FLARE SYSTEMS

Organics offers a range of standard waste-gas flaring and utilisation technologies designed to meet a wide range of environmental requirements.

At the top end, the Organics SMART flare technology offers high-temperature, extended retention time combustion, combined with exhaust gas recycling to minimise NOx formation mechanisms.

The SC and MC Classes of flare are a basic tool for the combustion of landfill gas and biogas in Europe, the United States and Australia/ New Zealand. They provide varying degrees of environmental control to meet the varying standards of the countries involved and the environmental objectives of the end-user.

The AC Range provides a no-frills combustion tool for locations where stringent environmental controls do not apply or where relatively

PRODUCT RANGE

F01 AC Range flares

F01-1 US AC Range flares
Open elevated flame combustion systems

F02 SC Class flares

F02-1 US SC Class flares
Enclosed high-temperature combustion systems-0.3 sec retention time, 1000^{o}C

F03 MC Class flares
Enclosed high-temperature combustion systems-0.6 sec retention time, 1200^{o}C

F04 RB Class flares
Low height combustion systems to meet environmental standards

F05 SMART low NOx flares
Ultra-low emission flares

F06 LHC Range flares
Low calorific value gas combustion sytems

F07 Standard options for flare systems

F08 Industrial flares
Petro-chemical industry flares

F09 Mobile ground flares

F10 Machine Range flares
Basic flares for base-load duties

F11 Solar powered flares
Open and enclosed flares powered by solar energy

CE

QMS ISO 9001 REGISTERED FIRM

PROJECT ROUTE

All projects follow a similar administrative route from initial specification through to handover. Organics has developed a project delivery structure over many years that ensures reliable completion and quality control whilst maintaining specification requirements, and time-schedules.

SPECIFICATION

Establishing a clear statement of the design parameters is the first step in administration of an order. The Order Confirmation provides this statement and is drafted by the engineers of the Operations Department who will be responsible for the build.

DESIGN

Each manufacturing project is designed as a one-off project ensuring that details are fully addressed. Detailed manufacturing drawings are produced for all projects.

PROCUREMENT

The Procurement function takes full responsibility for maintaining delivery schedules. Their remit is from drawings and component specification through to all parts ready for final fit-out and commissioning.

MANUFACTURE

Manufacture may either be completed to “good engineering practice” or, where specifically requested, under the supervision of a Third Party Inspector, such as Lloyds. All welders are coded and manufacturing quality is high.

FIT-OUT

Fit-out may occur in our factory or on site, for larger installations. Fit-out work is completed by suitably qualified personnel, under the supervision of an Operations Department engineer.

COMMISSION AND HANDOVER

Commissioning is undertaken on site by the Technical Manager or a member of his staff. Established procedures are followed to ensure that equipment is fully operational at the point of handover.

SERVICE SUPPORT

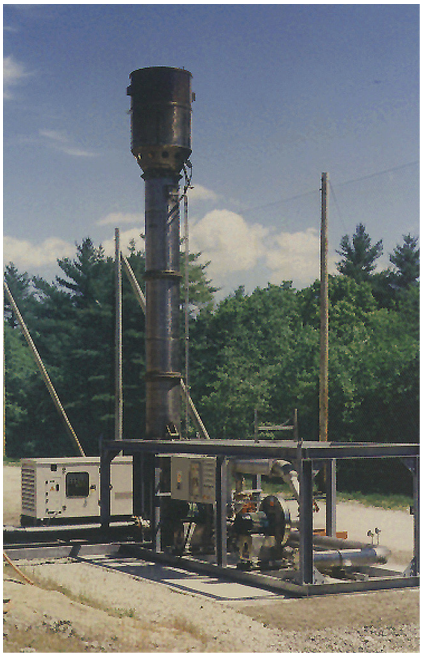
Following handover, responsibility fr equipment support passes to the Service Manager. This support can range from supply of spare parts and advice to regular servicing o complete operational management.

