**论文输入输出实例**

计算机科学与技术 专业

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摘要

关键词：流体力学，计算机并行，平衡点

## 1 example

## 通用数据

表格 1.1 通用数据

|  |  |
| --- | --- |
| 变量 | 数值 |
| 管柱的长度*L* | *12000in.* |
| 空气中每单位长度管柱平均重量 | *0.542lbm/in.* |
| 内径 | *1.22in* |
| 外径 | *1.438in* |
| 外力*F* | *20000lbf* |
| 外径内径比例*R* | *1.178* |
| *I* | *1.61i* |
| 管柱内液体密度 |  |
| 环空内液体密度 |  |
| 管柱内加压 | *5000Psi* |
| 环空内加压 | *1000Psi* |
| 封隔器通径 | *3.25in* |
| *r* | *1.61in.* |
|  | *0* |
|  |  |

表格 1.2 单位转换表

|  |  |  |
| --- | --- | --- |
| *ft* | *m* | *1ft=0.3048m* |
| *in* | *mm* | *1in=25.4mm* |
| *ft* | *in* | *1ft=12in* |
| *lbm[[1]](#footnote-2)* | *kg* | *1lbm=0.454kg* |
| *lbf* | *N* | *1lbf=4.45N* |
| *Mpa* | *Psi* | *1Mpa=145Psi* |
| *gal* | *cu ft.* | *1gal=0.1336808cu ft.* |
| *Psi* | *lbs/sq in.* | *1Psi=1lbs[[2]](#footnote-3)/sq in.* |

根据表1.1可得

*=6.49sq in****.***

*=4.68sq in.*

*=1.81sq in.*

*=8.30sq in.*

(1.1)

(1.2)

初始密度为，最终密度为，。所以密度变化为，。

初始压力为，根据公式(1.1)，。最终压力为,，根据公式(1.1)，，。所以压力变化值为，，，。

根据公式(1.2)及上述初始和最终密度数值，可得，每单位长度的质量初始值为，最终值为。

## EXAMPLE 1-PACKER PERMITTING FREE MOTION

(1.3)

(1.4)

(1.5)

(1.6)

(1.7)

(1.8)

(1.9)

(1.10)

(1.11)

(1.12)

(1.13)

根据公式(1.7)(1.8)(1.9)(1.10)可得，，，，，所以

根据公式(1.3)(1.4)可得，。

根据公式(1.12)，及，可得。

## EXAMPLE 1-PACKER PERMITTING LIMITED MOTION

## EXAMPLE 2- PACKER PERMITTING LIMITED MOTION

## EXAMPLE 2-PACKER PERMITTING NO MOTION

**术语：**

F= externally applied force (positive if a compression), Ibf (N)施加的外力

= average weight in air of the tube per unit length, Ibm/in. (g/mm) 空气中的每单位长度的管平均重量

= cross-sectional area of the tubing wall, sq in.(mm2)管壁的横截面积

=surface tubing pressure, Psi

=surface annulus pressure, Psi

= pressure outside the tube at the packer level, psi (Pa)

= pressure inside the tube at the packer level, psi (Pa)

= area corresponding to packer bore ID, sq in. (mm2)

= area corresponding to tubing ID, sq in. (mm2)

= area corresponding to tubing OD, sq in. (mm2)

= fictitious force in presence of no restraint in the packer,lbf

= actually existing pressure force at the lower end of the tubing subjected to no restraint in the packer

,lbf

v=Poissin’s ratio of the material (for steel ,v=0.3)

=coefficient of thermal expansion of the tubing material(for steel,)

=drop of pressure in the tubing due to flow per unit length

=change in average tubing temperature

=length change of the tubing due to Hooke’s law,胡克定律产生的形变由公式定义

=length change of the tubing due to helical buckling,变形弯曲产生的形变由公式定义

=length change of the tubing due to radial pressure forces and flow through the tubing,径向压力和液体流动产生的形变由公式(1.9)定义

=length change of the tubing due to temperature change,温度变化产生的长度变化由公式(1.10) 定义

=Over-all tubing change due to flow and to changes of pressure, temperature and density,压力，温度，密度和液体流动产生的管柱总长度变化，由公式 定义

参考文献

[1]Lubinski A,Althouse W S,Logan J L. Helical Buckling of Tubing Sealed in Packers[J]. Journal of Petroleum Technology, 1962, 14(6):655-670

附录

中立点（neutral point），就是在这个点上方管柱不发生形变，在这个点下方管柱弯曲。

1. 英制重量单位， 一般lb是表示力的单位--磅，也有时表示压力、质量 ，通用。为了区别起见，lbm 专门表示质量 ，lbf专门表示力。 [↑](#footnote-ref-2)
2. lb的复数是lbs [↑](#footnote-ref-3)