

SUCCESS STORY

➤ Polluted gases form during the artificial stone-making process, where ground stone is mixed with resin and other substances which provide suitable physical and decorative features.

The solvents in the polluted gases are adsorbed to the surface of the zeolite wheel and, later, released with a small blast of heated air, which heads to the thermal oxidation system to be cleaned. The regenerative thermal oxidation facility comprises 3 towers filled with ceramic material, which acts as a heat accumulator. The upper section of the towers contains an oxidation chamber with a burner.

It works in a cycle, such that each of the towers functions, in turn, as a gas heater, cooler or bleeder.

The energy required for oxidation comes from the contaminants present in the gases and the burning of natural gas in a modulating burner.

The unit has a hot by-pass to drain the excess energy supplied by the pollutants.

Likewise, the unit has a cleaning system (burn off) to prevent the ceramic blocks being clogged with condensates pulled in by the air.



INSTALLATIONS KALFRISA



COMMITMENT

➤ Kalfrisa has obtained the ISO 9001:2008 quality certificate for the design and provision of equipment, plants and technologies for heat recovery, air or gas heating, incineration, oxidation of volatile organic compounds (VOC) and industrial heating.

This certificate has been obtained as a result of the effort made by Kalfrisa to offer top quality service, implementing a working culture that is regulated by both internal and external quality standards.



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GAS CLEANING EQUIPMENT
Tailor-made solutions

CLEANING VOLATILE ORGANIC COMPOUNDS (VOC)



➤ The need to protect the environment has created concern amongst our society, which has been embodied in legislation on VOC emissions, which are applicable to a great many industries.

Thermal oxidation is a technique which comprises subjecting the polluted gases to a sufficiently high temperature to make the VOC oxidise. This enables a greater than 99% elimination efficiency rate.

Kalfrisa does the engineering and manufacturing for this kind of installation, offering comprehensive tailor-made solutions.

➤ Regenerative thermal oxidation



➤ Recuperative thermal oxidation



➤ ENERGY ASSESSMENT OF POLLUTANTS

Oxidation of the organic compounds present in the gas stream is an exothermic process whose energy can be recovered and used in the production process.

Sometimes liquid waste is generated that has a specific calorific value and can be treated in the thermal oxidation systems with the dual advantages of (a) being destroyed and (b) providing energy that can be used.

