

Knovel

科研流程的最佳辅助利器
Knovel交互式工程数据分析

飞资得信息技术(上海)有限公司
JUNE 9, 2011





内容	进度
Knovel简介：为实务工作中的问题提供最佳答案	
权威的内容、最佳化的检索以及数据分析工具 ➤ 在此一章节我们将体验Knovel独特的三项重要功能	
如何增加使用率 –内容浏览 ➤ 以Knovel Critical Tables 为例	
如何增加使用率–数据查询 ➤ 在此一章节我们将学习到如何透过数据分析工具的查询来找到问题的答案	
如何增加使用率–基本检索 ➤ 在此一章节我们将了解如何自超过2千种手册及参考工具书中发现答案。在说明中会强调如何整合文字于数字化的内容中。	
个人化的 Knovel – myKNOVEL ➤ 在此₂一章节中我们将说明如何让个别的教授和学生可以在Knovel中建立自己的空间	



Knovel协助教师达成帮助学生从实务问题中学习解决方案的目标

- **何谓Knovel?**Knovel是一个透过以领先的技术数据分析和搜寻工具来提供以Web为操作接口的工程学应用整合信息提供者
- **Knovel 专注于:** 横跨产、官、学三界的工程学社群
- **产品:** 透过领先的技术**资料分析**和**搜寻工具**来提供以Web为操作介面的**工程学应用整合平台**，为工程师提供值得信赖的答案并藉此创造出全新解决方案。
- **远景:** 作为工程师解决问题时的首选资源
- **历史:**
 - 在过去**10**年中，Knovel帮助在全球知名机构中的工程师发挥更多的创意以及可以实时的执行具有节省成本效益的项目计划。
 - **高达9成的续订率**
- **使用Knovel的单位:**
 - 超过**300**家技术独步全球的学术机构、研究单位及公司使用Knovel，其中有**70**家公司名列全球前**500**大企业。
 - 超过**340**家**顶尖大学**采用Knovel协助教学及研究，其中有**12**家名列全美前**15**大工程学院。
 - 亚太地区使用Knovel的知名学术机构日益增加，包括**新加坡南洋理工大学**、**澳洲雪梨大学**、**香港科技大学**、**韩国浦项科技大学**以及中国大陆的**中国科学院**。
 - 工程学领域学会，包括 ASME, AIChE, and ICHIME等前**10**大主要学会都与Knovel合作。



- Knovel 是**唯一特别针对工程学领域提供解决方案的数据库**。数据库的架构与内容都是依照工程学领域社群的需求所设计。
- Knovel提供**在工程学领域中兼顾深度与广度的无与伦比的内容**，内容不但来自最具权威的出版社和学会，同时可以提供工程师快速且精确的解决方案。
- Knovel**最特别的就是对于内容的加值**，不但可以搜寻图表，更提供了交互式工具，让工程师不但可以快速获得相关数据，分析工具更可以直接应用到日常工作中。



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- Hanyang University, Korea
- National Institute of Technologies, India

Worldwide



RG2

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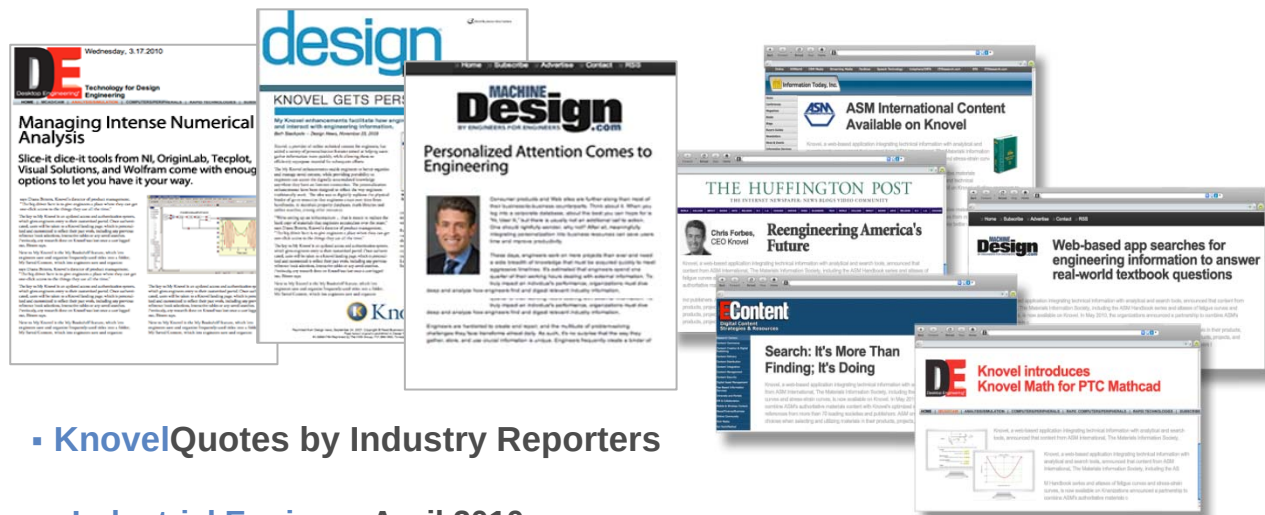
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Knovel 2010 Awards



Knovel Quotes by Industry Reporters

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Desktop Engineering March 2010

“Like a Google for engineers, this one-stop technical source streamlines the process of finding trusted content for increased productivity and accuracy.” – [Pamela Waterman](#)

Information Today December 2009

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	Knovel	E Book Company	E book via Google	Print Book
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提供可互动的表格、图解和公式以获得更好的输出应用	✓			
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All Activity	SINGAPORE	SINGAPORE	SINGAPORE	SINGAPORE	
Period	User Sessions	All Clicks	Total Time On	Average Time Online	
Last 24 Hours	25	310	10:44:58	00:25:47	
Last 7 Days	244	2027	82:45:35	00:20:21	
Last 30 Days	1382	11486	470:41:32	00:20:26	
Last 365 Days	12117	142489	3524:08:36	00:17:27	
Since Inceptio	92664	1157655	25030:03:58	00:16:12	
	AUSTRALIA	AUSTRALIA	AUSTRALIA	AUSTRALIA	
Last 24 Hours	61	266	10:47:45	00:10:37	
Last 7 Days	393	2408	87:23:03	00:13:20	
Last 30 Days	1567	10406	399:00:51	00:15:16	
Last 365 Days	15920	98907	2836:56:01	00:10:41	
Since Inceptio	100176	1006628	22992:34:41	00:13:46	
All Activity	AUSTRALIA	AUSTRALIA	AUSTRALIA	AUSTRALIA	
Period	User Sessions	All Clicks	Total Time On	Average Time Online	
Last 24 Hours	26	288	09:26:36	00:21:47	
Last 7 Days	316	2009	91:01:42	00:17:17	
Last 30 Days	1236	7478	373:35:16	00:18:08	
Last 365 Days	11693	119641	3139:44:51	00:16:06	
Since Inceptio	65447	676264	15609:04:11	00:14:18	
All Activity	HONG KONG	HONG KONG	HONG KONG	HONG KONG	
Period	User Sessions	All Clicks	Total Time On	Average Time Online	
Last 24 Hours	104	338	12:06:56	00:06:59	
Last 7 Days	284	1071	45:50:39	00:09:41	
Last 30 Days	687	3211	150:33:33	00:13:08	
Last 365 Days	8967	50692	1718:08:05	00:11:29	
Since Inceptio	29016	206202	5725:55:14	00:11:50	



...但我们期望可以做到更好

our **VISION:**

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engineers **GO**
TO **SOLVE PROBLEMS**



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权威的内容、最佳化的检索以及数据分析工具 ➤ 在此一章节我们将体验Knovel独特的三项重要功能	
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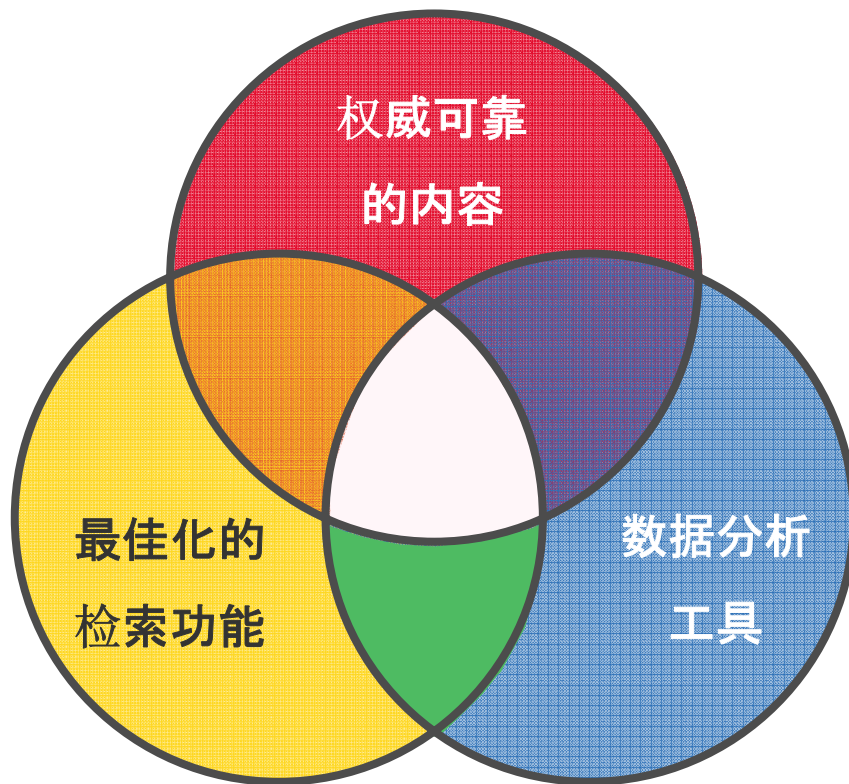
Knovel的解决方案:整合 3 项重要需求

Knovel is a **web-based application** integrating **technical information**
with **analytical & search tools**
which **drive innovation** and **deliver answers** engineers can trust

大学生

- 主要专注在内容

1. 直觉式的搜寻介面
2. 图书馆目录形式的浏览
3. 整合查询功能
4. 直接获得书中内容



研究生/学术研究

- 主要专注于加值的应用

1. 可以汇出做书目管理
2. 分析工具—提供交互式内容



来自卓越的出版社和学会的权威内容

经过验证的权威内容

- 来自于经专家认可的出版社和学会伙伴所建立及出版的科学资源
- 透过客户或产业需求所建立的专业内容
- 编辑群的7位专家在工程领域的资深经验与领导地位确保内容的广度与深度, 并且符合客户需求



