

2014



Inspection report

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1. Introduction

Company: **Silgan White Cap Italia S. r. L**
Street: **Via Bosco Fili II**
Post code, City: **I – 84091 Battipaglia**
Contact person: **Mr. Stefano Saglia**

The inspection takes on particular significance with relation to the reliable and economical operation of a ventilation system. Because of the inspections, the operational safety and service life of the thermal reactor are significantly improved.

According to DIN 746-1, plant operators must ensure that their combustion plants and safety-related equipment are inspected for functional safety by a technical expert at reasonable time intervals, but at least once a year.

Prior to beginning the inspection, it should be determined that the following documents are in the inspection folder:

- Operating Manual
- Parameter list
- R & I schematic
- A - plan
- Last inspection report
- Last operational fault reports
- Plant measurement data
- Layout data

2. Preparation

2.1. Customer prior to the inspection date

- Check the last inspection report
- Have all prescribed measures been fulfilled
- Have all required replacement parts been ordered
- Are measures still to be prepared
- On the part of the customer
- From other suppliers
- Review measurement reports
- Create a fault protocol
- Telephone coordination with L&E

2.2. L&E prior to the inspection date

- Check the last inspection report
- Have all prescribed measures been fulfilled
- Have all required replacement parts been ordered
- Are measures still to be prepared
 - On the part of the customer
 - L&E
 - From other suppliers
- Review measurement reports
- Take along possible required replacement parts
- Compile a complete list of inspection equipment
- Review the fault protocol
- Telephone coordination with the customer
- -
- -
- -

