Toscotec Steel Yankee Dryer

Take Care Of It!

www.toscotec.com

TOSCOTEC STEEL YANKEE DRYER

Main Features

INCREASED Heat Transfer **+** TT **PATENTED** Head Insulation

Energy **SAVINGS**

REDUCED Maintenance, Energy **SAVING** and **OPTIMIZED** Design

LESS production cost

NO RISK of Dangerous Fracturing

Intrinsically **SAFE**

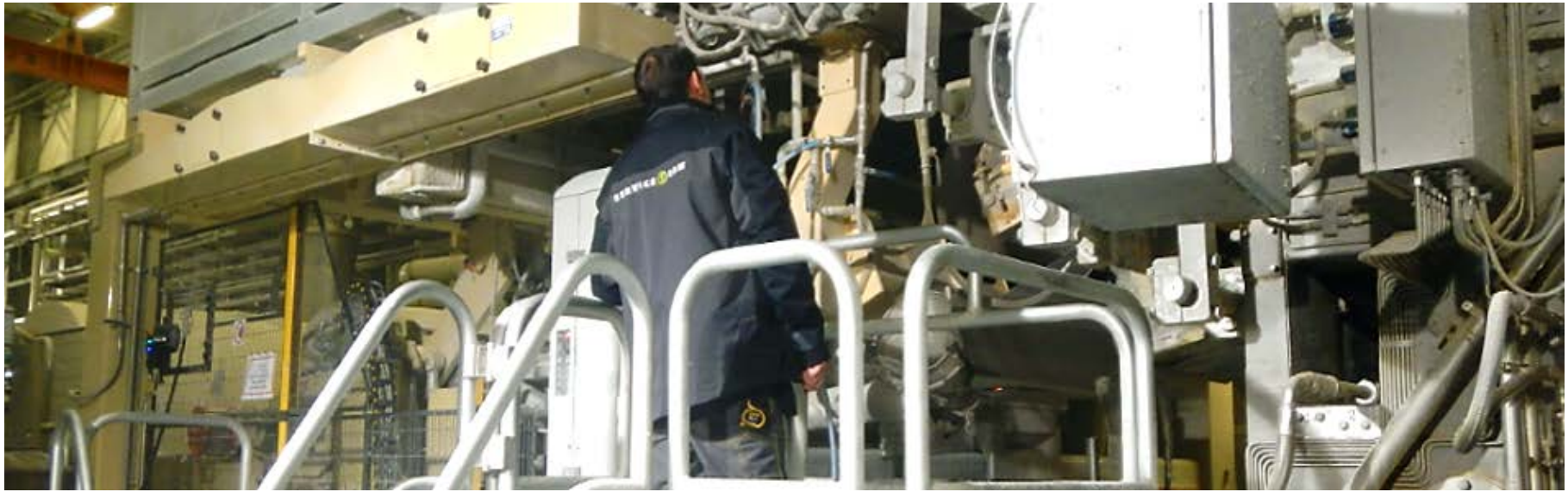
Toscotec **EXPERIENCE**

MORE Performance and Efficiency

SERVICING TOSCOTEC STEEL YANKEE DRYER

What to do?

- REGULAR MAINTENANCE
- INSPECTION AND PERIODIC CHECKS



REGULAR MAINTENANCE

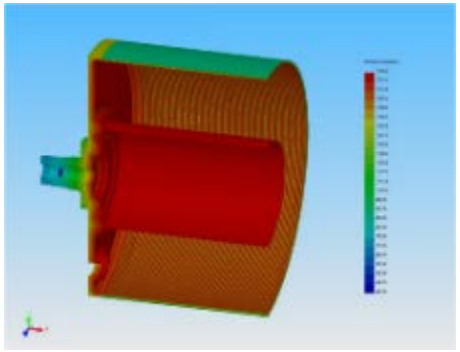
Guidelines and TIPs

Follow Guidelines and TIPs from the **Supplier Manual**

Maintain **Optimal Performance** of the Yankee

Avoid Damage of the Equipment

Increase Life of the Yankee



Why Follow the Warm Up Procedure?

- ✓ Guarantees uniform heating of the Yankee Dryer;
- ✓ Guarantees uniform thermal expansion of the YD;
- ✓ Minimizes thermal stress when starting from ambient temperature.

Why is the Water / Steam Quality important?

