FLARE AND VENT TIPS
STRUCTURES
PILOT AND IGNITION SYSTEMS
ANCILLARY EQUIPMENT
GBA operates from three main locations: London, Milan and Houston to cover all world markets.

GBA are represented in most countries through a network of established and professional agents, duly selected to meet the high expectations of GBA and our Clients.

Please contact our offices to know which agent is applicable to your location.

www.gba.com
GBA Flare Systems is an internationally based supplier of flare equipment to the world’s Oil, Gas and Petrochemical Industries, upstream and downstream, offshore and onshore.

GBA products include flare tips, ignition systems, support structures and associated equipment for use at oil refineries, chemical plants, oil and gas production facilities, power stations and anywhere there is a need to dispose of large volumes of flammable gases quickly and safely.

GBA is staffed by committed personnel many of whom have lengthy track records in the flare industry and are acknowledged experts in this field.

With its own workshop GBA has 100% control of engineering and production of its equipment, thus meeting clients expectations for high quality and timely delivery.
The Tallest Order

To the right, the three 204m derrick supported demountable multi-flare systems installed at FINA in Antwerp remain the tallest flare structures in Europe and three of the tallest demountable flare stacks in the world.

Quality Assurance

All companies within the GBA group have Quality Management Systems certified to ISO 9001 which clearly demonstrates GBA’s commitment to the quality of its products and services.
ONSHORE AND OFFSHORE FLARE AND VENT TIPS

CSF High Pressure Sonic Flare Tips

The GBA CSF is a multi-nozzle sonic high pressure flare tip designed to give superior performance where low thermal radiation and smokeless combustion is required.

At the heart of the CSF is an advanced sonic nozzle which ejects the gas through a narrow annulus thus maximising gas/air contact and minimising mixing depth.

Flare Tip design for long life

GBA is aware that a long service life is essential in order to comfortably span the extended periods between shutdowns now commonly employed in the industry.

The use of windshields, careful selection of materials and their thickness, weld design/location and using velocity seals in all flare tips, result in long flare tip life.

For most applications the CSF flare tip is provided with multiple sonic nozzles in order to give the optimum flare tip performance in terms of lowest emitted radiation, shorter flame lengths & smokeless combustion. However, for less demanding applications a single nozzle version is available. Many CSF flares are supplied in an HP / LP configuration where an LP stream is discharged co-currently with the HP stream, this offers advantages in terms of reduced radiation & better smokeless performance over separate flare tips.
Cold Vent Tips

GBA can also supply sonic and sub-sonic vent tips and carbon dioxide snuffing systems. These are based on the proven equivalent flare tips and provide significant advantages in terms of excellent dispersion characteristics and low radiation in the event of ignition.

If the event of accidental ignition GBA can provide snuffing systems using CO2 injection to rapidly and safely extinguish the flame.

CSF-VS Variable Slot Flare Tips

Where low thermal radiation and smokeless combustion is required under high turndown conditions, the GBA CSF-VS variable slot sonic high pressure flare tip is the best solution.

With its unique ability to automatically vary the gas discharge slot width in response to changes in the flare gas flow rate, the CSF-VS flare tip adapts to a wide range of operating conditions providing smokeless operation from purge to maximum relief.

The CSF-VS tip is proven in many applications to provide a safe, flexible, effective solution to meet the modern operators requirement for a smoke-free flame without requiring any external utilities.

CAF Air Assisted Flare Tips

The GBA CAF range of flare tips is designed to provide for smokeless combustion of low-pressure heavy waste gases where no process steam is available.

This tip achieves clean combustion through the injection of primary air into the base of the flame with the help of an electrically driven fan located at grade.
GCT Steam Assisted Flare Tips

With its robust and flexible design the GBA GCT flare tip provides a good all-round solution for most low pressure smokeless flare applications, and it is routinely used in refineries and chemical plants where steam is readily available.

Smokeless combustion is achieved through an upper steam manifold feeding a set of injection nozzles located around the circumference of the tip. Steam is injected at high pressure directly into the flame. This is supplemented by a centre steam nozzle located within the tip body.