2.3. External preparation (e.g. outside companies)

-

3. Inspection

THERMAL REACTOR INSPECTION

=====

Customer address: **Silgan White Cap Italia S. r. L**

Via Bosco Fili II
I – 84091 Battipaglia

Main order no.: **435 900**

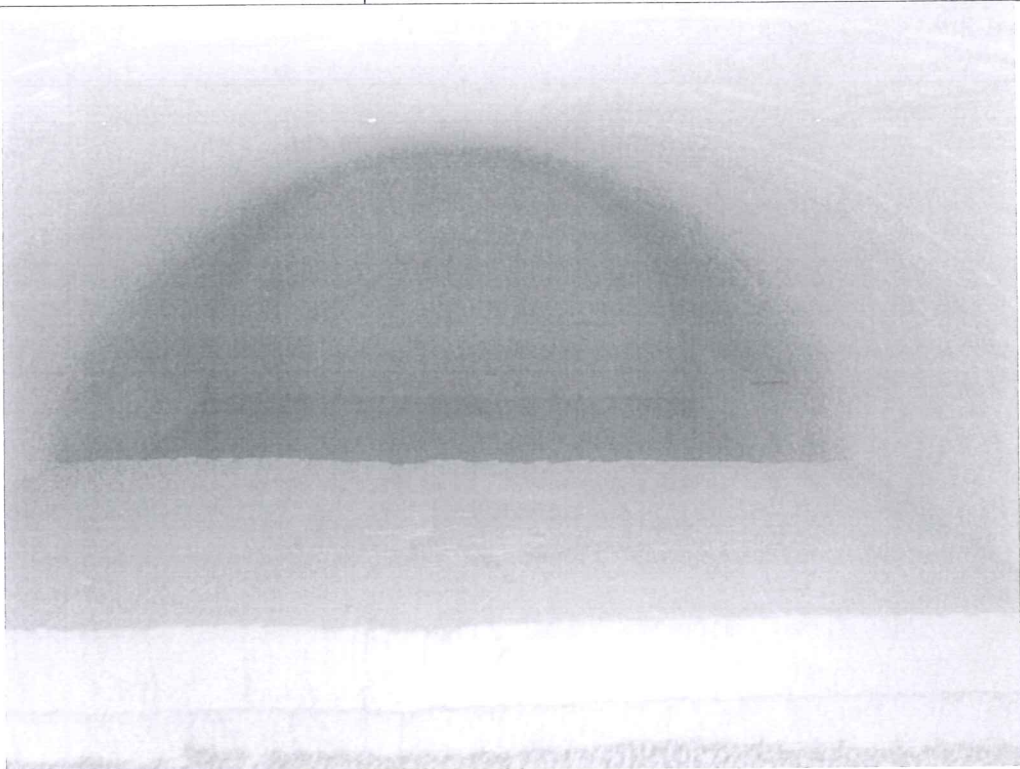
Inspection no.: **202987**


Plant type: **3 tanks system vacuum pressure**

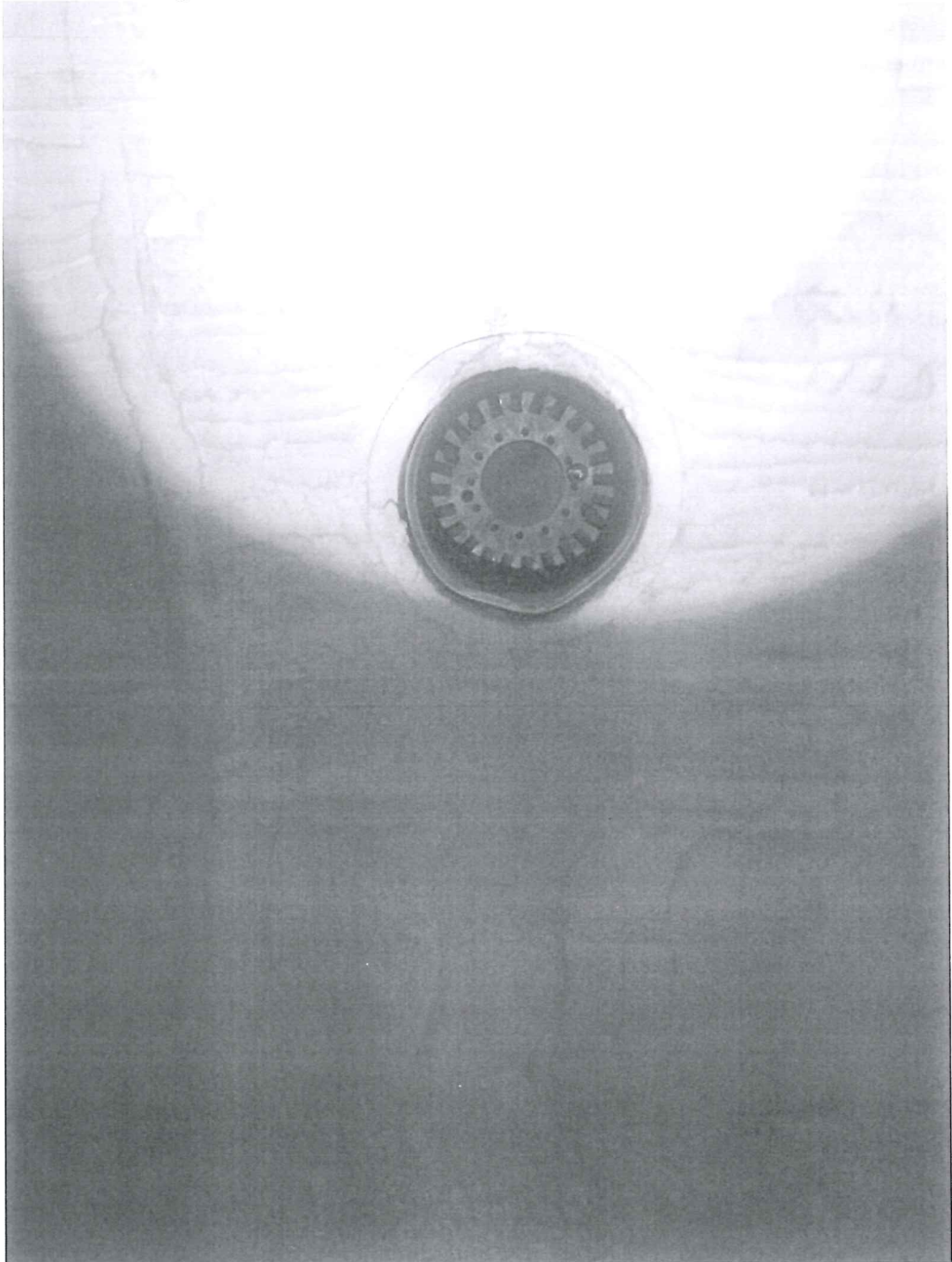
Year of construction: **2002**

Date of inspection:	01.05.2014 - 05.05.2014
The inspection was carried out by:	Mr. Sebastian Ehlers
Representative of the plant operator:	Mr. Stefano Saglia
phone:	0039 0/828 397 -217
fax:	0039 0/828 397-248
eMail:	stefano.saglia@silganwhitecap.com

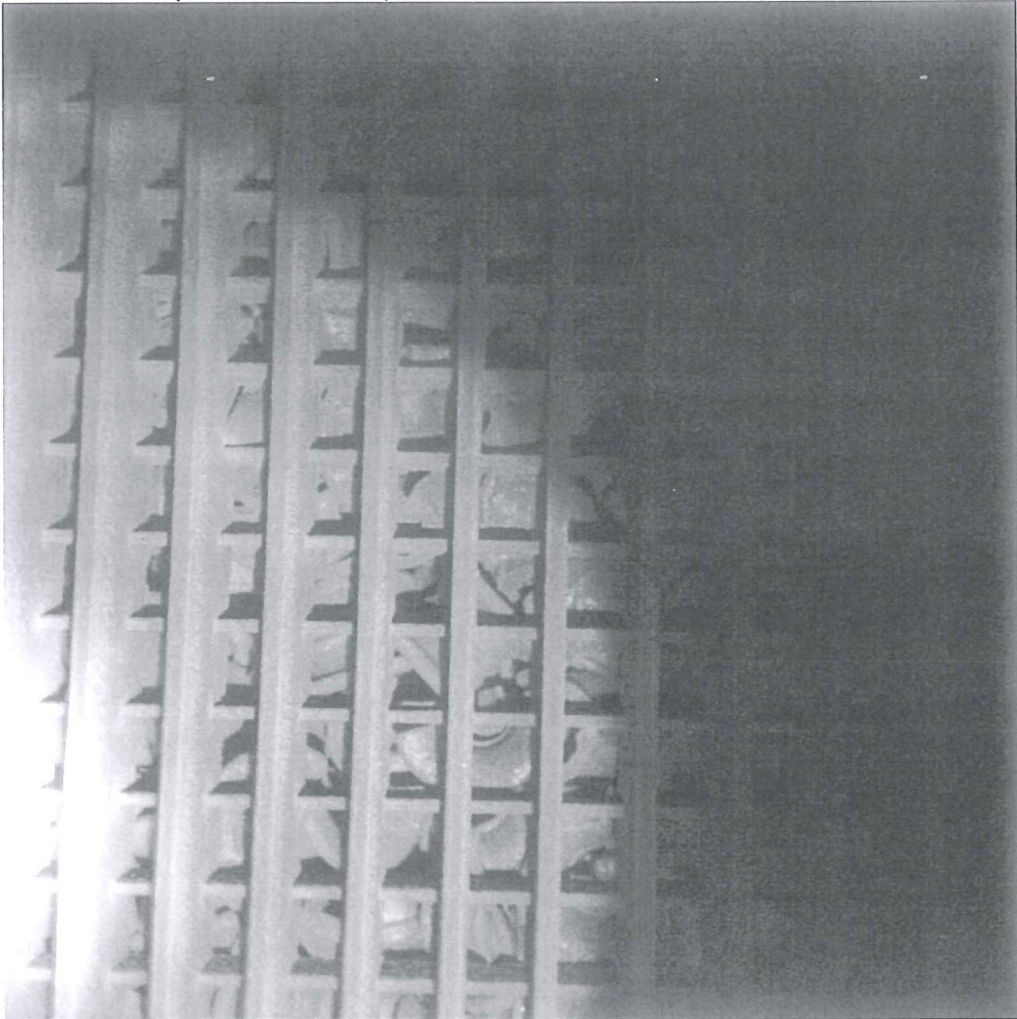
Inspection table for Thermal Reactor	In order	
	Not in order	
3.1. Customer tasks on the day of inspection		
Cool the TR down to inspection temperature (max. 40°C)		<input checked="" type="checkbox"/>
Provide a safety attendant when the plant is being inspected		<input checked="" type="checkbox"/>
Provide assembly personnel for possible repair work		<input checked="" type="checkbox"/>
Create a fault protocol for the TR plant		<input checked="" type="checkbox"/>
Clean the exhaust gas system	<input checked="" type="checkbox"/>	
Provide a social room		<input checked="" type="checkbox"/>
3.2. L&E tasks on the day of inspection		
Check oxygen content in the pipelines with an O2 measuring device	<input checked="" type="checkbox"/>	
Disconnect the gas line from the system		<input checked="" type="checkbox"/>
Disconnect the compressed air supply from consumers		<input checked="" type="checkbox"/>
Safely disconnect all EQ's from the TR		<input checked="" type="checkbox"/>
Check the RO exhaust gas pipe to the TR During the visual check, we have found sediments up to 5mm. The exhaust gas pipe must be cleaned to reduce the fire load.	<input checked="" type="checkbox"/>	
Switch the plant to zero voltage potential		<input checked="" type="checkbox"/>
Check all temperatures in the system (max ca. 40°C)		<input checked="" type="checkbox"/>
3.3. External specialist company tasks on the day of inspection		
Visually check, as far as possible dye penetrate test customer ordered an external company, the fan is okay		<input checked="" type="checkbox"/>
Dye penetrate test by local company		<input checked="" type="checkbox"/>
Cleaning of the exhaust collector to incinerator.	<input checked="" type="checkbox"/>	
3.4. The TR plant must be inspected for functionality and general condition according to the following assembly group list		
3.4.1. Refractory lining masonry (ceramic insulation)		
Check sealing joints		<input checked="" type="checkbox"/>
Check insulation seal		<input checked="" type="checkbox"/>
Check passages to the oxidation chambers		<input checked="" type="checkbox"/>
Visually check the ceramic insulation tank 1 for cracks and damage		<input checked="" type="checkbox"/>
Visually check the ceramic insulation tank 2 for cracks and damage		<input checked="" type="checkbox"/>
Visually check the ceramic insulation tank 3 for cracks and damage		<input checked="" type="checkbox"/>
Check for damage from the outside		<input checked="" type="checkbox"/>


Inspection table for Thermal Reactor	In order		
	Not in order		
			
Foto: Tank 1			
3.4.2. Oxidation chamber			
Check for cracks and damage			<input checked="" type="checkbox"/>

