A world leader in flare and flare system applications
Advanced flare and flare system designs

UOP Callidus prides itself in providing economical high destruction efficiency, high smokeless, low noise, low radiation flares for a broad range of flare applications. Through our engineering expertise, manufacturing capabilities and worldwide service, UOP Callidus has become a leading provider of flare technology. The UOP Callidus team has hundreds of years of combined flare design experience and has been involved in the fabrication, installation, and startup of thousands of flare systems worldwide.

Quality Manufacturing
Our manufacturing facility complies with the highest quality standards in the industry. Many of our internal quality assurance programs require even higher performance standards than industry certifications. All proprietary items are fabricated at our 82,000 sq. ft. U.S. facility which uses the latest manufacturing techniques and equipment. We can proudly say that our U.S. facility has the ASME “U” stamp and NBIC “R” stamp. Our manufacturing techniques use state-of-the-art equipment and our employees are highly trained for their specialized tasks. For example, our welders are all qualified in accordance with ASME Section IX. Ongoing training is regularly scheduled through our research and development group to ensure that the highest level of quality and performance is maintained for each project. UOP Callidus quality assurance personnel thoroughly inspect each flare system prior to shipment reducing installation time. In addition, UOP Callidus project execution and manufacturing is certified ISO 9001:2008.

UOP Callidus has a flare to match your application
UOP Callidus offers a comprehensive array of flares and flare systems.

Our products include:
• Pipes Flares
• Steam Assisted Flares
• Air Assisted Flares
• Gas Assisted Flares
• HemisFlares
• Offshore Flares
• Low BTU Flares
• Portable Flares
• Pit Flares
• Totally Enclosed Ground Flares
• Multipoint Ground Flares

Our elevated flares can be supported by a number of different methods.

Support methods include:
• Tripod Supported
• Self Supported
• Guy Wire Supported
• Derrick Supported
• Demountable Derrick Supported
• Portable Trailer Mounted

UOP Callidus flares are available with a number of accessories.
Available accessories include:
• High Stability Pilots
• Velocity Seal
• Density Seal
• Knock-out Drum
• Liquid Seal Drum
• Aircraft Warning Lights
• Davit
• Flame / Smoke Monitor
• Flame Arrestor
• CCTV

Upper Steam Flares
The UOP Callidus CAL-US flare incorporates a highly stable pilot and flame retention system in conjunction with a high efficiency, low noise steam injection ring to produce stable smokeless combustion. The UOP Callidus upper steam nozzle is a unique investment casting to accomplish the function of inspirating air into the flame bundle with steam. The casting is aerodynamically designed to maximize efficiency as well as multi-ported to minimize noise production. This allows the user to minimize steam consumption while optimizing smokeless capacity.

Upper Steam Flares:
• Low noise steam ring
• Advanced nozzle casting design
• Superior manifold connection
• Smokeless burning
• Extremely stable pilots

Internal Steam Flares
The UOP Callidus CAL-IS flare is a dramatic improvement over the traditional internal steam design. This flare offers internal steam tubes manufactured with cast 310 SS segments at the top to prevent tube cracking and warping. To prevent vibration failure, UOP Callidus utilizes a proprietary tube support system. This system allows free thermal expansion of the inner tubes and minimal waste gas flow blockage while still constraining flare inner tube vibration. To improve air inspiration, each steam tube inlet is constructed of a true inlet venturi, maximizing air inspiration. CFD modeling was used to optimize tube placement and muffler design, resulting in maximum air flow into the combustion zone with minimum noise.

The UOP Callidus CAL-IS flare is the newest generation of efficient internal steam design. The steam nozzles used in this flare tip utilize a converging/diverging nozzle to maximize steam velocity, and therefore air inspiration. This is a significant improvement in flare technology and increases our steam efficiency and thus allows increased smokeless capacity. This flare tip design generates some of the lowest noise levels and highest smokeless capacities of any tip on the market.

