FILE NAME : D:\08 Linked In\02 DWSim\00 Plan Personal\17 Pump Sizing\17 Pump Sizing.kdf

DEFAULTS : Fitting method = Crane
fT based on steel = Yes
Compressible = Isothermal
Two phase flow = Homogeneous
Acceleration = Homogeneous
Elevation den = Flanigan
Dukler hold-up = Hughmark
Smooth pipe f = No
Sonic velocity = HEMOmega
Two phase orifice = Homogeneous
Two phase valve = Homogeneous
Atmospheric pres = 1.0132 bar abs

VIEW/PRINT SETTINGS:
Font = Courier, Size 7-8
Orientation = Landscape
Margins = 1-2 cm.

RUN MESSAGE: Case 1 Hydraulic solution reached after 3 iterations.

NOTES:
1) Close this report before running/viewing next results.
2) Report is not automatically saved or printed.
Save the report as rtf file from the Korf menu (Hydraulics | Results | Save Report) or editor menu (File | Save As for MS Word).
After the final run, print the saved report with an editor (MS Word, etc.) for quality assurance purposes.

CASE 1 NORMAL

PRESSURE PROFILE REPORT

Circuit Feed 1

Number	Description	Flow kg/h	Density kg/m3	Visc cP	Dia in	Sch	Length m	dP/L kPa/100m	Velocity m/s	Elev m	dPelev bar	dPin-out bar	Pin barg	Pout barg
F1	Feed									0	0	0	0	0
L1	Pipe	14,956	997	0.89	2	40	2.0	75.5	1.92		0.0977	0.113	0	-0.1128
P1	Pump									1.0		-3.63	-0.1128	3.516
L2	Pipe	14,956	997	0.889	2	40	48.0	75.5	1.92		3.13	3.52	3.516	0
TK1	Product									33	0	0	0	0

NOTES - (1) dPElev and dPin-out represent DRAWING Inlet - Outlet.
(2) dPin-out = dPElev + dPfrictional + dPaccel
(3) Vessel/Tank dPElev represent effect of fluid levels inside vessel.
(4) Elev represent equipment or nozzle (vessel/tank) elevation.

CASE 1 NORMAL — PIPE LINE REPORT

Line number		L1			L2		
Line name		Pipe			Pipe		
PROCESS DATA		AVG	IN	OUT	AVG	IN	OUT
Temperature	C	25.0	25.0	25.0	25.1	25.0	25.1
Pressure	barg	-0.05639	0	-0.1128	1.758	3.516	0
Liq Fraction	wt	1.0	1.0	1.0	1.0	1.0	1.0
Total-Flow	kg/h	14,956			14,956		
Dens-NS	kg/m3	997	997	997	997	997	997
Elev	kg/m3	997			997		
Visc-NS	cP	0.89			0.889		
Vapor-Flow	kg/h	0			0		
Density	kg/m3	0	0	0	0	0	0
Visc	cP	0	0	0	0	0	0
Mol wt		0	0	0	0	0	0
Z		0	0	0	0	0	0
Cp/Cv		0	0	0	0	0	0
Liquid-Flow (wt)	kg/h	14,956			14,956		
Flow (vol)	m3/h	15.0			15.0		
Density	kg/m3	997	997	997	997	997	997
Visc	cP	0.89	0.89	0.89	0.889	0.89	0.888
PIPE DATA							
Material		Steel			Steel		
Size	in	2			2		
Length	m	2.0			48.0		
Schedule		40			40		
ID Flow/Hydr	m	0.0525	/ 0.0525		0.0525	/ 0.0525	
Roughness (E-3)	m	0.0457			0.0457		
Safety factor		1.0			1.0		
Sum of elev's	m	0			0		
VELOCITY							
Velocity	m/s	1.92	1.92	1.92	1.92	1.92	1.92
Sonic (Vap)	m/s	1,326			665		
PRESSURE DROP (In-Out)							
Overall	bar	0.1128			3.516		
Friction	bar	0.0151			0.3903		
Accel'n	bar	0			0		
Static	bar	0.09768			3.126		
dP/Length	kPa/100m	75.5			75.5		
LINE SIZING		MAX/LARGER	MIN/SMALLER		MAX/LARGER	MIN/SMALLER	
dP/Length	kPa/100m	22.6			22.6		
Velocity	m/s	100	0.30		100	0.30	
VelCoef	m/s	3.8	0.317		3.8	0.317	
Size-Larger/Small	in	3	1.5		3	1.5	
dP/Length	kPa/100m	10.5	269		10.5	269	
Velocity	m/s	0.874	3.17		0.874	3.17	