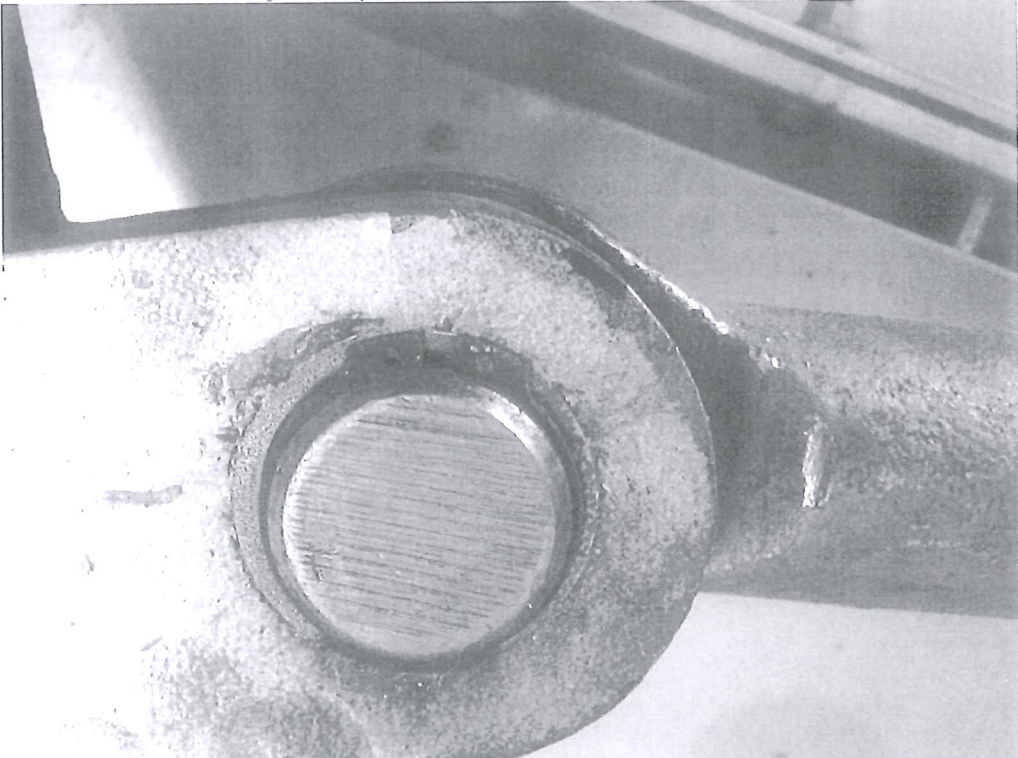
<p>3.4.3. Storage beds</p>		
<p>Observe the silicon oxide in the upper areas (up to 40 cm below the surface) is a marginally covered.</p> 		<p style="text-align: center;"><input checked="" type="checkbox"/></p>
<p>Check the differing bed heights (gives evidence of moving storage mass)</p>		<p style="text-align: center;"><input checked="" type="checkbox"/></p>
<p>Check for significant breaks in the caliper body</p>		<p style="text-align: center;"><input checked="" type="checkbox"/></p>


3.4.4. Burner muffle		
Check housing attachment 		<input checked="" type="checkbox"/>
Check for soot deposits		<input checked="" type="checkbox"/>

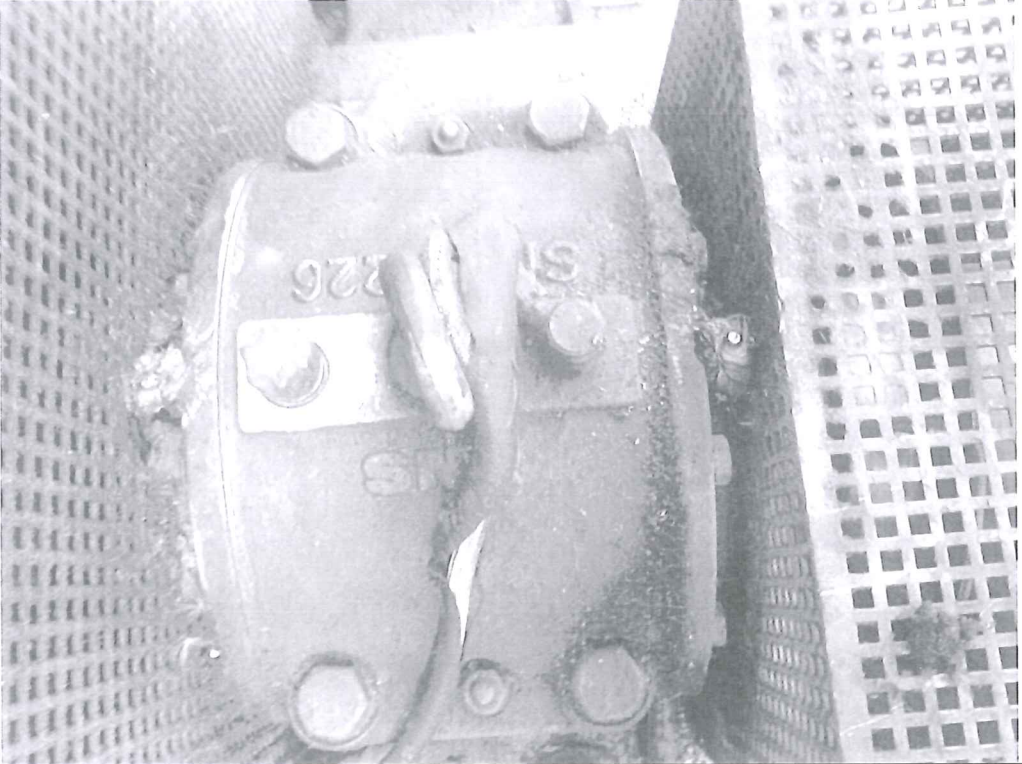
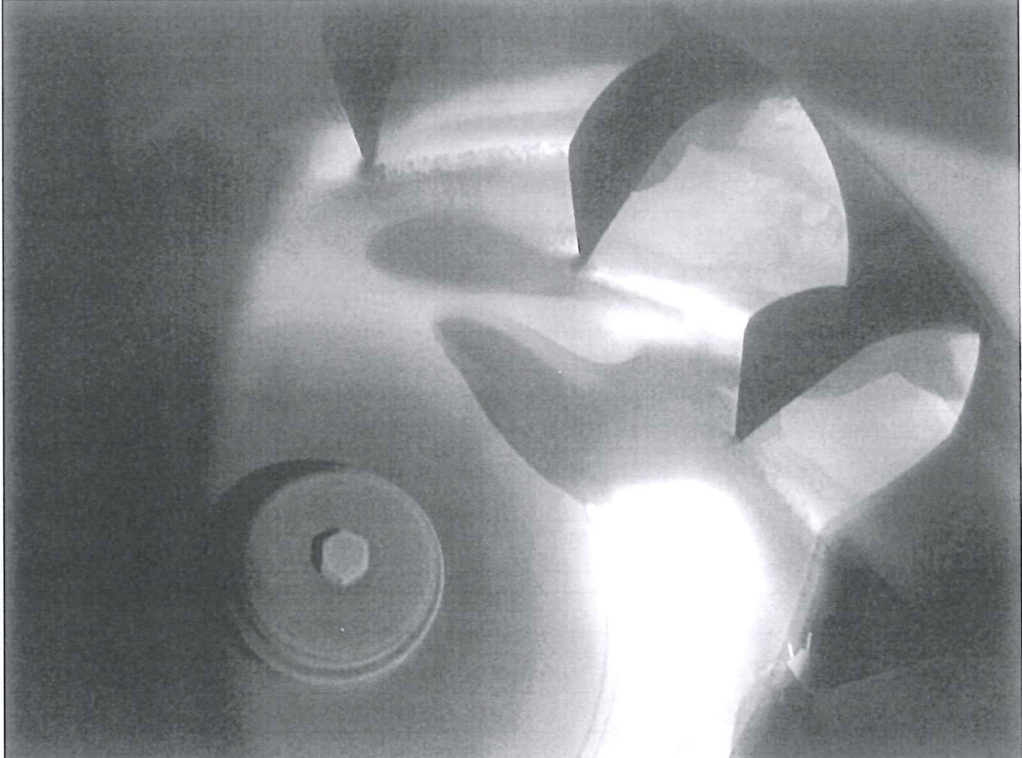
3.4.5. Raw gas, clean gas collectors		
Cleaning tasks should be performed by cleaning personnel		<input checked="" type="checkbox"/>
Check connections, doors and seals on the collectors		<input checked="" type="checkbox"/>
Check the collector for deposits and its condition		<input checked="" type="checkbox"/>
Check the pressure switch in the collector line for deposits		<input checked="" type="checkbox"/>

