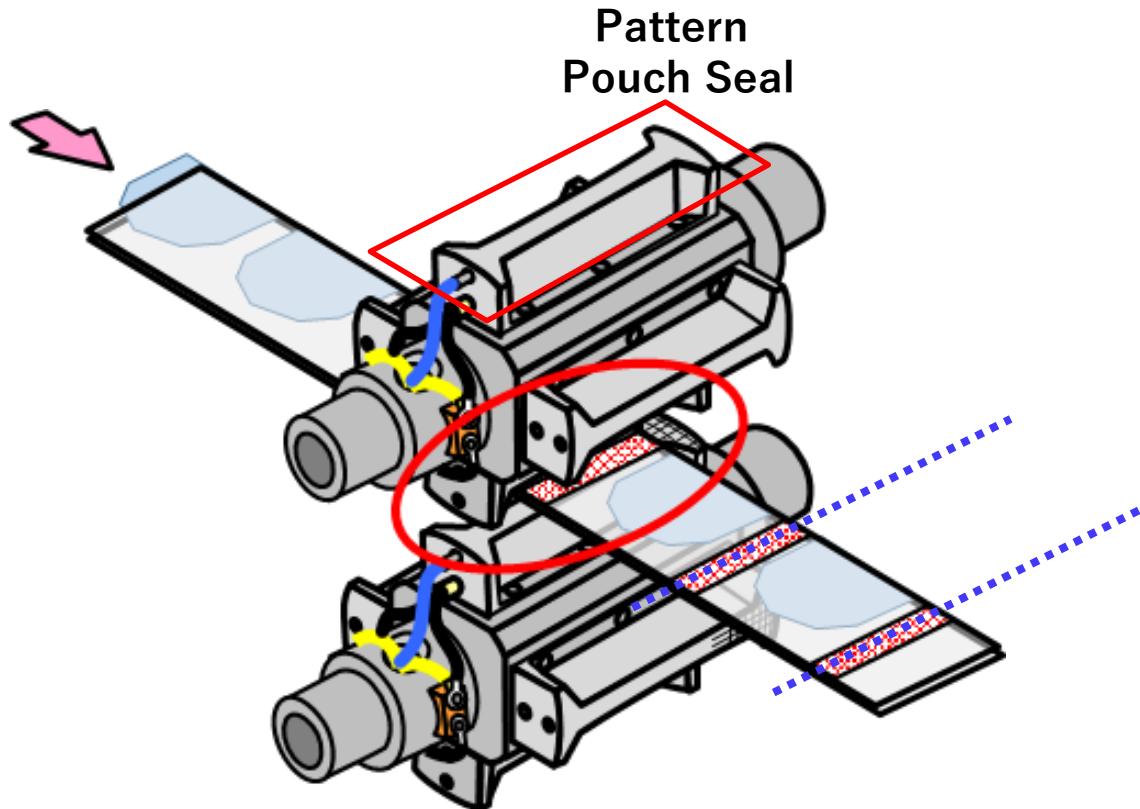
After Re-setting 8 speed servo ,
 in some part MC have condition flow product Un-Steady



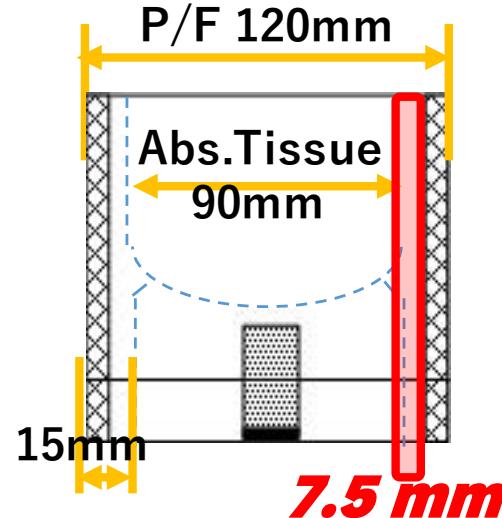
Product transfer process with conveyor
driven by servo motor