- ✓ Creates a thin and uniform layer of black oxide (magnetite) inside the YD;
- ✓ Avoids problem of plugging of the soda straw pipes.

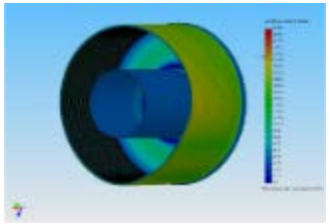
Why is prohibited to pour cold water directly on the Yankee Dryer surface?

- ✓ Avoids local thermal shock

Why is it necessary to work with proper doctor blade setting?

- ✓ Avoids problem on the YD surface

Why is it necessary to respect the loads considered in the project of the YD (e.g. presses loads, Internal pressure, etc.)?

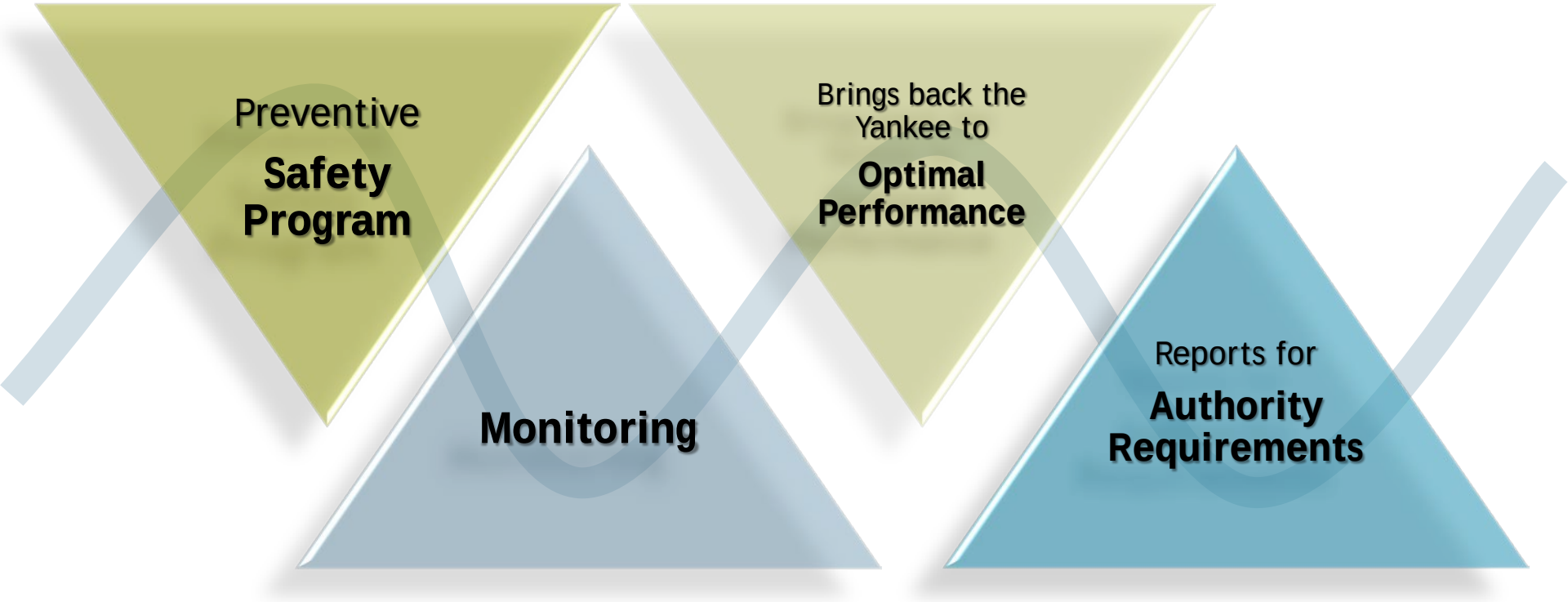


- ✓ Avoids over stresses of the YD

INSPECTION AND PERIODIC CHECKS

INSPECTION & PERIODIC CHECKS

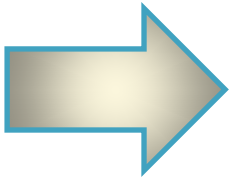
Why is it important?