CASE 1 NORMAL

PIPE LINE REPORT

Line number	L1				L2			
Line name	Pipe				Pipe			
LIQUID HOLDUP								
Liquid Fraction (vol)	1.0				1.0			
Liquid Holdup(dP) (vol)	1.0				1.0			
2-PHASE METHOD	Homogeneous				Homogeneous			
FLOW REGIME								
Horizontal (Mandane)	-				-			
Horizontal (Dukler)	-				-			
Vertical Up (Fair)	-				-			
Vertical Up (Dukler)	-				-			
Vertical Down (Golan)	-				-			
HOMOGENEOUS/DUKLER/BEGGS								
Reynolds No	113,201				113,365			
Friction factor	0.02147				0.02146			
Friction factor (turb)	0.01897				0.01897			
ftp/fns	0				0			
Dentp/Denns	0				0			
LOCKHART-M/CHENOWETH-M								
Liquid-Re	0				0			
f	0				0			
Psi/Psi^2	0				0			
Vapor-Re	0				0			
f	0				0			
Psi^2	0				0			
X factor	0				0			
FITTINGS	TYPE	No	L/D	K	TYPE	No	L/D	K
	Entrance	0	0	0.50	Entrance	0	0	0.50
	Exit	0	0	1.0	Exit	0	0	1.0
	Gate valve	0	8.0	0	Gate valve	0	8.0	0
	Globe valv	0	340	0	Globe valv	0	340	0
	Check	0	50.0	0	Check	0	50.0	0
	Stop-check	0	400	0	Stop-check	0	400	0
	Elbow	0	20.0	0	Elbow	4	20.0	0
	180 Bend	0	50.0	0	180 Bend	0	50.0	0
	T-Straight	0	20.0	0	T-Straight	0	20.0	0
	T-Branch	0	60.0	0	T-Branch	0	60.0	0
	Other	1	0	0	Other	1	0	0
Fitting K	0				0			
Fitting L/D	0				80.0			
Total Eq Length m	2.00				51.71			

NOTES - (1) dPoverall = dPfrictional + dPaccel + dPstatic
(2) NS = No slip or homogenous

FEED SUMMARY

Number	Description	Elevation m	Density kg/m3	Level m	Rel Elev m	dP loss bar	dP level bar	dP inlet bar	dP total bar	Pres barg
F1	Feed	0	997	0	0	0	0	0	0	0

NOTES - (1) dP Inlet for Feed, Products and Vessels represent pressure to velocity conversion only, not friction.

PRODUCT SUMMARY

Number	Description	Elevation m	Density kg/m3	Level m	Rel Elev m	dP loss bar	dP level bar	dP inlet bar	dP total bar	Pres barg
TK1	Product	33.0	997	0	0	0	0	0	0	0

NOTES - (1) dP Inlet for Feed, Products and Vessels represent pressure to velocity conversion only, not friction.

CASE 1 NORMAL

PUMP SUMMARY

Number	Description	Eff	Power kW	Flow kg/h	Density kg/m3	Vol Flow m3/h	Head m	Pout-Pin bar	PresIn barg	PresOut barg
P1	Pump	0.75	2.02	14,956	997	15.0	37.1	3.63	-0.113	3.52

CASE 1 NORMAL

PUMP NPSH AND CURVES

PUMP NUMBER: P1 Pump

SOURCE FEED/VESSEL

Vessel Number	F1				
Vessel Elevation	0	m	Nozzle Rel Elev	0	m
Pump Elevation	1.0	m	Vessel dP (Pfluid-Ptop)	0	barg
Fluid Density	997	kg/m3			

NPSH AVAILABLE			NPSH REQUIRED		
Vessel Top Pres	0	barg	Pump Suctions	1	
Pump Suction Pres	-0.113	barg	Pump Speed	2950	rpm
Vapor Pres Credit	1.03	barg	Pump SSSpeed	9000	gpm, ft basis
Pump Suction Vel	1.92	m/s	NPSH Required (est)	1.13	m
Contingency	1.0	m			
NPSH Available	8.57	m			

SHUT OFF PRESSURES

Vessel Max Top Pressure	0	barg	dP Shut Off Basis	dPcalc	
Vessel Max Fluid Level	0	m	dP Shut Off/dP Calc	1.25	
Maximum Suction Pressure	-0.0978	barg	dP Shut Off Margin	1	
Shut Off Discharge Pres	4.44	barg	dP Shut Off	4.54	bar

Warning! Line L1 dP/L exceeds maximum (kPa/100m) = 22.6
Warning! Line L2 dP/L exceeds maximum (kPa/100m) = 22.6

End of file