Internal Steam Flares:
• Optimum tube density
• Superior manifold connection
• Low noise steam ring
• Very high smokeless capacity
• Extremely stable pilots

Air Assisted Flares
The UOP Callidus CAL-AA flare is an effective alternative to steam assisted smokeless flares, especially when steam is not available. The main advantages of our air assisted flare design over steam are:
• Operation in freezing climates
• Lower operating costs in desert areas where steam is expensive
• Smokeless operation where steam is not available

The UOP Callidus design locates the air blower near grade to allow “on-line” maintenance of the smoke suppression system. In addition, the continual flow of forced draft air cools the tip and prevents flame pull down in high wind conditions. This greatly extends the life of the tip.

Air Assisted Flares:
• Low maintenance
• Long service life
• Low operating costs
• No steam lines
• High smokeless capacity
• Low noise design available
• Online maintenance of smoke suppression equipment
• Extremely stable pilots
HemisFlare CFD Modeling

• High stability pilots
• Smokeless flaring
• Long service life
• Short rigid flame
• Light weight
• Low radiation over wide range

HemisFlares:
The UOP Callidus CAL-HF utilizes the Coanda effect in conjunction with a variable exit area principle to produce better air/fuel mixing, resulting in increased smokeless capacity and lower radiation. These flares have the ability to dispose of high molecular weight gases smokelessly at low pressures without the use of steam or expensive air induction equipment. These flares use stainless construction and CK-20 investment cast nozzles that operate well at low flow and low purge and components.

Totally Enclosed Ground Flares
The UOP Callidus CAL-TEGF was developed by UOP Callidus to burn flare gases with minimal environmental impact. The flame burns completely concealed from view with no smoke, low noise, reduced emissions, and no radiation at grade outside the combustor. This design is ideal for FPSO/FSO applications where constant flaring can occur. The CAL-TEGF flare utilizes a refractory lined combustor with highly efficient burners. Most equipment is located near grade for easy and online maintenance. Both forced draft and natural-draft systems are available. Our experience provides a one stop source for enclosed flares from vapor inlet to combustor stack. UOP Callidus enclosed flares are available completely skid mounted, pre-wired, pre-piped, and tested. Applications include truck, marine and rail car terminals, production onshore and offshore (FPSO), refineries, and petrochemical plants.

Totally Enclosed Ground Flares:
• Easy, on-line maintenance
• Turnkey systems including installation
• Skids 100% pre-wired, pre-piped, assembled and tested
• Flame finder technology
• Smokeless combustion
• Very low noise levels
• No radiation outside the combustor
• Reduced emissions

MultiPoint Ground Flares
The UOP Callidus CAL-MP flare system is the result of over 20 years of work in the development of multipoint flare designs. UOP Callidus’ superior burner system develops significantly higher surface to area relationships for the waste gas exit. This feature provides more air inspiration and greater turndown capability. Multipoint flares offer unlimited smokeless capacity and the lowest possible radiation. UOP Callidus MP burners are high quality stainless steel castings with thicker metal cross sections, longer life, better waste gas flow patterns, and lower internal pressure drops. These high quality castings also dramatically reduce the potential of cracking.

Multipoint Flares:
• Unique burner design provides high surface to area relationship
• Unlimited smokeless capacity
• Extremely stable pilots
• Easy maintenance-all equipment at grade
• Low radiation and no radiation designs available
• High quality investment cast stainless steel burner
• Infinite turndown staging system
• Extremely long life burners

Demountable Flare Systems
The CAL-DFS (Demountable Flare System) features a derrick with the risers mounted in such a way as to permit the lowering of the flare burner to grade for service without the use of a crane. Since the stack is lowered to grade, no personnel are required to climb the stack beyond the first riser length to perform needed maintenance. Flame systems with multiple risers allow service to be performed on all risers and flare burners except the one flare in service. This means flare maintenance can be performed safer without a plant wide shutdown saving time and money.

