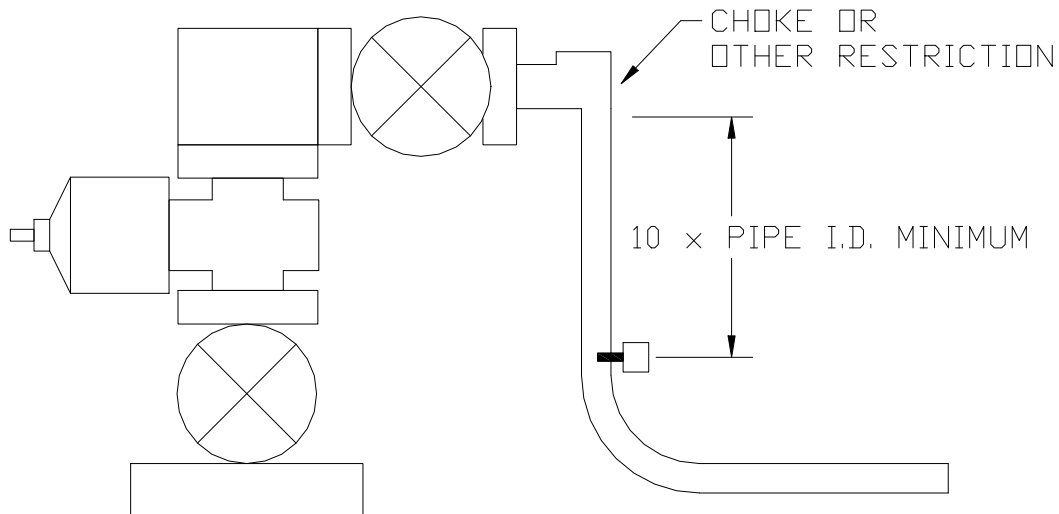


Factors for Proper Use of Sand Probe Elements

For Sand erosion probes to perform effectively, **two** factors must be taken into consideration.

1. The **placement** of the Probe

The Sand Erosion Probe must be placed in the area of Maximum Velocity. In most cases this is **approximately 10 pipe diameters, or an average of two (2) feet, downstream from a choke**. This will allow for maximum velocity to erode the probe and allow for turbulence to dampen and flow to be even all the way across the pipe. This location should be **before the first 90° turn in the flowline**.



The probe should also be placed in the flow stream so that the flow is 90° from the probe length.

1. The **selection** of the element.

There are three factors to consider in the selection of the sand erosion probe

Length

Material

Wall Thickness

Length

HLR Controls has developed a standard probe length for 2, 3, 4, 6, 8, and 10 Flowlines. Sand Probes ordered for these flowline sizes will fit all schedule pipe with a standard ½" NPT threaded weld-o-let.

HLR Controls should be contacted directly for any installation **not** using standard piping with a ½" NPT weld-o-let. These installations would include use of instrument blocks or other flanged applications.

Material

Maximum correlation of erosion data between flowlines and probes is achieved by installing a probe of the same material as the flowline. For standard installations, HLR Controls recommends the use of 7620 Series Sand Probes manufactured of 4140 alloy steel.

Applications that involve severe service conditions such as high temperature, high velocity, or high pressure require the use of HLR 7620MR Series Sand Probes. The 7620MR Series Sand Probes are machine of solid bar stock 410 stainless steel.

In addition to 4140 alloy steel and 410 stainless steel, HLR Controls also manufactures probes in the following materials:

4140 “DD” Trim - same as 4140 but heat tempered and quenched for sour oil and gas

410 “FF” Trim - same as 410 SS but heat tempered and quenched for sour oil and gas, and corrosion service.

316 Stainless Steel - good for sour oil and gas in the annealed condition with RHC of 22 or less.

Duplex Stainless Steel - good for sour oil and gas and corrosion service

Wall Thickness

Since several probes may fail before the piping must be repaired, greater accuracy can be obtained with a greater number of probes between overhauls. This means the probe wall needs to be thin.

The limit on how thin the wall can be is the amount of pressure that must be held. If the wall is too thin, the tube will collapse from external pressure.

HLR Part Number	Operating Pressure	Collapse Pressure
HLR 7620-pipe size-025	400 - 1,000 PSI	8,076 PSI
HLR 7620-pipe size-035	1,000 - 2,160 PSI	11,306 PSI
HLR 7620-pipe size-050	2,160 - 5,000 PSI	21,560 PSI
HLR 7620-pipe size-065	5,000 - 10,000 PSI	26,988 PSI
HLR 7620MR-pipe size-025	400 - 1,000 PSI	5,873 PSI
HLR 7620MR-pipe size-035	1,000 - 2,160 PSI	8,223 PSI
HLR 7620MR-pipe size-050	2,160 - 5,000 PSI	15,680 PSI
HLR 7620MR-pipe size-065	5,000 - 10,000 PSI	19,629 PSI
HLR 25 Series	up to 15,000 PSI	45,473 PSI

NOTES:

1. HLR 7620 Series External Pressure Design Criteria ASME Code Section VII, Div1.,UG-28 through UG-30, Code B31.3 Section 304.1,3
2. HLR 25 Series Design Criteria per API Bulletin 5C3