

Control Valve Sizing Calculation Worksheet for Critical and Sub-Critical Flow

Calculation Sheet No.

Project Name

Client Name

Location

Subject

S. No.	0	1	2	3
Date	20/2/2025	21/2/2025	22/2/2025	24/2/2025
Prepared By	XXXXXX	XXXXXX		
Checked By			XXXXXX	
Approved By				XXXXXX

Summary	Design calculated Cvc	120.00
	Selected Cv =	60
	Cvc / Cv =	2.00
	Body / Trim size/Type:	40
Line no. :	Fcv- 2000	
Service :	Flow control - CWP	

Referred from control valve Catalogue
Eg: Masonellan

Referred from control valve Catalogue
Eg: Masonellan

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Physical properties		
Phase:	1	
Operation temperature:	29	°C
Up stream Pressure P1:	14.00	bara
Down stream Pressure P2:	12.00	bara
Flowrate Q:	230	m³/h
Critical Pres Pc:	10	bara
Vapour Pres Pv:	1	bara
Density of the process ρ:	0.8	kg/m³
Viscosity of the process μ:	1.2	cP
Design factor:	20	

Check for critical flow	(Based on Masonellan handbook p. 3)	
Valve dependent critical flow factor, Cf	1	(Collected from control Valve hand Book)
DPs = P1 - (0.96 - 0.28 (Pv / Pc)^0.5) * Pv	or if	Pv < 0.5 P1
	DPs =	P1 - Pv
DPs =	13.00	
Design Calculations		
Flow is sub-critical if, DP < Cf * DPs	DP =	2 bar
	Cf * DPs =	13.00 bar

Control Valve is	Sub-Critical Flow	
Control valve sizing:	(Based on Masonellan handbook p. 3)	
Specific gravity at flowing temp., Gf =	0.001	
Critical Flow:	Cv = 1.16 * Q / Cf * sqrt[Gf / DPs]	
Normal	Cv =	Not Applicable
Design	Cv =	N/A
Sub-critical Flow:	Cv = 1.16 * Q * sqrt[Gf / DP]	
Normal	Cv =	5
Design	Cv =	107

**Excel Tool -
Liquid
Application**

Flow Calculation For Gases Needle Valve

American Chemical Society

The logo of the American Chemical Society, featuring a red semi-circle with a white center, positioned to the right of the text.

Flow Calculation For Gases Needle Valve:

Quantitative Gas Chromatography for Laboratory Analyses and On-Line Process Control G. Guiochon, C.L.

Guillemin, 1988-06-01 Here is an invaluable new book on quantitative gas chromatography which explains how the method can or should be used for accurate and precise analysis Gas chromatography is firmly established as one of the few major methods for the quantitative analysis of complex mixtures It is fast accurate and inexpensive with a broad range of applications It has however become very complex and involved over 200 stationary phases more than 10 detector principles and several very different column types are available from among the catalogs of over 100 manufacturers and major retailers The progressive changes in the nature of gas chromatography have created new needs for information which are not satisfied by the literature presently available This book provides a complete discussion of all the problems involved in the achievement of quantitative analysis by gas chromatography whether in the research laboratory in the routine analysis laboratory or in process control For this reason the presentation of theoretical concepts has been limited to the essential while extensive explanations have been devoted to the various steps involved in the derivation of precise and accurate data This starts with the selection of the instrumentation and column continues with the choice of optimum experimental conditions then calibration and ends with the use of correct procedures for data acquisition and calculations Finally there is almost always a way to reduce errors and an entire chapter deals with this single issue Numerous relevant examples are presented The first part of the book presents the theoretical background simple enough to be understood by all analytical chemists but still complete and up to date It discusses the problems of flow dynamics retention and band broadening The changes in band profile associated with column overloading are explained without much recourse to mathematics The second part describes the gas chromatograph and discusses the properties of each of its parts gas flow and pressure controller sampling system oven column switching valves detectors The different implementations their advantages and drawbacks are discussed and compared In addition three chapters present packed column technology open tubular column technology and some sophisticated new phase systems respectively The new phase systems described use adsorbents modified by coating or grafting organic phase and carrier gases containing vapors which are sorbed by the stationary phase and modify it such as steam The third part discusses the applications in qualitative and quantitative analysis Calibration peak integration sources of errors arising from the various parts of the instrument as well as from the measurement process itself are carefully described in four detailed chapters Methods to carry out accurate and precise analysis are presented A last chapter is devoted to process control analysis and gives a number of detailed examples of applications A lexicon explaining the most important chromatographic terms and a detailed index complete the book This is a book which no chemical analyst should be without It should be on the library shelf of all universities instrument companies and any laboratory and plant where gas chromatography is used

