TEARING DEFECT

(Root Cause, Corrective & Preventive Action)

PRESENTED BY :
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SNR. GENERAL MANAGER

TEARING DEFECT IS OUR NUMBER ONE ENEMY

1.0 HISTORY of CUSTOMER COMPLAINT DUE TO TEARING DEFECT FOR TG GROUP

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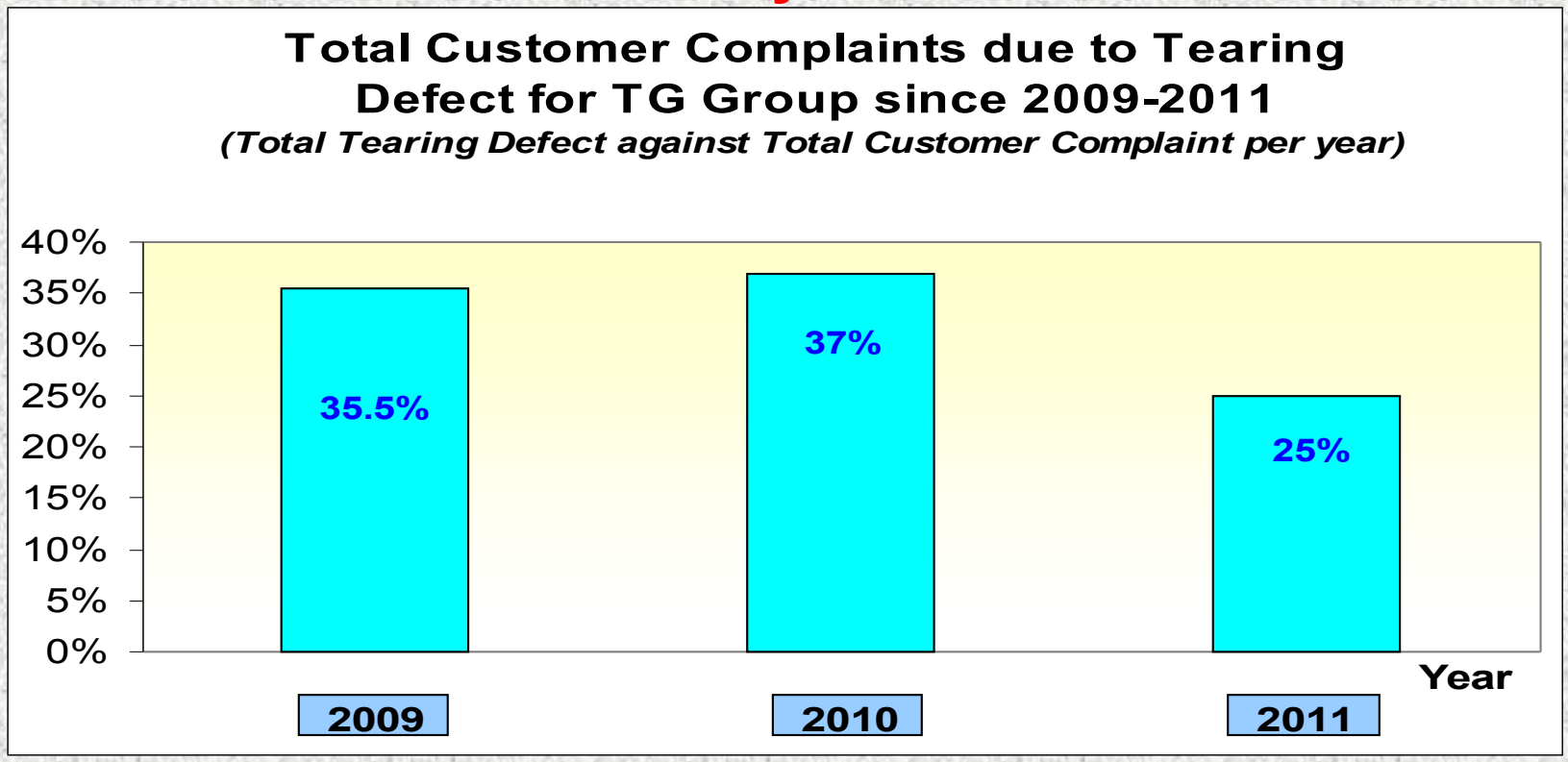