Knovel 提供必备的技术参考内容, 包括

修习时必备的基础内容

经由学会和出版社审阅过的内容

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Space Vehicle Dynamics and Control

Radar Foundation for Imaging and Advanced Concepts

Military Handbook – ML – HDBK-5h Metallic Materials and Elements for Aerospace Vehicle Structures (Knovel Interactive Edition)

Radar Design Principles

Combustion Instability – Progress Astronautics/ Aeronautics

Titanium

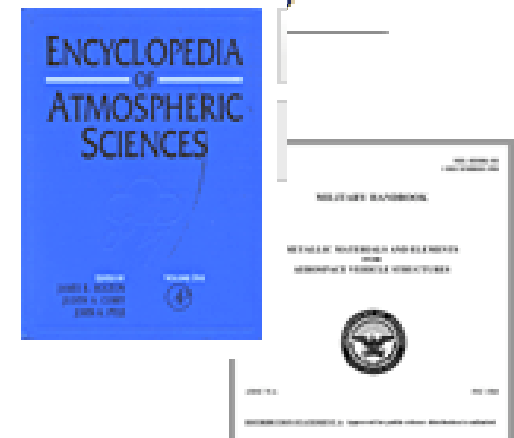


Radar Handbook

Rocket Propulsion Elements

Modeling and Simulation of Aerospace

Vehicle Dynamics





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ASME Boiler and Pressure Vessel Code

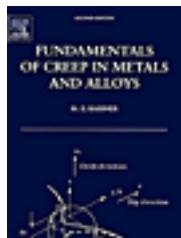
Alloy Digest – Data on World Wide Metals and Alloys

Atlas of Fatigue Curves

Corrosion Survey Database

Corrosion in the Nuclear Industry

Handbook of Composites



Handbook of Corrosion Data

Handbook of Materials Selection

Machinery's Handbook & Guide to Machinery's Handbook

Materials Properties Handbook – Titanium Alloys

Metal Material Data Sheets

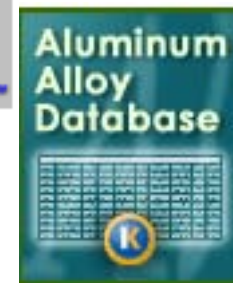
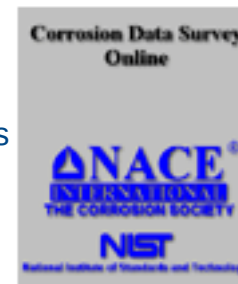


Physical Metallurgy and Advanced Materials

Smithells Metals Reference Book

Soluble Silicates – their Properties & Use

Woldmans' Engineering Alloys





Trusted & Validated 石油与天然气 Handbooks/Reference Books

Yaws' Handbook of Thermodynamic and Physical

Properties of Petroleum Fluids

Sax's Dangerous Properties of Industrial Materials

Refining Processes Handbook

Seawater Corrosion Handbook

Wiley Critical Content – Petroleum Technology



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Civil Engineers Reference Book

Energy Efficiency Manual

2004 ASME Boiler and Pressure Vessel Code:
Section II Materials

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Standard Handbook of Petroleum and
Natural Gas

Process Piping Design Handbook –
Advanced Piping Design





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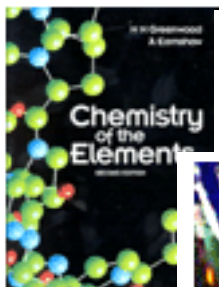
ARS Pesticide Properties Database

Corrosion Survey Database (COR-SUR)

Sax's Dangerous Properties of Industrial Materials

Hawley's Condensed Chemical Dictionary

Heat Transfer Book



Patty's Toxicology

Knovel Critical Tables

Energy Efficiency Manual

Industrial Solvents Handbook

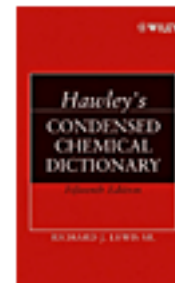
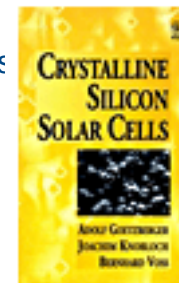


Chemical Process Equipment – Selection and Design

Yaws' Handbook of Thermodynamic and Physical Properties of Chemical Compounds

Handbook of Solvents

Handbook of Materials Selection





专为工程师设计的最佳化搜寻引擎



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- 搜寻隐藏在表格、图解和公式中的数据数据
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直接从内容页(content page)中使用超过 80,000 个已数字化的交互式表格、图解与方程式



Knovel Critical Tables (2nd Edition)

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Description: This new 2nd Edition has been updated with over 40 new interactive tables which include new tables covering 503 Heat Capacity and Thermal Conductivity, 3,133 Reaction Thermodynamics and Equilibrium Constants, 854 Density and Compressibility, 13,332 Vaporization and Vapor Pressure, 185 Thermal Expansion, 377 Transport and Flow, and 1902 Electrical Properties data.

Table of Contents

- Front Matter
- Preface to the Second Edition
- Periodic Table of the Elements
- Basic Physical Properties of Chemical Compounds
- Fundamental Physical Constants
- Common Isotopic Compositions
- Calculated Properties of Common Organic Compounds
- Vapor-Liquid Equilibrium Data for Organic Mixtures
- Heat Capacity and Thermal Conductivity

Content Results

- Text
- Text
- Text
- Table (21824)
- Text
- Table (350)

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Field Operator Value

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optical properties band gap pressure coefficient physical constants critical pressure triple point pressure vapor pressure surface area processing properties

surface properties specific surface area surface tension surface area (vol basis) test/exposure conditions allowed working pressure exposure medium exposure strain exposure medium class

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The Short-Term Hydrogen Economy: Fueling Fuel Cells from Natural Gas by Jason M. Keith, Department of Chemical Engineering, Michigan Technological University. Posted 5/19/2010

Adams Golf Tees Off with Integrated CAD and CFD By Scott Burnett, Director of Advanced Product Development, Adams Golf. Posted 5/11/2010

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将数据分析工具整合在工程师的工作流程中

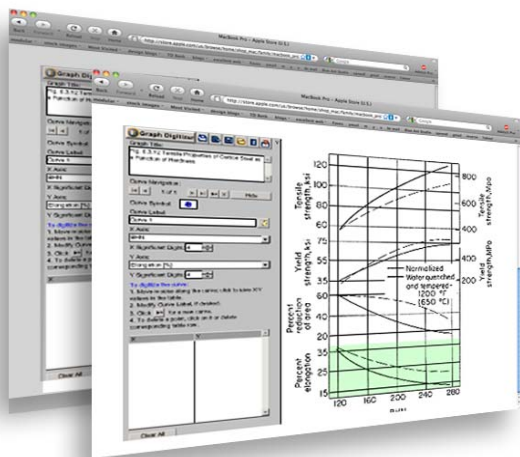


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Search Optimized for Engineers

- Finds hidden data, hidden tables, graphs, and equations
- “Understands” engineering language
- Automatically performs unit conversion
- Allows numeric range search
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将数据分析工具 整合在工程师的工作流程中

- 容易使用的工具可以做初步的计算与资料的整合
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- 可以直接在图表中绘制一个或多个数据点和曲线
- 可以汇出数据到指定的格式和文件 (Excel, MathCAD)



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General References

[All Titles](#)[Titles with Interactive Tools](#)

显示已有数字化的表格、图解和公式

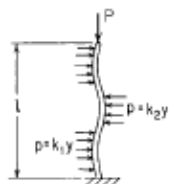
- Chemical Properties Handbook  
- Chemical Reaction Engineering (3rd Edition)  
- Chemistry of the Elements (2nd Edition) 
- DIPPR 882 - Transport Properties and Related Thermodynamic Data of Binary Mixtures, Parts 1-4 
- DIPPR Project 801 - Full Version   
- Dean's Analytical Chemistry Handbook (2nd Edition) 
- Dean's Handbook of Organic Chemistry (2nd Edition) 
- Handbook of Inorganic Chemicals 
- Hawley's Condensed Chemical Dictionary (14th Edition) 
- International Critical Tables of Numerical Data, Physics, Chemistry and Technology (1st Electronic Edition) 
- Knovel Critical Tables (2nd Edition)    
- Knovel Steam Tables   



数据分析工具公式的套用

TABLE 15.1 Formulas for elastic stability of bars, plates, and beams (Continued)

5. Uniform straight bar under end load P ; both ends hinged; direction of the deflection ($p = k_1 y$ for deflection toward



$$P' = \frac{\pi^2 EI}{l^2} \left(m^2 + \frac{k_2 l^4}{m^2 \pi^4 EI} \right)$$

m	α
1	1
2	$1 + \phi(0.23 - 0.0$
3	$0.75 - 0.56\phi$

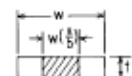
This is an empirical expression carried out for values of

6. Straight bar, middle portion uniform, end portions tapered and alike; end load; I = moment of inertia of cross section of middle portion; I_0 = moment of inertia of end cross sections; I_x = moment of inertia of section x



(For singly tapered columns see Ref. 46.)

