

Calculation header

Identifier *BINAK*
 Tag No. *FE-2271*


Medium selection and state

Medium  *Natural Gas (AGA8)*
 Mixture composition  *V-2205 OUTLET*
 State  *Gaseous*
 Gas *Gas, dry (Operating conditions)*

Inlet properties

Operating temperature t_1 *36.78* °C
 Operating pressure p_1 *4.9* bar(g)
 Operating density (t_1 , p_1) ρ_1  *5.7546* kg/m³
 Isentropic exponent (t_1 , p_1) κ_1  *1.2189* -

Pipeline




☒ Pipe class  *ANSI*
 Size class  *4"*
 Schedule  *Schedule 80*

Orifice plate




Throttle *Single stage*
 Type of orifice plate *Single-hole orifice*
 Type of bore *Cylindrical bore*
☐ Flow coefficient C  *0.80382* -

Operating data

☐ Critical flow according to R. W. Miller Calculation ☐ Safety-related application *d*

Permanent pressure loss $\Delta\omega$ *250.0* mbar
 Throttle orifice (20°C) d  *21.491* mm
☒ Mass flow rate q_m *556.38* kg/h
☐ Volume flow rate (operating conditions) q_v  *425.69* GPM(US)
 Flow type  *Non-critical*



Calculated auxiliary values

Sound pressure level (A-weighted)	LpAe 	50.8	dB(A)
Diameter ratio	β 	0.22115	-
Power loss	P 	0.91642	hp(l)

Outlet properties

Operating pressure	p2 	4.65	bar(g)
Mach number	Ma2 	0.010683	-




Hint:

-  Approximate value: Dynamic viscosity (t_1 , p_1) - η_1
-  Approximate value: Min. orifice thickness for Δp - E_{\min}

Comments:**Mixture composition**

Methane: 63.9 %, Nitrogen: 0.298 %, Carbon dioxide: 3.16 %, Ethane: 13.8 %, Propane: 7.73 %, n-Butane: 1.86 %, i-Butane: 0.839 %, n-Pentane: 0.377 %, i-Pentane: 0.697 %, n-Hexane: 0.655 %, n-Heptane: 0.196 %, n-Octane: 0.0596 %, n-Nonane: 0.0297 %, n-Decane: 0.0099 %, Water: 1.03 %, Hydrogen sulphide: 5.41 %

Legend

-  Calculated value
-  Lookup value
-  Hint