TG Group			
Year	2009	2010	2011 (as to date)
Total Number of Customer Complaints	276	335	8
Total Complaint due to Tearing Defect	98	124	2
Percentage of Tearing Defect, %	35.5%	37.0%	25.0%

1.1 HISTORY of CUSTOMER COMPLAINT in F4

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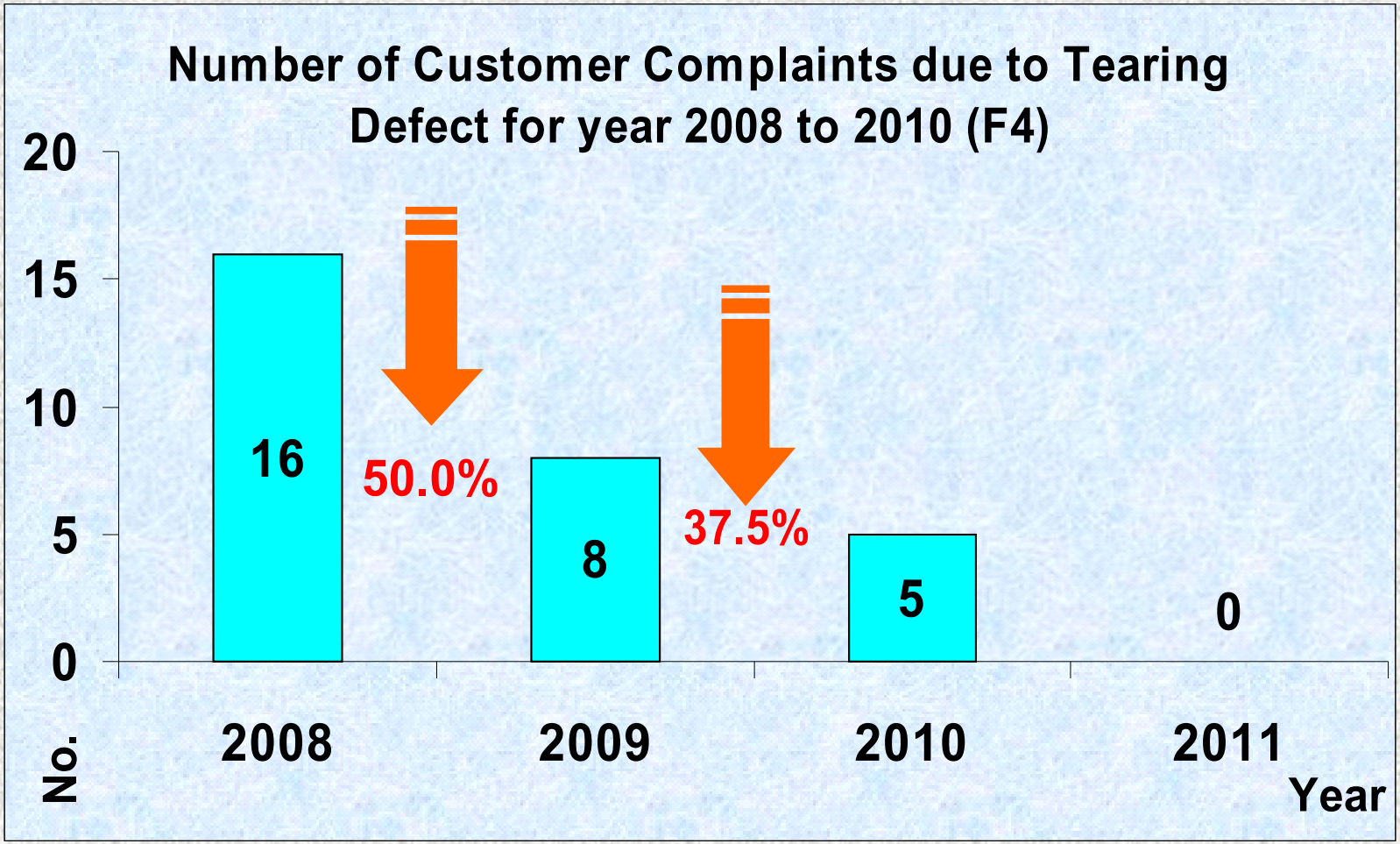
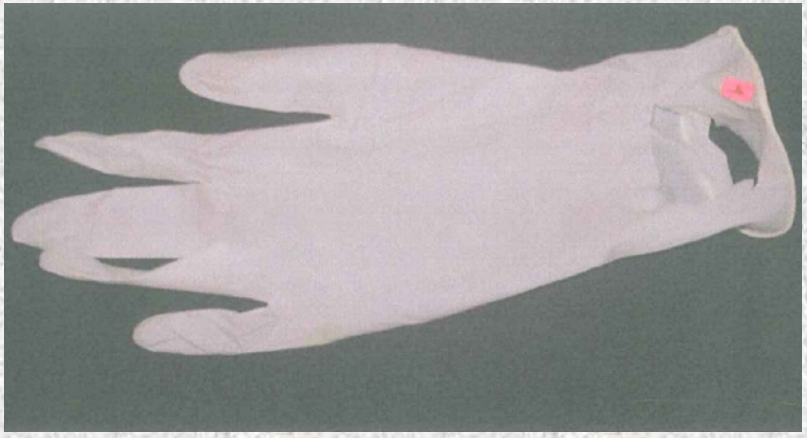