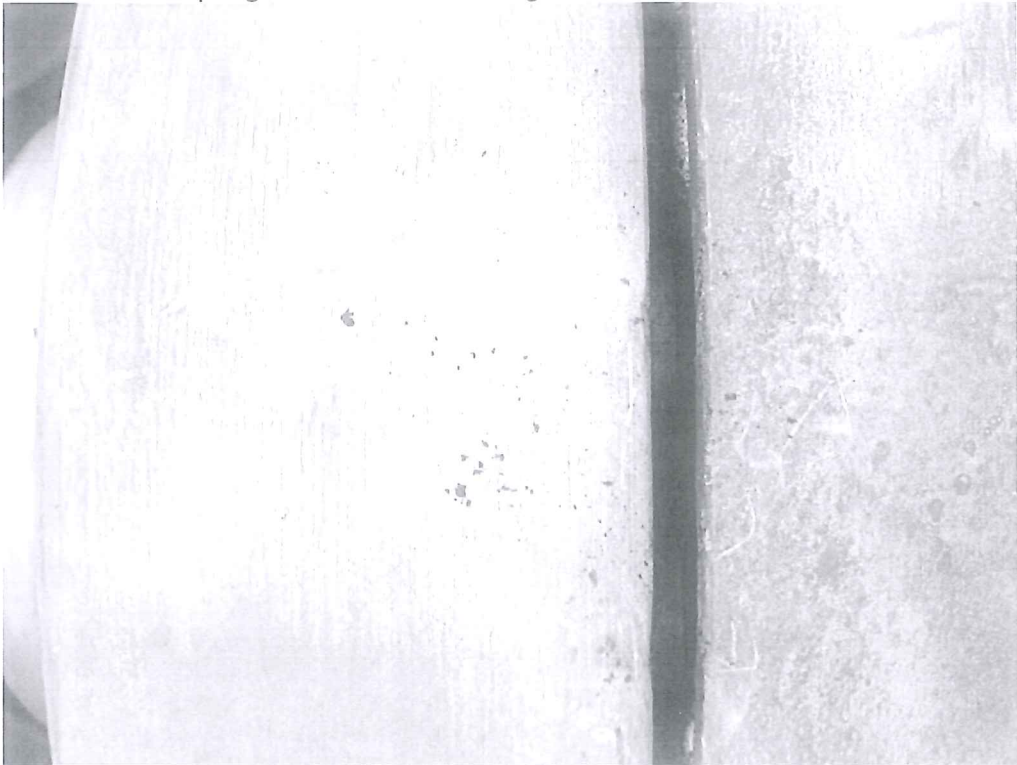
3.4.6. Grating below the bed		
<p>Check for deposits Small deposits on the ceramics and gratings.</p> 		<input checked="" type="checkbox"/>
Check the gaps in the grating		<input checked="" type="checkbox"/>
Check for damage to, or warping of the grating		<input checked="" type="checkbox"/>

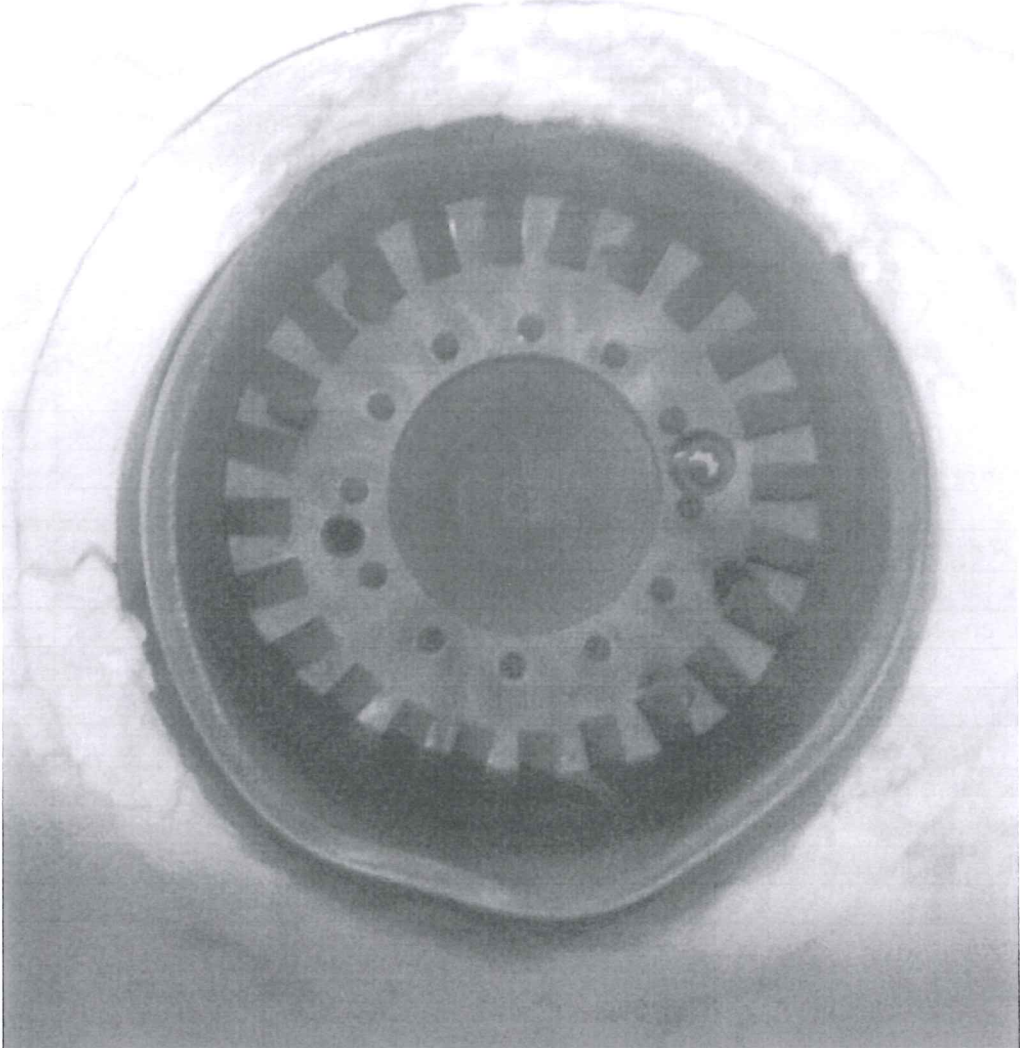
<p>3.4.7. Compensators</p>		
<p>Check compensators for damage The compensators at the TR and the outside placed compensator from the double line are okay, only small scratches on the surfac. Compensator inside the double line was handicapped by deposits. As the outside placed compensator has scratches on the surface, we recommend keeping a replacement in stock.</p>  <p>Picture: compensator 2 on the roof after standpipe</p>		<input checked="" type="checkbox"/>

