

FLOW CALCULATION SHEET, IC Version 1.10

Tag.No: **82-FE-024**  
 Service: **C8202 overhead to V8351/V8902**

Date : **Tuesday, August 19, 2008**  
 Drawing:  
 Sheet : **0**  
 Revision:

	Minimum	Normal	Maximum	
<b>FLOW DATA</b>				
Flow rate	<b>74</b>	<b>155.2959</b>	<b>221.85128</b>	t/d
Device orientation: <b>Horizontal</b>				
<b>DEVICE DATA (at ambient temperature)</b>				
Type: <b>Orifice, square edge with flange tapings</b>				
Reference: <b>ISO 5167-1:1991/Amd.1:1998(E)</b>				
Device vendor:				
Orifice diameter		<b>27.01</b>		mm
Bleed hole		<b>0</b>		mm
Linear expansion coefficient		<b>1.2E-5</b>		/°C
Transmitter range		<b>500</b>		mbar
Ambient temperature		<b>20</b>		°C
<b>PIPE DATA (at ambient temperature)</b>				
Nominal pipe diameter: <b>50 mm 2 in sch 40</b>				
True internal pipe diameter		<b>52.5</b>		mm
Linear expansion coefficient		<b>1.2E-5</b>		/°C
Roughness		<b>0.07</b>		mm
Straight length		<b>0</b>		m
<b>OPERATING DATA (at upstream conditions)</b>				
Type of fluid: <b>Liquid</b>				
Density		<b>508</b>		kg/m³
Temperature		<b>38</b>		°C
Pressure		<b>21.5</b>		bara
Vapour pressure		<b>0</b>		bara
Viscosity		<b>0.1</b>		mPa.s
<b>CALCULATED DATA</b>				
Pipe velocity	<b>0.7785</b>	<b>1.63375</b>	<b>2.33393</b>	m/s
Pipe Reynolds number	<b>207,670.58916</b>	<b>435,816.08542</b>	<b>622,594.40775</b>	
β (ratio d/D, at operating temperature)		<b>0.51448</b>		
Discharge coefficient C		<b>0.60606</b>		
Pressure loss (at maximum flow)		<b>0.35738</b>		bar
<b>UNCERTAINTY DATA</b>				
Pipe diameter		<b>0.5</b>		%
Orifice diameter		<b>0.05</b>		%
Transmitter (at normal flow)		<b>1.02</b>		%
Density		<b>1.5</b>		%
Device (at normal flow)		<b>0.5</b>		%
Flow rate (at normal flow)		<b>1.05</b>		%

**MESSAGES**

**9 - Pipe roughness too high.**