李治勤,马 静.迷宫灌水器水流流态试验[J].农业工程学报,2012,28(1):82-86

迷宫灌水器水流流态试验

Experiment on flow pattern in labyrinth emitter

投稿时间： 2011-11-14 最后修改时间： 2011-12-10

中文关键词：流态,雷诺数,损失,灌水器,迷宫流道

英文关键词:flow patterns Reynolds number losses emitter labyrinth channel

基金项目:山西省自然科学基金资助项目（2008011054）

作者	单位
李治勤	1. 西安理工大学水利水电学院，西安 710048； 2. 太原理工大学水利科学与工程学院，太原 030024
马 静	2. 太原理工大学水利科学与工程学院，太原 030024

摘要点击次数:**522**

全文下载次数:**126**

中文摘要:

为分析迷宫灌水器流道内水流流态及其相互转换的临界雷诺数，该文对5种流道尺寸的模型中水流流动现象进行观测与分析，并进一步分析了迷宫流道内水流水头损失与断面平均流速之间的关系以及相应断面尺寸直流道内水流沿程水头损失与断面平均流速之间的关系。结果表明：迷宫灌水器不断转折的流道对水流有很大的干扰，可以使其中水流在雷诺数为41.5时就失去稳定转变为过渡区；迷宫流道进口段单元中可能出现层流，出现层流的单元数占总单元数的10%～12%。从整体来看，可认为迷宫灌水器中水流流态为紊流或过渡区；与经典雷诺试验结果不同，迷宫流道中水流水头损失与断面平均流速的2.0～2.5次方成比例；迷宫灌水器的流态指数可达到0.4～0.5；该试验迷宫流道中水流过渡区与紊流区相互转换的临界雷诺数为87.5～125.0。

英文摘要:

In order to analyze the flow pattern and the critical Reynolds number of flow pattern conversion to each other in the runner of the labyrinth emitter, the tests of the water flow for the model with five different sizes of runner were conducted, the phenomena of water flow were observed and analyzed, the relationship between the head loss and average velocity in the labyrinth runner was analyzed, and the relationship between friction loss and average velocity along the straight runner that with the same section size as the labyrinth runner was analyzed. The results show that: The labyrinth path has great disturbance on the flow, making the laminar flow change into the transition region when Reynolds number is 41.5; the laminar flow may occur in the labyrinth units at the entrance section which accounts for 10%-12% of the whole labyrinth units. as a whole, the flow pattern can be regarded as turbulence or transition region; unlike the classical Reynolds test, the head loss in the labyrinth path is proportional to the 2.0-2.5th power of average velocity of section; the flow pattern index of labyrinth emitter can be 0.4-0.5; and the critical Reynolds number of flow state conversion between transition region and the turbulence ranges from 87.5 to 125.0 in the test.

查看全文 下载PDF阅读器

关闭

您是第**5179568**位访问者

主办单位： 单位地址：北京朝阳区麦子店街41号

服务热线：010－65929451 传真：010－65929451 邮编：100125 Email：tcsae@tcsae.org
本系统由北京勤云科技发展有限公司设计