3.4.8. Raw gas, clean gas cylinders		
Check raw gas and clean gas cylinder function		<input checked="" type="checkbox"/>
Check the OPEN and CLOSE positions		<input checked="" type="checkbox"/>
Check damping end-position OPEN		<input checked="" type="checkbox"/>
Check damping end-position CLOSED		<input checked="" type="checkbox"/>
Check run-up to the initiators		<input checked="" type="checkbox"/>
Check the switching clearance from the initiators to the measuring flags		<input checked="" type="checkbox"/>
Check the seals along the pneumatic path Only one small leak on the coupling nut from the cylinder raw gas damper tank 1.		<input checked="" type="checkbox"/>
Check pneumatic component function		<input checked="" type="checkbox"/>
Check structural cylinder mountings Between the bolt and the connection point we have noticed erosion. This should be observed and repaired within the next inspection in year 2015. We will send you a quotation of the required spare parts.		<input checked="" type="checkbox"/>
		
Check grease and oil lubrication intervals		<input checked="" type="checkbox"/>
Check the stuffing box on the shaft passage		<input checked="" type="checkbox"/>
Determine if the bearing is a floating bearing or fixed bearing		<input checked="" type="checkbox"/>
3.4.9. Raw, clean gas dampers		
Check the double bulb seal		<input checked="" type="checkbox"/>
Check the damper plate		<input checked="" type="checkbox"/>
Check the lever arm		<input checked="" type="checkbox"/>

<p>Check bolt connections</p> 		<input checked="" type="checkbox"/>
<p>3.4.10. Fresh air, purge air, EQ dampers</p>		
<p>Check for mechanical function</p>		<input checked="" type="checkbox"/>
<p>Check initiators</p>		<input checked="" type="checkbox"/>
<p>Check control valve function and control characteristics</p>		<input checked="" type="checkbox"/>
<p></p>		
<p>3.4.11. Rotary piston drive</p>		
<p>Check the coupling from the drive to the damper shaft</p>		<input checked="" type="checkbox"/>
<p>Check damping end-position</p>		<input checked="" type="checkbox"/>
<p>Check functionality</p>		<input checked="" type="checkbox"/>
<p></p>		

<p>3.4.12. Ventilators</p> <p>The customer should confirm grease lubrication and oil change</p> 		<input checked="" type="checkbox"/>
<p>Inspect the exhaust air ventilator from inside, rotate the blade and check for loose parts and deposits is okay</p> 		<input checked="" type="checkbox"/>

<p>Check the coupling for wear and damage little abrasion</p> 		<input checked="" type="checkbox"/>
<p>Coupling slack max. 3 mm We have noticed that the coupling slack is more than 3mm. Additionally we have noticed that some coupling rubbers have been displaced. The coupling rubbers need to be stocked and replaced at short time.</p>		<input checked="" type="checkbox"/>
<p>Check the motor for vibration and running smoothness</p>		<input checked="" type="checkbox"/>
<p>The customer should confirm lubrication intervals for the E-motor</p>		<input checked="" type="checkbox"/>
<p>3.4.13. Gas control line</p>		
<p>Check solenoid valve function</p>		<input checked="" type="checkbox"/>
<p>Clean the filter</p>		<input checked="" type="checkbox"/>
<p>Check the gas leak flow control function</p>		<input checked="" type="checkbox"/>
<p>Check the gas pressure regulator function</p>		<input checked="" type="checkbox"/>
<p>Check the gas regulator damper function</p>		<input checked="" type="checkbox"/>
<p>Check gas regulator damper rods, grease as necessary, secure with a cotter-pin</p>		<input checked="" type="checkbox"/>
<p>Dismantle hand control elements from all shut-off valves and keep them readily available</p>		<input checked="" type="checkbox"/>

<p>3.4.14. Main burner</p>		
<p>Check the fire tube for deformation The fire tube is a little bit deformed. The condition of the tube is okay and should be observed within the next inspection.</p> 		<input checked="" type="checkbox"/>
<p>Check the swirl plate and gas nozzle for damage or soot deposits</p>		<input checked="" type="checkbox"/>
<p>With a 4.5 mA control output, a flame should not be visible</p>		<input checked="" type="checkbox"/>
<p>Combustion air is used as cooling air with the main burner closed and should therefore never be 100% closed</p>		<input checked="" type="checkbox"/>
<p>The flame must never backfire into the burner so, for this reason, combustion air must always create an opposing pressure to the combustion chamber.</p>		<input checked="" type="checkbox"/>
<p>3.4.15. Pilot burner</p>		
<p>The pilot burner regulator and gas regulator must provide stable regulation of the established pressure</p>		<input checked="" type="checkbox"/>
<p>The pilot burner and ignition electrode must not be scaled</p>		<input checked="" type="checkbox"/>

The ionization monitor must provide as stable and strong a signal as possible	<input checked="" type="checkbox"/>
Check the installation position of the pilot burner in the swirl plate	<input checked="" type="checkbox"/>
If possible, check the thermal switch-off function of the pilot burner	<input checked="" type="checkbox"/>
3.4.16. Pressure switch	
Give heed to air-side contamination	<input checked="" type="checkbox"/>
Check for the established switching point with mechanical test equipment Pressure switch gas-minimum and raw-gas-minimum have been replaced by new pressure switch.	<input checked="" type="checkbox"/>
Check the switch-off function with the plant in operation	<input checked="" type="checkbox"/>
Check the remote reporting function	<input checked="" type="checkbox"/>
3.4.17. Hardware temperature switch (TS)	
Check the TS switch-off function	<input checked="" type="checkbox"/>
Check the displayed temperatures	<input checked="" type="checkbox"/>
Lead-seal HW switches	<input checked="" type="checkbox"/>
3.4.18. Regulators	
Check all position regulators with the mA transducer for range of control	
Mech. check the position regulators	
3.4.19. Other work tasks	
Check all safety signs and retrofit as necessary (on-site)	<input checked="" type="checkbox"/>
Check barriers	<input checked="" type="checkbox"/>
Check outer insulation	<input checked="" type="checkbox"/>

Inspection table for Thermal Reactor	In order		
	Not in order		
3.4.20. Safety position of the TR control valve			
Fresh air	OPEN		<input checked="" type="checkbox"/>
Burner 1	CLOSED		<input checked="" type="checkbox"/>
3.4.21. Safety position of the TR damper			
Raw gas 1	CLOSED		<input checked="" type="checkbox"/>
Raw gas 2	CLOSED		<input checked="" type="checkbox"/>
Raw gas 3	CLOSED		<input checked="" type="checkbox"/>
Clean gas 1	CLOSED		<input checked="" type="checkbox"/>
Clean gas 2	CLOSED		<input checked="" type="checkbox"/>
Clean gas 3	CLOSED		<input checked="" type="checkbox"/>
Purge air 1	CLOSED		<input checked="" type="checkbox"/>
Purge air 2	CLOSED		<input checked="" type="checkbox"/>
Purge air 3	CLOSED		<input checked="" type="checkbox"/>