with Additional Roll
The Flow SFG is more stable



Domestic Product Size

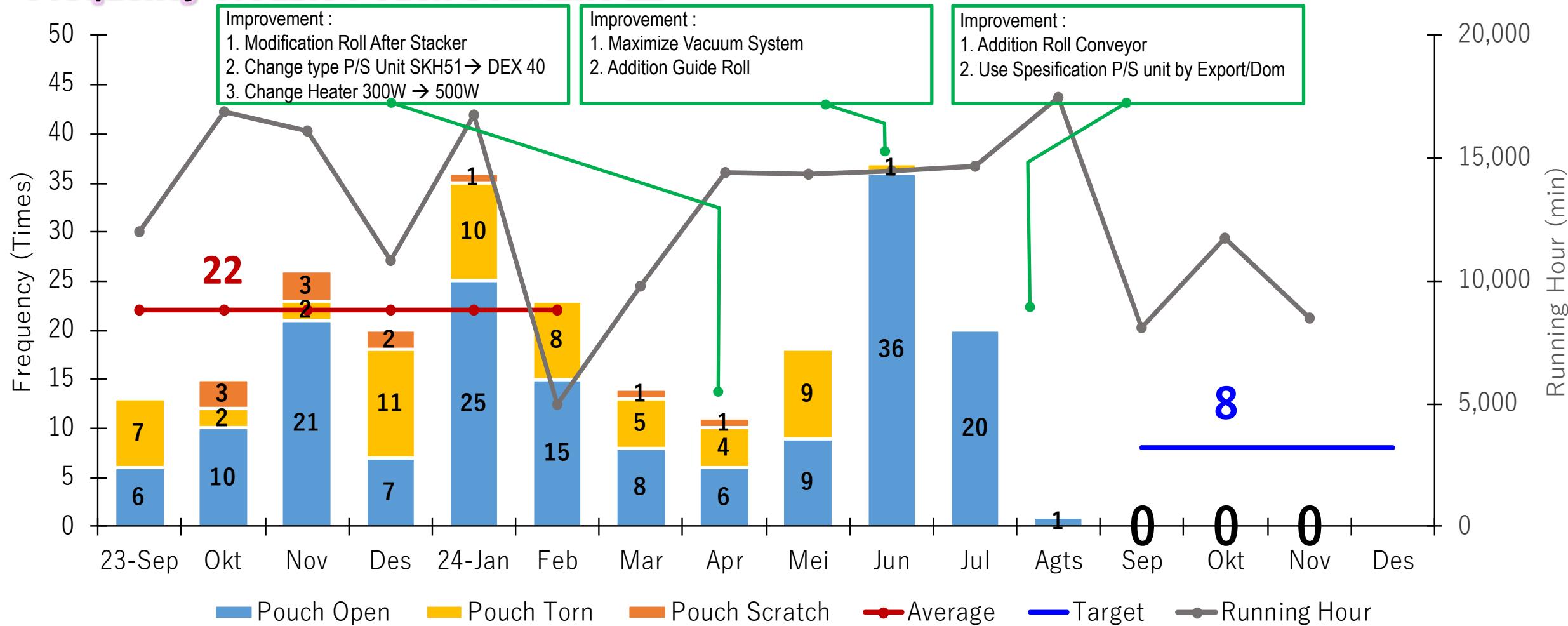


Critical Point
Space Seal with Abs.Tissue



Result QCC Activity

Frequency Trouble Pouch Seal Line 22



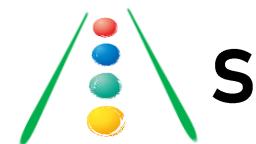
Before QCC :
Ave/Month Freq. Trouble : 22 Times
Ave : Sep'23 ~ Feb'24



Target QCC :
Freq. Trouble : 8 Times
Reduce 60%



QCC Result :
Freq. Troubles : 0
Result Sep' 24 ~ Nov' 24



Standarization

Maintain The Activity For Stable Operation

Improvement

9 Item

1. Free roll addition before pouch seal
2. Modification of roll belt after steker into crown grib type
3. Modification the belt cover after steker to be transparent
- 4. Addition of periodical chek seal pad unit repitch drum**
5. Standarisasi temp actual pouch seal
- 6. Cange the heater specification pouch seal to 500 watt**
- 7. Standarisasi unit pouch seal DEX (export) and SKH (Domestic)**
- 8. Modification turn press belt before steker**
9. Standarisasi clearance turn press belt

One Point Lesson (OPL)