6a. $I_x = I \frac{x}{b}$
for example, rectangular section tapering uniformly in width



6b. $I_x = I \left(\frac{x}{b} \right)^2$
for example, section of slender members lapped together



EquationSolver9 - Microsoft Internet Explorer

Equation Solver

Equation:

$$P' = \frac{\pi^2 EI}{l^2} \left(9 + \frac{k_2 l^4}{9 \pi^4 EI} \left(\frac{k_1}{k_2} \right)^{0.75 - 0.56 k_1 / k_2} \right)$$

Input Values to Calculate P':

Symbol	Value	Unit (click to change)
E	10	ksi
I	1.234	lb in ²
l	10	in
k1	1	lb/in
k2	1	lb/in

P' : Critical Load

P' Significant Digits: 4

P' = 0.1525 lbf

Calculate

☐ Display Plotting Controls

Select Variable and Plot P':

Variable	Definition
pi	Circumference-diameter ratio of a circle
E	Modulus of Elasticity
I	Moment of Inertia
l	Length
k1	Later Force per Unit Length of Deflection Toward Soft

I Min.: 1.000 in

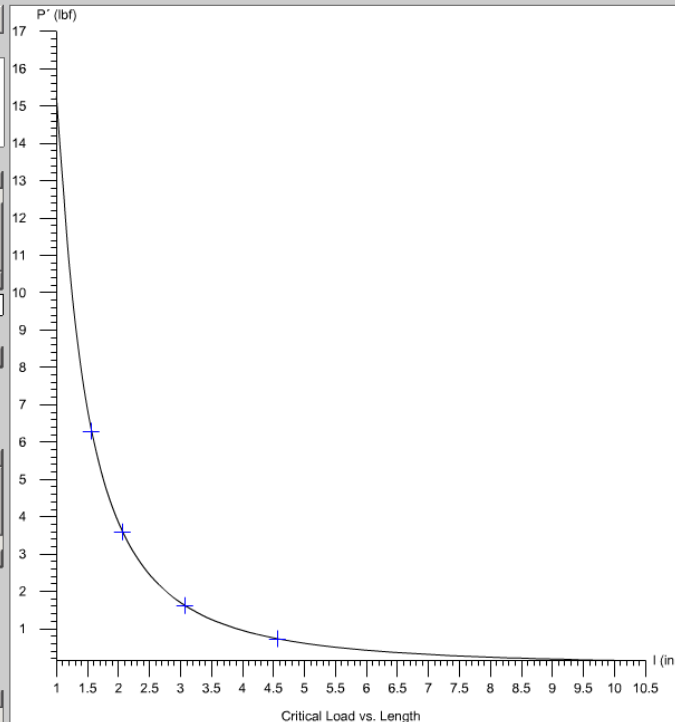
I Max.: 10.00 in

I Significant Digits: 4

Digitize Curve (Click on the curve; or press Add Point, input a value in the table, and press Enter):

l (in)	P' (lbf)
1.557	6.289
2.061	3.589
3.069	1.619
4.563	0.7323

Plot Add Point Clear All



Zoom: 50% 100% 150%

I Axis: ☒ Linear ☐ Log
P' Axis: ☒ Linear ☐ Log

Show: ☐ Grid Lines



数据分析工具表格

Table 1A 2004 SECTION II

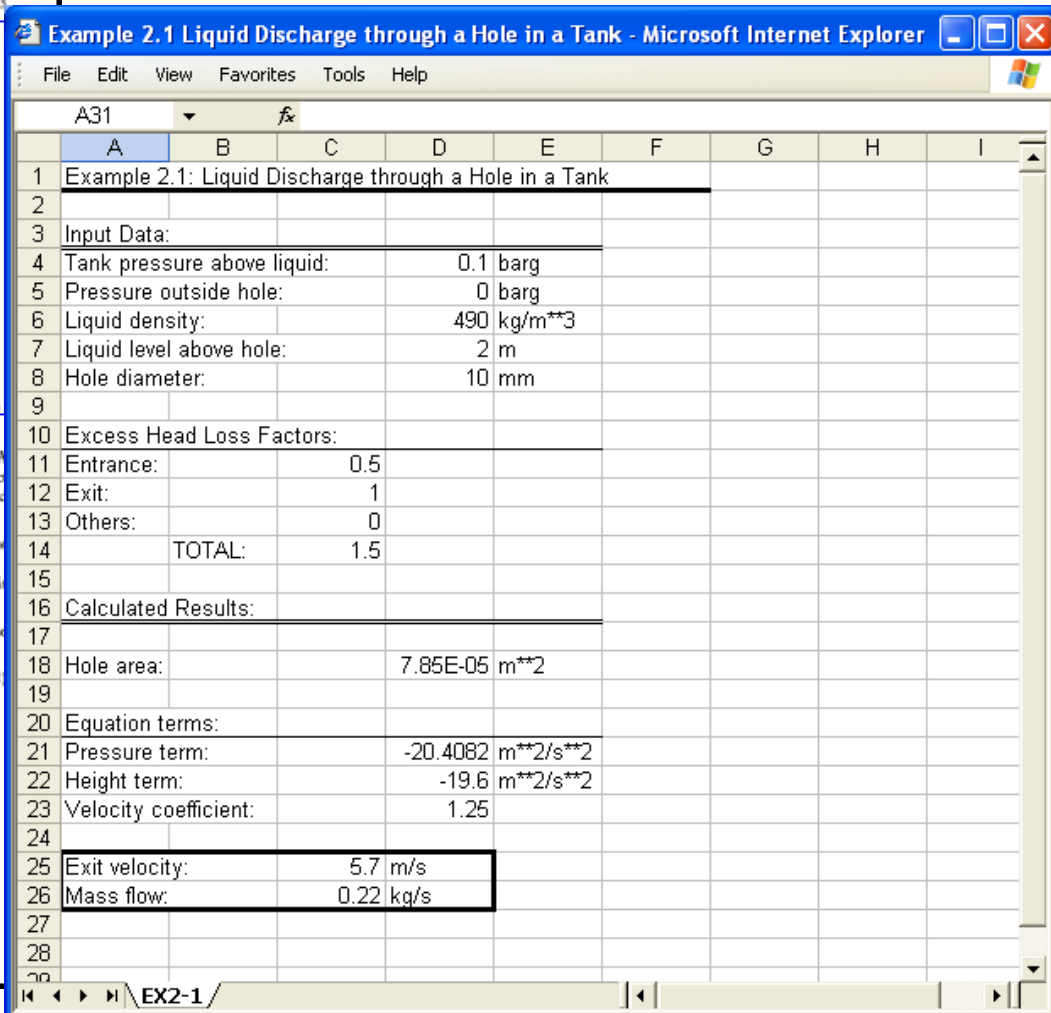
INTERACTIVE TABLE TABLE 1A
SECTION I; SECTION III, CLASS 2 AND 3; * SECTION VII
MAXIMUM ALLOWABLE STRESS VALUES SFO
(*See Maximum Temperature Limits for Re

Line No.	Nominal Composition	Product Form	Spec. No.	Type/Grade
1	Carbon steel	Sheet	SA-1006	CS-A
2	Carbon steel	Sheet	SA-1006	CS-B
3	Carbon steel	Bar	SA-675	45
4	Carbon steel	Wld. pipe	SA-124	A2e3A
5	Carbon steel	Plate	SA-263	A
6	Carbon steel	Plate	SA-265	A
7	Carbon steel	Wld. pipe	SA-672	A45
8	Carbon steel	Sheet	SA-414	A
9	Carbon steel	Wld. tube	SA-178	A
10	Carbon steel	Wld. tube	SA-178	A
11	Carbon steel	Smis. tube	SA-179	...
12	Carbon steel	Smis. tube	SA-192	...
13	Carbon steel	Wld. tube	SA-214	...
14	Carbon steel	Smis. tube	SA-556	A2
15	Carbon steel	Wld. tube	SA-557	A2
16	Carbon steel	Wld. pipe	SA-53	E/A
17	Carbon steel	Wld. pipe	SA-53	E/A
18	Carbon steel	Wld. pipe	SA-53	E/A
19	Carbon steel	Wld. pipe	SA-53	F
20	Carbon steel	Smis. pipe	SA-53	S/A
21	Carbon steel	Smis. pipe	SA-53	S/A
22	Carbon steel	Smis. pipe	SA-106	A
23	Carbon steel	Wld. pipe	SA-125	A
24	Carbon steel	Flanged pipe	SA-369	FPA
25	Carbon steel	Wld. pipe	SA-567	...
26	Carbon steel	Wld. pipe	SA-567	...
27	Carbon steel	Bar	SA-675	50
28	Carbon steel	Bar	SA-675	50
29	Carbon steel	Wld. pipe	SA-124	A2e3B
30	Carbon steel	Plate	SA-263	B
31	Carbon steel	Plate	SA-265	B
32	Carbon steel	Plate	SA-265	B
33	Carbon steel	Wld. pipe	SA-672	A50
34	Carbon steel	Sheet	SA-414	B
35	Carbon steel	Plate	SA/EH 1002e-3	P275NH
36	Carbon steel	Bar	SA-675	55
37	Carbon steel	Bar	SA-675	55

material or substance name	structure	mol. formula	mol. weight	CAS Registry no.	RTECS no.	EINECS no.	melting point (°C)	boiling point (°C)	flash point (°C)	sp. gravity
A-α-C		C ₁₁ H ₉ N ₃	183.21	26148-68-5			202			
abietic acid		C ₂₀ H ₃₀ O ₂	302.46	514-10-3		208-178-3 (technical)	172-175 (monoclinic plates from alcohol plus water), commercial abietic acid may be glassy or partly crystalline and may melt as low as 85			
acenaphthene		C ₁₂ H ₁₀	154.21	83-32-9	AB 1000000	201-469-6	93-95	279		1.0242 at 90°C with respect to water at 4°C
acenaphthylene		C ₁₂ H ₈	152.20	208-96-8	AB 1254000	205-917-1	92-93	265-275		0.899 at 16°C with respect to water at 2°C
acephate		C ₄ H ₁₀ NO ₃ PS	183.17	30560-19-1	TB 4760000	250-241-2	88-90; 82-93 (technical grade)			1.35 (temperature unspecified)
acetal	CH ₃ CH(OCH ₂ CH ₃) ₂	C ₆ H ₁₄ O ₂	118.18	105-57-7	AB 2800000	203-310-6	-100	102.7	-20.5	0.8254 at 20°C with respect to water at 4°C
acetaldehyde	CH ₃ CHO	C ₂ H ₄ O	44.05	75-07-0	AB 1925000	200-836-8	-123.5	20.2	-27	0.783 at 20°C
acetaldehyde formylmethylhydrazone	H ₃ CCH=NNCH ₃ CHO	C ₄ H ₈ N ₂ O	100.12	16568-02-8	LQ 8500000		5			
acetaldoxime	CH ₃ CH=NOH	C ₂ H ₅ NO	59.07	107-29-9	AB 2975000	203-479-6	47	115		



FIGURE 2.9. Tank geometry for Example 2.2.





数据分析工具数字化的图表

3-48 MECHANICS OF FLUIDS

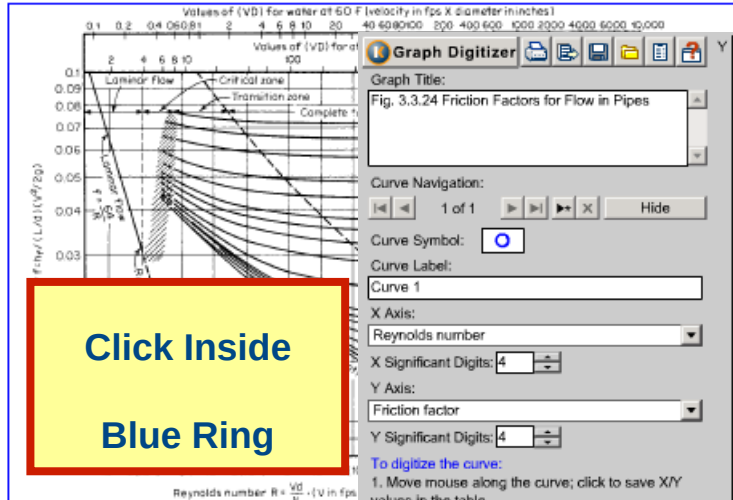


Fig. 3.3.24 Friction factors for flow in pipes.

can be maintained with care to very low Reynolds numbers, but the slightest upset will result in laminar flow if the Reynolds number is less than 2,000. The Reynolds-number range between 2,000 and 4,000 is called the critical zone. Flow in the zone is unstable, and designers of piping systems must take this into account.

