

# PILLARD NANOxFLAM ®.

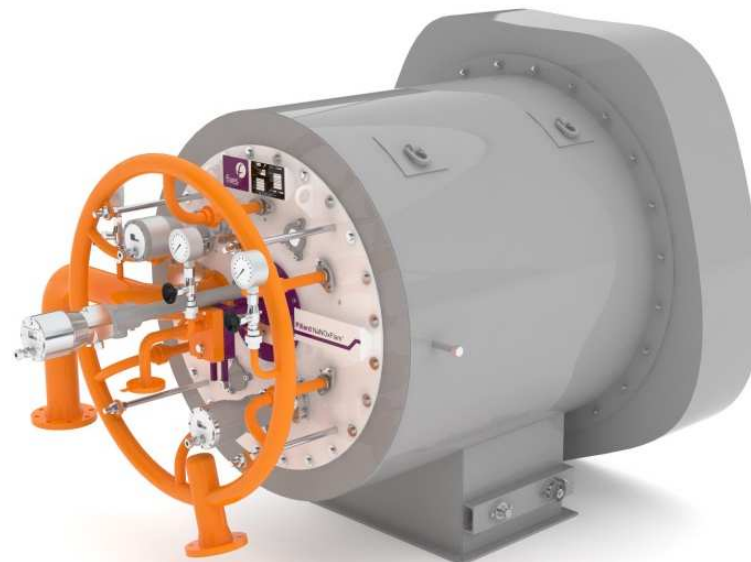
Best Burner ever !!



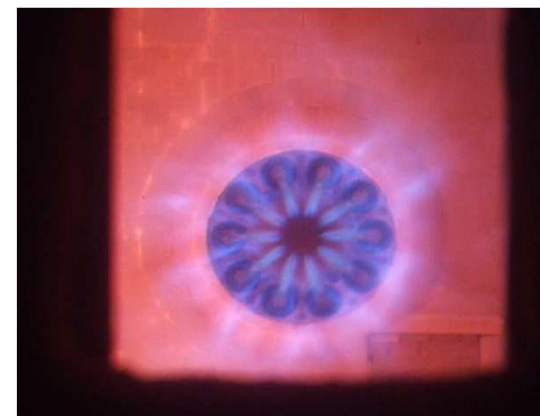
## What is Pillard NANOxFLAM?

**PILLARD NANOxFLAM<sup>®</sup> is the best burner ever for boilers**

➤ **Simple, sturdy and efficient design**



➤ **Beautiful compact natural gas flame**



## What is Pillard NANOXFLAM?

**PILLARD NANOXFLAM<sup>®</sup>** is a burner of 5 to 60 MWt for

- **WATER TUBE BOILERS**

Natural Gas firing with diesel oil as backup



- **FIRE TUBE BOILERS**

Natural Gas firing with diesel oil as backup



## History of Pillard NANOxFLAM

### PILLARD NANOxFLAM® is the best burner ever for boilers

- 2011 – Project start with definition of prototype with 3D model and Ansys simulation financed in part by ADEME.
- 2012/2013 – Experimental development through 5 MW prototypes mounted on a water-tube boiler and on a fire tube boiler in our Tests Center.
- 2014 – 11 MW industrial burner through an industrial partnership with Solvay valence France.
- 2014 – Very Good Results at Solvay valence plant
- 2015 – Burners standardization from 5 to 60 MWt.
- 2015 – First orders from Samsung South Korea.
- 2016 - Very Good Results at Samsung South Korea
- 2016 – Other order from CPCU Hospital Kremlin Bicêtre (Paris urban heating)
- 2016 The PILLARD NANOxFLAM® technology is registered as **best available techniques for Large Combustion Plants (Draft BREF 2016)**

## Main characteristics of Pillard NANOXFLAM?

# PILLARD NANOXFLAM® is the best burner ever for boilers

### ➤ EMISSIONS:

- NO<sub>x</sub> < 25 ppm @ 3% O<sub>2</sub> dry without FGR
- NO<sub>x</sub> < 10 ppm @ 3% O<sub>2</sub> dry with FGR
- CO < 12 ppm @ 3% O<sub>2</sub> dry

### ➤ NATURAL GAS with Diesel oil as backup

- fuel pressure same as standard burner
- PID same as standard burner

### ➤ EFFICIENCY

- Typical O<sub>2</sub> in flue gas 1.8% to 2.5%

### ➤ TURN DOWN :

- 1 to 6
- 1 to 8 (option)