TWO TYPES OF TEARING DEFECTS :-

a. Easy Tearing

- ***Tear while donning***
- ***Found by customers & end users***



b. Torn Glove

- ***Found in glove inner case***
- ***Already shipped out by TG***

A. Defective Former/Dirty Former/Poor Former Cleaning Process

Cause	Description
Oily/dirty former	Poor pick up of coagulant
Defective former	Hairline crack, ceramic chipped off, etc. >> weak spot on glove
Former glaze worn out	Uneven surface >> cause thin area/thin spot/thin patches
Acid solution dirty	Inefficient as former cleanser
Low acid % or alkaline %	Inefficient to remove $Ca(CO_3)_2$% >> former dirty >> thin area/thin spot/thin patches
Circular brush damaged/dirty	Poor cleaning efficiency
Water spray spoilt/dirty	Unable to rinse the dirt away while brushing
Incorrect position of the brush	Brushing system is not efficient
Dirty water in water rinsing tank	Unable to remove the acid/alkaline residue effectively
Low water level in water rinsing tank	Unclean at cuff area

3.0 ROOT CAUSES

B. Poor Condition during Coagulant Dipping

Cause	Description
Bubbles formation	Via direct heating / former rotation/ stirrer speed >> pin hole/ thin area/ thin spot/ thin patches
Dipping Track Design	Too sharp after the dipping & former swings too fast >> uneven coating
Unsmooth dipping track	Cause former jerking >> uneven coating
Low Temperature	Poor coagulant coat on former
Nozzle pipe blockage	Un-homogenize coagulant dispersion
Inconsistent % of $CaCO_3$ & $Ca(NO_3)_2$	Poor pick up >> thin area defect / underweight glove
NRD / oily layer / foreign material on coagulant surface	Former unable to pick up coagulant

C. Poor Condition in Coagulant Drying Oven

Cause	Description
Low temperature	Poor drying of coagulant layer on former >> wash off when dip into latex dipping tank
High temperature	It will increase former temp. (overheat) before latex dip
Spoilt IR burner	Spark >> burnt mark on glove (weak area)

3.0 ROOT CAUSES

D. Poor Condition during Latex Dipping

Cause	Description
High SI	Glove too soft >> difficulty to strip off at auto stripping station
Low SI	Glove overcure >> hard & brittle >> easily tear off
Low pH	Lump formation
Compounding process	Excessive / contaminated filler & poor dispersion of chemical in latex compound
Long maturation hour	Due to ad-hoc downline / major line breakdown causing latex overcure
Bubble in latex dipping tank	Cause fish eye >> pin hole & weak area on glove

E. Poor Condition in Post- Leaching Tank

Cause	Description
Low water level (below beading) & high temperature	Glove sticks on former and difficult to strip off

F. Poor Condition in Beading Station

Cause	Description
Beading brush spoilt	Defect Beading or No Beading >> glove tear off at cuff area
Incorrect position of beading brush	Improper Beading Defect

