

Industrial Solutions

polflame<sup>®</sup> VN

Clinkering zone burner

Difficult fuels  
made simple



thyssenkrupp



## Fuel as a cost factor

In the cement industry, fuels are an important cost factor. To reduce this factor, high-grade standard fossil fuels, such as coal, oil and gas are being replaced by lower quality substitute fuels. Whereas combustion in the precalciner is non-critical from a process-technological point of view, the thermal conversion of substitute fuels in the rotary kiln is a much more demanding process in which such criteria as process stability and product quality play a decisive role.



poliflame® burners are ideally suited to use with the standard fuels, namely coal dust, fuel oil and/or natural gas, as well as with substitute fuels.

# Custom-tailored Innovative Developed

We at thyssenkrupp Industrial Solutions have developed the polflame® VN, an innovative burner designed not only for grey/white cement manufacturing, but also for the minerals industry.

Whether you operate your kiln with standard or substitute fuels, or a combination of several fuels, the polflame® VN can be individually adjusted to the various fuel types. No matter whether the production capacity in question is less than 1,000 tonnes or more than 12,000 tonnes of clinker per day, polflame® VN clinkering zone burners can be implemented with thermal capacities from 10 MW to 300 MW.

The polflame® VN design allows you to react quickly to new requirements – such as clinker quality, short defined clinkering zones, a controlled temperature profile and coating-formation behaviour in the rotary kiln, as well as variations of raw meal and fuel – just by changing a few settings.

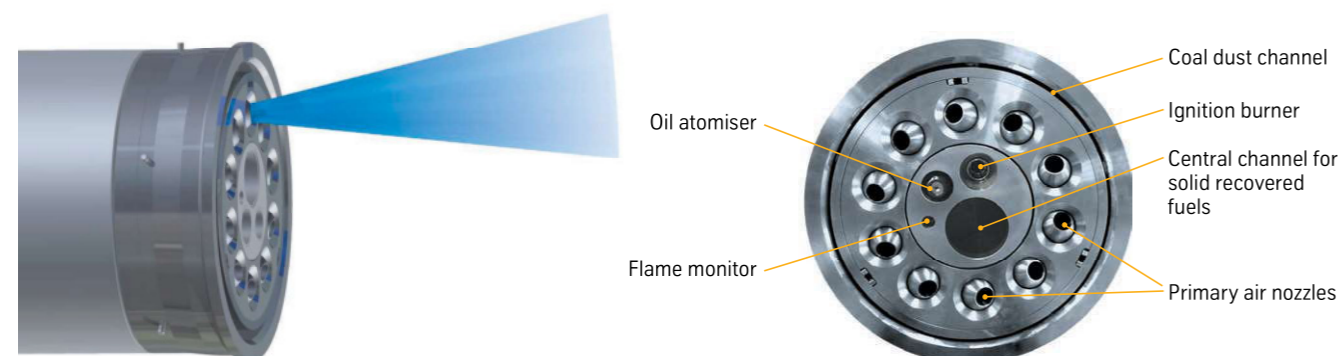
#### Primary air nozzles:

Thanks to concentrically arranged nozzles, the primary air is directly injected at the burner tip, into the combustion space. Primary air jets ensure that the hot secondary air is efficiently drawn in and that fuels and combustion air are optimally mixed. By means of the nozzles, which are continuously adjustable in swirl direction, it is possible to influence this effect and, thus, the inflammability and the burnout performance of the fuels.

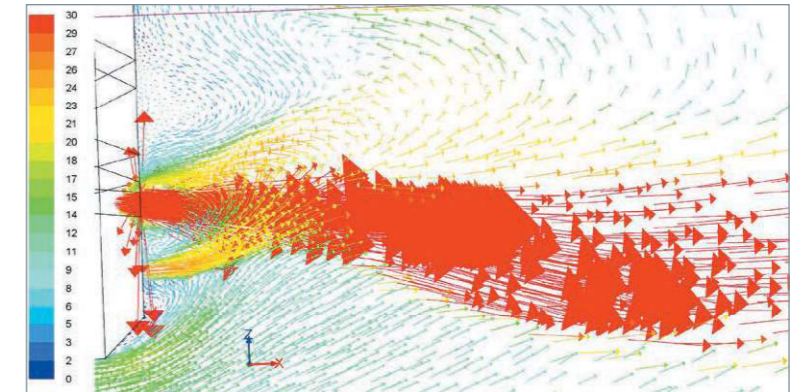
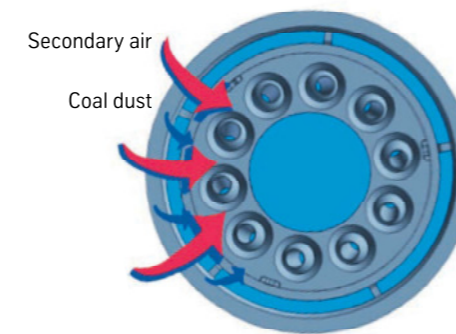
#### Coal dust channel:

During operation with coal, the fuel is injected into the combustion space via the outer channel at the burner tip. The coal comes into direct contact with the drawn-in hot secondary air and is mixed with it. This improves inflammability, especially in the case of coals that are difficult to ignite. The burner is cooled using conveying air. In the case of coal firing, it is possible to do without additional cooling air.