GCT-AJ High Capacity Low Noise Steam Assisted Flare Tips

The GCT-AJ flare tip offers maximum smokeless capacities with minimum noise impact. The GCT-AJ achieves this by using an advanced annular jet (AJ) inducer to inspirate large quantities of air into the root of the flame envelope via the multiple internal steam/air tubes. The AJ inducer not only entrains air very efficiently but also generates less noise than conventional steam jets. The noise signature is further reduced by using a composite noise shield to absorb and reflect the sound upwards and away from grade.
GBA have extensive experience covering a wide spectrum of special flare applications. The below list is a summary of some of the special flare solutions GBA can offer:

- Gas Assisted (GA) flare tips for smokeless combustion
- Gas Assisted (GA) flare tips for low calorific value gases
- Acid Gas Flare Tips (using exotic alloys)
- Water Assisted flare tips for both smokeless combustion and radiation reduction
- Ammonia Flares
- Staged Flare Systems
- Syngas / High Hydrogen Flares
- Cryogenic Flares (LNG Plants)
- Liquid Flares (Condensate and LNG/cryogenic)
- Burn Pit Flares
- 2-Phase Flares
- Crude Oil / Mud Burners

Flame stability is guaranteed under all wind conditions through the use of a series of flame retention lugs around the periphery of the tip and through the auxiliary stabilising effect of the purpose designed pilots. To further enhance its operating life the PF flare tip is provided with external wind deflectors, which eliminate the low pressure zone created on the downwind side of the flare and consequently minimise flame impingement.
Although GBA made its name by designing and building some of the world’s tallest flare structures, GBA has also built examples of every conceivable type of flare structure: free-standing derricks, guyed derricks, guyed risers (single and twin), self-support, offshore fully welded structures and multi-riser demountable structures.

GBA specialises in demountable flares where individual risers and tips can be dismounted for maintenance without affecting the operation of the remaining flares. Demountable flares are not only used for duty/stand-by configurations but also where it is required to group flares together to minimise the real-estate requirements of multiple separate stacks. GBA has grouped up to 8 risers together in a single structure and supplied up to 200m height.

If in doubt about the structure design for any application GBA can advise the optimum selection.
The GBA Enclosed Ground Flare provides concealed, low-noise, smokeless flaring of waste streams generally without the need for additional utilities such as steam or power. It achieves this by using the GFIN matrix burner in combination with advanced air management techniques & burner staging as appropriate. Thermal radiation emission is negligible enabling the EGF to be located close in or even within the plant it serves.
ANCILLARY EQUIPMENT

Water Seals and Knock-Out Drums

Water Seals
The Water Seal provides a positive means of flashback prevention in addition to causing the upstream system header to operate at a slight positive pressure at all times. This is especially of use when an elevated flare is used in combination with another flare or with a flare gas recovery system. The GBA Water Seal design incorporates advanced features to ensure smooth gas flow without pulsation. These features have been successfully retrofitted to existing equipment to solve pulsation problems.

Knock-out Drums
Knock-Out Drums are designed to effectively remove hydrocarbon liquids from the main relief gas to prevent the possibility of carryover and "flaming rain" from the flare tip.

Flare Steam Control

The automatic control of steam flow to a smokeless flare can be achieved by the use of a remote infrared sensor, which detects flame quality changes and provides the process variable signal for steam control allowing only the correct amount of steam necessary for the required smokeless capacity.

Alternatively ultrasonic flare gas mass flow meters can be employed to control the steam flow using algorithms incorporating the flare gas molecular weight.

Aircraft Warning Lights

GBA supplies state of the art LED based Aircraft Warning Lights that offer the prospect of never needing replacement/attention. These units are available in Medium and Low Intensity format. When conventional lights are used, GBA has developed a unique demounting system specifically designed for flare stack applications and which enables replacement from grade, without shutting down the flare.

Purge Minimisation

To prevent air ingress into the riser two types of seals can be provided: a Molecular Seal bolted below the flare tip or an Air Lock Seal (Velocity type) within the flare tip.

Molecular Seal
The Molecular Seal works by relying on the density difference between the purge gas and air. In this way only a very low continuous purge flow is necessary to maintain conditions within the seal. The Molecular Seal maintains safe conditions in the upstream riser for several hours in the event of a loss of purge gas.

Air Lock Seal
The Air Lock Seal (ALS) is a conical device located as an integral part of the flare tip. When a flare tip operates with very low flare gas flows, air will tend to enter the tip due to both wind action and by decantation and will slowly diffuse down the inside walls of the tip. The Air Lock Seal design locally increases the velocity of purge gas through the seal, thereby moving any air back out of the tip. GBA install Air Lock Seals in all flare tips to minimise purge gas consumption and maximise flare tip operating life.