Example. Glycerin at 68°F (20°C) flows through a horizontal pipe 1 in in diameter and 20 ft long at a rate of 0.005 lbm/s. What is the pressure loss? From the continuity equation $\dot{V} = Q/A = (\dot{m}/\rho)(\pi D^2/4) = (0.005/12.6)(\pi/4) = 0.000157$ ft³/s. The Reynolds number $R = \rho V D / \mu = (12.6)(0.000157)(1/12.6) / (0.000157) = 1.449$. $R < 2,000$, therefore, flow is laminar and $f = 64/R = 64/1.449 = 44.17$. $K = fL/D = 44.17 \times 20/12 = 73.61$. $\Delta p = K \dot{V}^2 / 2 = 73.61 \times (0.000157)^2 / 2 = 9.19 \times 10^{-6}$ lb/ft² = 0.00065 lb/in².

Turbulent Flow. The friction factor for Reynolds number over 4,000 is computed using the Colebrook equation:

$$\frac{1}{\sqrt{f}} = -2 \log_{10} \left(\frac{\epsilon/D}{3.7} + \frac{2.51}{R\sqrt{f}} \right)$$

Figure 3.3.24 is a graphical presentation of this equation (Moody, Trans. ASME, 1944, pp. 671–684). Examination of the Colebrook equation indicates that if the value of surface roughness ϵ is small compared with the pipe diameter ($\epsilon/D \rightarrow 0$), the friction factor is a function of Reynolds number only. A smooth pipe is one in which the ratio $(\epsilon/D)/3.7$ is small compared with $2.51/R\sqrt{f}$. On the other hand, as the Reynolds number increases so that $2.51/R\sqrt{f} \rightarrow 0$, the friction factor becomes a function of relative roughness only and the pipe is called a rough pipe. Thus the same pipe may be smooth under one flow condition, and rough under another. The reason for this is that as the Reynolds number increases, the thickness of the laminar sublayer decreases as shown in [Figure 3.3.20](#) exposing the surface roughness to flow. Values of absolute roughness ϵ are given in [Table 3.3.10](#). The variation

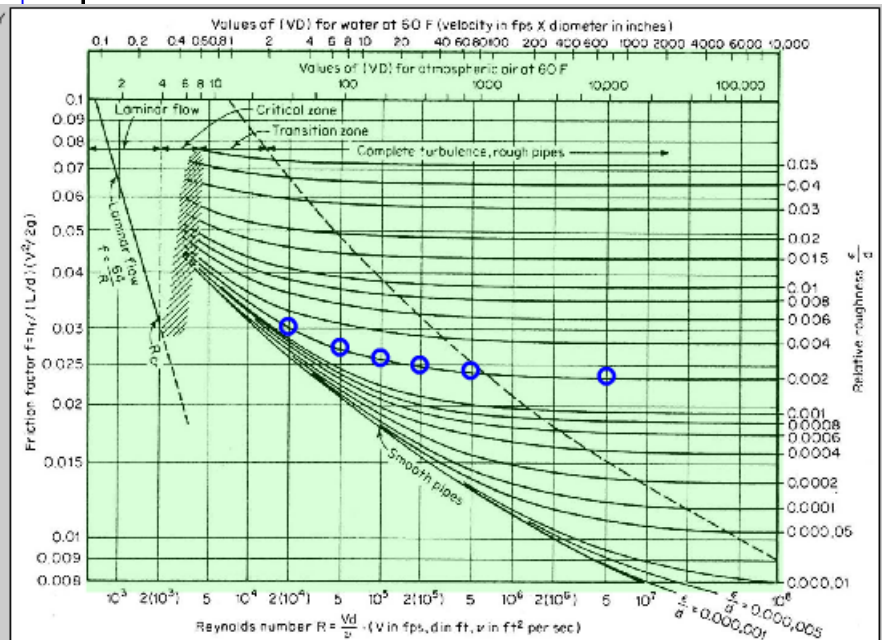
X	Y
20140	0.03027
49540	0.02715
100200	0.02571
199100	0.02472
482000	0.02399
5172000	0.02329

Clear All

Zoom: 100% 200% 300%

2. Determine flow rate Q when L , D , and Δp are known.

3. Determine pipe diameter D when Q , L , and Δp are known.



To drag the image or a point press the Ctrl key, click on the object, and then release the Ctrl key.

Show: ☒ Active Area X



内容	进度
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Title Details

Citation

Table of Contents

Interactive Tables

Content Results

- Front Matter
- Preface to the Second Edition
- ☐ Periodic Table of the Elements

 Text

 Text

 Text

- Introduction

 Text

☐ Properties of the Elements

 Table (115)

- Basic Physical Properties of Chemical Compounds

 Table (21824)

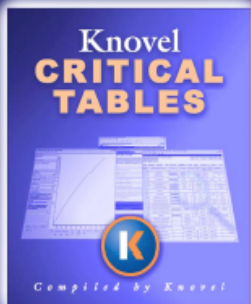
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- Common Isotopic Compositions

 Table (350)

☐ Calculated Properties of Common Organic Compounds



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 - Enthalpy of Formation
 - Enthalpy of Vaporization
 - Entropy of Formation
 - Entropy of Gas
 - Gibbs Energy of Formation
 - Heat Capacity of Gas
 - Helmholtz Energy of Formation
 - Internal Energy of Formation
- Calculated Vapor Pressures of Organic Compounds
- Heat Capacity of Organic Compounds in Gas Phase
- Heat Capacity of Organic Compounds in Liquid Phase
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Table: Interactive Table 4.10 Viscosity, Dielectric Constant, Dipole Moment, and Surface Tension of Selected Organic Substances

Table Type: Interactive Table

Search Query: (*surface tension* >= 25 mN/m) and (*dynamic viscosity* <= 0.5 mPa s)

Total Number of Search Hits: 35

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Interactive Table 4.10 Viscosity, Dielectric Constant, Dipole Moment, and Surface Tension of Selected Organic Substances						
✓ Select Rows Filter Data Print Table Export Table View Table Notes Unit Converter Help						
no. ▲	material or substance name	viscosity (mN s/m ²)	dielectric const.	dipole moment (D)	surface tension, coeff a (dyne/cm)	surface tension, coeff b (dyne/cm)
402	<i>trans</i> -1,2-Dichloroethylene	0.423 @ 15°C	Sort Ascending Sort Descending Columns	0.7 @ 25°C; benzene	25 @ 20°C	
408	Dichloromethane	0.449 @ 15°C		1.6, gas	30.41	0.1284
458	Diethyl sulfide	0.446 @ 20°C		1.52, gas	27.33	0.1106
491	Dimethylamine	0.207 @ 15°C	6.32 @ 0°C	1.03, gas	29.5	0.1265
539	Dimethyl sulfide	0.289 @ 20°C	6.2 @ 20°C	1.45 @ 25°C; benzene	26.07	0.0805
599	Ethanethiol	0.00316, gas	6.9 @ 15°C	1.57, gas	25.06	0.0793
614	Ethyl acetate	0.473 @ 15°C	6.11 @ 20°C	1.78, gas	26.29	0.1161
656	Ethylene oxide	0.3 @ 0°C	14 @ -1°C	1.88, gas	27.66	0.1664
660	Ethyl formate	0.419 @ 15°C	7.16 @ 25°C	1.94, gas	26.47	0.1315

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案例说明:实境学习- 真实的问题, 实际的解决方案 = 数据搜寻

案例

一个工程师正在开发一个用于清洁在生产过程中使用的混合容器的改良液体, 我们都知道高表面张力和低黏度的溶液是比较好的清洁剂。

所以, 工程师想要搜寻一个表面张力大于等于 25 (milliNewtons/metre) 和 黏度小于等于 0.5 (milliPascal /second) 的溶液。

方案

Knovel 可以帮助工程师解决这个问题。工程师可以使用 **DATA**search 的功能, 指定查询的性质和想要搜寻的数值后, 利用Knovel搜寻到适合的表格、图解或公式。



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rate of pressure rise

electrical properties

surface resistance

surface resistivity

hazard-related properties

explosion pressure

exposure limit (w/v)

exposure limit

optical properties

band gap pressure

coefficient

physical constants

critical pressure

triple point pressure

vapor pressure

surface area

processing properties

surface properties

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surface area (vol basis)

test/exposure conditions

allowed working pressure

exposure medium

exposure strain

exposure medium class

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Field

surface tension

is (=)
is not null (exists)
less than or equal to ($\leq$)
✓ greater than or equal to ($\geq$)
is between ($\geq$ / $\leq$)

-67.4 - 7000.0 mN/m

Units

mN/m

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Field

surface tension

Operator

greater than or equal to

Value

25

-67.4 - 7000.0 mN/m

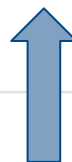
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- ✓ mN/m
- dyne/cm
- lbf/ft
- N/m
- erg/cm²
- gf/cm
- J/m²
- 10⁻³ lb-f/ft
- lbf/in
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Field



surface tension

Operator

greater than or equal to ▾

Value

25

Units

mN/m ▾

-67.4 - 7000.0 mN/m

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☐ Or

☐ Not

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Field	Operator	Value	Units
surface tension	greater than or equal to	25	mN/m
-67.4 - 7000.0 mN/m			

☒ And ☐ Or ☐ Not

Field	Operator	Value	Units
dynamic viscosity	<input "="" type="text" value="less than or equal to (<="/>	0.5	mPa s
-7.51E-10 - 1.5E16 mPa s			

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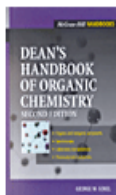
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Content Type

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Table (35)

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Table (3)



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Interactive Table 4.10 Viscosity, Dielectric Constant, Dipole Moment, and S...

