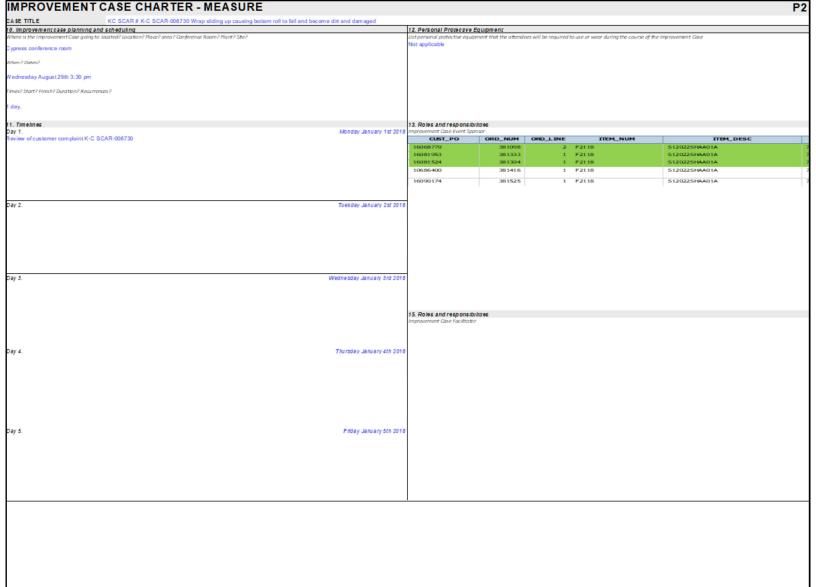


I used the DMAIC procedure on this problem. This was a recurring packaging problem where the stretch film wrap of a product roll build was slipping down off the product roll when being transported. As this was a hygiene product the customer – who was the biggest customer the company supplied to – was not happy that this was happening and considered it a contamination risk and they wanted it rectified. All attempts at resolving the problem by adjusting this and that had failed. It recurred again and again and the customer was understandably annoyed. I suggested that for such a 'chronic' problem a better approach would be to use a structured method. I gained agreement and I formed a small team of people who were specialist in their field and we set to work to fix the problem. This is my own DMAIC work sheet and charter template.

There are many descriptions of Six Sigma, ranging from it being a quality level of 3.4 rejects per million opportunities, to a life philosophy. A more practical definition is data driven problem solving.

The DMAIC process starts when you have identified a problem. The Define phase helps to clarify your understanding of 'why' is it a problem, before investing time, money and resources in commencing a project. I have to admit getting started is the most difficult part as you have a blank template on a computer screen in which you have fill in with everything know and unknown about the problem. Once the decision is made you draft your charter.

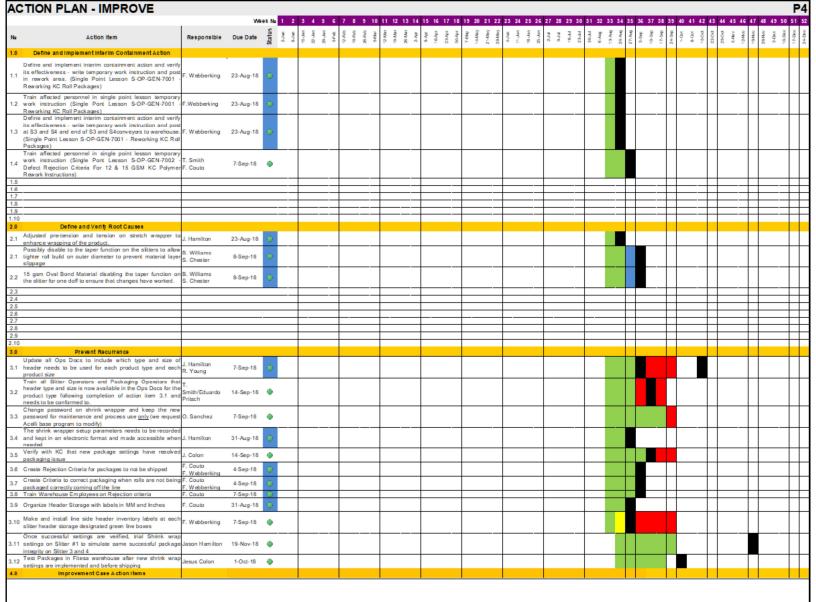
Page 1 of 11.



The Measure phase aims to set a stake in the ground in terms of process performance or a baseline though the development of clear and meaningful measurement systems.

