For the calculation of maximum velocity and life time specialised computer programmes are available and should be employed.

If the available pressure drop allows, the velocity shall in general be sufficiently high to ensure homogeneous flow. This prevents un-stabilities due to liquid accumulations, and it allows simple pressure drop calculations. If lower velocities are required due to limited available pressure drop or at turndown situations, problems with slugging and/or liquid accumulation in the lines shall be considered.

6.5 Sizing of flare and vent lines

6.5.1 General

In general, all flare lines shall be designed to keep the $\rho V^2 < 200\,000$ kg/ms^2 criteria (where ρ is the fluid density or mixed density for two phase conditions in kg/m^3 and V is the velocity in m/s).

Further, the selection of piping specification shall consider the effect of acoustic fatigue, which is affected by factors such as

- relative differential pressure in upstream restriction device,
- temperature in the flowing gas,
- mole weight of flowing gas,
- pipe diameter and wall thickness,
- mass flow rate.

6.5.2 Flare headers and sub-headers

Piping for flare and sub-headers shall be designed for a maximum velocity of Mach 0,6.

6.5.3 Pressure safety valve lines

The upstream and downstream line shall be sized according to requirements in the relevant pressure relieving design code.

Maximum flowing velocity in the lines downstream of the PSVs to the first sub-header, shall in general be less than Mach 0,7. For the PSVs where the outlet velocity is higher, a reducer should be installed as close as possible to the PSV to increase line size and hence limit the velocity to maximum Mach 0,7 downstream of the reducer. Nevertheless, the actual back pressure at the PSV outlet and in the block valve shall be checked to be consistent with back pressure limitations.

6.5.4 Controlled flaring lines

Flaring lines downstream of control valves shall be designed for a maximum velocity of Mach 0,5.

6.5.5 Depressurisation lines

The maximum flowing velocity in the lines downstream the reducer shall be Mach 0,7.

The pressure loss shall not impose any restrictions on the depressurisation objectives.

6.5.6 Relief lines with slug/plug flow

For potential slug/plug flow, line sizing shall be based on slug velocity and slug density. These slug characteristics shall form the basis for stress calculations and design of piping support.

6.5.7 Vent lines

Maximum backpressure shall be 0,07 barg.