

Questions and answers

Do you live near Dow Terneuzen? Then you've probably noticed the light and sound of our flares. We produce plastics and chemicals, and the flare is a very important safety component in this production process. For example, a flare is used to burn gases in a safe and environmentally responsible manner. We would like to tell you more about this important safety feature, so we have compiled a list of frequently asked questions. Is your question not listed? Please let us know via beneluxinfo@dow.com.

What do you need a cracker for?

Plastics and chemicals are made from the raw material Naphtha. This is a by-product of crude oil. An important chemical process for making plastics and chemicals is so-called 'steam cracking'. Cracking produces chemicals such as: ethylene, propylene, butadiene and benzene. These basic raw materials are used to make plastic products such as food packaging, toys and many applications in cars and homes.

How does a cracker work?

Naphtha is cracked to make plastics and chemicals. Naphtha is first heated with steam and led through pipes to the cracking furnaces. In these cracking furnaces, temperatures of over 1100°C are reached. This causes the long molecules to fall apart into short pieces and thus become 'cracked'. After cracking, the gases are cooled step by step. At each cooling step, the gases become liquid one by one. They are then separated and distilled. This leaves chemicals such as ethylene, propylene, butadiene and benzene. These are raw materials for making plastic products such as food packaging, coatings, insulation material and mattresses.

Why does Dow Terneuzen have flares?

All crackers in our industry are equipped with a flare as standard. This is the most important safety component of a cracker and thus indirectly of all factories. During the production process of plastics and chemicals, it may be necessary to flare. This may be in order to deal with a disruption to the production process or to (partially) start up or shut down the production process. For instance, before or after maintenance work. Residual mixtures of gas and air are then led to the flare for effective, safe and environmentally responsible burning.

What does the flare look like?

It is a large steel chimney of about 90 meters high, with a burner at the top. It is at a safe distance from the crackers and other factories on the Dow site. During flaring, gases are burned in the safest and most environmentally friendly way possible. During complete combustion, more than 99.5% of the gases are burned and what remains after combustion (carbon dioxide and water vapor) is released high into the atmosphere. This way, the emissions are dispersed and the environment suffers as little as possible. The flare is on standby 24/7, so it can always be used when needed.

When does Dow Terneuzen use the flare?

The flare is used as little as possible. There are four reasons why Dow Terneuzen uses the flare. When shutting down and starting up a factory, during process failures and when cleaning parts in the factory. Every 8 years we perform 'major maintenance' on 1 of the

crackers. This means that the entire installation is literally taken apart and every part is checked. Before you can do this, that installation must be shut down. Any remaining gases must then be flared. Once the maintenance is complete and the system is put back together, the cracker can be restarted. Just as a diesel engine must first warm up, the required temperatures and pressures must also be reached in the cracker during start-up. Until the product reaches the required quality and the production flows are balanced. In the meantime, products are produced that do not yet have the right qualities and are otherwise not useful. That gas is then safely flared. But even when the installation is in normal use, a flame may occasionally be seen.

Is flaring harmful to the environment?

Flaring is necessary to remove gases in a safe and environmentally friendly way. It is better for the environment to burn these gases, because by burning them completely, they will not be released into the atmosphere. So it is actually important that these gases are fully burned, resulting in carbon dioxide and water vapor. Just like burning gas from our gas stove.

With complete combustion, 99.5% of gases are burned. The gases that remain after combustion are also found in the emissions of, for example, a car.

The flare is part of the standard production process of the crackers and is the most important safety component. As Dow, we have an environmental permit for the use of these flares so that we comply with the legal obligations and standards. Naturally, we keep flaring to an absolute minimum.

Is there soot coming from the flare?

With every combustion process, including something like an open fire, soot can form. When flaring, you can avoid this by adding steam to optimize combustion. If a pilot flame is visible on the flare, the flare is burning without forming soot. In the event of a process disruption, for example, everything is geared towards ensuring complete combustion. When the flare is actively used from the standby position, soot formation may occur. The colleagues in the control room keep the flare under camera surveillance. They see immediately when there is soot formation (this means that at that moment, full combustion is not taking place yet), and can then adjust the steam supply to optimize combustion. In addition, we ensure that not too much steam is supplied in order to minimize noise pollution for the surrounding area.

Can you also store excess gases instead of burning them?

Safe storage of excess gases is not feasible. Major maintenance works, associated with large flaring activities, generally only occur once every three years. To store the gases that are then released, you would have to build a gigantic tank farm. That you could only use once every three years. Moreover, you can only store large quantities of gases properly after they have cooled to liquid. This process requires a great deal of energy, which is not justified from a sustainability, safety or economic point of view.

Isn't flaring just the easiest solution?

We keep flaring to an absolute minimum, because we want to minimize inconvenience to our surroundings and the environment. In addition, valuable raw materials are lost during flaring, which we also want to prevent.

Is Dow investing in the best available technology?

Dow continuously invests in new technology and innovative projects. Burning gases by flaring is still prescribed as the best available technology. No better alternative has yet been developed.

Who monitors Dow's flare operations?

As Dow, we have an environmental permit for flaring. This sets out the legal obligations and standards, and we adhere to them. In the case of planned flaring activities which could cause nuisance to the surrounding area, we report this in advance to the supervisory authorities. In addition, the emissions from flaring activities are reported annually to the Dutch government.

Why does the flare make noise?

It is important that the combustion of gases takes place in the best possible way. If this combustion is not optimal, soot can form. To minimize these soot emissions, we add steam during combustion. The addition of steam causes the typical, humming sound of the flare. The intensity of that sound itself depends on the amount of steam added to the flare as well as the weather conditions and wind direction.

How far can the flare be seen or heard?

That's hard to say and depends on various circumstances. These include weather conditions (fog, rain, wind direction and speed), the time of flaring and the degree of flaring. Flaring can sometimes be observed from Walcheren, Zuid-Beveland or the Belgian border.

Can't Dow just flare during the day?

We'd love to, but it's not technically possible. The production process runs 24/7. The flare is one of the most important safety systems and should therefore always be available. When the cracker starts up after maintenance, the flare comes on and stays on until the installation is perfectly tuned. Then it stays on standby. When flaring occurs during normal operations, there may be a technical malfunction or a process deviation. For safety's sake, it is important that we can intervene immediately, during the day but also at night.

What is Dow doing to reduce emissions?

The flare ensures that the gases are burned rather than emitted. Burning gases is less harmful to the environment than emitting them. Our goal is to keep flaring to a minimum.