IMPROVEMENT CASE CHART	TER - ANA	LYZE					PS
CASE TITLE KC SCAR # K-C SCAR-00	08730 Wnapsliding u	p causing bo	ttom roll to f	all and becom	e dirt and dar	maged	
13. Roles and responsibilities cont							18. Venfy corrective actions
mprovement case Team Leader							Through testing will the corrective actions indeed correct the problem? Has anything been missed out? We evaluated the over-lap of the shrink wrap at the footer and the header to verify that it had enough strengh to hold the header and footer in place. We als pick up and lowered the package several time with a clamp fork lift truck and left it in the warehouse (un-air conditioned) for 2 days to verify that the wrap ha not slipped up.
14.Current state documents, records, forms requirements						19. Implement permanent corrective actions	
What information has been identified in writing the improvement Case the	at will be needed at th	e time? Docum	ents? Farms?			97	Plan and schedule the permanent corrective actions.
Document Records Forms Shrink wrapper operation manual				Respon	nsible		We have implement the permanent corrective actions with some addition follow up action items that need to be address that can affect the problem from neutuming. See Recurrence Prevention below.
				+			-
15. Improvement Case workshop stationary requirements What other preparations are needed for a successful improvement Case?	Cafear hosante (Ean d)	Accelia coldano S	Znadni de 2 Pko	tion on themself	Campounication	une 2	20. Prevent recurrence What can be done to fix or upgrade the process, system, part or equipment that allowed the problem to happen in the first place?
What Examples of the defecive roll packages	r negresititiensis rubur	AUDIO VIDEOT FI	107E67UIST 316	Respon		e D. F	During the course of investigating this problem there were some corelated causal factors that were found that need to be addressed to prevent it recurrence.
							Machine Marpower: We have a problem where the stretch wrapper settings in the electronic menu are not sufficiently controlled from misuse of unauthorized alteration. We need to lock down and secure the settings once optimized parameter are eestablished.
							Method: We currently do not call out what size headers to use in our operations documents. This will need to be an action item so that the correct siz header is used for each product type and size.
							Material: Further studies need to be carried out understand the relationship between the indirect material (shrink wap plastic) being in contact with the drei material (Polypropylene with 1% polyvel) that affects it adhesion. We need to run a problem solving workshop on this item.
16. Implement and verify in terim containment actions solute the effect of the problem while corrective actions are being address	ss ed to protect the cust	omer. Address	effects and s	imtoms. Apply	Temporary fixe	s. Baseline data.	21. Congratulate your team What lessons have been learned from this improvement Case for future improvement Cases?
We have put in place an interim containment action to protect the							
oinding them together using 2" packaging tape. This is manually p and affected employees performing this rework task have been tra made.							
Hall Todd (Senior Sales Manager) made a trip to the customer v	week of 08/20/2018	to assess the	e problem c	ondition and e	establish sev	erity and extent o	
Single Point Lesson							
S-OP-GEN-7001.docs							
17. Define a verify root causes indentify all possible causes 5Ws - 5Ws. What are the cause and effect reli	Intinue bine? Can collect	tad data art - b t	leh natuatiel		for the neather	m2	22. Record keeping reporting History III the Improved Core to explain for figure reference 2 Extention partial 2.
indentify all possible causes SWS - SWS, What are the cause and effect reli Based on these results wrapper program 4 which is used to run th							How will this Improvement Case be archived for future reference? Retention period? Not applicable.
carried out two years ago for a potential new stretch wrap materi	ial and we experime	ent with data s	set up point	s to achieve t	he best outco	ome to secure the	
stack of rolls without it slipping up when left in the warehouse for effect of worsening the condition and made several trails to discove					we found this	s had the opposit	
and the service of th	Trial	Top Wraps	Bottom	Pr. Tersion	PreStretch (%)	Wrap Quality	
Criteria Ranking	Control	25	Wraps 35	[%] 65	200	Ranking 4	
1 1 The best conditon for package integrity 1 6 The worst conditon package integrity	1	25	40	100	200	5	
o the worst condition package integrity	2	25 25	40	100 50	250 250	6	
	4	25	40	50	200	2	
	5	25	40	50	300	3	