Table: Interactive Table 4.10 Viscosity, Dielectric Constant, Dipole Moment, and Surface Tension of Selected Organic Substances

Table Type: Interactive Table

Search Query: (*surface tension* >= 25 mN/m) and (*dynamic viscosity* <= 0.5 Pa s)

Total Number of Search Hits: 35

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Pages:

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Interactive Table 4.10 Viscosity, Dielectric Constant, Dipole Moment, and Surface Tension of Selected Organic Substances						
Select Rows Filter Data Print Table Export Table View Table Notes Unit Converter Help						
no.	material or substance name	viscosity (mN s/m ²)	dielectric const.	dipole moment (D)	surface tension, coeff a (dyne/cm)	surface tension, coeff b (dyne/cm)
402	trans-1,2-Dichloroethylene	0.423 @ 15°C	Sort Ascending Sort Descending Columns	0.7 @ 25°C; benzene	25 @ 20°C	
408	Dichloromethane	0.449 @ 15°C		1.6, gas	30.41	0.1284
458	Diethyl sulfide	0.446 @ 20°C		1.52, gas	27.33	0.1106
491	Dimethylamine	0.207 @ 15°C	6.32 @ 0°C	1.03, gas	29.5	0.1265
539	Dimethyl sulfide	0.289 @ 20°C	6.2 @ 20°C	1.45 @ 25°C; benzene	26.07	0.0805
599	Ethanethiol	0.00316, gas	6.9 @ 15°C	1.57, gas	25.06	0.0793
614	Ethyl acetate	0.473 @ 15°C	6.11 @ 20°C	1.78, gas	26.29	0.1161
656	Ethylene oxide	0.3 @ 0°C	14 @ -1°C	1.88, gas	27.66	0.1664
660	Ethyl formate	0.419 @ 15°C	7.16 @ 25°C	1.94, gas	26.47	0.1315

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Physical Properties

Table: Physical Properties

Table Type: Interactive Table

Search Query: (*dynamic viscosity* ≤ 0.5 mPa s) and (*surface tension* ≥ 25 mN/m)

Total Number of Search Hits: 18

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Number of Hidden Columns: 3

Pages:

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Physical Properties									
Select Rows Filter Data Print Table Export Table View Table Notes Unit Converter Help									
molecular weight	freezing temperature (°C)	boiling temperature (°C)	evaporation rate, butyl	color	dielectric constant	surface tension (mN/m)	viscosity (mPa s)	molar volume (cm ³ /mol)	specific gravity (g/cm ³)
5	-112	51		colorless	15.8	26.7	0.369	71.4	1.105
1	-84	77		colorless		27.3	0.34	67.1	0.8
1	-99	75	7.8	colorless	13.4	29.9	0.43	88.5	0.8
1	-110.8	46.3		colorless	2.6	32	0.36	60	1.293



检索结果可以汇出以提供离线浏览

Knovel® Interactive Table 4.10 Viscosity, Dielectric Con

Table: Interactive Table 4.10 Viscosity, Dielectric Constant, Dipole Moment
Table Type: Interactive Table
Search Query: (*surface tension* >= 25 mN/m) and (*dynamic viscosity* < 0.5 mPa·s)
Total Number of Search Hits: 35
Total Number of Rows: 1359

Interactive Table 4.10 Viscosity, Dielectric Constant, Di		
Select Rows Filter Data Print Table Export Table View		
no. ▲	material or substance name	viscosity (mN s/m ²)
402	<i>trans</i> -1,2-Dichloroethylene	0.423 @ 15
408	Dichloromethane	0.449 @ 15
458	Diethyl sulfide	0.446 @ 20
491	Dimethylamine	0.207 @ 15
539	Dimethyl sulfide	0.289 @ 20
599	Ethanethiol	0.00316, ga Done
614	Ethyl acetate	0.473 @ 15°C
656	Ethylene oxide	0.3 @ 0°C
660	Ethyl formate	0.419 @ 15°C

Knovel – Knovel Content
http://www.knovel.com/web/portal/knovel_content?p_p_id=EXT_KNOVEL_CONTENT&p_p_action=1&p_p_state=normal

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Knovel: Export Table

Select an Export Option:

☒ Current page of table (up to 50 rows)

☐ Current page of table (up to 50 rows) with rows displayed as text
Rows displayed as text show information from a row including synonyms and some other data accessible from hyperlinks.

NEXT

CLOSE

HELP

6.11 @ 20°C	1.78, gas	26.29	0.1161
14 @ -1°C	1.88, gas	27.66	0.1664
7.16 @ 25°C	1.94, gas	26.47	0.1315

Dean's Handbook of Organic Chemistry (2nd Edition)
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Done



选择档案类型 (FILETYPE)

Knovel - Knovel Content

http://www.knovel.com/web/portal/knovel_content?p_p_id=EXT_KNOVEL_CONTENT&p_p_action=1&p_p_state=normal&p_p_mode=view&p_p_col_id=column-1&p_p_col_count=1&_EXT_KNOVEL...

Knovel®

Interactive Table 4.10 Viscosity, Dielectric Constant, Dipole Moment

Table: Interactive Table 4.10 Viscosity, Dielectric Constant, Dipole Moment
Table Type: Interactive Table
Search Query: (surface tension >= 25 mN/m) and (dynamic viscosity < 0.5 mPa·s)
Total Number of Search Hits: 35
Total Number of Rows: 1359

Interactive Table 4.10 Viscosity, Dielectric Constant, Dipole Moment

Select Rows | Filter Data | Print Table | Export Table | View Table

no.	material or substance name	viscosity (mN s/m ²)
402	trans-1,2-Dichloroethylene	0.423 @ 15
408	Dichloromethane	0.449 @ 15
458	Diethyl sulfide	0.446 @ 20
491	Dimethylamine	0.207 @ 15
539	Dimethyl sulfide	0.289 @ 20
599	Ethaneethiol	0.00316, gas
614	Ethyl acetate	0.473 @ 15°C
656	Ethylene oxide	0.3 @ 0°C
660	Ethyl formate	0.419 @ 15°C

Knovel: Export Table

Select a File Type:

- ☒ Microsoft Excel
- ☐ HTML
- ☐ PDF
- ☐ Text (tab-delimited)

BACK **EXPORT** **CLOSE** **HELP**

Done

no.	material or substance name	viscosity (mN s/m ²)	dielectric constant	dipole moment (Debye)
614	Ethyl acetate	0.473 @ 15°C	6.11 @ 20°C	1.78, gas
656	Ethylene oxide	0.3 @ 0°C	14 @ -1°C	1.88, gas
660	Ethyl formate	0.419 @ 15°C	7.16 @ 25°C	1.94, gas

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Done



决定要打开或储存 Excel

Knovel - Knovel Content

http://www.knovel.com/web/portal/knovel_content?p_p_id=EXT_KNOVEL_CONTENT&p_p_action=1&p_p_state=normal&p_p_mode=view&p_col_id=column-1&p_col_count=1&EXT_KNOVEL...

Knovel®

Interactive Table 4.10 Viscosity, Dielectric Constant, Dipole Moment

Table: Interactive Table 4.10 Viscosity, Dielectric Constant, Dipole Moment
Table Type: Interactive Table
Search Query: (surface tension >= 25 mN/m) and (dynamic viscosity < 0.5 mN s/m²)
Total Number of Search Hits: 35
Total Number of Rows: 1359

Interactive Table 4.10 Viscosity, Dielectric Constant, Dipole Moment

Select Rows | Filter Data | Print Table | Export Table | View Table

no.	material or substance name	viscosity (mN s/m ²)
402	trans-1,2-Dichloroethylene	0.423 @ 15°C
408	Dichloromethane	0.449 @ 15°C
458	Diethyl sulfide	0.446 @ 20°C
491	Dimethylamine	0.207 @ 15°C
539	Dimethyl sulfide	0.289 @ 20°C
599	Ethanethiol	0.00316, gas
614	Ethyl acetate	0.473 @ 15°C, 6.11 @ 20°C, 1.78, gas
656	Ethylene oxide	0.3 @ 0°C, 14 @ -1°C, 1.88, gas
660	Ethyl formate	0.419 @ 15°C, 7.16 @ 25°C, 1.94, gas

Dean's Handbook of Organic Chemistry (2nd Edition)
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Knovel: Export Table

Select an Export Option:

- ☒ Current page of table (up to 50 rows)
- ☐ Current page of table (up to 50 rows) with rows displayed as text

Rows displayed as text show information from a row including...

NEXT CLOSE

Opening TableData.xls

You have chosen to open

TableData.xls
which is a: xls File
from: http://www.knovel.com

What should Firefox do with this file?

- ☐ Open with Choose...
- ☒ Save File
- ☐ Do this automatically for files like this from now on.

Cancel OK



现在检索结果已经储存在个人计算机里供后续分析应用

																				Sheets Charts SmartArt Graphics WordArt									
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T									
1	Title: Dean's Handbook of Organic Chemistry (2nd Edition)																												
2	Table: Interactive Table 4.10 Viscosity, Dielectric Constant, Dipole Moment, and Surface Tension of Selected Organic Substances																												
3																													
4	no.	material or viscosity (dielectric c dipole mor surface ter surface tension, coeff b (dyne/cm)																											
5	14	Acetone, li	0.391 @ 0°	20.7 @ 25°	2.77 @ 20°	26.26	0.112																						
6	18	Acetonitrile	0.397 @ 10	37.5 @ 20°	3.97, gas	29.58	0.1178																						
7	30	Acrylonitrile	0.35 @ 20°	33 @ 20°C	3.91, gas	29.58	0.1178																						
8	32	Allyl acetate	0.207 @ 30			28.73	0.1186																						
9	33	Allylamine	0.375 @ 25		1.3 @ 25°C	27.49	0.1287																						
0	98	Bromoethane	0.397 @ 20	13.6 @ -60	2.03, gas	26.52	0.1159																						
1	153	1-Butaneth	0.501 @ 20	5.07 @ 25°	1.54 @ 25°	28.07	0.1142																						
2	160	2-Butanone	0.428 @ 20	18.5 @ 20°	3.2 @ 30°C	26.77	0.1122																						
3	207	Butyraldehyde	0.455 @ 20	13.4 @ 26°	2.45 @ 40°	26.67	0.0925																						
4	218	Carbon dis	0.363 @ 20	3 @ -112°C	0, gas	35.29	0.1484																						
5	231	1-Chlorobu	0.469 @ 15	9.07 @ -30	2.13, gas	25.97	0.1117																						
6	288	3-Chloro-1-	0.347 @ 15	8.2 @ 20°C	2, gas	25.5	0.0946																						
7	330	Cyclopenta	0.439 @ 20	1.965 @ 20	0	25.53	0.1462																						
8	394	1,1-Dichlor	0.505 @ 25	10.1 @ 18°	2.06, gas	27.03	0.1186																						
9	400	cis-1,2-Dic	0.467 @ 20	9.2 @ 25°C	2.95, gas	28 @ 20°C																							
0	402	trans-1,2-D	0.423 @ 15	2.14 @ 25°	0.7 @ 25°C	25 @ 20°C																							
1	408	Dichlorome	0.449 @ 15	9.14 @ 20°	1.6, gas	30.41	0.1284																						
2	458	Diethyl sulf	0.446 @ 20	5.72 @ 25°	1.52, gas	27.33	0.1106																						
3	491	Dimethylam	0.207 @ 15	6.32 @ 0°C	1.03, gas	29.5	0.1265																						
4	539	Dimethyl st	0.289 @ 20	6.2 @ 20°C	1.45 @ 25°	26.07	0.0805																						
5	599	Ethanethiol	0.00316, g	6.9 @ 15°C	1.57, gas	25.06	0.0793																						
6	614	Ethyl aceta	0.473 @ 15	6.11 @ 20°	1.78, gas	26.29	0.1161																						
7	656	Ethylene ox	0.3 @ 0°C	14 @ -1°C	1.88, gas	27.66	0.1664																						
8	660	Ethyl forma	0.419 @ 15	7.16 @ 25°	1.94, gas	26.47	0.1315																						
9	677	Ethyl methy	0.373 @ 20			27.63	0.1286																						
0	782	Iodomethar	0.5 @ 20°C	7 @ 20°C	1.64, gas	33.42	0.1234																						
1	862	Methyl acel	0.388 @ 20	7.03 @ 20°	1.7, gas	27.95	0.1289																						
2	906	cis-4-Methy	0.247 @ 25	13.3, mixec	2.7 @ 30°C	29.07	0.069, mixed isomers																						



