



Hall 11.1 Stand D 022

Flare plants have an important share in emission protection and emission trading

Flare plants are an environment-friendly and economic solution for the disposal of polluting gas and exhaust gas flows. HAASE flares have an important share in the Kyoto objectives and are of great interest to the emission trade with CO₂ certificates. HAASE Energietechnik has been manufacturing flare plants for more than 25 years and has shaped with innovations the state-of-the-art in this field.

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Due to their capacity for the lasting reduction of harmful emissions, HAASE flares are splendidly suitable for the generation of CO₂ certificates. In principle this is valid for the entire product range of HAASE flare stacks. Thus the high-temperature flares are especially relevant for generating CO₂ certificates, as they have the highest emission reduction degree. The emission reduction has to be reported continuously in order to use the full potential for CO₂ certificates. For this purpose a suitable exhaust gas technology is installed on the flares.

Modern HAASE high-temperature flares are low-emission, energy optimised high-tech plants, which meet all requirements of the latest TA-Luft amendment dated 2002 and BImSchV as well as the stringent UK guideline and if so specific local requirements. Mainly they are ground flares with a total height between 4.5 and 10m and a combustion capacity between 1 MW and 27MW.

HAASE measuring equipment enables an automatic supervision and archiving of all relevant operation data. These data can also be sent by remote data transmission (HAASE Telecontrol). They can be interpreted and archived on a remote computer. It is also possible to operate the flare by remote control.

Flare stacks for emergency or continuous disposal of CO₂ relevant gas

In general flare plants are applied for the auxiliary or continuous combustion of polluting gases. Emergency flares serve as secondary gas recipient for high energy gases like sludge gas, marsh gas, landfill gas and biogas, in cases of downtimes of the primary gas recipient, e.g. maintenance of the CHP gas engine. Continuously operating flares are applied for the thermal exhaust gas purification, in order to dispose harmful exhaust air and exhaust gas flows resulting from industry.

Emergency flares for biogas are relatively easy to design. They are available with an open combustion (type LTO) or enclosed flame (type LTU) at approx. 800°C.

High-temperature combustion plants (type HT) for the continuous disposal have a defined, very high emission reduction degree and allow a thermal post-combustion for the decontamination and purification of toxic media mainly having an organic character. HT flares can be applied for the disposal of landfill gas, but also in order to dispose harmful exhaust air and exhaust gas flows resulting from industry.

HAASE flares combust hydrocarbon compounds like methane (CH_4) to water vapour and carbon dioxide at high temperatures. Thus the methane (CH_4), which amounts to half of the biogas volume and which is 21 times more harmful to climate than carbon dioxide, loses its extremely harmful effect to climate.

Flares, type HT, can be adjusted to temperatures from 850°C to 1,200°C. Due to the insulated combustion chamber, they do not release radiant heat and thus do not need any min. spacing to neighbouring buildings or plants. The innovative combustion technology with the option of several burner circuits enables the combustion of different gases with one single flare (control range 1:50). The combustion is low-noise and „invisible“ from outside.

Low energy gases like solvent steam that are not able to burn solely, are combusted by adding propane or natural gas. An autothermic combustion (without auxiliary gas) can be realised already for methane concentrations between 10 and 27 Vol% by means of heat recovery systems.

Example for a calculation of the proceeds:

A 10 MW landfill gas flare generates CO₂ certificates worth over 1Mio.€ per year

If a HT flare is applied for the disposal of landfill gas with 50Vol-% of CH_4 in order to generate CO₂ certificates, the calculation balances as follows:

A HT flare with a heat capacity of 10MW processes approx. 2,000m³/h of landfill gas which complies with 1,000m³/h of methane. 1 ton of methane complies with 21 tons of CO₂. Based on subject to a methane density of 0.72 kg/m³ this flare generates 128,520t/a of CO₂e.

Based on a receipt of 8€ per ton of CO₂e¹, this flare obtains a receipt of 1,028,160,€ per year.

¹ The receipt per ton CO₂e depends on the market situation and could be considerably higher.

Some application examples

- Cancer causing benzene exhaust air
High-temperature flare with 1MW, natural gas auxiliary firing, for the combustion from three metering matters at the same time (*year of construction 2007*)
- Ethylene oxide from the sterilisation of clinical devices
High-temperature flare for combustion > 850°C with propane auxiliary firing (*year of construction 2006*)
- Tank degassing flare (-> **Picture 1**)
Mobile high-temperature flare for flammable volatile gases from the loading in tank farms and from purifying refinery tanks, 5MW, 500 up to max. 3,000m³/h, combustion >850°C with propane auxiliary firing, stringent requirements acc. to TrbF20, certified by Germanischer Lloyd, innovative flare burner for changing heating values of the combustion gases minimises operation costs and emissions (*year of construction 2007*)
- High-temperature flare with heat recovery for liquefied petroleum gas
0.6MW; heat exchanger system for water heating from 70 to 90°C recovers 100kW (*year of construction 2006*)
- Flash gas flare
at the second largest natural gas storage in Central Europe, Austria; 3.2MW at 13m height, control range 10:1 (*year of construction 2007*)
- Sludge gas flare (-> **Picture 2**)
27MW, with two-stage burner and pilot burner for midget quantities (*year of construction 2007*)
- Landfill gas flare plant (-> **Picture 3**)
6 high-temperature flares on an English landfill site with a total combustion capacity of 60MW (*year of construction 2007*)
- Mobile landfill lean gas flare (hired flare)
for landfill gas resulting from an old landfill with methane contents between 10 and 60 Vol% 1,000°C, 1.8MW, control range 3:1, suction capacity 600-1,800m³/h

Safety

More than 1,000 reference projects with HAASE flare plants represent decade-long know-how and a high international quality standard. All HAASE flares say *safety first*. The plants comply with all requirements of the explosion protection guideline ATEX and the DVGW. A comprehensive quality assurance is guaranteed by the certification acc. to DIN EN ISO 9001:2000. The HAASE concept ensures safety beyond legal regulations. This is certified by independent experts like the German TÜV or Germanischer Lloyd.

More products by HAASE gas engineering experts

HAASE also produces the necessary booster stations including gas analysis equipment, as well as CHP plants and the VocsiBox[®] for the thermal disposal of exhaust air with energy contents from 0.4 to 10 Vol%. The latest product developed by the HAASE gas specialists ist the Biogas-Upgrader for processing biogas to biomethane with natural gas quality. HAASE experts set new standards in gas engineering in many countries all over the world.

HAASE experts on the Carbon Expo:

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Picture 1: Mobile high-temperature flare for the disposal of explosive mixtures from tank farms. The total combustion capacity amounts to 5MW with a suction capacity from 500 to 3,000m³/h



Picture 2: HAASE sludge gas flares Next to the flare operating since 2004 (left, 12,5MW), an additional flare was installed (right, 27MW). It is furnished with a two-stage burner and a pilot burner for midjet quantities



Picture 3: 6 landfill gas flares on Brogborough landfill site, England Total combustion capacity 100MW. The appending gas booster stations supply 27,6000m³/h of landfill gas