### ➤ BOILER OPENING AND BURNER DIMENSIONS :

- Limited

### ➤ FLAME DIMENSIONS

- Similar a standard burner

Fives Pillard PATENT  
N°WO2014162074

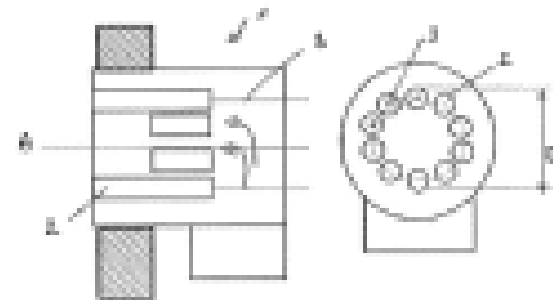


Figure 1

Figure 2

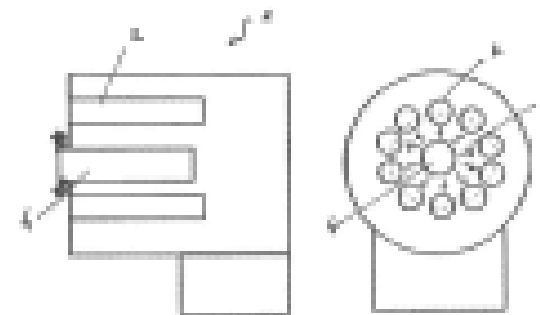


Figure 3

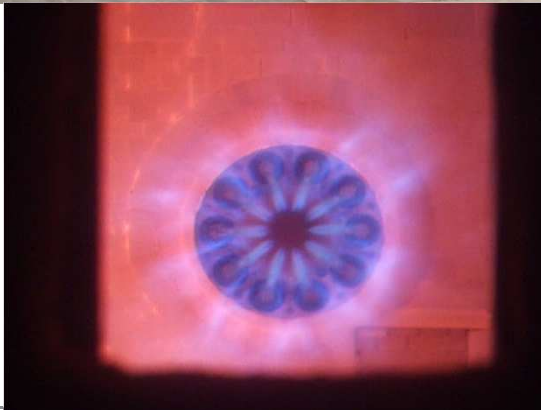
Figure 4

# EXPERIENCE RETURN 1

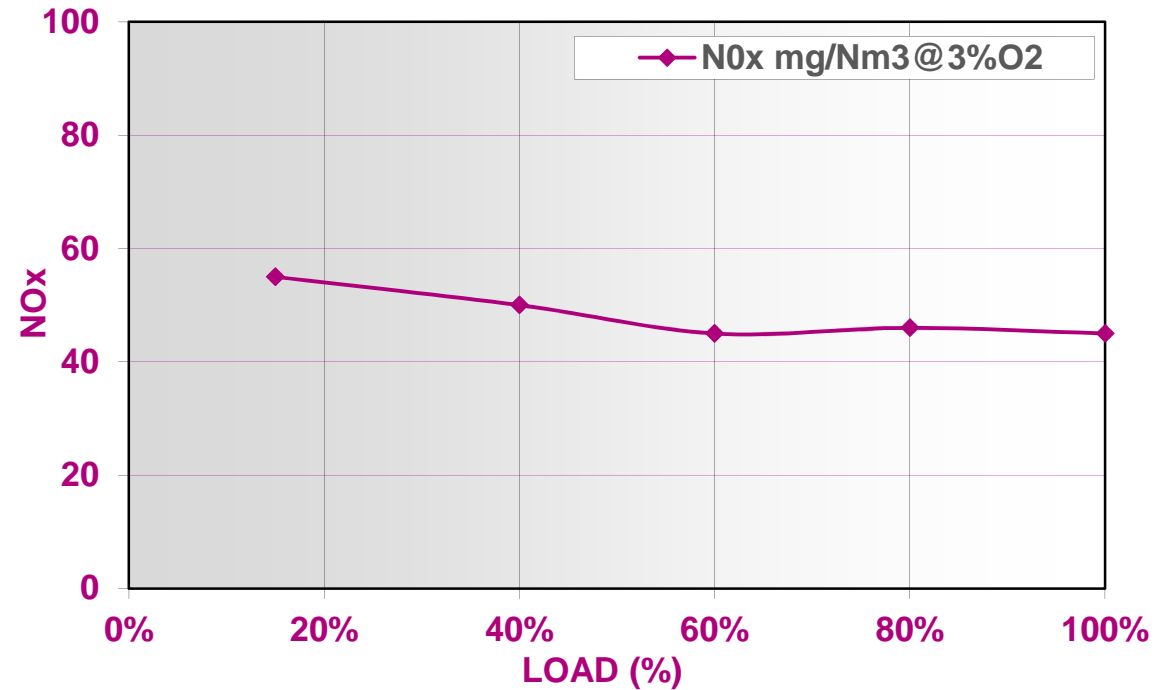
## PILLARD NANOxFLAM®



### 2014 FIRST INDUSTRIAL BURNER SOLVAY



Water tube boiler– 11 MW



**NOx < 25 ppm @ 3%O2 dry without FGR**

**CO < 12 ppm @ 3%O2**

**O<sub>2</sub> dry < 3,0%**

# EXPERIENCE RETURN 2 to 6

## PILLARD NANOxFLAM®

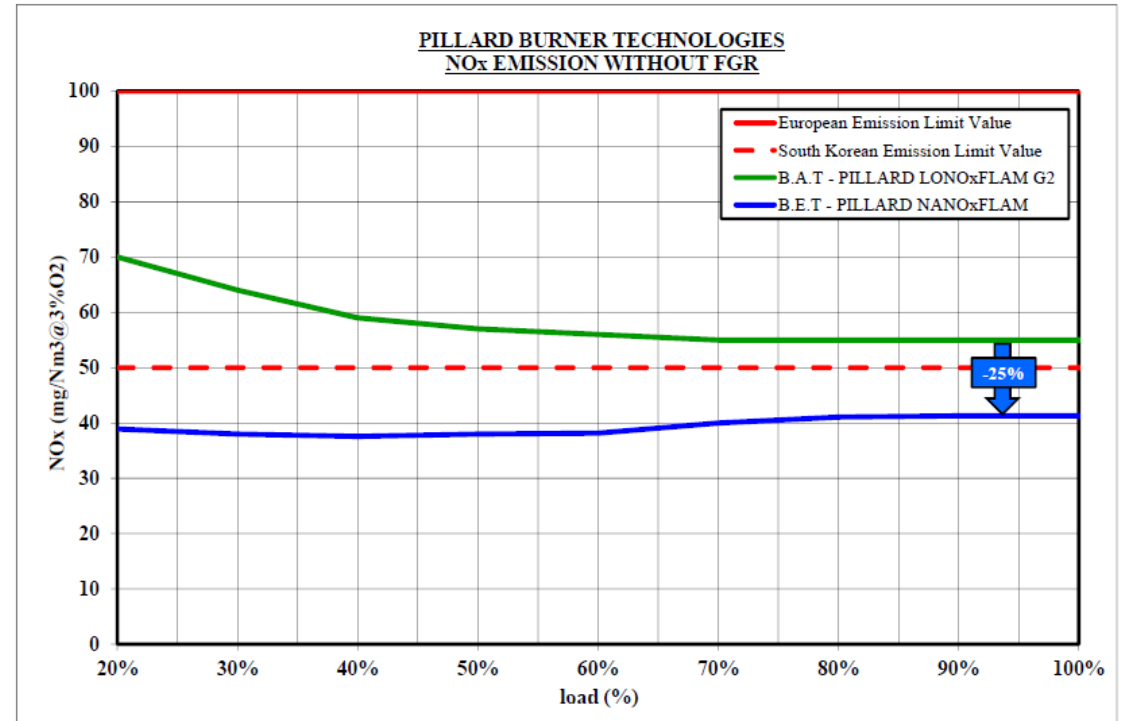


2014 -2016 Samsung 5 boilers in operation

- Design to cost
- High efficiency



1 Water tube boiler– 15 MW - Onyang  
4 water tube boiler– 32 MW - DC



NO<sub>x</sub> < 20 ppm @ 3%O<sub>2</sub> without FGR

CO < 12 ppm @ 3%O<sub>2</sub>

O<sub>2</sub> dry < 2,2%