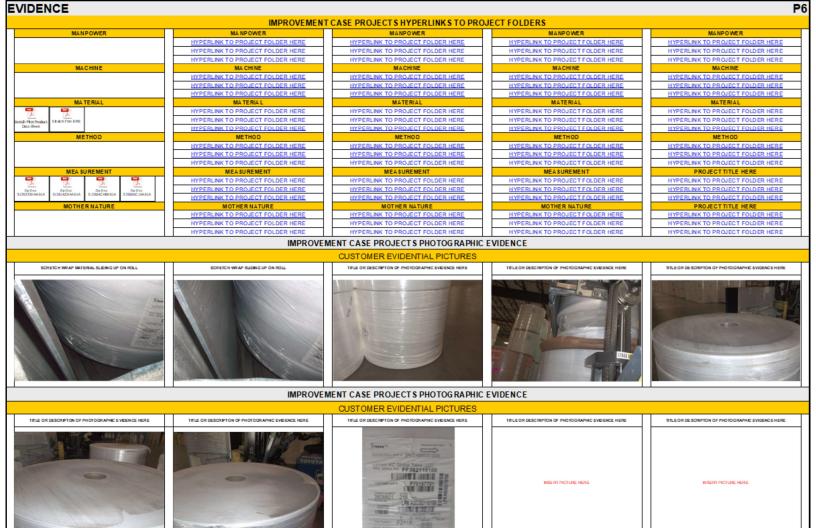
The Analyze phase aims to identify critical factors and elements of a good product or service and the root causes of defects. Its has less of a logical flow, but provides more of a toolbox of tools and techniques.



The improve phase aims to develop, select and implement the best solutions, with controlled risks. The effects of the solutions are then measured with the key performance indicators developed during the Measure phase.

COUNTERMEASURES - CONTROL P5											
Item Ne	Action Item №	Associated Action Item	Problem	Countermeasure	Responsible	Date Added	Due Date	Status			
1	3.1	Make and install line side header inventory labels at each slitt header storage designated green line boxes	Sent out the inset email on 09/05/18 to all improvement case respondents. To date no response.	To be determined at review meeting on 09/17/18	F. Webberking	17-Sep	17-Sep				
		-									
		-									
	_										
	_										
	_										
		-									
	_	-									
		-									
	_										
		-									
The	Contro	I phase aims to ensure	that the solutions that h	have been implement	ed beco	me em	bedde	d into			

the process, so that the improvements will be sustained after the project has been closed.



IMPROVEMENT CASE PROJECTS PHOTOGRAPHIC EVIDENCE

As you dig into a problem such as this one keep every bit of evidence both on your side and on your customer's side. Photos, documents, correspondences, pictures etc.



As you dig into a problem such as this one keep every bit of evidence both on your side and on your customer's side. Photos, documents, correspondences, pictures etc.

HOW

How is this a problem to the customer? (JC) Rolls get contaminated and they cannot use it.

In what mode does the problem marifest itself here or at the customer's plants? Is the problem only occurring at the customer's plant and not here at our plant? (JC) it also happens here when handling these products.

Has the problem occurred only at one particular customer plant and not others? (JC) No.

During which specific operation here or at the customer's plant does the problem occur? Does the problem occur on its own or only when it is transported or moved? (JC) Yes, only when its moved. Especially when two packages are stacked on top of each other.

of each other.

Any variation in circumstances of occurrence such as the problem occurs only at the bottom of the roll package and not at the top of the roll package? (JC) The main problem is at the bottom wrap.

Does the problem occur frequently or only rarely? (JC) Frequently.

Does its paper abunyly or gradually? (JC) Gradually since the packages look fine before they are handled.

Does the problem appear continuously or discontinuously? (JC) Continuously.

Does the problem appear at regular or irregular intervals? (JC) Regular.

How long has the product, the service, or the process been in service or made available to the customer or consumer market place? (JC) A couple of months for the 15 and over a year for the 12. Half has more details.