数据后续的加值与应用

Title: Knovel Solvents - A Properties Database

Table: Physical Properties

no.	name	IUPAC Name	CAS Registry no.	molecular weight	freezing temperature (°C)	boiling temperature (°C)	evaporatio	color	dielectric constant	surface tension (mN/m)	viscosity (
20	Acetyl chloride	acetyl chloride	75-36-5	78.5	-112	51		colorless	15.8	26.7	0.369
32	Acrylonitrile	prop-2-enenitrile	107-13-1	53.1	-84	77		colorless		27.3	0.34
157	Butyraldehyde	butanal	123-72-8	72.1	-99	75	7.8	colorless	13.4	29.9	0.43
163	Carbon disulfide	methanedithione	75-15-0	76.1	-110.8	46.3		colorless	2.6	32	0.36
288	Dichloromethane	dichloromethane	75-09-2	84.94	-94.92	39.6	14.5	colorless	9.1	27.89	0.4043
345	Dimethyl sulfide	methylsulfanylmethane	75-18-3	62.1	-98	37		colorless	6.3	26.5	0.28
717	Methyl formate	methyl formate	107-31-3	60.05	-100	32		colorless	8.5	25	0.328
730	Methyl propyl ketone	pentan-2-one	107-87-9	86.15	-78	102	2.4	colorless	13.6	33.87	0.489
966	Solvon ACS			122.99		71		colorless		25.9	0.49
967	Solvon AER			122.99		71		colorless		25.9	0.49
968	Solvon DR					70				25.9	0.49
969	Solvon IP					68				25.9	0.49
970	Solvon PB					70				25.9	0.49
1004	Tetrahydrofuran	oxolane	109-99-9	72.12	-108.4	65.9	6.3	colorless	7.58	26.4	0.46
1199	Lenium RV					71				25.9	0.49
1200	Lenium XS					71				25.9	0.49
1238	Eastman methyl acetate		79-20-9	74.09	-98	55.8	6			25.8	0.4
1412	Triagen					71				25.9	0.49

Knovel Solvents - A Properties Database © 2008 ChemTec Publishing



另一个范例: Let's check it out LIVE

Problem

A perfume chemist working on a new formulation would like to find a co-solvent, perhaps an alcohol, that ensures solubility of all the ingredients and a clear solution. **Alcohols** with a **boiling point between 100-200° C**, and a **melting point between 50-100° C** can be considered.

Solution

- Let's use Knovel DATA SEARCH to find a solution.



找尋答案的檢索方式如下

Data Search retrieves numeric and other tabular data contained in Knovel's interactive graphs, equations and tables. Click in the Field box to display the available search fields. When you begin typing, the list is filtered.



Help

Field	Operator	Value	Units
melting point	is between (>= / <=)	50 and 100	°C
-272.0 - 10500.0 °C			

☒ And ☐ Or ☐ Not

Field	Operator	Value	Units
boiling point	is between (>= / <=)	100 and 200	°C
-273.0 - 215000.0 °C			

☒ And ☐ Or ☐ Not

Field	Operator	Value
material or substance name	is (=)	alcohol

Search

or [clear form](#)



内容	进度
Knovel简介：为实务工作中的问题提供最佳答案	☒
权威的内容、最佳化的检索以及数据分析工具 ➤ 在此一章节我们将体验Knovel独特的三项重要功能	☒
如何增加使用率 – 内容浏览 ➤ 以Knovel Critical Tables 为例	☒
如何增加使用率– 数据查询 ➤ 在此一章节我们将学习到如何透过数据分析工具的查询来找到问题的答案	☒
如何增加使用率–基本检索 ➤ 在此一章节我们将了解如何自超过2千种手册及参考工具书中发现答案。在说明中会强调如何整合文字于数字化的内容中。	
个人化的 Knovel – myKNOVEL ➤ 在此一章节中我们将说明如何让个别的教授和学生可以在Knovel中建立自己的空间	



案例说明:情境

问题

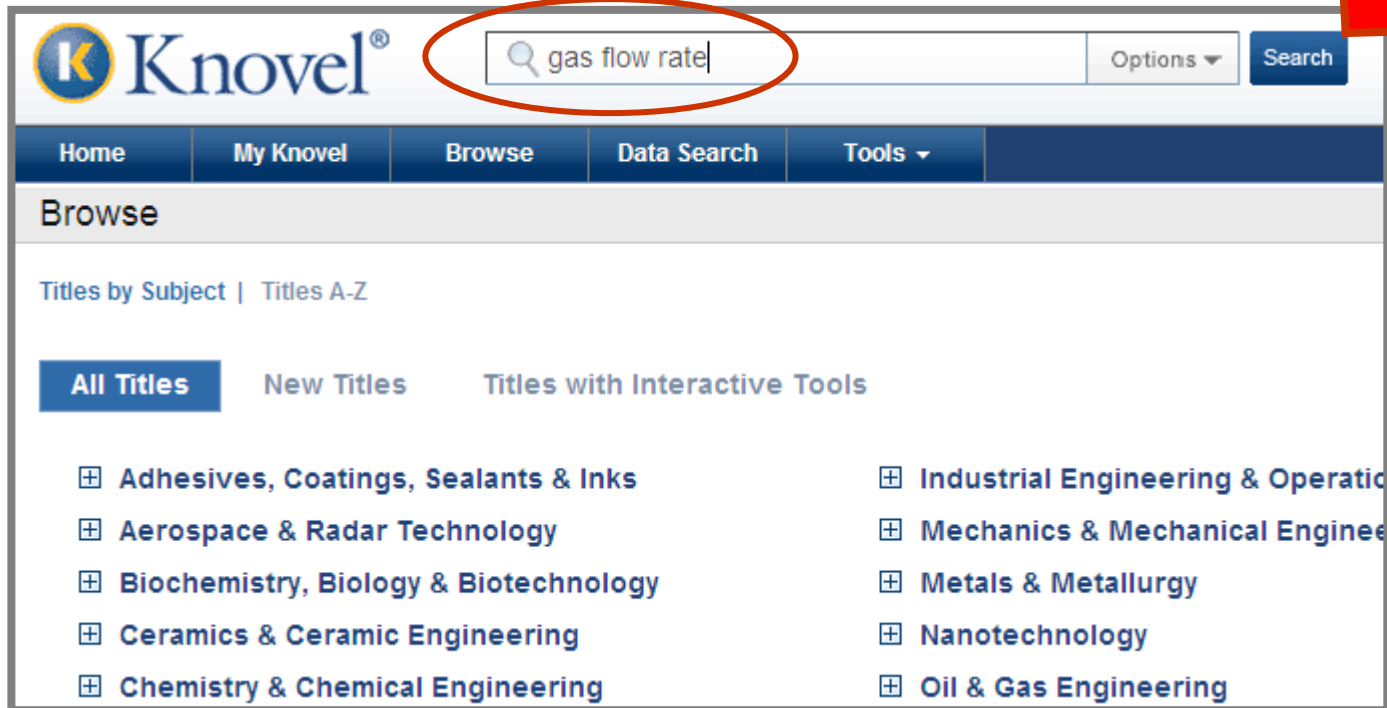
一个石油工程师要设计一个横跨整个厂房来运输天然气的管路。厂方提供要求如下：

- 运输管路将长达10英哩
- 运输管路的内部直径为 6.1 英吋

方案

- 使用Knovel来看解决方案

Knovel Basic Search– 直接输入 gas flow rate



The screenshot shows the Knovel website interface. At the top, there is a search bar containing the text "gas flow rate". A red circle highlights the search bar, and a red arrow points to it from the right. Below the search bar is a navigation menu with links: Home, My Knovel, Browse, Data Search, and Tools. The "Browse" link is selected. Below the navigation menu, the "Browse" section is displayed, showing a list of titles by subject. The titles are organized into two columns, each with a plus icon in a square box next to the title. The titles are: Adhesives, Coatings, Sealants & Inks; Aerospace & Radar Technology; Biochemistry, Biology & Biotechnology; Ceramics & Ceramic Engineering; Chemistry & Chemical Engineering; Industrial Engineering & Operations; Mechanics & Mechanical Engineering; Metals & Metallurgy; Nanotechnology; and Oil & Gas Engineering.