Structural Periodic checks

EVERY 2 YEARS

1. Metallized surface inspection
2. SYD internal inspection and condensate removal system check
3. Structural inspection:
   - On the Welds:
     - MPI (Magnetic Particle Inspection)
     - Ultrasonic Test
     - Phased Array Test (**Innovative Tecnique!**)
   - On the Connecting Bolts/Screws:
     - Ultrasonic Test



NO NEED
to remove metallization

NO RISK
for Health and Safety of people

Performed during
REGULAR SHUTDOWN

FAST
checks

1. Metallized Surface inspection

DESCRIPTION

- Visual checks of the metallization surface;
- Roughness measurements;
- Shell TIR (Grind condition) – Total Indicated Runout measurements

PURPOSES

- ✓ Check the presence of damages on the SYD surface (impacts, scratches, etc.);
- ✓ Asses the current status of the metallization surface;
- ✓ Understand if there are possible issues on the condensate removal system

2. SYD internal inspection and condensate removal system

DESCRIPTION

- Check the inner surface of the SYD
- Check the clearance of all the soda straw pipes
- Check all the soda straws for plugging
- Check the integrity of the condensate removal system
- Riser pipes and header wall thickness measurements (with Ultrasonic method)

PURPOSES

- ✓ Verify the presence of a thin and uniform layer of black oxide (magnetite)
- ✓ Maintain the optimal heat transfer efficiency of the SYD
- ✓ Verify the absence of erosion/corrosion in the riser pipes and headers

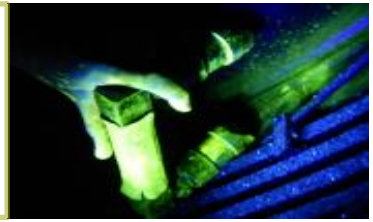
3. Structural Periodic Inspection

DESCRIPTION

- Phased Array (PA) and Ultrasonic Test (UT) on:
  - 100% Circumferential shell-head welds
  - 100% Longitudinal shell welds
  - 100% Circumferential welds on the Center Stay
  - 100% of the Center Stay-Heads bolts and the Journals-Head screws
- Magnetic Particle Inspection (MPI) on:
  - 100% Circumferential shell-head welds and Manhole welds

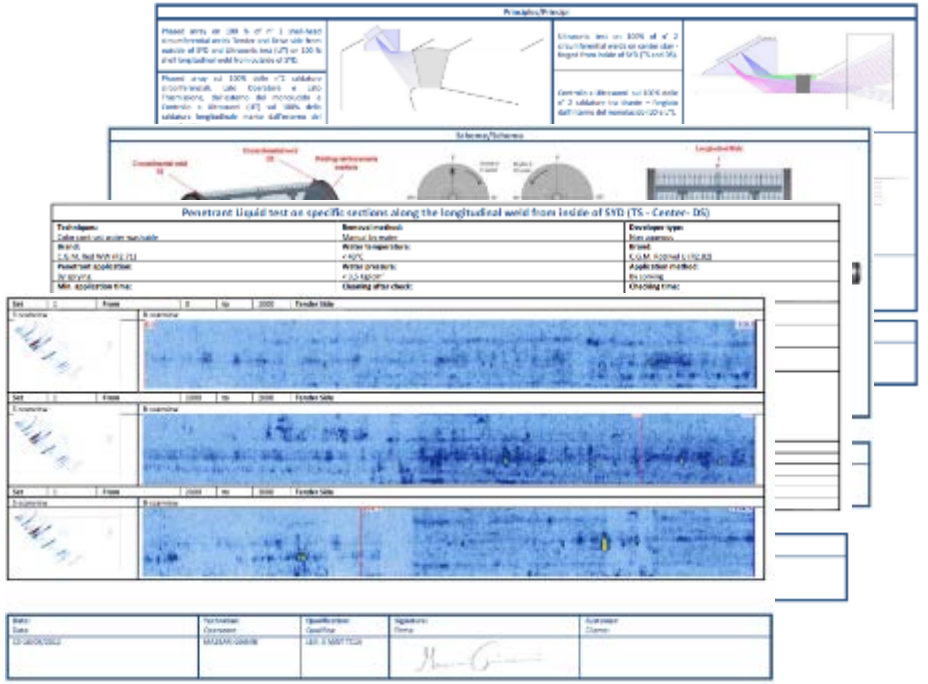
PURPOSES

- ✓ Verify the absence of sign due to the operation of the equipment



INSPECTION & PERIODIC CHECKS

Detailed Reporting



Valid for Insurance purposes and requirements from local authorities!