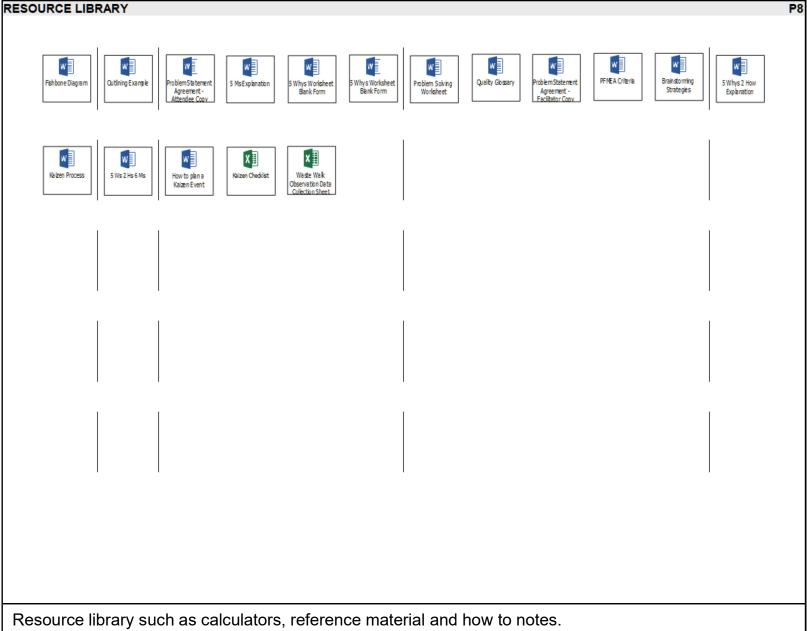
HOWMANY

12 gsm: 29 packages, 3 complaints, always a problem

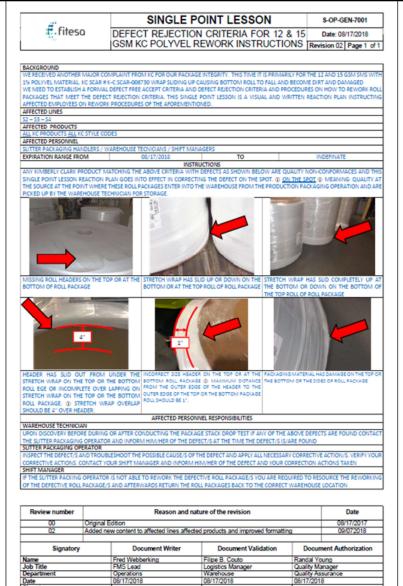
15 gsm: 77 packages, 5 complaints, always a problem

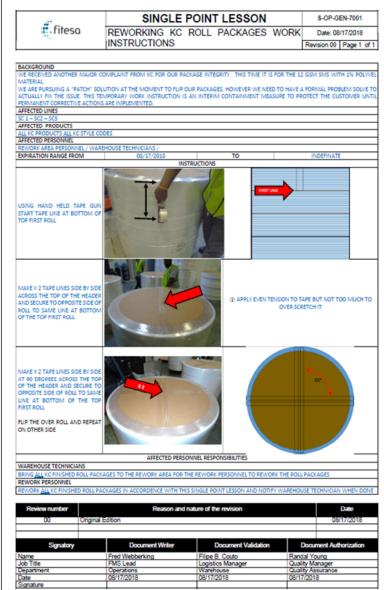
20 gsm: 8 packages, 1 complaint, just came in but here it happens as well.

Again keep all information no matter big or small.

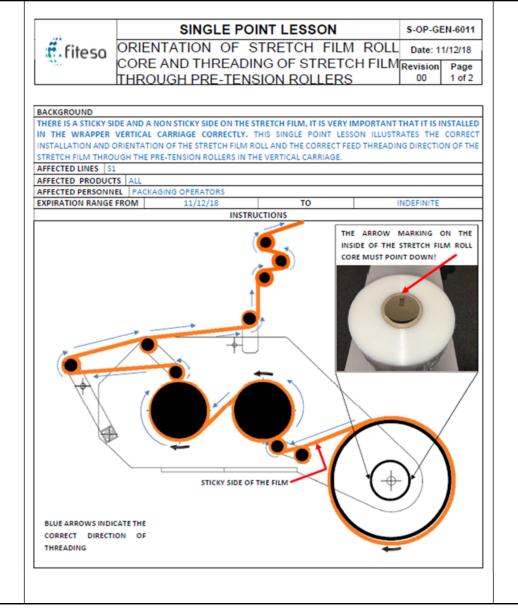


Resource library such as calculators, reference material and now to notes.





One of the first things you act on when you decide something is a problem is its containment to protect the customer or end user. Here I designed and drafted Single Point Lessons. The document on the left details identification of the problem and the document on the right is a rework instruction on how to secure the stretch film wrap to the packaging header by using packing tape. Even a rework instruction should follow the PDCA process. Make the document, register it in your document control system, train affected personnel to it, sign off to human resources and check for conformity.



It is a very, very rare occasion that you have a single smoking gun to a problem, but this problem despite taking us 7 weeks to figure had one. During the Analyze phase – which we during the course of this problem investigate did a lot of tests, trails, experiment – everything was checking good. Was the material sliding on itself? Was the stretch wrap covering the roll properly. Everything was investigated. I invited the manufacturer supplier of the stretch film wrap to school us in all thing stretch film wrapping and there is a whole science behind it, trust me.

There is a sticky side and a non-sticky side to stretch film wrap. To indicate to the operator installing a replacement roll there is an arrow on the inside of the core denoting the direction the roll must face for proper orientation so that the sticky side of the film is in contact with the material roll.

This was a big find. None of the operators knew this. So, part of the Improve was to develop a single point lesson, register it in the document control system, laminate them and post them in plastic pocket at the point of use for each of the four automatic packaging vertical stretch film wrappers. Train all affected personnel and add the single point lesson to the packaging operator training matrix so that all new operators were trained to the single point lesson.

There were other 'causal factors' that contributed to the problem such as the pre and secondary film tensions and overlapping, but this one was the most significant. The single point lesson above shows the correct orientation of the roll correct threading of the film through the rollers of the vertical carriage assembly. Problem solved! Didn't have and recurrence...