Knovel®

gas flow rate

Options Search

Home My Knovel Browse Data Search Tools

Browse

Titles by Subject | Titles A-Z

All Titles New Titles Titles with Interactive Tools

- Adhesives, Coatings, Sealants & Inks
- Aerospace & Radar Technology
- Biochemistry, Biology & Biotechnology
- Ceramics & Ceramic Engineering
- Chemistry & Chemical Engineering
- Industrial Engineering & Operations
- Mechanics & Mechanical Engineering
- Metals & Metallurgy
- Nanotechnology
- Oil & Gas Engineering

Knovel 检索结果— 显示 gas flow rate 有486笔数据

COLLAPSE ALL

Number of Titles Retrieved: 486 Page: 1 of 17

You searched for *(gas flow rate)*

Add Search to My Knovel

Titles:

 Gas Well Testing Handbook 

100 %



Add Book to My Knovel

Search Within

Sections

Appendix D: Gas Flow Rate Measurement Techniques

100 %

 [Text](#)

D.1 Gas Flow Rate Calculations

100 %

 [Text](#)

Interactive Graphs

62 %

 [Table \(8\)](#)

4.7 Gas Well Deliverability Testing and Production Potential Analysis

50 %

 [Text](#)

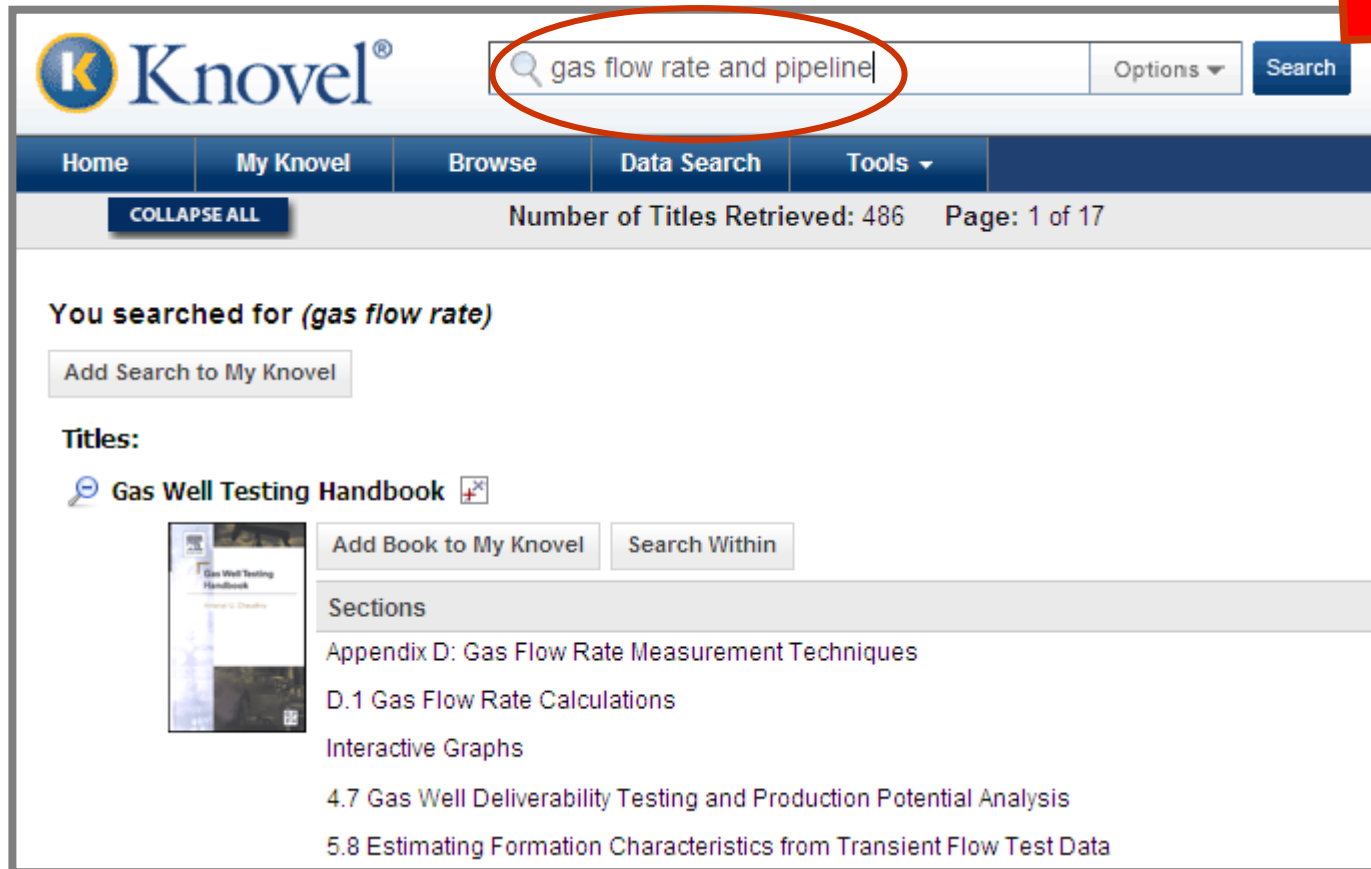
5.8 Estimating Formation Characteristics from Transient Flow Test Data

31 %

 [Text](#)

[Show more results](#)

Knovel Basic Search— 增加检索为 gas flow rate and pipeline



Knovel®

gas flow rate and pipeline Options Search

Home My Knovel Browse Data Search Tools

COLLAPSE ALL Number of Titles Retrieved: 486 Page: 1 of 17

You searched for *(gas flow rate)*

Add Search to My Knovel

Titles:

 **Gas Well Testing Handbook** 

 Add Book to My Knovel Search Within

Sections

- Appendix D: Gas Flow Rate Measurement Techniques
- D.1 Gas Flow Rate Calculations
- Interactive Graphs
- 4.7 Gas Well Deliverability Testing and Production Potential Analysis
- 5.8 Estimating Formation Characteristics from Transient Flow Test Data

Knovel 检索结果— gas flow rate and pipeline 总共有41笔

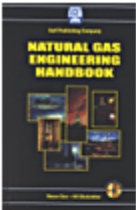
COLLAPSE ALL **Number of Titles Retrieved: 41** Page: 1 of 2

You searched for *(gas flow rate and pipeline)*

[Add Search to My Knovel](#)

Titles:

 **Natural Gas Engineering Handbook**  100 %

 [Add Book to My Knovel](#) [Search Within](#)

Sections	Relevancy	Content Type
11.2.1 Sizing Pipelines	100 %	 Text
11.2.2 Pipeline Wall Thickness	67 %	 Text
Table 11.1 Input Data and Results Given by PipeCapacity.xls	67 %	 Text
12. Special Problems	34 %	 Text
12.1 Introduction	34 %	 Text

[Show more results](#)

Knovel 检索结果— 搜寻有互动图表内容的数据

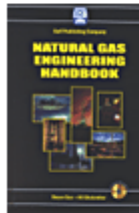
You searched for *(gas flow rate and pipeline)*

Add Search to My Knovel

Titles:



Natural Gas Engineering Handbook



Add Book to My Knovel

Search Within

Relevancy

100 %

Sections	Relevancy	Content Type
11.2.1 Sizing Pipelines	100 %	Text
11.2.2 Pipeline Wall Thickness	67 %	Text
Table 11.1 Input Data and Results Given by PipeCapacity.xls	67 %	Text
12. Special Problems	34 %	Text
12.1 Introduction	34 %	Text

[Show more results](#)

Knovel 检索结果– Sizing Pipelines

You searched for *(gas flow rate and pipeline)*

Add Search to My Knovel

Titles:

 **Natural Gas Engineering Handbook** 



Add Book to My Knovel

Search Within

Sections

Relevancy

Content

11.2.1 Sizing Pipelines

100 %

 [Text](#)

11.2.2 Pipeline Wall Thickness

87 %

 [Text](#)

Table 11.1 Input Data and Results Given by PipeCapacity.xls

67 %

 [Text](#)

12. Special Problems

34 %

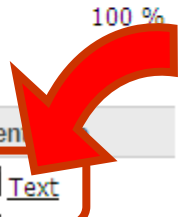
 [Text](#)

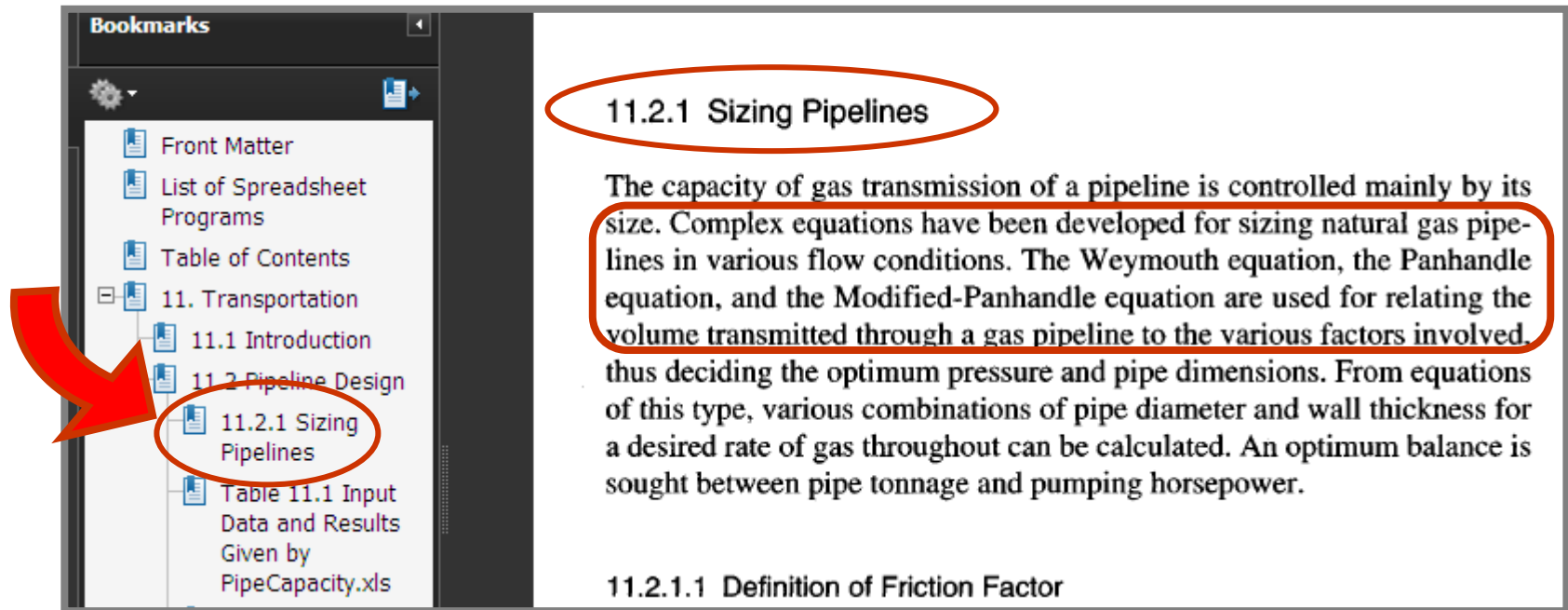
12.1 Introduction

34 %

 [Text](#)

[Show more results](#)