AC RANGE FLARES

The AC Range of open flare stack provides techniques that allow a degree of control over the combustion process in an elevated flame burner. The burner tip arrangement is based upon the principle of pre-aerated combustion giving the option of a short, sharp, non-luminous flame, as opposed to the yellow-tipped, long, lazy, flame typical of diffusion burners. In the latter system, air is mixed with the combustion gases after exiting the burner port. Flame temperatures are controlled in the range of 800 to 1,000^{O}C, depending upon the methane concentration, flow rate and prevailing wind conditions. The increased aeration reduces flame yellowing, which in turn reduces radiant heat, allowing a shorter flare without an increase in ground temperatures.

US AC RANGE FLARES

The US AC series of open (also referred to as candle or utility) flare stack has been designed specifically to meet the requirements of the North American market where tall burners are a preference. It provides a degree of control over the combustion process in an elevated flame burner. The burner tip arrangement is based upon the principle of pre-aerated combustion giving the option of a short, sharp, non-luminous flame, as opposed to the yellow-tipped long, lazy, flame typical of diffusion burners, in which air is mixed with the combustion gases after exiting the burner port. Flame temperatures are controlled in the range of 800 to 1,000^{O}C (1,500 to 1,800^{O}F).



SC CLASS FLARES

The SC (Standard Combustor) Class of flare stacks provides a realistically priced option to meet growing public concern about emissions from landfill gas flares. The key to the current technologically preferred solution is to raise the temperature of the combustion process to at least 1,000^{O}C and retain the combusted gases at this temperature for an extended period of time. This can only be achieved with an SC (or “enclosed”) type of flare unit which controls heat loss to the environment and holds the gases at the design temperature for a specified period, referred to as the “retention time”. Critical to a successful application of this approach to meet emission standards is control of the combustion air. This must provide homogenous conditions in the shroud, achieved by means of good mixing of fuel gas and combustion air within the combustion zone.

US SC RANGE FLARES

The US SC Class of flare stacks is designed and manufactured for use in the United States of America and locations around the world where US preferences are to be found. The principal facets of this approach are that the retention time is increased and the flame temperatures are in general somewhat lower. The Organics US SC Class flare maintains higher temperatures whilst increasing the retention time from a minimum of 0.3 seconds to a minimum of 0.6 seconds with a temperature of least 1,800^{O}F. Where ultra-low emissions are required lower flame temperatures are used.

RB CLASS FLARES

The RB Class flare stack is designed to offer low height, environmentally sound, combustion systems for use in locations where height restrictions apply.

The process is based upon an extended diameter flare shroud and increased flame distribution across the shroud cross-sectional area. With a lower heat-flux to area ratio it is possible to maintain elevated temperatures with extended retention times over a shorter combustion chamber.

A short shroud also gives a lower head for air inspiration, leading to the possibility of long, lazy diffusion flames. The Organics approach is to use a higher pressure at the burner to achieve the conditions required for turbulent diffusion flame combustion, thus avoiding the symptoms of lazy diffusion flames.

As with all landfill gas flaring equipment manufactured by Organics, the RB Class is designed for use in the open air.

Hazardous area zoning requires electrical equipment to be either Intrinsically Safe (IS) or to Zone II hazardous area standards. Where required, the plant can be built to Zone I standards, although this will not be necessary for a normal landfill environment.

Control panels are built with a 20% expansion factor to allow for the installation of additional control equipment.

LOW HEAT CONTENT FLARES

Interest in low methane flares for landfill gas first developed in the mid-1990s. Organics was the first company to develop such technology, with support from the UK Department of Trade and Industry, and is proud to see that the technical solutions developed by the company have been widely replicated in the landfill gas flare market.

Low heat content flares are required where a landfill site's gas production potential is in decline or where collection efficiency is low. Cases of the latter use include situations where migration control takes precedence over methane concentration.

BCW Range

The BCW Range of solar, wellhead mounted flares is designed for use in locations where an active landfill gas extraction system may not be practical and landfill gas combustion is required.

ACE Range

The ACE Range of solar flares is designed for situations where open flames will not be acceptable and power is not available to drive an active extraction gas feed to a flare.

The ACE flare is a high-quality solar powered gas flaring system that uses the power of the sun to maintain power within a battery pack.