Clinical Calculations - E-Book Joyce LeFever Kee, Sally M. Marshall, Mary Catherine

Forrester, Kathryn Woods, 2020-06-12 NEW Updated information on Antidiabetic Agents orals and injectables has been added throughout the text where appropriate NEW Updated content on Anticoagulant Agents is housed in an all new chapter NEW Colorized abbreviations for the four methods of calculation BF RP FE and DA appear in the Example Problems sections NEW Updated content and patient safety guidelines throughout the text reflects the latest practices and procedures NEW Updated practice problems across the text incorporate the latest drugs and dosages

A Study of the Factors Influencing the Rate of Absorption and Equilibrium of Carbon Dioxide in Alkaline Solutions Robert Vernon Williamson, 1923 *Gas Phase Chromatography* Rudolf Kaiser, 2012-12-06 THE remarkable capabilities of capillary gas partition chromatography or in short capillary chromatography are beyond all doubt In spite of this difficulties are continually arising in the experimental realization of this interesting development of gas chromatography and this hinders the rapid acceptance of these methods For this reason in the present work I have dealt with experimental and practical problems rather than with theoretical aspects hoping that this may serve to remove many of the problems concerned The present publication is based on experimental work carried out in productive collaboration with my teachers and colleagues to whom I owe a great deal I should like to thank the following for their valuable assistance and stimulating suggestions Professor E Cremer Dr H Kienitz and his colleagues Professor A I M Keulemans Dr I Halasz and in particular Mr D H Desty and Dr R P W Scott I should also like to thank the management of the Badische Anilin und Sodafabrik AG Ludwigshafen for their generous support and for permission to publish this book The outstanding co operation of the Verlag Bibliographisches Institut Mannheim was for me a particular pleasure

Process Analyzer Sample-Conditioning System Technology Robert E. Sherman, 2002-01-11 Sampling systems are one part chemistry one part engineering electrical chemical mechanical civil and maybe even software No one person possesses all of the knowledge required Bob Sherman comes as close as anyone John A Crandall V P Sales Americas ABB Process Analytics This resource provides both novice and experienced technologist with the technical background necessary to choose sample conditioning system components that will allow the process analyzer system to function reliably with minimal maintenance The conditioned process sample presented to the process analyzer should be of similar quality to the calibration material used to zero and span the analyzer Filling a long standing void in the process field this book addresses the system concept of Process Analyzer Sample Conditioning Technology in light of the critical importance of delivering a representative sample of the process stream to the process analyzer Offering detailed descriptions of the equipment necessary to prepare process samples and listings of two or more vendors when available for equipment reviewed Process Analyzer Sample Conditioning System Technology discusses The importance of a truly representative sample Sample probes transfer lines coolers and pumps Sample transfer flow calculations for sizing of lines and system components Particulate filters gas liquid and liquid liquid separation devices Sample pressure measurement and control Enclosures and walk in shelters their electrical hazard ratings and climate control systems With extensive system and component examples

including what worked and what didn't Process Analyzer Sample Conditioning System Technology gives the new technologist a basic source of design parameters and performance proven components as well as providing the experienced professional with a valuable reference resource to complement his or her experience

Clinical Anesthesia (SAE) Dr. Nishkarsh Gupta, Dr. Anju Gupta, 2021-06-01

Fundamentals of Gas Analysis by Gas Chromatography Brian Thompson, 1977

Columns used in gas analysis Carrier gas control Multi column systems and switching valves Balancing column systems Sample introduction Determination of hydrogen Quantitation and calibration Selection of columns and valving configuration Miscellaneous applications Valving configurations

The American Gas Light Journal, 1903 **Gas and Oil Power**, 1917 **Oil & Gas Journal**, 1926 Merchant Plumber and Fitter, 1923 **International Surgical Digest**, 1926 **Western Gas**, 1930 *Gas Industry*, 1923 **Engineering and Contracting**, 1923 Engineering & Contracting, 1923 **Information** Harvey Elmer Phillips, 1919 **Journal of the American Chemical Society** American Chemical Society, 1925 Proceedings of the Society are included in v 1 59 1879 1937 Journal American Chemical Society, 1925 **Proceedings of the Ohio Gas Light Association** Ohio Gas Light Association, 1904

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