3.0 ROOT CAUSES

G. Poor Condition in Curing Oven

Cause	Description
High Temp.	Glove overcure >> hard & brittle
Low Temp.	Glove undercure >> soft >> difficulty to strip off
Touching with broken former inside main oven	

H. Poor Condition during Slurry / Polymer Dipping

Cause	Description
Poor coating of cornstarch or polymer	Hard to don >> use stronger force >> cause tearing

I. Poor Condition at Auto Stripping Station

Cause	Description
Stripper	• Pulling too hard • Long finger nail • Not wearing cotton gloves to strip • Poor work concentration
Air Jet	• Soft air jet and hard air jet too strong • Incorrect position of air jet nozzle
Rubber Pad	• Misalignment of rubber pad
Former Temp.	• Cuff area too hot & stick to former, thus difficult to strip off
Cuff Brush	• Not well placed to loosen the glove • Too sharp & tend to poke glove surface • Nipple is higher than required position >> tends to scrape lightly on former surface & removes glaze

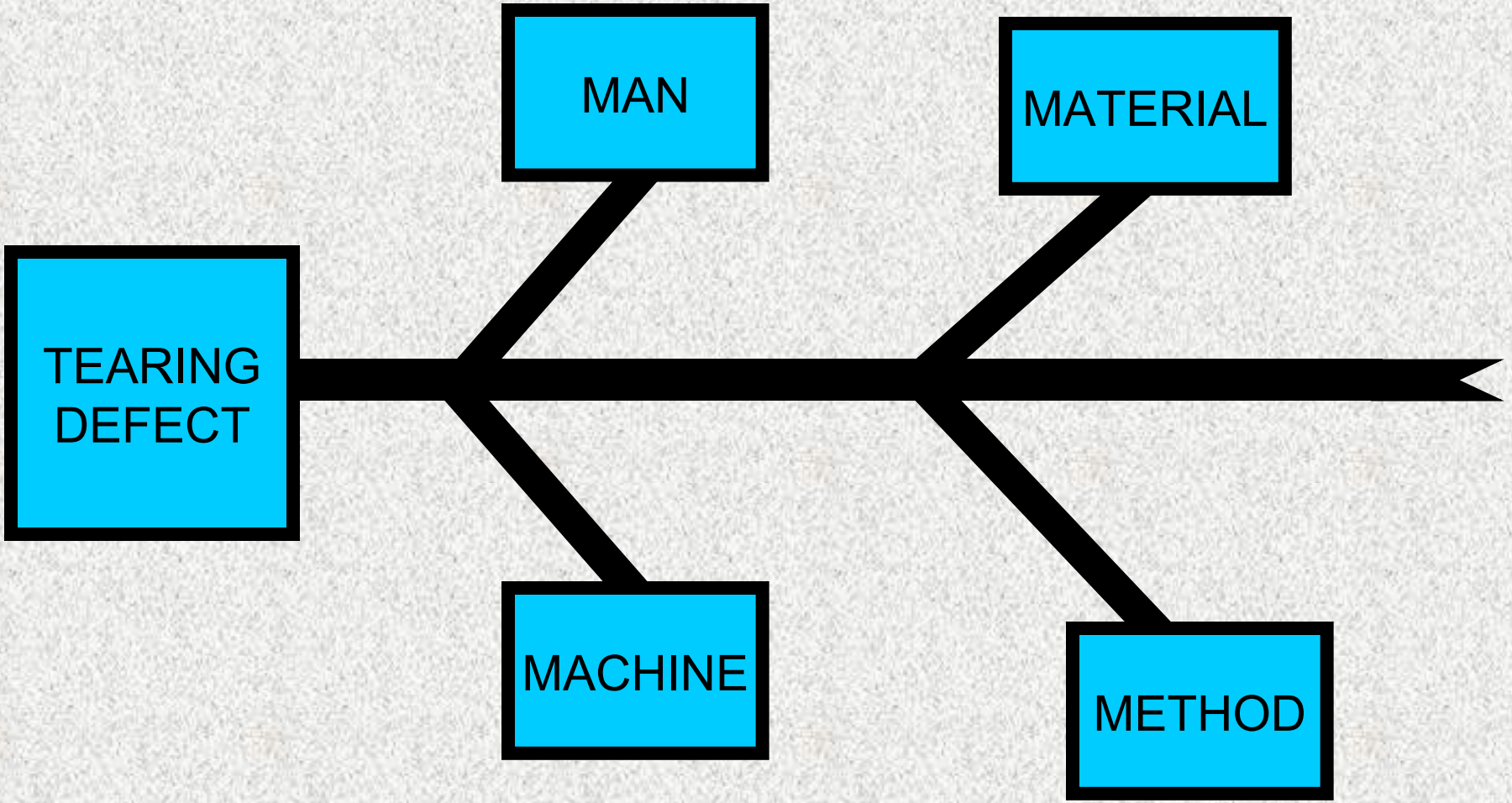
J. Poor Condition during Glove Tumbling Process