INSPECTION & PERIODIC CHECKS – EVERY 2 YEARS

Steel Yankee Dryer vs. Cast Iron Yankee Dryer

	CIYD (Routine Periodical Inspection)	SYD (Periodical Structural Inspection)
HEAD TILT	Cold and Hot Condition	Not Necessary
SPIGOT FIT GAP CHECK	YES	Not Necessary
UT	✓ 20 % of Shell – Head Bolts (UT) ✓ 20% of Journal – Head Bolts (UT) ✓ 20% of Center Stay - Head Bolts (UT) ✓ Root Shell Thickness Measurement (UT)	✓ 100 % Shell-heads Circumferential welds (PA) ✓ 100% Shell Longitudinal welds (UT) ✓ 100% Center Stay Circumferential welds (PA) ✓ 100% Center Stay – Head Bolts (UT) ✓ 100% Journal – Head Screws (UT)
CONDENSATE REMOVAL SYSTEM INSPECTION	100 %	100 %
MPI	✓ 100% Shell – Head flange from inside and outside ✓ 100% Journal-Head flange from inside and outside ✓ 100% manholes from inside and outside	✓ 100% Circumferential shell-heads Welds ✓ 100% Manholes Welds
METALLIZATION	Visual Check (shell surface if metallization not present)	Visual Check
STEAM LEAK	Visual Check	Visual Check
TIR (HOT CONDITION)	Shell TIR	Shell TIR
TIMING	Approx. 2 working days	Approx. 2 working days

INSPECTION & PERIODIC CHECKS - EVERY 5 YEARS

Steel Yankee Dryer vs. Cast Iron Yankee Dryer

	CIYD (Fitness For Service Inspection)	SYD (Fitness for Service Inspection)
HEAD TILT	Cold and Hot Condition	
SPIGOT FIT GAP CHECK	YES	
UT	✓ 100% Shell Surface from Outside ✓ 100% Shell – Head flange from Outside ✓ 100% Shell – Head Bolts ✓ 100% Journal – Head Bolts ✓ 100% Center Stay Connecting Bolts ✓ Root Shell Thickness Measure	
CONDENSATE REMOVAL SYSTEM INSPECTION	100 %	
MPI	✓ 100% Shell Surface from Outside ✓ 100% Shell – Head flange from inside and Outside ✓ 100% Journal-Head flange from inside and outside ✓ 100% Manholes from inside and outside ✓ 100% Shell – Head extension from inside	
METALLIZATION	Visual Check (shell surface if Metall. not present)	
STEAM LEAK	Visual Check	
TIR (HOT CONDITION)	Shell TIR	
TIMING	Approx. 3 - 4 working days	

INCLUDED IN THE PERIODICAL STRUCTURAL INSPECTION!

TROUBLESHOOTING

Metal pieces between Yankee and Press

DAMAGE :	• Screw M20 passed between Yankee and Suction Press at 90 kN/m
FIRST ACTION :	• Non Destructive Examination Test to verify STRUCTURAL INTEGRITY of the Yankee Dryer
EVALUATION :	• Absorption of the impact without affecting the structural integrity and consequently the safety of the YD
SOLUTION :	**GRIND the metallization surface**

Plugging of Soda Straw

DAMAGE :

- Plugging of the soda straws pipes present inside the Yankee Dryer

FIRST ACTION :

- Clean and reassemble all the soda straw pipes

EVALUATION :

- Low Quality of Steam >> Excessive formation and detachment of Black Oxide (Magnetite) that led to the plugging of the soda straws

SOLUTION :

Toscotec reitterates the **quality standard parameters** of the boiler water, steam and condensate for the correct operation of the SYD.

Toscotec works jointly with Customer to find the **best operating conditions** to avoid the same problem in the future.

TT SYD REFERENCES

Success Worldwide

Toscotec Steel Yankee Dryer

Take Care Of It!

1. **Toscotec Steel Yankees Dryer** >> More than 15 Years of **Experience**
2. **Maintenace Guidelines** >> Key to **successfully** run at **top** performance & Increase Life of Yankee
3. **Periodic Structural Checks** >> Safety Always **at the Top**!
4. **TT Service** >> **Troubleshooting** & Customer Care
5. **TT SYD References Worldwide** >> More than **160** TT-SYD sold Worldwide

Thanks for YOUR attention!