

Double tank 4 bar

Calculation Table Pressure Conveying

Client: Mike Kaufman
 Filepath: c:\V\d400.txt
 Product: Cement
 5 of 5

Convey distance horizontal: 370 m
 Convey distance vertical: 30 m
 Total conveying length: 400 m
 Number of Bends: 7
 Pump displacement at 2.5 bar(p): 0.9995 m³/sec
 Volumetric efficiency: 0 %
 Booster displacement: 0 m³/sec
 Rotarylock leakage: 0 m³/sec
 Gas displacement at end: 1.013 m³/sec
 Capacity: 139.5 tons/hr
 Pressure: 40000 mmWC
 Back pressure: 0 mmWC
 Pressure drop: 40000 mmWC
 Loading ratio: 32.7
 Pipeline energy consumption: 1.71 kWh/ton
 Compressor power: 239 kW
 Conveying energy: 166.1 kW
 Pneumatic conveying efficiency: 69.3 %
 Bend losses: 24.5 kW
 Material intake loss: 0.24 kW
 Re-number * 10⁻⁵: 3.905
 Empty pipeline pressure drop: 3782 mmWC
 Empty pipeline filter press. drop: 479 mmWC
 Material loss factor: 0.0243
 Lossfactor at end: 1.4866E-12
 Intake pressure drop: 100 mmWC

Progress
 Filter:

Iteration:

| Part | Part description | Length(m) | v-gas m/sec | v-product m/sec | Pressure drop mmWC | v-wall/ v-susp | residence time | mass kg | kW | % kW | Bend loss kW | Sediment % kW |
|------|------------------|-----------|-------------|-----------------|--------------------|----------------|----------------|---------|--------|------|--------------|---------------|
| 1 | Intake | 1 | 8.8 | 6.7 | 818 | 3.41 | 0.155 | 5 | 2 | 1.2 | | |
| 2 | Pipe | 2 | 8.94 | 8.98 | 1815 | 4.48 | 0.381 | 10 | 2.5 | 1.5 | | |
| 3 | Bend | | 12.51 | 5.32 | 1815 | | 0.4427 | 3 | 0 | | 1 | 0.6 |
| 4 | Pipe | 150 | 8.51 | 8.8 | 9566 | 4.34 | 17.7347 | 766 | 19.6 | 11.7 | | |
| 5 | Bend | | 12.44 | 5.2 | 9567 | | 17.7973 | 3 | 0 | | 0.9 | 0.5 |
| 6 | Pipe | 168 | 11.98 | 11.82 | 21250 | 5.07 | 34.3184 | 720 | 34.6 | 20.8 | | |
| 7 | Bend | | 14.97 | 6.99 | 21250 | | 34.365 | 2 | 0 | | 1.7 | 1 |
| 8 | Pipe | 22 | 13.04 | 12.72 | 23611 | 5.25 | 36.15 | 76 | 8.6 | 5.1 | | |
| 9 | Bend | | 16.08 | 7.14 | 23611 | | 36.1944 | 2 | 0 | | 2.1 | 1.2 |
| 10 | Pipe | 27 | 19.39 | 17.55 | 32202 | 6.24 | 38.0324 | 77 | 39.7 | 23.8 | | |
| 11 | Bend | | 21.79 | 10.36 | 32203 | | 38.064 | 1 | 0 | | 3.8 | 2.3 |
| 12 | Pipe | 10.01 | 22.27 | 20.17 | 34496 | 6.63 | 38.588 | 21 | 13.9 | 8.3 | | |
| 13 | Bend | | 24.37 | 11.91 | 34497 | | 38.6154 | 1 | 0 | | 5.1 | 3 |
| 14 | Pipe | 20.01 | 33.02 | 27.82 | 39511 | 7.94 | 39.4623 | 34 | 39.5 | 23.7 | | |
| 15 | Bend | | 34.46 | 16.57 | 39512 | | 39.4821 | 0 | 0 | | 9.6 | 5.8 |
| 16 | | | | | | | | | | 0.4 | | |
| 17 | | | | | | | | | | 2.8 | | |
| 16 | Outlet | | 34.46 | 16.57 | 39512 | | 39.4821 | | 0.7153 | 0.4 | | |
| 17 | Filter | 50 | 1.1 | m/min | 40000 | | 39.4821 | | 4.7061 | 2.8 | | dp = 487 mmWC |

Buttons: Back to start menu, Print calculation, Change product, New Calculation, Calculation results

