

Wet scrubber

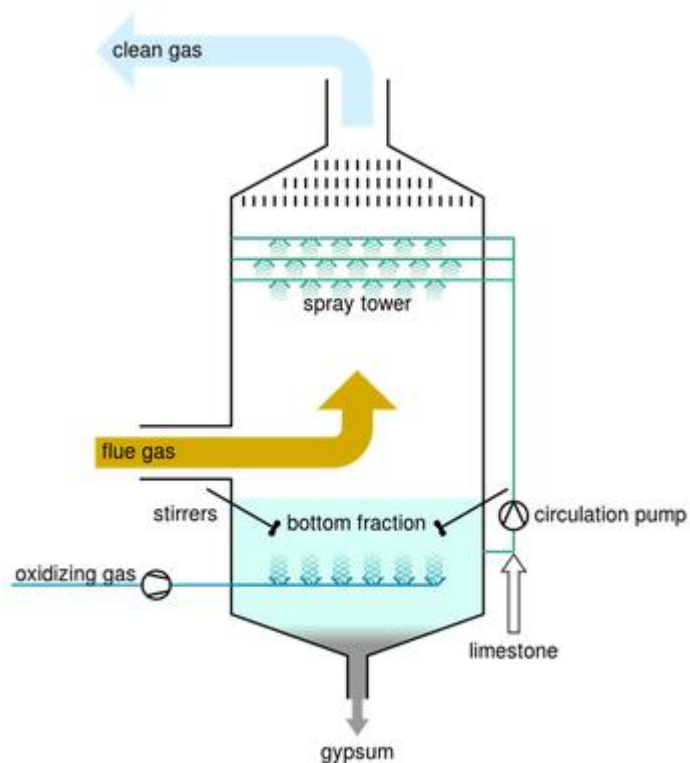


Figure 1. A diagram of a wet scrubber. This diagram shows a collection pool at the bottom where the waste [liquid](#) is drained off, and the misters at the top of the chamber where the liquid is misted onto the [exhaust gas](#) as it moves upwards.^[1]

A **wet scrubber** or **wet scrubber system** is one type of [scrubber](#) that is used to remove harmful materials from industrial exhaust [gases](#)—known as flue gas—before they are released into the [environment](#). It was the original type of scrubbing system, and utilizes a wet substance to remove [acidic](#) gases that contribute to [acid rain](#).^[2]

When using a wet scrubber, flue gas is funneled through an area and sprayed with a wet substance. [Water](#) is used when dust and [particulate matter](#) is to be removed, but other [chemicals](#) can be added.^[3] These chemicals are chosen to specifically react with certain airborne contaminants—generally acidic gases. This process adds significant amounts of [vapour](#) to the exhaust—which causes the release of exhaust that appears as white smoke when vented.

One reason for the development of [dry scrubbing](#) was because the sprayed water added considerable weight and volume to the waste, which led to difficulties in storing and disposing of the waste material.^[4]

Use

Wet scrubbers are a special device used to remove a variety of [pollutants](#) from exhaust gas from furnaces or other devices. These devices use a **scrubbing liquid** to remove the pollutants. The exhaust gas is moved through the scrubbing liquid (usually through a chamber) and the liquid is misted through the gas. Then, the gas emerges without the contaminants and pollutants that existed before exposure to the scrubbing liquid.^[4] When the gas is sprayed with the [fluid](#), the

heavier pollutants are pulled out of the gas and attach to the liquid because of its chemical composition. As the gas is passed through the cleaning mist, the contaminants are attracted to the mist and left behind.

Although misting is a common method of cleaning exhaust gas in wet scrubbing, a different design forces the gas to bubble through a pool of scrubbing fluid. The method for removing the contaminants is mostly the same, however, as the contaminants bind to the fluid as the gas is filtered through the pool.^[3] This leaves the gas clean as it comes out and leaves the contaminants in the pool.

Regardless of which method of introducing the scrubbing fluid is used, most wet scrubbers are similar in design. A typical scrubber is composed of ductwork and a fan system to force gas through its chambers. There is also a pump, and a collection area for used scrubbing liquid and some method to bring the used fluid away from the cleaned gas.^[3] The liquid sprayed through the exhaust collects at the bottom of the chamber where the spraying occurs. This liquid is funneled away and collected for specialized disposal because of the potentially harmful materials contained in it. This [liquid](#) cannot simply be thrown away or reused because of its chemical content.

These scrubbers are used frequently in manufacturing plants that process [propane](#) and other types of [natural gas](#).

Advantages and Disadvantages

There are advantages and disadvantages to the use of a wet scrubber. First and foremost, these scrubbers are beneficial as they prevent a wide range of pollutants from entering the air through the exhaust gas. Second, these units are fairly sturdy and can tolerate a wide range of temperatures, making them ideal for operation in almost any environment. Lastly, wet scrubbers can be used to remove a wide range of pollutants from [sulfur](#) to acidic gases that contribute to acid rain.^[5]

Despite the advantages, there are a few drawbacks. These machines require frequent maintenance, and they can suffer from corrosion quite severely. If maintained and vented properly, these machines can be used for many years before they require replacement.