Demountable Flare Systems:
• Pivoting working platforms are designed for 360˚ access to the flare stack.
• Multiple risers allow flare tip to be maintained at grade while the flare system and plant remain in operation.
• Multiple risers allow for smaller plot space.
• Extra space on derrick may allow for the addition of risers for future expansion.
Flares designed to meet the application

Pipe Flares
The UOP Callidus CAL-PF incorporates several key design features which ensure a stable burning flare designed for long life and dependable service. The flare comes with a high stability flame retention system to ensure stable burning during all types of weather conditions. This feature also allows the use of smaller flares, greatly increasing flare life while also decreasing operating costs.

Pipe Flares:
• High stability flame retention system
• Extremely stable pilots
• Long service life
• Reliable pilot ignition systems
• Plug welded brackets

High Stability Pilots
UOP Callidus has developed an extremely stable pilot system that can survive hurricane wind conditions of over 125 mph with rainfalls over 12 inches per hour. The pilot system incorporates a windshield, strainer, and a true premix burner capable of firing in 0% oxygen environments at the pilot tip ensuring stable operation. The pilot gas tip, flame shield and thermocouple mounting well are all investment castings of CK-20 material, which is a casting version of 310SS. The castings metallurgy, the lack of forming stresses, and the metal thickness combine to make a long-lived pilot. In addition, UOP Callidus designers have selected a thermocouple placement to maximize response in all weather conditions, as well as minimize the exposure to direct flame. The stability, metallurgy, and thermocouple placement make the UOP Callidus pilot one of the most reliable pilots on the market.

Density Seal
UOP Callidus offers an advanced CAL-DS purge reduction labyrinth-type density seal. The UOP Callidus density seal design uses two 180° bends in the waste gas flow stream. Because the purge gas has a different density than air, lighter purge gas tends to collect in the upper end of the seal while heavier purge gas tends to collect at the bottom of the seal. The accumulated purge gas forms an effective barrier to air infiltration. At proper purge rates, oxygen levels below the density seal will be less than 0.1%.

The UOP Callidus density seal has several improved features not found in the industry standard labyrinth seal:

1) The unique internals of the UOP Callidus density seal are designed to support maximum flow with minimum pressure drop while still maintaining an adequate purge gas accumulation.

2) The UOP Callidus density seal is available with an industry-exclusive lower head rather than the standard flat plate or rolled cone. This results in a stronger, better draining density seal chamber.

Velocity Seal
UOP Callidus also offers a CAL-VS purge reduction velocity seal which is a less expensive option to the density seal design that uses more purge gas. At low gas flow rates, air will enter the flare tip through the top and tends to travel down the inside wall of the tip. The cone-shaped design of the velocity seal breaks the flow of air into the system by disrupting the flow attachment of air to the wall of the flare tip and creating a velocity differential barrier in the purge gas. Proper purge rates will ensure 6 to 8% oxygen below the seal.

Purge Reduction Devices
During normal operation, a flare stack is open to atmosphere in an unpurged flare system. It is possible for air to infiltrate the flare stack and mix with the hydrocarbons in the stack, resulting in a combustible mixture. In order to prevent this from happening, flare stacks are operated with continuous purge gas flow. The flow of the purge gas will sweep the oxygen from the stack, preventing combustion inside the flare stack. The purge gas can be any non-condensable oxygen free gas. Nitrogen and natural gas are the two most common purge gasses.

Our services include:
• Installation
• Guy wire tensioning
• Supervision and inspections
• Commissioning and start-up
• Servicing tuning and training
• Rental fleet
• Spare parts
Test Facility
The UOP Callidus test facility is in continual use for combustion technology research and development as well as customer witnessed demonstrations. Our array of test systems allows us to closely match actual field operating conditions, providing results which will more accurately predict actual measured performance.

Global Coverage
UOP Callidus reaches the global market through our headquarters located in Tulsa, Oklahoma, USA with regional direct sales offices and independent sales representation around the world. Meeting our customers’ expectations and setting the standards for the combustion industry have always been our company goals. Each burner, flare, thermal oxidizer and catalyst system we design and manufacture is built with those goals in mind.

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