

APPLICATIONS

The EUROCLAUS® process recovers elemental sulfur from H₂S-containing gases originating from gas treating and sour water stripper plants. The EUROCLAUS® process is an improvement of the SUPERCLAUS® process. Yields from 99.3 up to 99.5% overall sulfur recovery, without any further tail gas cleanup, are possible.

DESCRIPTION

The EUROCLAUS® process consists of a thermal stage followed by three or four catalytic reaction stages, with sulfur removed between stages by condensers. The final Claus reactor is filled with a layer of hydrogenation catalyst, followed by a reactor filled with selective oxidation catalyst.

In the thermal stage, the acid gas is burned with a sub-stoichiometric amount of controlled combustion air; the tail gas leaving the last Claus reaction typically contains 0.8-1.0 vol.% of H₂S and 100-200 ppmv SO₂. This low SO₂ content is obtained with a hydrogenation catalyst that converts SO₂ to H₂S in the bottom of the last Claus reactor. The selective oxidation catalyst in the final reactor oxidizes the H₂S to sulfur at an efficiency of more than 85%. Total sulfur recovery efficiency up to 99.3% can be obtained with three reactor stages, and up to 99.5% can be achieved with four stages.

OPERATING CONDITIONS

Three main principles are applied in operating the EUROCLAUS® process:

- » Operating the Claus plant with excess H₂S to suppress the SO₂ content in the Claus tail gas
- » Selective reduction of SO₂ to H₂S in the Claus process gas by means of a catalyst with hydrogenating properties
- » Selective oxidation of the remaining H₂S in the Claus tail gas by means of special catalyst which efficiently converts the remaining H₂S in the presence of water vapor and excess oxygen to elemental sulfur.

Other operating features that apply to Jacobs' Comprimo® Claus process, also apply to the EUROCLAUS® process. These include NH₃ destruction up to 30 vol.%, turndown ratios of 100-15%. Producing 99.9% pure bright yellow sulfur.

UTILITIES

Basis: 100 t/d, one Claus reactor, one Claus/reduction reactor, one selective oxidation reactor, 71 vol.% H₂S and 11 vol.% NH₃ feed gas, thermal incineration with heat recovery, and sulfur recovery of 99.3%.

		Consumption	Production
4 bar(g) steam	t/h	-	2.8
40 bar(g) steam	t/h	-	13.0
Pre-/Reheat 40 bar(g)	t/h	1.7	-
Electricity	kW	310	-
Fuel gas	t/h	0.29	-
Boiler feed water	t/h	16.5	-
Steam for plant heating	t/h	0.9	-

LICENSOR

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REFERENCES

Since the first commercial demonstration of the EUROCLAUS® process in 2000, more than 40 units have started up or are under construction. Units with a total production capacity of more than 14,200 t/d have been licensed.

FEATURES

- » Application in both new and existing plants
- » Selective oxidation catalyst as applied in the SUPERCLAUS® process
- » A final Claus reactor also containing hydrogenation catalyst
- » Sulfur recovery up to 99.5%
- » Long catalyst lifetime
- » Simple continuous operation
- » Low additional investment costs
- » NH₃ destruction
- » High turndown
- » High reliability - less than 1% unscheduled shutdown time