Table calculation

Client: Mike Kaufman
 Filepath: c:\V\d400.txt
 Product: Cement

Convey distance horizontal: 370 m
 Convey distance vertical: 30 m-up 0 m-down
 Total conveying length: 400 m
 Number of Bends: 7
 Pipe diameter begin: 200 mm
 Pipe diameter end: 200 mm

Mass displ. pump: 1.184 kg/sec (Sonoc choke/turbo)
 Booster displacement: 0 m³/sec
 Gas volume end: 1.0097 m³/sec

Two vessel installation

| Pressure bar | pipe line capacity tons/hr | system capacity tons/hr | Number of kettles/hr | < Kettle range > | Solid Loading Ratio SLR | gas velocity begin m/sec | gas velocity end m/sec | System energy consumption kWh/ton | residence time seconds | Sediment |
|--------------|----------------------------|-------------------------|----------------------|------------------|-------------------------|--------------------------|------------------------|-----------------------------------|------------------------|------------------|
| 4 | 139.5 | 107 | 19.6 | >capacity | 32.7 | 8.8 | 34.4 | 1.97 | 39.48 | No sedimentation |
| 3.95 | 138.6 | 107 | 19.5 | >capacity | 32.5 | 8.8 | 34.4 | 1.97 | 39.22 | No sedimentation |
| 3.9 | 137.8 | 107 | 19.4 | >capacity | 32.3 | 8.9 | 34.3 | 1.97 | 38.95 | No sedimentation |
| 3.85 | 136.9 | 106 | 19.3 | >capacity | 32.1 | 9 | 34.3 | 1.99 | 38.68 | No sedimentation |
| 3.8 | 136 | 106 | 19.3 | >capacity | 31.9 | 9 | 34.3 | 2 | 38.42 | No sedimentation |
| 3.75 | 135.2 | 105 | 19.2 | >capacity | 31.7 | 9.1 | 34.3 | 2.02 | 38.14 | No sedimentation |
| 3.7 | 134.3 | 105 | 19.1 | >capacity | 31.5 | 9.2 | 34.2 | 2.02 | 37.87 | No sedimentation |
| 3.65 | 133.4 | 104 | 19 | >capacity | 31.3 | 9.3 | 34.2 | 2.04 | 37.6 | No sedimentation |
| 3.6 | 132.5 | 104 | 19 | >capacity | 31 | 9.4 | 34.1 | 2.04 | 37.33 | No sedimentation |
| 3.55 | 131.6 | 104 | 18.9 | >capacity | 30.8 | 9.5 | 34.1 | 2.05 | 37.05 | No sedimentation |
| 3.5 | 130.7 | 103 | 18.8 | >capacity | 30.6 | 9.5 | 34.1 | 2.07 | 36.77 | No sedimentation |
| 3.45 | 129.8 | 103 | 18.7 | >capacity | 30.4 | 9.6 | 34 | 2.07 | 36.49 | No sedimentation |
| 3.4 | 128.8 | 102 | 18.6 | >capacity | 30.2 | 9.7 | 34 | 2.09 | 36.21 | No sedimentation |
| 3.35 | 127.9 | 102 | 18.5 | >capacity | 30 | 9.8 | 34 | 2.1 | 35.92 | No sedimentation |
| 3.3 | 127 | 101 | 18.4 | >capacity | 29.7 | 9.9 | 34 | 2.12 | 35.64 | No sedimentation |
| 3.25 | 126 | 101 | 18.4 | >capacity | 29.5 | 10 | 33.9 | 2.12 | 35.35 | No sedimentation |
| 3.2 | 125 | 100 | 18.3 | >capacity | 29.3 | 10.1 | 33.9 | 2.15 | 35.06 | No sedimentation |
| 3.15 | 124.1 | 100 | 18.2 | >capacity | 29.1 | 10.2 | 33.8 | 2.15 | 34.77 | No sedimentation |
| 3.1 | 123.1 | 99 | 18.1 | >capacity | 28.8 | 10.3 | 33.8 | 2.17 | 34.47 | No sedimentation |
| 3.05 | 122.1 | 99 | 18 | >capacity | 28.6 | 10.4 | 33.8 | 2.17 | 34.18 | No sedimentation |
| 3 | 121.1 | 98 | 17.9 | >capacity | 28.4 | 10.5 | 33.7 | 2.2 | 33.89 | No sedimentation |

Empty pipeline system pressure drop: 3778 mmWC

Buttons: Back to start menu, Print table, New Calculation