KEY FEATURES

PROVEN EXPERIENCE IN FLARE DESIGN FOR LANDFILL GAS, BIOGAS AND STANDARD FUEL GASES FOR OVER MORE THAN 15 YEARS

EQUIPMENT PROVIDING MORE THAN 99% AVAILABILITY FOR COMPLETE COMBUSTION FACILITIES AND 99% FOR GAS PUMPING AND PROCESSING EQUIPMENT

TURNKEY DESIGN, MANUFACTURE AND INSTALLATION SERVICES AVAILABLE OR COMPONENT SUPPLY ONLY

FINANCE AVAILABLE THROUGH AFFILIATED COMPANIES FOR FINANCE AND OPERATE PROJECTS

OPERATION AND MAINTENANCE SERVICES PROVIDED

A ONE-STOP SOLUTION FOR A COMPLETE SERVICE RELATING TO THE COMBUSTION OF WASTE AND SURPLUS GASES

DATA SHEET ODSL00

SPECIFICATION DATA

Flow rates available:
50 to 15,000 cubic metres per day

Materials: Carbon steel, stainless steel and stainless steel alloys have been employed in a wide range of project specific applications

Pressure rise across gas booster:
60"WG (150 mbar)

Flame temperatures:
1,500 to 1800^{o}F (800 to 1000^{o}C)

Retention time:
Up to 0.6 secs

Minimum methane concentration for combustion to be sustained:
12%

Pipework finish:
Hot dip galvanised to industry standard, 304 ss, 316 ss

Burner material:
High temperature stainless steel

Flame arrestor:
On gas booster inlet and outlet

Flame detection:
Self-checking UV sensor

MC CLASS FLARES

The MC Class flare stack provides a combustion strategy which holds the gases at 1200^{o}C for the specified retention time. This takes to its realistic limit this method of emissions control from the combustion of landfill gas. Above this temperature NOx levels increase dramatically as a result of thermal NOx formation. The key to this form of technological solution is to raise the temperature of the combustion process to 1200^{o}C and retain the combustion gases at this temperature for an extended period of time.

This can only be achieved with a shrouded type of flare unit. Heat loss to the environment via the combustion chamber walls must be kept to the absolute minimum. The gases are held at the design temperature for a specified period within a combustion chamber of adequate volume.

The calculation required to correctly calculate retention time involves adding the volume of landfill gas with the volume of air necessary to achieve complete combustion and correcting for temperature. The stoichiometric, or ideal, mix of air and methane is approximately 10:1. In reality the imperfect mixing of combustion gases requires a greater volume of air. Typically the ratio may be closer to 25:1. It is the additional air which cools the flame and prevents excessively high temperatures from being attained.

Tight control of combustion air is, therefore, essential with this type of flare system.

SMART CLASS LOW EMISSION FLARES

The Organics SMART flare technology is intended for use in situations where there are concerns with emissions from landfill gas flares. The principal objective is to reduce exhaust gas concentrations of the oxides of nitrogen. The technology also ensures a thorough mixing of air and the fuel-gas in the combustion zone to minimise the formation of carbon monoxide.

When combined with extended retention times, SMART flare technology can deal with a wide array of toxic trace gases, producing Destruction and Removal Efficiencies in excess of 95% for most compounds.

A particular development of the techniques involved has led to thermal oxidisers that can destroy ammonia gas in large quantities without an increased NOx burden.

The basic technical principles involved in "SMART" flare technology are exhaust gas recycle and fuel-staging. These have the combined effect of reducing the intensity and heat of combustion, ensuring that air and fuel-gas are thoroughly mixed, and reducing free oxygen that may be taken up in the formation of NOx.

The separation of the combustion process into two zones permits the peak flame temperatures to be minimised. This, in turn, reduces the rate of formation of Thermal NOx, the primary source of nitrogen oxides in landfill gas flares.

Organics Limited

Sovereign Court II
University of Warwick Science Park
Coventry CV4 7EZ,
United Kingdom
T: +44 (0)2476 692141
F: +44 (0)2476 692238
E: comms@organics.co.uk
W: www.organics.co.uk