➤ APPLICATIONS

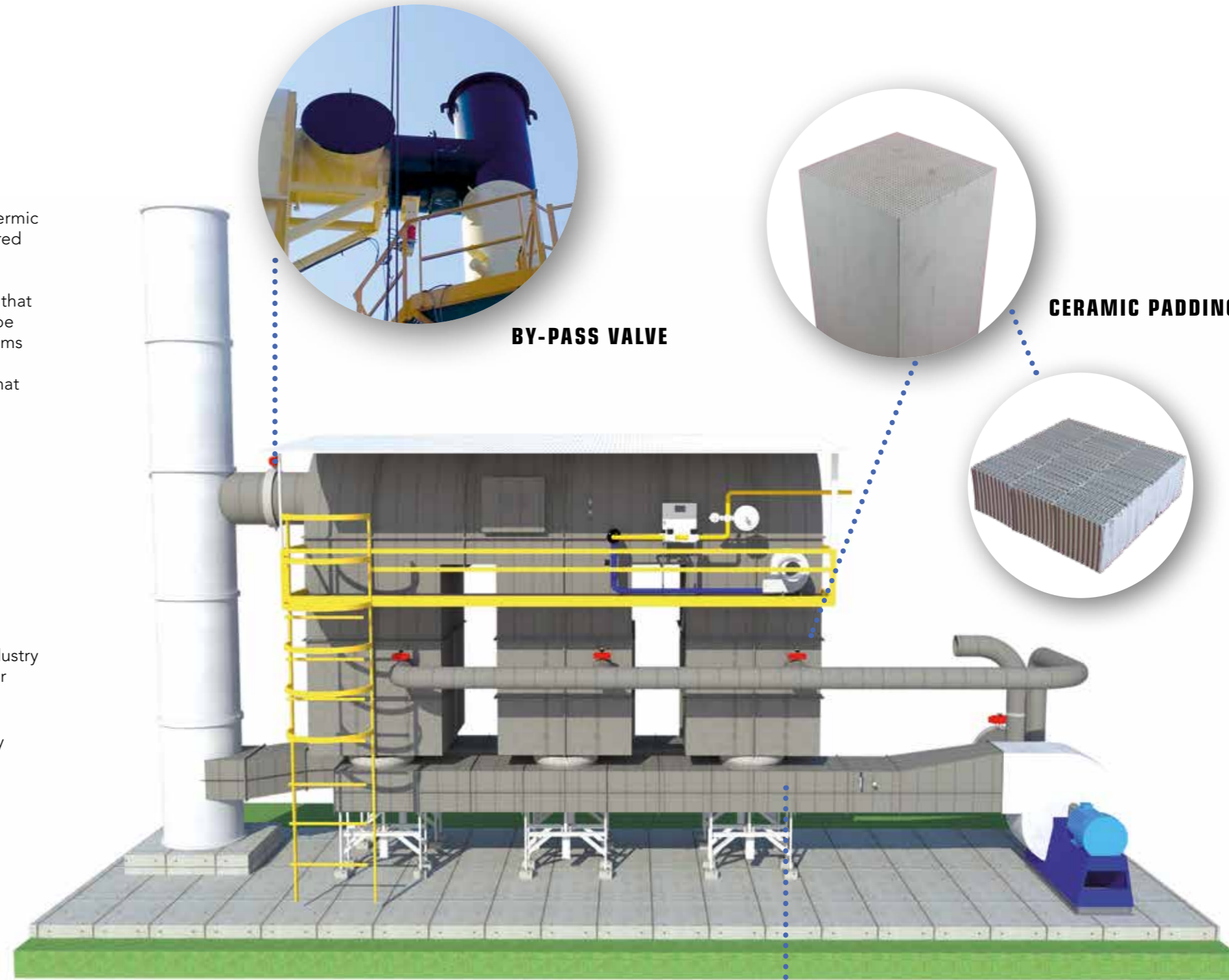
Thermal oxidation units can be used in a wide variety of sectors. Generally speaking, they can be used in any industry in which solvents or smells are used or generated. In particular:

- Graphic & Flexographic Industry
- Plating for metal surfaces
- Chemical industry
- Car industry



CHARACTERISTICS

- ❑ AD HOC DESIGN FOR EACH CASE.
- ❑ COMPREHENSIVE SERVICE.
- ❑ MAXIMUM ENERGY EFFICIENCY.
- ❑ IN-HOUSE CONSTRUCTION.
- ❑ HIGHLY RELIABLE FACILITIES.



➤ HEAT RECOVERY

High temperatures are required to purify gases using the thermal oxidation method, which means the heat needs to be recovered. This may be done in various ways:

- Heating water or thermal oil
- Steam generation
- Heating air to be used in the production process
- Pre-heating the gases which will be cleaned

Regenerative thermal oxidation is a specific example of pre-heating the gases to be cleaned, which uses ceramic heat accumulators. A heat recovery efficiency level of over 95% is achieved and the energy consumption required in the cleaning process is minimised - being nil for levels of contaminants over 1.7 g/Nm³ (called a self-heating system).

➤ DES AUTRES POLLUANTS

Sometimes other contaminants may be present, such as:

- Solid or liquid particles
- Sulphur dioxide (SO₂)
- Nitrogen oxides (NO_x)
- Halogen, acidic or alkali compounds

These compounds may be in the gas flow to be cleaned or may form during the organic compound oxidation process.

Kalfrisa studies and develops the best technology available for each individual case, supplementing their facilities with the necessary equipment.