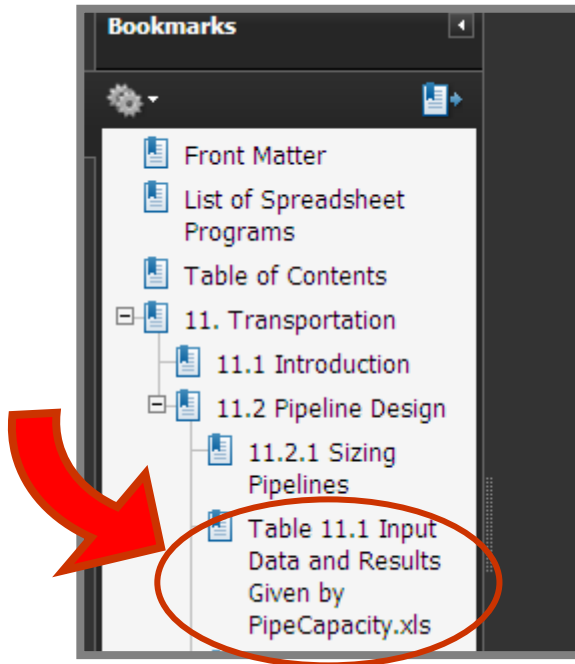
Bookmarks

- Front Matter
- List of Spreadsheet Programs
- Table of Contents
- 11. Transportation
 - 11.1 Introduction
 - 11.2 Pipeline Design
 - 11.2.1 Sizing Pipelines**
 - Table 11.1 Input Data and Results Given by PipeCapacity.xls

11.2.1 Sizing Pipelines

The capacity of gas transmission of a pipeline is controlled mainly by its size. Complex equations have been developed for sizing natural gas pipelines in various flow conditions. The Weymouth equation, the Panhandle equation, and the Modified-Panhandle equation are used for relating the volume transmitted through a gas pipeline to the various factors involved, thus deciding the optimum pressure and pipe dimensions. From equations of this type, various combinations of pipe diameter and wall thickness for a desired rate of gas throughput can be calculated. An optimum balance is sought between pipe tonnage and pumping horsepower.

11.2.1.1 Definition of Friction Factor



11.2.1 Sizing Pipelines

The capacity of gas transmission of a pipeline is controlled mainly by its size. Complex equations have been developed for sizing natural gas pipelines in various flow conditions. The Weymouth equation, the Panhandle equation, and the Modified-Panhandle equation are used for relating the volume transmitted through a gas pipeline to the various factors involved, thus deciding the optimum pressure and pipe dimensions. From equations of this type, various combinations of pipe diameter and wall thickness for a desired rate of gas throughput can be calculated. An optimum balance is sought between pipe tonnage and pumping horsepower.

11.2.1.1 Definition of Friction Factor

Bookmarks

- Front Matter
- List of Spreadsheet Programs
- Table of Contents
- 11. Transportation
 - 11.1 Introduction
 - 11.2 Pipeline Design
 - 11.2.1 Sizing Pipelines
 - Table 11.1 Input Data and Results Given by PipeCapacity.xls**
 - Table 11.5 Input Data and Solution Given by LoopedLines.xls
 - 11.2.2 Pipeline Wall

Click to View Calculation Example

Table 11-1 Input Data and Results Given by PipeCapacity.xls(a)

Instructions: 1) Update input data; 2) Run Macro Solution and view results.

Input Data	
Pipe ID:	12.09 in
Pipe roughness:	0.0006 in
Pipeline length:	200 mi
Average temperature:	80 °F
Base temperature:	60 °F
Base pressure:	14.7 psia
Inlet pressure:	600 psia
Outlet pressure:	200 psia
Gas properties:	
Gas-specific gravity:	0.7 air = 1
Mole fraction of N ₂ :	0
Mole fraction of CO ₂ :	0
Mole fraction of H ₂ S:	0
Calculated Parameter Values	

通常电子书查询到这边就无法继续提供其它加值功能。

Knovel可以提供互动表表格(蓝框标示的范围)来应用于工作流程中

Knovel 交互式表格– PipeCapacity.xls

	A	B	C	D	E	F	G
1	PipeCapacity.xls						
2	This spreadsheet computes capacity of gas pipelines.						
3	Instructions: 1. Update input data in blue; 2. Run Macro Solution; 3. View results.						
4	Input Data:						
5		Pipe I.D.:				12.09	in.
6		Pipe roughness:				0.0006	in.
7		Pipeline length:				200	miles
8		Average temperature:				80	°F
9		Base temperature:				60	°F
10		Base pressure:				14.7	psia
11		Inlet pressure:				600	psia
12		Outlet pressure:				200	psia
13		Gas properties:					
14			Gas specific gravity:			0.7	air = 1
15			Mole fraction of N ₂ :			0	
16			Mole fraction of CO ₂ :			0	
17			Mole fraction of H ₂ S:			0	

B) Use Weymouth Equation:

$$q_h = \frac{18.062 T_b}{p_b} \sqrt{\frac{(p_1^2 - p_2^2) D^{16/3}}{\gamma_g \bar{T} Z L}}$$

1,076,035 cfm

Knovel 交互式表格– PipeCapacity.xls – 变更为工程师实际要计算的数据

	A	B	C	D	E	F	G
1	PipeCapacity.xls						
2	This spreadsheet computes capacity of gas pipelines.						
3	Instructions: 1. Update input data in blue; 2. Run Macro Solution; 3. View results.						
4	Input Data:						
5		Pipe I.D.:				6.1 in.	
6		Pipe roughness:				0.0006 in.	
7		Pipeline length:				10 miles	
8		Average temperature:				80 °F	
9		Base temperature:				60 °F	
10		Base pressure:				14.7 psia	
11		Inlet pressure:				600 psia	
12		Outlet pressure:				200 psia	
13		Gas properties:					
14			Gas specific gravity:			0.7	air = 1
15			Mole fraction of N ₂ :			0	
16			Mole fraction of CO ₂ :			0	
17			Mole fraction of H ₂ S:			0	

44							
45		B) Use Weymouth Equation:					
46							
47		Pipeline flow capacity =	$q_h = \frac{18.062 T_b}{p_b} \sqrt{\frac{(p_1^2 - p_2^2) D^{16/3}}{\gamma_g \bar{T} z L}}$			776,397	cfh
48							
49							

转换单位— Knovel Unit Converter

44						
45		B) Use Weymouth Equation:				
46						
47		Pipeline flow capacity =	$q_h = \frac{18.062 T_b}{p_b} \sqrt{\frac{(p_1^2 - p_2^2) D^{16/3}}{\gamma_g \bar{T} \bar{z} L}}$	776,397	cfh	
48						
49						

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Results– Unit Converter (cfh to cym)

The screenshot shows the Knovel Unit Converter web application. The interface includes a header with the Knovel logo and title. The main area contains several input fields and buttons. Red ovals highlight the 'Property', 'Input Value', 'Convert from', 'Output Value', 'Significant digit', and 'Convert to' fields. A large red arrow points from the 'Input Value' field to the 'Output Value' field, and a yellow arrow points from the 'Convert from' field to the 'Convert to' field.

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Knovel Unit Converter

Property: flowrate (vol basis) ▼

Input Value: 776397

Output Value: 479.2574

Significant digit: 7 ▼

Convert from: ft³/h ▼

Convert to: yd³/min ▼

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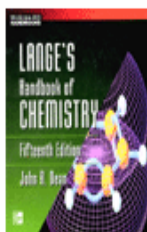
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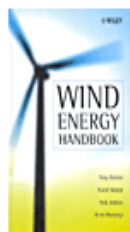


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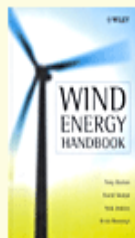
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Wind Energy Handbook

By: Burton, Tony; Sharpe, David; Jenkins, Nick; Bossanyi, Ervin

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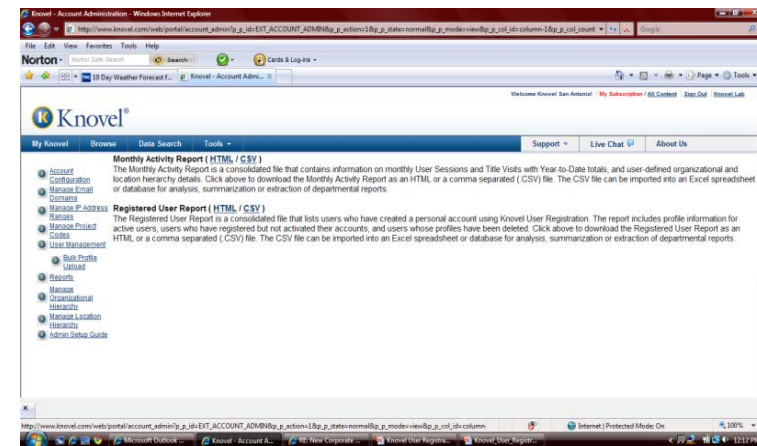


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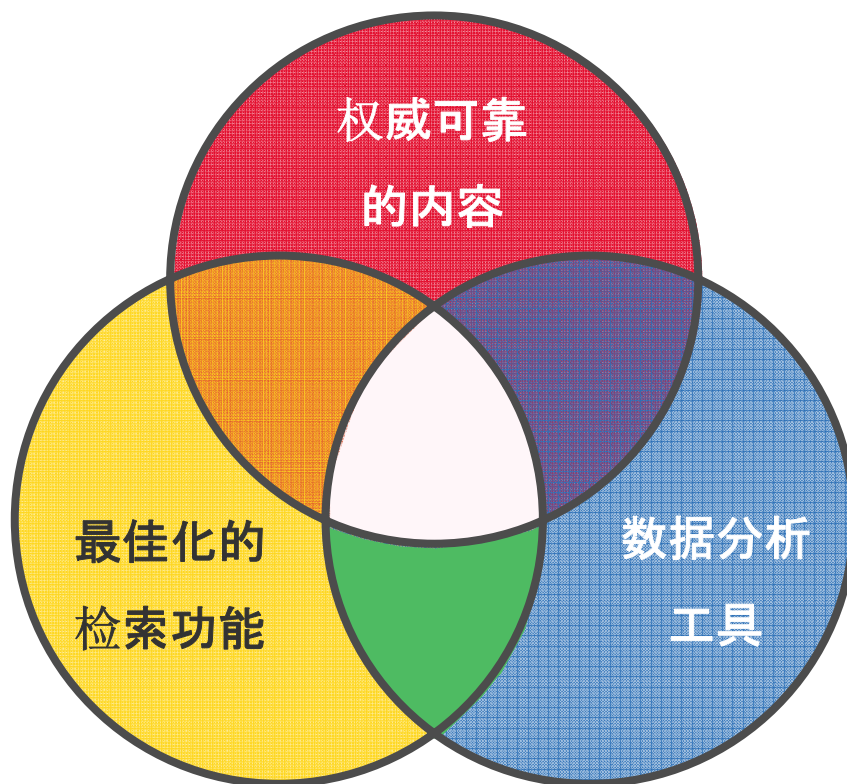
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