Inspection table for Thermal Reactor

3.4.22. TR parameter list

mc	description	switch point				function		fault message	
		Target	Actual	i.O.	n.i.O	i.O	n.i.O	i.O	n.i.O
	Temperature switch ctrl. Cabinet+F2								
TO-U1	Temp. switch above bed 1	980 °C	982 °C	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
TO-U2	Temp. switch above bed 2	980 °C	981 °C	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
TO-U3	Temp. switch above bed 3	980 °C	987 °C	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
TU-U1	Temp. switch below bed 1	550 °C	551 °C	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
TU-U2	Temp. switch below bed 2	550 °C	550 °C	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
TU-U3	Temp. switch below bed 3	550 °C	554 °C	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
VA-U3	Temp.- in front of VA	300 °C	302 °C	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
	burner panel +P1								
VV-S1	Burner 1	80 °C	80 °C	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
	Pilot burner								
BS1-B1	pilot burner 1- gas	55 mbar	40 mbar	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			
BS1-B1	pilot burner 1- air	60 mbar	50 mbar	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			
	Main burner								
BS2-B1	gas pressure burner	92 mbar	94 mbar	<input checked="" type="checkbox"/>					
JSAV	cut-off pressure	300 mbar	298 mbar	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			
VSBV	blow-off pressure	110 mbar	108 mbar	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			



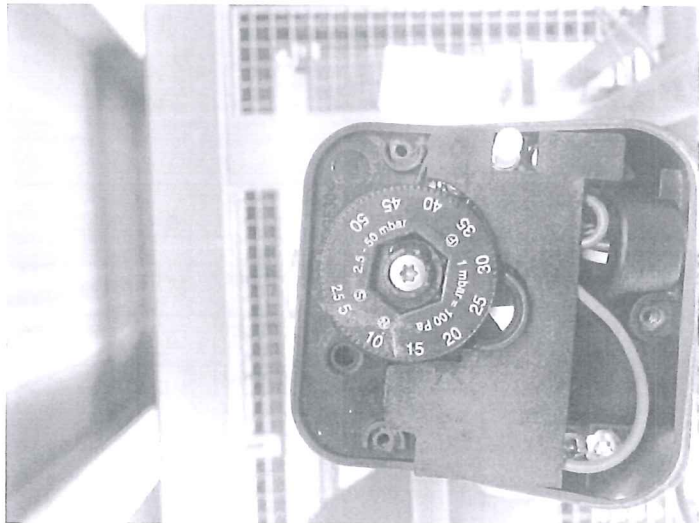
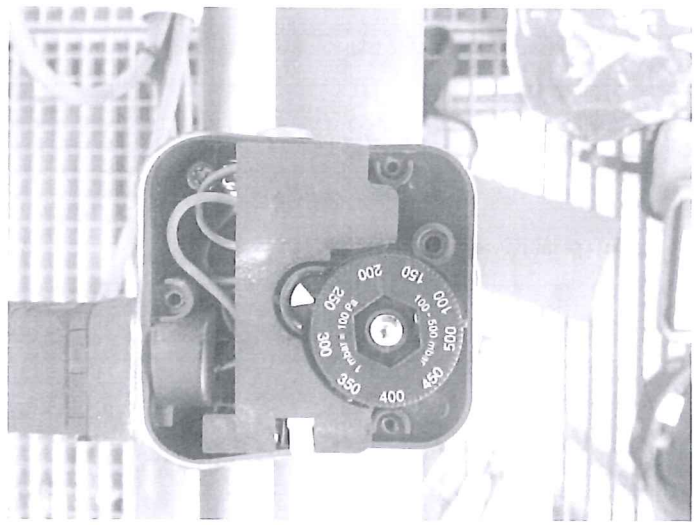
Inspection table for Thermal Reactor

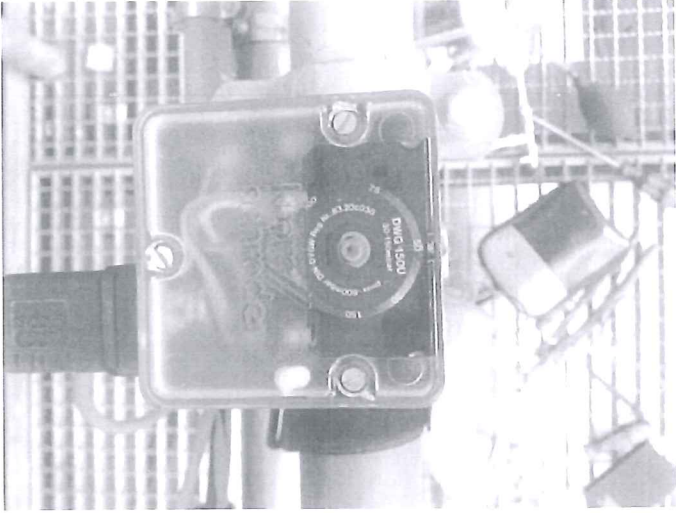


mc	description	switch point				Function		fault message	
		Target	Actual	i.O.	n.i.O	i.O	n.i.O	i.O	n.i.O
	Pressure switch								
RO-S1	raw gas (in front of TR) max Unterdruck	-30 mbar	-30 mbar	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
RO-S2	raw gas (in front of TR) min Überdruck	7 mbar	8 mbar	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
VA-S1	in front of exhaust air fan	100 mbar	90 mbar	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
VV-S2	combustion air	15 mbar	25 mbar	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
BS1-S4	leaking gas control	50 mbar	50 mbar	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
TB1-S1	pressure switch gas pressure max.	250 mbar	250 mbar	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
TB1-S2	pressure switch gas pressure min.	50 mbar	50 bar	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/> no fault indication
SL-S1	pressure switch gas pressure min.	5,5 bar	4,5 mbar	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	

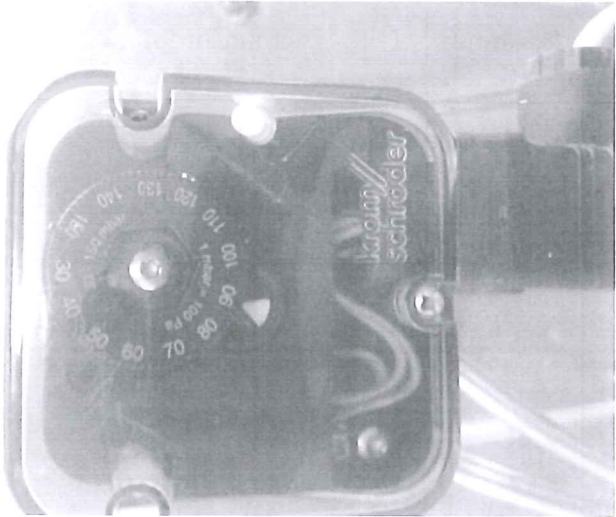
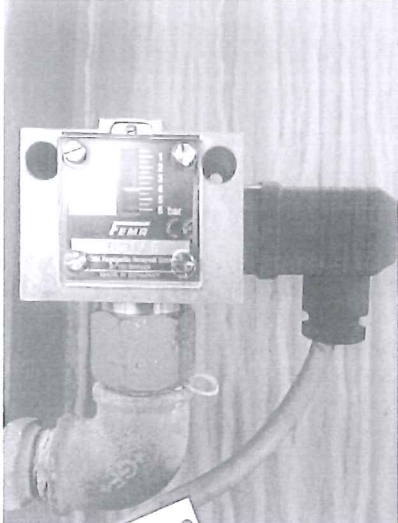
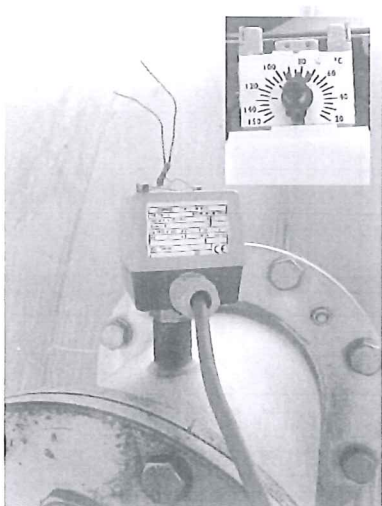
During preheating operations, all functions must be checked in the automatic mode
Location : I – 84091 Battipaglia plant operator: Mr. Stefano Saglia
Date: 03.05.2014 L&E Technical Service: Mr. Sebastian Ehlers

