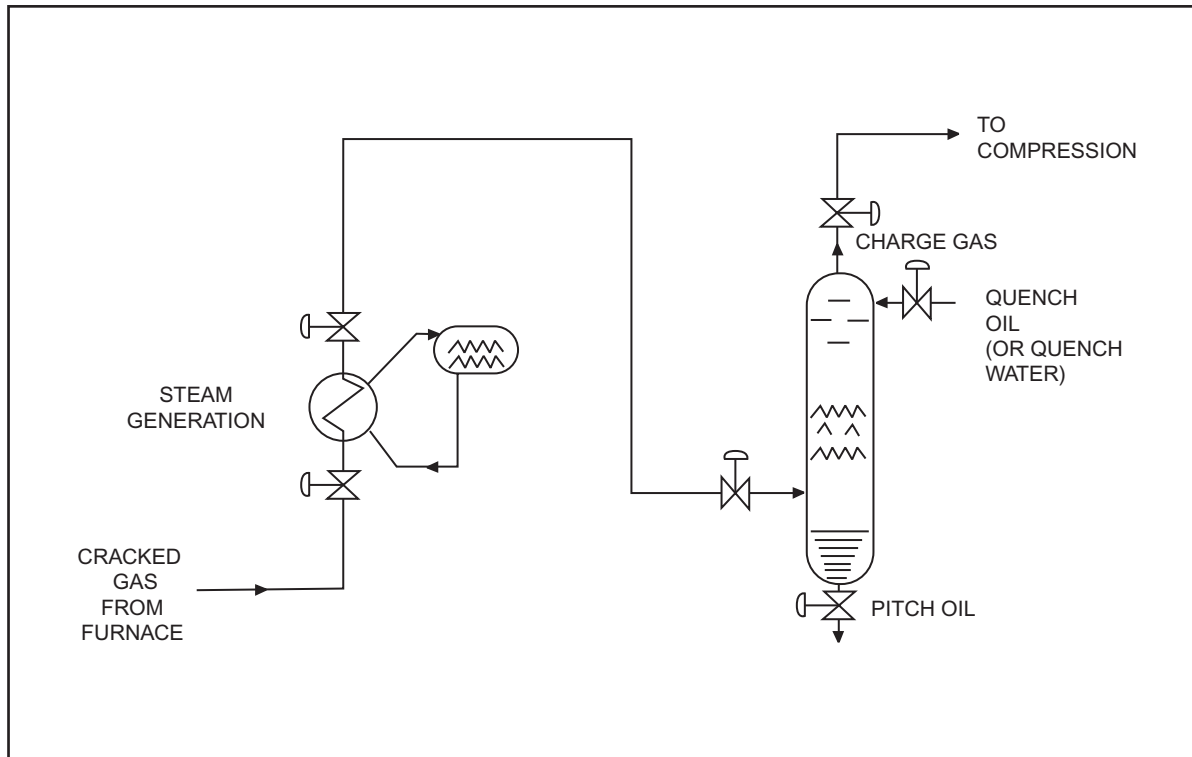


Quenching (ethylene)



Introduction

Quenching is the rapid cooling of any hot material (such as in metallurgy) or gas, as in the case of ethylene production. To obtain the optimum yield from the cracked gas, the exit gas is quickly cooled or quenched (to 550-600 °C / 1022-1112 °F). This quick cooling avoids the degradation of the olefins and therefore increases the yield of ethylene. It also avoids further coke formation.

The Process

The initial cooling is done by means of heat exchangers which produce high pressure steam (100-130 bar / 1450-1885 psi). This steam is recycled for use in the steam cracking process. Depending on the quality of the naphtha, this step may be reduced or eliminated, in order to reduce the temperature as quickly as possible for coke avoidance.

The secondary cooling is normally done by means of a quench oil, which is a heavy grade hydrocarbon. The quench oil also serves to remove coke particles from the cracked gas.

The cooling of the gases is of such importance that if the quench oil for cooling runs out, a quench water is available. This, however, is only used in emergency situations.

From the quench tower bottom, heavy oil, called pitch oil, is removed. Pitch oil contains coke particles and olefinic hydrocarbons, and has a tendency to polymerize. Normally this oil is pumped to the boilerhouse for burning.

Most of the valve applications in this area deal to some extent with slurry conditions.

Valve applications

Related application bulletin	Code	Issue
Pitch Oil Control	2722/02/01	3/03
Quench Water	2722/02/02	3/03
Quench Oil Circulation	2722/02/03	3/03

The information provided in this bulletin is advisory in nature, and is intended as a guideline only. For specific circumstances and more detailed information, please consult with your local automation expert at Metso.

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