Helix Technologies Pty Ltd

Project	Helix QA	Client	Helix QA
Project No.	4567	Design Date	15/03/2017
Category	Demo Liquid QA	Atmos. Press	100.19 bar
Network Type	Liquid	Calc. Method	Darcy
Description	Lube Oil Crane 410M ex 4-8 pg 4-4		

Oil Flow ref. 'Flow of Fuids Through Valves, Fittings and Pipe', Crane Technical Paper 410 M Example 4-8 pg 4-7
SAE 70 Oil at 40 deg C flows through a pipe 8" Sch 40, 60m long with a single globe valve. Determine the pressure drop.

Fitting Description	Kft	K	Qty
Globe Valve - 90 degree seat pattern	340	4.76	1

Calculation Results	Crane 410	Helix
Pressure Drop bar	0.188	0.1871
Reynolds no	332	333
Friction factor	0.193	0.1922

Excellent Correlation.

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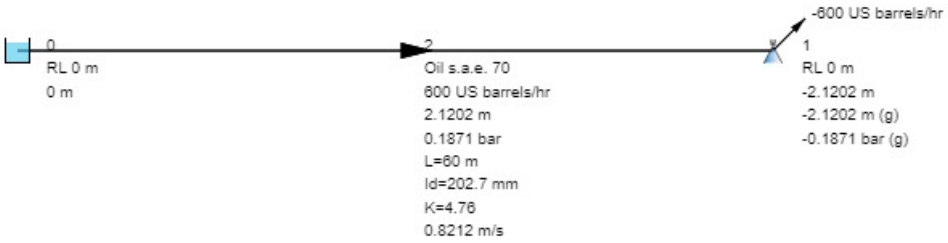

Lube Oil Crane 410M ex 4-8 pg 4-4

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Description	Lube Oil Crane 410M ex 4-8 pg 4-4		

Pipe No	2	From node to node	0 - 1
Description		Equipment No	
Liquid	Oil s.a.e. 70	Viscosity	450 cp
Temperature	15 C	Density	900 kg/m3
Vapour Pressure	0 bar		
Pipe Description	Steel Pipes 8" AS1836 (ANSI B36.10)	Pipe Class	Sch 40
Nominal Diameter	200 mm	Inside Diameter	202.7 mm
Outside Diameter	219.1 mm	Pipe Length	60 m
Pipe Roughness	0.03 mm	Allowable Press.	7180 bar
Orifice Plate Dia	-	Non Return Valve	No

Pipe Fitting Description	Qty	K value	Kft value
Globe Valve - 90 degree seat pattern	1	4.76	340

Total Fittings k	4.76	Total Fittings kf	0
Flow Rate	600 US barrels/hr	Velocity	0.8212 m/s
Friction Loss	1.9566 m	Fitting Losses	0.1637 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	2.1202 m	Total Pressure Drop	0.1871 bar
Entry Total Head	0 m	Exit Total Head	-2.1202 m
Entry Gauge Head	0 m	Exit Gauge Head	-2.1202 m
Reynolds No.	332.9141	Friction Factor	0.1922418 (Darcy f)

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Description	Lube Oil Crane 410M ex 4-8 pg 4-4		

Node No	0	Node Type	Tank
Description		Equipment No	
Rel. Level (RL)	0 m	Pressure Input	0 bar
Nozzle K value	-	Ext Flow (+In/-Out)	-
Int.(Gauge) Head	-	Int.(Gauge) Pressure	-
Total Node Head	0 m		

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Description	Lube Oil Crane 410M ex 4-8 pg 4-4		

Node No	1	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	0 m	Pressure Input	0 bar
Nozzle K value	0	Ext Flow (+In/-Out)	-600 US barrels/hr
Int.(Gauge) Head	-2.1202 m	Int.(Gauge) Pressure	-0.1871 bar
Total Node Head	-2.1202 m		