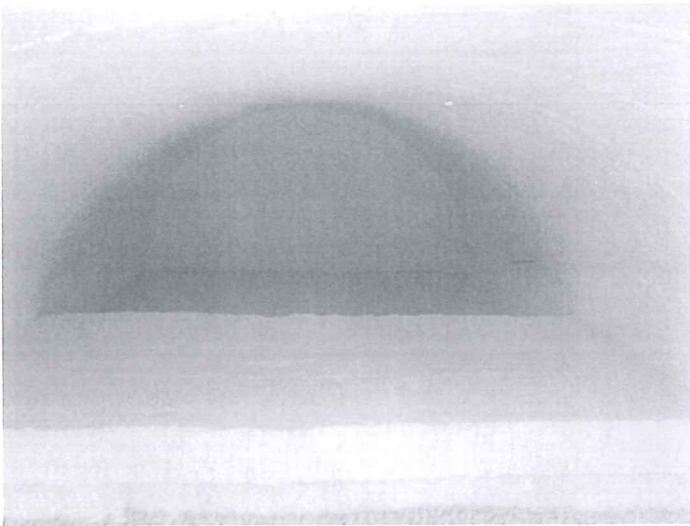
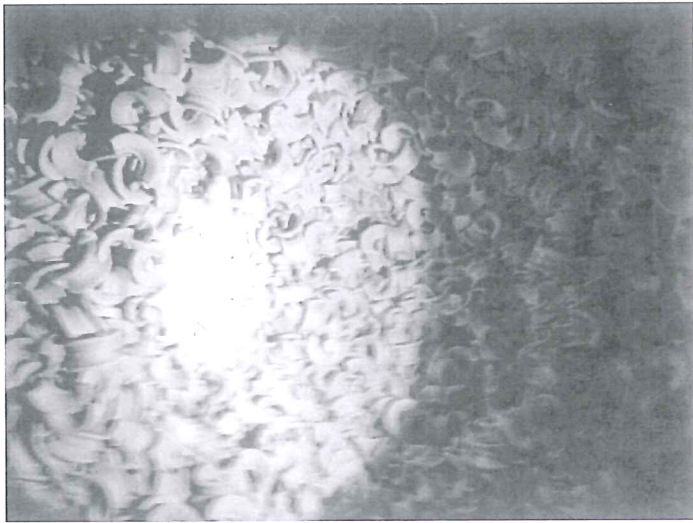
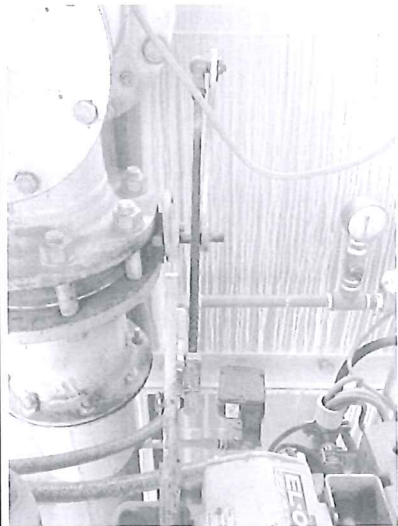
4. Plant pictures

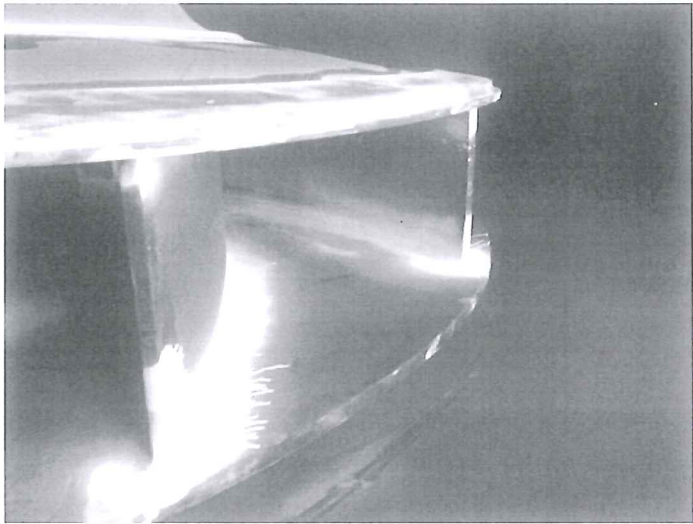
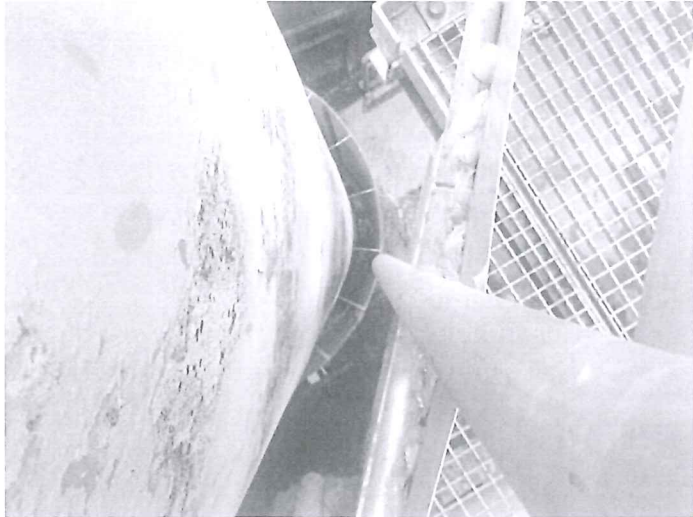
Above all, pictures should be made of damage, for example, to dampers, seals, insulation, etc.
 All relevant mechanical settings, such as gas damper rods, should be photographed.
 The pictures should be inserted into the inspection folder.

Component or condition	Picture
<p>Pressure switch, combustion air</p>	
<p>Pressure switch, gas max.</p>	

