Tank Flame Arrestor Pressure Drop

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Query:
(1) Vendor is indicating 100 mmWC(0.981 kPa) Delta P in a Flame arrestor. Is it normal. It is 76% of tank design pressure and appears NOT acceptable
(2) Tank design pressure is indicated as 40 mbarg

My response:
(2) 40 mbarg = 40/1000*100 = 4 kPag. High. I have come across 2 KPag as the maxm so far. Best to check with vessel/ tank design mech engr as bolt load on base foundation would be too high.

(1) Usually the blow-off hatch or tank's PSV is set at tank design pressure of 2 KPa or 200 mm WC. Vents are usually sized for a pressure drop of at 50% or 100 mm WC for normal loading/unloading breathing + at 75% or 150 mm WC for maximum flow – that is loading/ unloading + thermal in or out breathing.

Total pressure drop in a vent is made of (A) friction loss in vent pipe + (B) flame arrestor pressure drop + (C) 1 velocity head as exit loss. A+B+C = 50% of design pressure for normal flow or 75% of design pressure for maxm flow. Flame arrestor pressure drop B depends on A and C.

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