#### polflame® VN design



#### Effect produced by the nozzles



#### Substitute fuels:

Where solid recovered fuels are used, injection of the prepared fuel into the flame can take place either in the centre of the burner or from outside. In both cases, the primary air nozzles ensure optimum mixing of the substitute fuels with the standard fuels and the hot secondary air. In combination with coal, the effect of the outer coal dust channel described above also assists the inflammability of solid recovered fuels.

#### Centre:

In addition to the oil/gas injection point, the flame monitor (in the form of an optical sensor) and the ignition burner are also located in the centre of the burner (depending on requirements). Both components contribute to safe operation, particularly during starting-up of the kiln.

#### Burner setting:

As the primary air nozzle swirl increases, the mixing of fuel and hot combustion air is improved. This significantly shortens the reaction zone; the flame temperature increases and combustion intensifies. This is a decisive advantage in the case of slow-reacting fuels which are difficult to ignite, such as petroleum coke or entrainable substitute fuels (e.g. finely ground RDF).

## Advantages of the polflame® VN clinkering zone burner

Take a look at the list of impressive polflame® VN features:

- Easy operability
- Reproducible burner setting, thanks to patented nozzle adjustment system
- Long service life
- High injection performance, thanks to highly efficient primary air nozzles
- Significant influence on inflammability and burnout performance of the fuel, and thus on product quality
- High substitution rate – Reduction of costs for fossil fuels
- Short delivery time, thanks to modular design and a high level of standardisation

# Servicing and maintenance

## Maintenance and replacement:

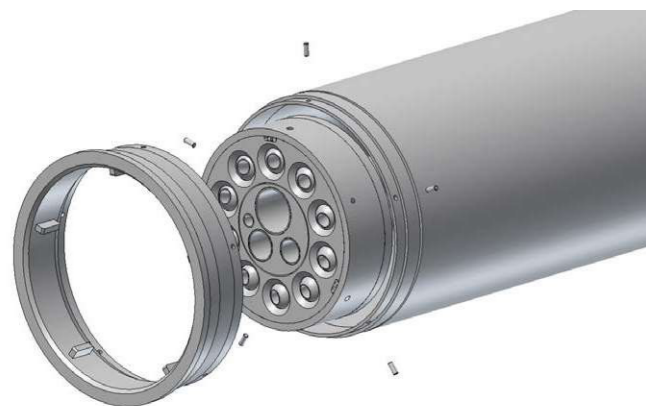
In the area of the coal dust connection, the coal dust channel is lined with wear-resistant material. The inlet zone can be inspected by opening the inspection cover, and the wear protection can be replaced if required.

Should requirements change with regard to, for example, burner capacity or fuels, the polflame® VN is designed such that the centre, the burner tip and the primary air nozzles can be easily adapted to the new conditions. Wear parts such as the outer burner tip can be replaced easily, and fuel lances can be retrofitted.

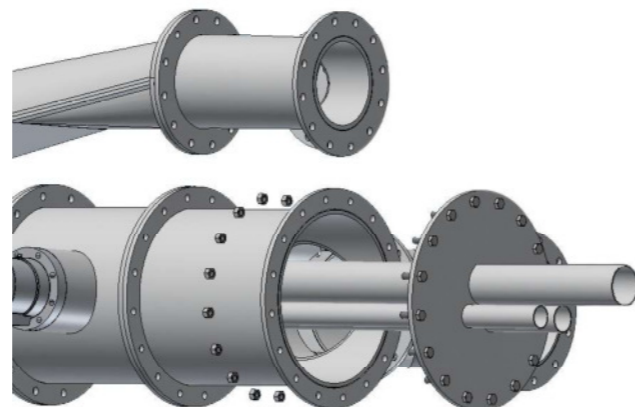
## Maintenance and replacement



Dismounted burner tip



Replaceable centre



# Components for the polflame® VN

thyssenkrupp Industrial Solutions supplies valve stations and burner operating valve stations suitable for gas, heavy oil and light oil – integrated with a fully automatic ignition device and a flame monitor. These components meet all safety-relevant requirements and comply with European standards.



Burner operating valve station/Valve station for oil

Thanks to our burner management system, you can check and monitor the firing system in the field or in the control room. This ensures safe burner operation in every situation.

We can supply all further burner system components or, via engineering services, can have them manufactured/procured locally:

- Burner support system (suspended or vertical)
- Primary air fan and cooling air fan
- Flexible connection of fuel and primary air



thyssenkrupp Industrial Solutions  
can assist you in all aspects of  
rotary kiln firing systems.

**Curious to find out more?  
Contact us:**

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