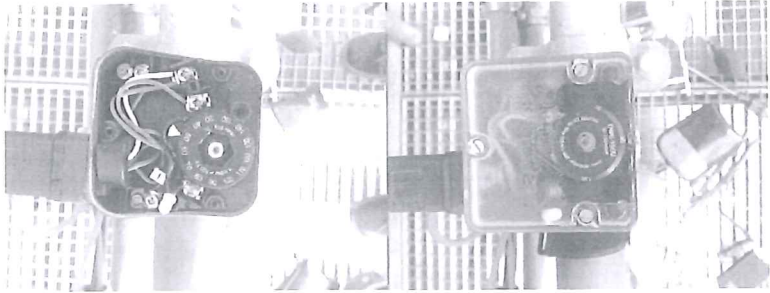
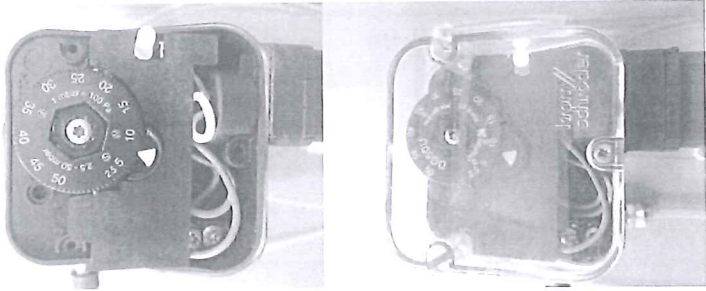
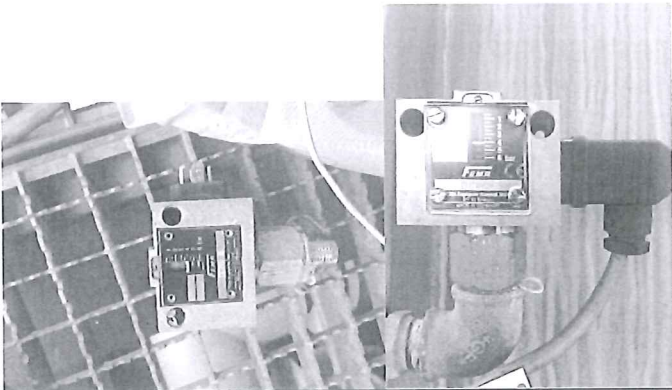
Component or condition	Picture
<p>Pressure switch, gas min.</p>	
<p>Pressure switch, raw gas max.</p>	
<p>Pressure switch, raw gas min.</p>	

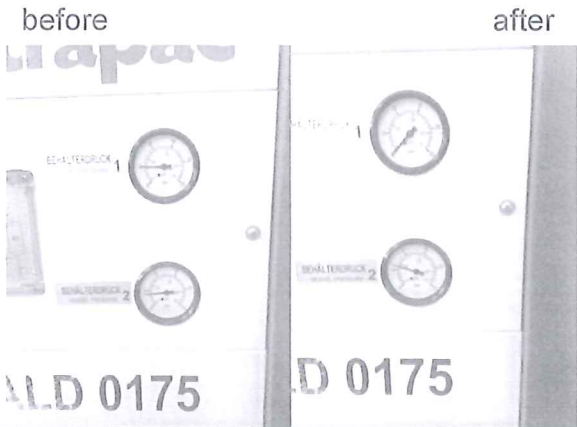
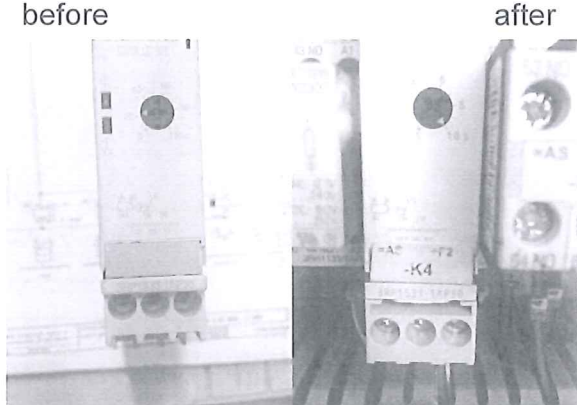
Component or condition	Picture
<p>Pressure switch in front of ALV (EA-fan)</p>	
<p>Pressure switch SL</p>	
<p>TS + PS</p>	

Component or condition	Picture
<p>Combustion chamber insulation</p> <p>with description „ok“ or „not ok“</p>	
<p>Storage mass</p> <p>should be dug approx. 40 cm deep</p>	
<p>Burner damper rods</p> <p>with all mech. safeguards</p>	

Component or condition	Picture
<p>ALV impeller</p> <p>include abnormalities in report</p>	
<p>Contamination or rust formation in the plant</p> <p>Main exhaust pipe painting need to be refreshed, corrosion is not on surface anymore!</p>	

5. Damage or repairs

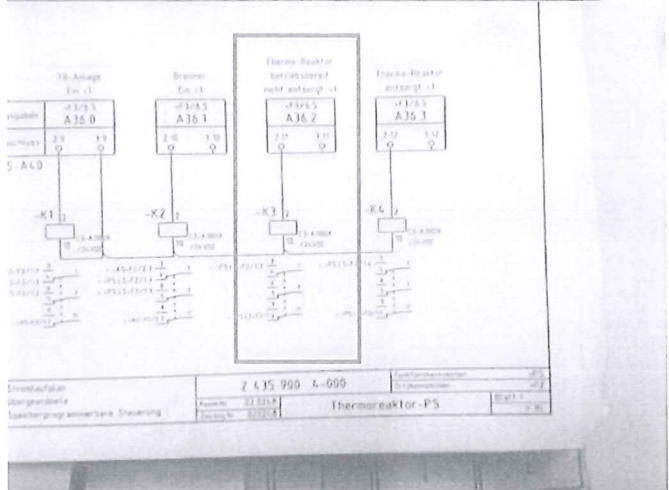
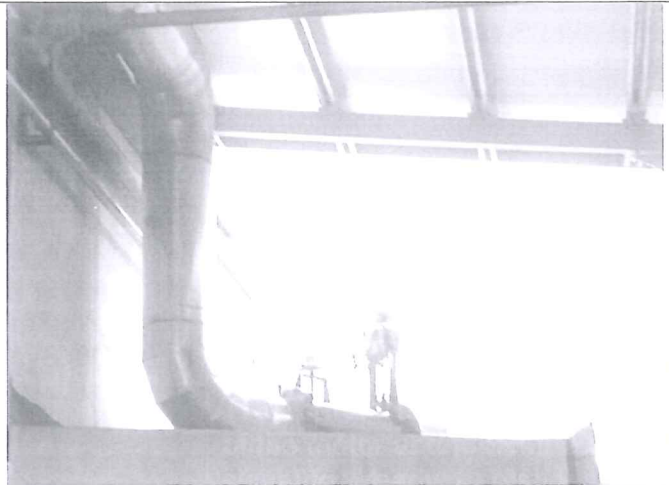
Component:	Pressure switch gas-min high hysteresis (20 mbar)	
Damage:	high hysteresis (20 mbar)	
Measure:	Replaced by a new one from L+E	
Picture:	before	after
		
Component:	Pressure switch rawgas-max	
Damage:	sticking contacts	
Measure:	exchanged with a pressure switch from Silgan White Cape	
Picture:	before	after
		
Component:	Pressure switch controll air	
Damage:	custom ordered change	
Measure:	exchanged with a pressure switch from L+E	
Picture:	before	after
		

Component:	adsorption filter for controll air
Damage:	leaky magnetic valve, only 4 bars after regeneration, resulting the TR shut down fourtimes.
Measure:	Maintenance repair the adsorption filter
Picture:	
Component:	Relay time delayed switch off =AS+F2-K4, Siemens, Type 3Rp1533-1AP30, 30 sec. delay
Damage:	Relay flaffs
Measure:	Maintenance changed against a relay with 10 sec., need to be changed against the 3Rp1533-1AP30 with 30 sec. delay,
Picture:	

6. Other remarks

New Flaps on the roof on the switch room. They block the way from mixing room 1+2 and washing machine to TR.

Initially the flap to TR was open, when current or control air is missing. The signal for driving was the output-signal "soiled valve for the fresh air flap power on". This is dangerous and soils the TR. Therefore we change the spin of the motor and taken the output-signal for "ready for disposal" (-PS+F3-A36.2).



During the purging of the thermo reactor system line 1 smoulders. The reason for the smouldering is a decrease of the controlled underpressure at the raw gas connecting point during purging of the thermo reactor. To solve this problem, we will install an offset to increase the frequency of exhaust air fan before the purging starts. The required SPS-element will be prepared and sent by mail.

