# Examination test of February 1, 2002

A globe valve has to be sized for water, using the following working conditions and data:

Nominal volume flow rate : = 9.016 L/s

Piping nominal size: DN = 2”

Upstream pressure: P1= 2.505 atm

Downstream pressure: P2= 0.905 atm

Vapor pressure: Pv= 3.7 psi

Recovery coefficient: FL=0.9

Critical pressure ratio: FF=0.956

1. Calculate the flow coefficient Cv for the valve



A De Zurik SD1000 valve (globe and single seat) is available for sizing, with rangeability r=20 and the following table of Cvn and plot of intrinsic characteristics:

|  |  |  |
| --- | --- | --- |
| Valvesize | **Cvn***Equal percentage* | **Cvn***Linear* |
| 1” | 13 | 14 |
| 1.5” | 29 | 31 |
| 2” | 52 | 54 |
| 3” | 115 | 115 |

1. Choose the most appropriate valve for DN and intrinsic characteristic
2. Check cavitation according to the IEC norm.
3. Suggest what Cv, min could be for the chosen valve.
4. Plot a diagram of the efflux characteristic, i.e.,  vs. ).
5. Is the same valve suitable to pass gasoline (ρ=740 kg/m3) through the valve, with the flow rate and pressure conditions as above. What’s the new Cv value?