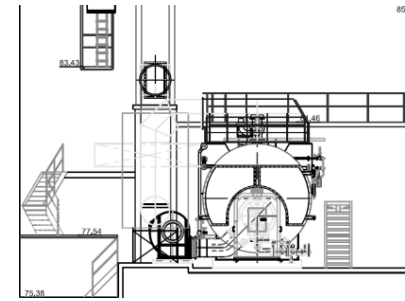
# PENDING EXPERIENCE RETURNS

## PILLARD NANOxFLAM®



### Commissioning for 2017:

- **CPCU (Paris district heating) Kremlin-Bicêtre :**  
1 x Water tube boiler 18 MW with turn down 1 to 120



- **Samsung Electronics :**  
1 x Water tube boiler 32 MW / NOx < 10 ppm @3%O2 « single digit » with FGR



- **W. Hamburger paper :** 2 x Fire tube boilers of 21 MW, each equipped with 2 NANOxFLAM® burner





**BE THE BEST, INNOVATE**



## **PILLARD NANOxFLAM® is the best burner ever for boilers**

- **SHOW EASILY THE ADVANCE and INNOVATION CAPACITY OF YOUR COMPANY WITH THIS SIMPLE SOLUTION.**
- **GIVE YOUR CUSTOMER AND OUR PLANET LOWER EMISSIONS FOR A BETTER LIFE WITH A BETTER EFFICIENCY.**
- **CUSTOMERS and PEOPLE WILL LOVE YOU FOR LONG TIME WITHOUT EFFORTS AND WITHOUT SPENDING LOT \$\$ !**
- **BE READY FOR THE FUTURE !**
- **TAKE THIS ADVANTAGE FOR YOUR COMPANY NOW !**