2 item

1. How to install seal pad repitch drum →
2. How to cleaning patern & anvil pouch seal →

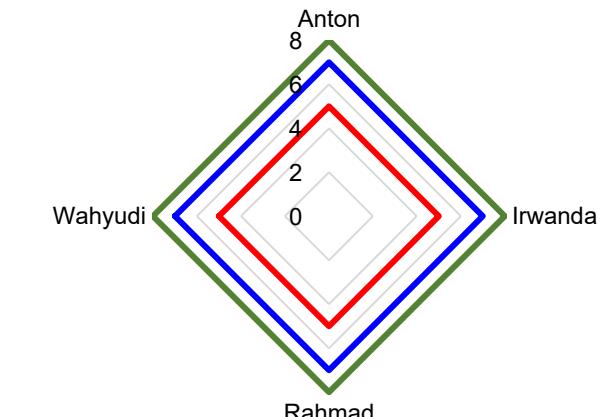
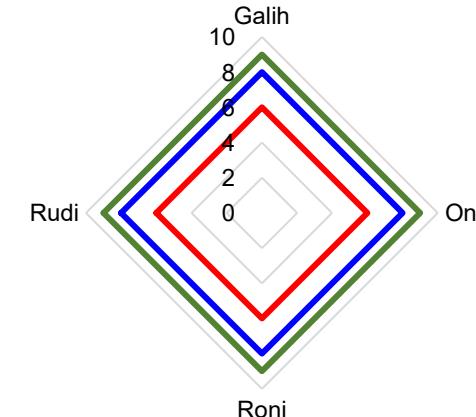
Op & Astor

MTN

How to cleaning patern & anvil pouch seal How to install seal pad repitch drum

Pre test Post test Target

Pre test Post test Target



TPM	ONE POINT LESSON		
Tujuan	Dilaksukan	Diketahui	Berikan Sampaikan
Cara Cleaning Patern & Anvil Pouch Seal			
Definisi :			
3. Pouch seal adalah part pada mesin yang digunakan untuk membeli setelah	Foto/foto :		
2. Silakan terbuka	Head seal		

TPM	ONE POINT LESSON		
Tujuan	Dilaksukan	Diketahui	Berikan Sampaikan
Penggantian Seal Pad Repitch Drum MC 22			
Definisi :			
1. Repitch Drum adalah salah satu unit mesin converting yang berfungsi untuk memutar arah SFG dari transfer drum A,pesisi horizontal ke transfer drum B menjadi posisi vertical.	Foto/foto :		
2. Pad Repitch Drum adalah part bagian dari repitch drum yg berfungsi untuk memegang SFG dan memutar arah SFG.	 		
3. Seal Pad Repitch Drum adalah karet seal yang berfungsi untuk menghindari vacuum pada repitch drum agar tidak bocor.	 		

Skill up MTN & Operator

Bertujuan untuk memastikan laju SFG tetap di repitch drum tidak miring pada saat di komisi ke transfer drum B



Effect From Activity



Environment

Reduce SFG waste

Loss SFG before QCC – Loss SFG after QCC

Loss stop/start up = (freq stop x Qty SFG Reject)

(22 x 130 = 2860 pcs/month)

34.320 pcs/year

206 kg/year



Zero complaint
related to Pouch Seal Defect



Cost potential saving

Production (based on stop time)

= (Avg.Stop Time before QCC) x pcs/minute x price (Rp)

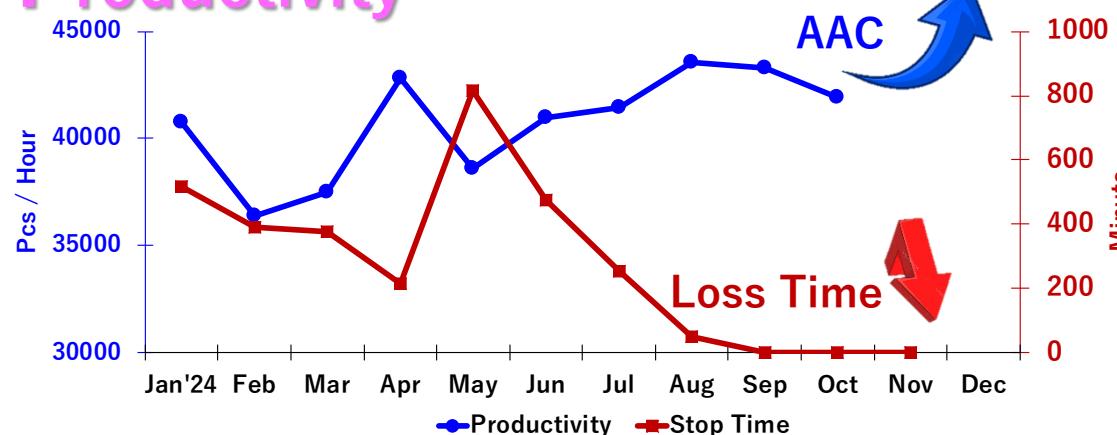
$$= 327 \times 750 \times 519$$

$$= 127.284.750 \text{ IDR/month}$$

1.5 Bill IDR/year



Productivity





THANK YOU