Causes
Sharp edge in the tumbler machine especially in the tumbler inner drum
Tumbler boy's finger nail too long & not wearing cotton glove
Foreign particles (screw / former fragments) present in tumbling machine
Tumbler basket broken and has sharp corners

K. Miscellaneous

Causes
Inconsistent line speed causing poor process control & fluctuation in process parameter
Poor segregation of torn glove during production and packing
End user using undersize glove

4.0 CORRECTIVE & PREVENTIVE ACTION



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4.0 CORRECTIVE & PREVENTIVE ACTIONS

MAN

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Workers	•Training & re-training for quality mindset (e.g. OJT & Offline Training)
Production leader	•Spot-check first grade basket at auto stripping every 2hours
Stripper	•Trained to monitor the glove after passing air jet nozzle & •To segregate defective gloves into torn glove basket •To strip glove properly by using two hands (with short nail).
Packers	•Visual checking while packing to screen out tearing/torn glove
QA / Pre-shipment	•Ensure proper donning, tearing / tensile/ elongation, visual & cuff thickness check to prevent customer complaint on tearing defect
Maintenance team	• To check air jet condition regularly & • Set up service schedule & record book

4.0 CORRECTIVE & PREVENTIVE ACTIONS

METHOD

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Double Dipping	**•Dip glove that undergoes WTT inspection especially glove with size L & XL to minimize pin hole/ thin area & easy tearing**
Formers	**•At optimum temp. at auto stripping area & before latex dip •Clean & in good condition at all times**
Auto Stripping Station	**•Pre-stripping air jet / cuff-brush well function to loosen up the gloves •Air-jet pressure is within standard and the air-jet nozzle is placed**
Main Oven	**•Main oven temperature within standard to prevent overcure / undercure**
Post leaching	**•Post leaching temperature and water level within standard**
Coagulant, latex & slurry/polymer	**•Ensure parameters within standard**
Line Speed	**•Run at optimum speed**

4.0 CORRECTIVE & PREVENTIVE ACTIONS

MACHINE

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Nitrate Spray Nozzle	Installation of full cone spray nozzle after coagulant dipping tank to spray nitrate at cuff area (former) to thicken the cuff area
Air Jet	Implementation of Alpha Nozzle Air Jet with less pressure to reduce the tearing defects
Circular Washing Brush Tank	Install additional circular washing brush tank to improve cleaning efficiency at BF and Palm area.
Tumbler Inner Drum	Good condition without sharp objects inside the machine
Conveyor chain & open channel	Good condition to prevent former from jerking
Water Removal Brush	Installation of 12cm long bristles brush (0.5cm thickness) before coagulant tank to increase the efficiency of removing water droplet from between finger area and thumb area for better pick up of coagulant.
Coagulant Tank	Service coagulant tank stirrer and nozzle pipe regularly to improve coagulant circulation in the tank.

4.0 CORRECTIVE & PREVENTIVE ACTIONS

MATERIAL

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Material	Description
Latex, chemical & other dipping & compounding materials	Adequately & qualitatively prepared, mixed & stored under clean condition to prevent pin hole, thin area and other glove defects.

5.0 CONCLUSION

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Looking backwards, based on the history of customer complaints due to tearing defect for year 2009 to 2011 for the whole of TG Group with 98 for year 2009, 124 for year 2010, 2 for year 2011 as at to date; we hope with clearer understanding of the causes for tearing defect and implementation of both corrective and preventive action, we can reduce the tearing defect complaint by 30-50% for current year and the following years.

Terima Kasih
Thank You
Xie Xie
Nandri
Arigatou Gozaimasu