

# Kaizen projects reporting format: INNOVATION CATEGORY - PATENTABLE MODE

<b>Project :</b> <b>REBREAKER PRODUCTIVITY &amp; ENERGY SAVING</b>		<b>Project Launch no: RB/001</b>
<u>Company Name:</u>	Spin Knit Limited, Nakuru, Kenya	Team Name: OKOA JAHAZI Members: Maintenance Team  Kaizen implementers: Maintenance Team
<u>Gemba:</u>	Rebreaker MC in acrylic spinning area	
<u>Dates:</u>	MAY 2012	

DESCRIPTION OF PROBLEM/ PROJECT	COUNTER MEASURES	RESULTS (MEASURABLE)
<p>The speed of Rebreaker was 216 mpm (OEM specified maxima) and was restricting.</p> <p>1. The machine was on a floor and hence vibration of machinery was high thereby limiting speed owing to friction.</p> <p>2. The floor caused frequent disruption of the alignment of the machine that in turn was leading to mechanical breakdowns</p>	<p>Damping vibrations and ensuring that only 0.25-.3 of the original load is transmitted back onto the frame.</p> <p>1. Mounting the frame on rubber pads with the use of bolts that drive right through the pad and are hence compensated for both the reactive forces as also on the primary collision impact</p> <p>2. The frame is literally floating on the rubber pad with no contact with the floor thereby eliminating the impact of the restitution forces on the frame.</p>	<p>Energy: 30% reduction</p> <p>Productivity: 38% enhancement</p>

<b>BEFORE KAIZEN (USE PHOTOGRAPHS / SKETCHES)</b>	<b>AFTER KAIZEN (PHOTOGRAPHS/ SKETCHES)</b> <b>THIS IS A PATENTABLE INNOVATION AND THESEPARATE PATENTAPPLICATION CAN BE FURNISHED TO THE AUDITORS TO SHOWCASE THE INNOVATION AS AND WHEN REQUIRD TO DO SO.</b>					
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5 'S'	Q	C	D	S		

# Kaizen projects reporting format: INNOVATION CATEGORY - PATENTABLE MODE

<b>Project : RIETER PRODUCTIVITY &amp; ENERGY SAVING</b>		<b>Project Launch no:RTR/002</b>
<u>Company Name:</u>	Spin Knit Limited, Nakuru, Kenya	Team Name: OLD IS GOLD Members: Maintenance Team  Kaizen implementers: Maintenance team
<u>Gemba:</u>	Rieter ring spinning MC in acrylic spinning area	
<u>Dates:</u>		

DESCRIPTION OF PROBLEM/ PROJECT	COUNTER MEASURES	RESULTS (MEASURABLE)
<p>Rieter Ring spinning frames are outdated and have high levels of vibrations causing frequent failure</p> <p>1. The machine is heavily built with cast iron and is susceptible to frequent structural deformation eventually leading to major machining issues and breakdowns</p> <p>2. The floor caused frequent disruption of the alignment of the machine that in turn was leading to mechanical breakdowns</p>	<p>Damping vibrations and ensuring that only 0.45-0.65 of the original load is transmitted back onto the frame.</p> <ol style="list-style-type: none"> <li>Mounting the frame on spring-laadMaintenance Teamed frame bolts that are designed to absorb 0.35 of the vibrations and compensate on the amplitude.</li> <li>The frame is literally compensated by the springs on each collision thereby minimizing the restitution forces.</li> </ol>	<p>Energy: 12% reduction</p> <p>Productivity: 15% enhancement</p>

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# Kaizen projects reporting format: INNOVATION CATEGORY - PATENTABLE MODE

**Project : Semi-automatic knitting productivity & damage reduction    Project Launch no:SA/003**

<b><u>Company Name:</u></b>	Spin Knit Limited, Nakuru, Kenya	Team Name:THETRACKERS Members: Maintenance Team  Kaizen implementers: Maintenance Team
<b><u>Gemba:</u></b>	Knitting machine- Semi-Automatic	
<b><u>GKW Dates:</u></b>	MAY-JULY 2012	

DESCRIPTION OF PROBLEM/ PROJECT	COUNTER MEASURES	RESULTS (MEASURABLE)
<p>The speed of knitting was on mode-4 (OEM specified maxima)-6) but at the specified OEM maxima, the needle breakage and fabric damage was high. Mode-4 was thus the limiting speed</p> <p>1. The machine was on a floor and hence vibration of machinery was high thereby limiting speed owing to friction.</p> <p>2. The floor caused frequent disruption of the critical cam alignment of the machine that in turn was leading to both needle and fabric panel damages.</p>	<p>1) Damping vibrations and ensuring that only 0.65-0.75 of the original load is transmitted back onto the frame.</p> <p>2) Designing an effective stop motion for the high speed traction load of the needles at mode-6.</p> <p>3) Designing an effective stop motion for fabric let-off to compensate for abrupt machine stoppages with high inertial values.</p>	<p>Energy: 10% reduction</p> <p>Productivity: 33%</p>

