

PERMIT APPLICATION FOR AUTHORIZATION TO OPERATE A FLARE

A separate application/ section is required for each flare in the facility unless they are identical

1. USE OF FLARE

- a) Indicate the number and type of flares (including emergency flares, if any) which are planned for the proposed plant.

- Normal Upset
 Emergency/ Power Failure Start-up
 Turnaround and shutdown Off-spec material

Number of Identical Flares: _____ Units

Flare ID: _____

- b) Provide a description of the design of the flare. The description should include details regarding
- Gas collection system.
 - Knock-out drum.
 - System to prevent flash back.
 - Ignition and flame detection systems.
 - Source of steam/ air.
 - Competing demands for steam/air under normal conditions and in emergencies.
 - Manufacturer's name and model number.

List the relevant section/ page numbers in the attachment

- c) Provide the following drawing

- Location of the flare

Drawing No. _____

- The flare header system presenting sources of materials to be flared

Drawing No. _____

- The knock-out drum

Drawing No. _____

- The flare tip

Drawing No. _____

2. INFORMATION ON THE FLARE

Please provide the following information to describe the flare:

| | |
|---|--|
| Type (elevated, ground flare, etc) | |
| Height above ground level (m) | |
| Effective release height (m) | |
| Flame length (m) | |
| Cross sectional area (m ²) | |
| Average design feed rate (kg/hr) | |
| Maximum design feed rate (kg/hr) | |
| Combustion Temperature (C ⁰) | |
| Destruction Removal efficiency (%) | |
| Exit Temperature (C ⁰) | |
| Air assistance feed rate (m ³ /hr) | |
| Steam assistance feed rate (kg/hr) | |
| Maximum smokeless design flow rate (kg/hr) | |
| Maximum exit velocity at the tip of flare (m/sec) | |

3. SUPPLEMENTARY FUEL

Please provide the following information on the supplementary fuel:

| | |
|---|--|
| Fuel type | |
| Use (start-up, shutdown, emergency, etc.) | |
| Average fuel feed rate (m ³ /hr) | |
| Max. fuel feed rate (m ³ /hr) | |
| Heat content | |
| Sulfur content | |
| H ₂ S content (g/dscm) | |
| Nitrogen content (wt%) | |

4. FLUIDS FLARED/ FLARING SCENARIOS

Please provide all process units / sources that are connected to the flare (*add additional lines if necessary*)

| Process / Source | Main Fluids Flared | Scenarios * | Frequency of Flaring (No of hrs/day) | Flaring Rate (kg/hr) |
|------------------|--------------------|-------------|--------------------------------------|----------------------|
| | | | | |
| | | | | |
| | | | | |

* Please fill all scenarios for flaring that may occur (normal, start-up, emergency, off-spec raw material or product, process upsets, power failure, etc.)

5. INFORMATION ON THE FLUIDS TO BE FLARED

Please provide information on the composition of fluids to be flared for each scenario

| Item | Scenarios | | | |
|--|-----------|---------------|----------|-----------|
| | Normal | Power Failure | Start-up | Shut-down |
| Name & Composition of Fluid* - Please specify each constituent in Wt% | | | | |
| Heat content (MJ/scm) | | | | |
| Max feed rate (kg/h) | | | | |
| Total heat release rate (kcal/sec) | | | | |
| Quantity of steam available (kg/h) | | | | |
| Quantity of air available (m ³ /h) | | | | |
| Excess air (%) | | | | |
| Combustion efficiency | | | | |
| Volume of flue gases (scm/sec) | | | | |

* Please include all hydrocarbons, S, H₂O, N, CO, CO₂, and inert gases.

6. RADIATION ISOPLETHS:

Please enclose radiation isopleths superimposed on facility layout and adjacent areas.

7. NOISE

Please indicate noise levels 100m from the center of the flare during:

| | Noise Level (dBA) |
|-----------|-------------------|
| Emergency | |
| Start-up | |

8. AIR POLLUTANTS

Complete the following table for all emission sources. For sources that are equipped with an emission control device, provide data after the emission control.

| Source | Unit ID | Pollutant | Max. Emission Rate (kg/hr) | Avg. Emission Rate (t/yr) | Emission Estimation Technique* |
|--------|---------|-----------|----------------------------|---------------------------|--------------------------------|
| | | | | | |
| | | | | | |
| | | | | | |

* Emission estimation must be based on one of the following

EF: Emission Factors

ST: Stack testing or monitoring

MB: Material Balance

EC: Engineering Calculation