LED Medium Intensity Obstacle Light (MIOL)

MS-48 and MS-20 Molecular Seals
Refinery, Thailand

Purification Plant, Saudi Arabia

Vertical Knock-out Drum
Refinery, Singapore
GBA Pilots and Ignition Systems

GBA flare pilots and ignition systems are designed to resist extreme weather conditions whilst minimising fuel gas consumption. GBA pilots are designed to meet the latest requirements specified in ISO 25457 (API 537).

Specifically, GBA have developed the LCHW pilot that has the lowest possible fuel consumption (1 Nm³/hr each) and is stable at windspeeds in excess of 150 mph (250 km/h). We also offer the GBA CHT-SS pilot, a continuously sparking unit that uses a side stream of flare gas as its fuel.

These advanced pilots use the CHT High Energy solid state ignition system to provide a reliable source of ignition.

GBA also supplies the well tried and tested Flame Front Generator (FFG) in both forced draft (uses compressed air) and natural draft (inspirates its own air) versions.

Pilot Sensing
GBA offers pilot sensing using the following techniques:
• Thermocouples
• Ionisation Rod
• Remote Infra-red

The key to the success of the CHT pilot is that the ignitor rod is continuously gas cooled.
The majority of GBA’s equipment is fabricated at our own manufacturing plant located in the north of Italy (Parma).

The GBA workshop, covering 15,500m², is almost completely dedicated to the production of flare systems and has a segregated stainless steel shop for the fabrication of flare tips and stainless steel components.

The factory has sufficient area to enable the trial assembly and fit-up of very large flare derrick structures and riser pipes.

Depending on workload & other factors GBA also employs other qualified & reputable fabricators around the world.

Our fabrication shop

GBA Construzioni is wholly owned by the GBA group of companies and operates a Quality Management System to ISO 9001. It holds approvals to PED, DIN 18800 and other major standards.
GBA’s client list is extensive and includes most of the world’s oil majors and also the world’s leading engineering contracting companies.

Here is a list of some of our clients:

**OPERATORS**
- ADCO
- ADNOC
- AGIP
- ANADARKO
- PETROLEUM
- ARAMCO
- BOROUGE
- BRITISH
- PETROLEUM
- CHEVRON
- CONOCO PHILLIPS
- DOW CHEMICAL
- EKB (ETZEL)
- ENI
- EXXON
- FINA
- GASCO
- GDF SUEZ
- HELLENIC
- PETROLEUM
- IBN ZAHR
- IPLOM
- KNPC
- KOC
- LUKOIL
- MAERSK OIL
- MOBIL OIL
- MOTOR OIL
- HELAS
- NESTE OIL
- NIGERIA LNG
- NIOC
- NORSK HYDRO
- ONGC
- PETROBEL
- PETRONAS
- PETROVIETNAM
- PHILLIPS
- POLIMERI
- EUROPA
- QATAR GAS
- QATAR
- PETROLEUM
- RAFFINERIA DI LIVORNO
- RASGAS
- REPSOL YPF
- SARAS
- SDAG
- SHELL
- SYRIAN GAS COMPANY
- SINGLE BUOY MOORINGS
- SONATRACH
- STATOIL
- TAMOIL
- TEXACO
- TOTAL
- TRACTEBEL GAS
- TUPRAS
- CW SINGAPORE
- DAEKWOO
- ENPPi
- FARAB
- FLUOR DANIEL
- FOSTER WHEELER
- GS E&C
- HOWE-BAKER
- HYUNDAI
- IHC GUSTO
- IOEC
- JACobs
- JGC
- CORPORATION
- KEYSTONE
- ENGINEERS
- LINDE
- M W KELLOGG
- MACDONALD ENG.
- MODEC
- MUSTANG ENG.
- OCEAN ENERGY
- OIEC
- PARAGON ENG.
- PARSONS
- INTERNATIONAL
- PDIL
- PETRO-MARINE INC.
- SADRA
- SAIPEM
- SAMSUNG
- SKEC
- SNAMPROGETTI
- STONE & WEBSTER
- TECNICAS
- REUNIDAS
- TECHNIP
- TECNIMONT
- THRONSON ENG.
- TRI-OCEAN
- WORLEY
- PARSONS
- W S NELSON