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5 'S'    Q    C    D    S    PROJECT



Kaizen projects reporting format: INNOVATION CATEGORY – PROCESS RE-ENGINEERING MODE

Project : Murata 7V resolution of bearing and belt failure		Project Launch no:M7V/004
Company Name:	Spin Knit Limited, Nakuru, Kenya	Team Name: MVUMILIVU Members: Maintenance Team  Kaizen implementers: Maintenance Team
Gemba:	Murata 7V	
Dates:		

DESCRIPTION OF PROBLEM/ PROJECT	COUNTER MEASURES	RESULTS (MEASURABLE)
<p>The main motor bearing was failing (OEM specified ball bearing) .</p> <p>The drive belts were failing frequently</p> <p>The motor temperatures were very high in the range of 90-110 degrees celsius</p> <p>1. The axial thrust was not compensated with the ball bearings causing unresolved forces to amplify collisions of high-impact and low frequency types.</p> <p>2. Stick-slip phenomenon on the bearings at rpm of&gt; 2900 was the root cause of belt traction loads and eventual wear</p> <p>3. The raceway of the grooves of the drive pulleys were also wearing off because of the higher traction load of the belts</p>	<p>Root cause analysis of the problem revealed that the ball bearings were resolving the applied loads on 2-dimensional matrix of x-y thereby forcing the unresolved z-directional axial thrust to amplify the stick-lip movement.</p> <p>Resolving the reactive forces on the z-axis would bring down stick-lip movement of the ball bearings.</p> <p>The resolution in z-direction can be done by the application of angular contact ball bearings</p>	<p>Energy: 8% reduction</p> <p>MTBF for belts: 1500 hrs from 250hrs</p>

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5 'S'	Q	C	D	S	PROJECT	





Kaizen projects reporting format: INNOVATION CATEGORY - PATENTABLE MODE

Project : Seydel productivity		Project Launch no:SYL/005
Company Name:	Spin Knit Limited, Nakuru, Kenya	Team Name: THE OASIS Members: Maintenance Team  Kaizen implementers: Maintenance Team
Gemba:	Seydel MC in acrylic spinning area	
Date:		

DESCRIPTION OF PROBLEM/ PROJECT	COUNTER MEASURES	RESULTS (MEASURABLE)
<p>The speed of Seydel M/C was 170 mpm (OEM specified maxima-220 mpm) and was limiting the productivity of the plant.</p> <p>1. The spline shaft drive was not aligned owing to a high load skew on a concentrated area.</p> <p>2. The coupling point was absorbing higher amplitudes causing a systemic wearing off of the gear box and failure of the bearing eventually leading to mechanical breakdowns</p> <p>3. The hydraulic pump was generating lower pressure leading to frequent failure of accumulation and return valves while the hydraulic oil bath temperature was escalating caused by higher sulphur content</p>	<p>1. Alignment of the spline shaft with a tolerance of 20 microns instead of 300 microns to lower amplitude of compensation at the coupling points.</p> <p>2. The use of anti-static oil to improve hydraulic flow</p> <p>3. The flushing cycle to improve on contaminant levels in the oil bath an facilitate the lowering of temperatures and consequent wear and tear levels</p> <p>4. A patented bush design has been in place to distribute the load on the shaft of the gear box to minimize sulphur content in oil through war of gears.</p>	<p>Energy: 7% reduction</p> <p>Productivity: 29%</p>

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# Kaizen projects reporting format: INNOVATION CATEGORY - PATENTABLE MODE

<b>Project : Compressor management</b>		<b>Project Launch no:SYL/005</b>
<b>Company Name:</b>	Spin Knit Limited, Nakuru, Kenya	<b>Team Name:</b> THE OASIS <b>Members:</b> Maintenance Team  <b>Kaizen implementers:</b> Maintenance Team
<b>Gemba:</b>	Compressor	
<b>Date:</b>	25.08.2012	

DESCRIPTION OF PROBLEM/ PROJECT	COUNTER MEASURES	RESULTS (MEASURABLE)
<ol style="list-style-type: none"> <li>The load factor is 88% on an average instead of a targeted 65-75% bandwidth</li> <li>The compressed air requirement was 7-7.1 bar on an average against a targeted potential of working with 6.5 bar.</li> </ol>	<ol style="list-style-type: none"> <li>The leakage of compressed air points was detected and systematically plugged on a regular basis after dividing each machine in to four zones.</li> <li>The use of anti-static oil to improve fluid dynamics during the service of the oil filter, oil separator and the flushing of the oil tank itself</li> <li>The air filters were cleaned with a cleansing solvent on a regular basis to improve performance</li> <li>As a result of the above measures we managed to lower operating pressure to 5.8 bars at load factor of 67%</li> </ol>	<p>Energy: 14% reduction</p> <p>Life enhancement of critical components to the extent of &gt; 50% on expected life</p>

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