

# Quality Supervision and Test of Irrigation and Drainage Equipment in China



**China Institute of Water Resources and Hydropower  
Research (IWHR)**  
**Fortaleza 2012.05**

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# Basic information

**Founded in 1985, namely “Test Center for Equipment on Irrigation and Drainage, Ministry of Water Resources”,**

**Founded in 2006, namely “National Center for Quality Supervision and Test of Agricultural Irrigation and Drainage Equipment” is attached to China Institute of Water Resources and Hydropower Research (IWHR). It has been authorized by the Certification and Accreditation Administration of the People’s Republic of China. It has a staff of 19 (including 5 professors, 2 senior engineers, 5 engineers and 7 technicians) and has a test hall with 1500 m<sup>2</sup> and 4 laboratories well-equipped with more than 200 instruments and devices. The laboratories can conduct the tests of hydraulic properties, material properties, soil physical and chemistry properties and geotextiles properties.**

# Basic information

## Tasks and Functions

**Products Certification:** Authorizing the products for efficient irrigation according to international, national and local standards

**Supervision and Test:** Conducting the laboratory tests and on-site tests of efficient irrigation products, Supervising and evaluating the product quality

**Standard Formulation:** Formulating and revising national and local standards, and developing test methods

**Training and Consultation :** Training technicians for other test laboratories, and providing professional consulting service

# Basic information

## Scope of Business

9 kinds of the equipment/materials on irrigation and drainage can be tested, including:

Sprinklers, Micro-irrigation Emitters, Pipes, Pipe fittings, Geotextiles, Materials of rubber dams , Soil physical and chemical properties, Pumping devices of wells

# Certification & authorization

Our test center possess 4 kinds marker (logo)



# Certification & authorization



- **ilac-MRA** stand for The International Laboratory Accreditation Cooperation (ilac) --Mutual Recognition Arrangement (MRA)
- **CNAS** stand for China National Accreditation Service for Conformity Assessment

# Certification & authorization



# Certification & authorization



CMA stand for China  
Metrology Accreditation  
(Authorized according to  
China Metrology Law)



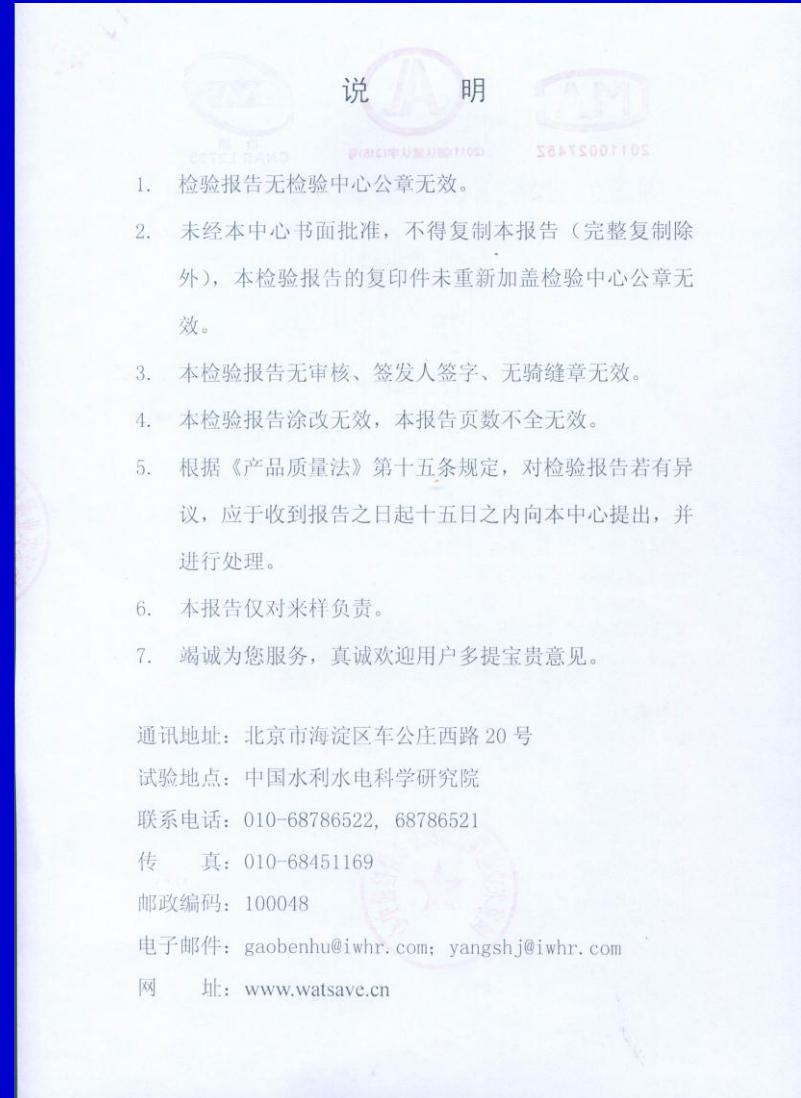
# Certification & authorization



CAL stand for China  
Accreditation Laboratory  
(Authorized according to China  
Standardization Law)



# TEST REPORT SAMPLE



# TEST REPORT SAMPLE

国家农业灌排设备质量监督检验中心  
National Center for Quality Supervision and Test of Agricultural Irrigation and Drainage Equipment

检验报告首页

TEST REPORT

编号(NO.): X12044 共 2 页 第 1 页

样品名称 Product Name	内镶式滴灌带	型号规格 Model/Type	(详见续页)
委托单位 Inspected Body	湖北孚龙管业科技有限公司	委托单位地址 Address of Inspected Body	湖北省黄石市发展大道 269 号 邮编: 435005
生产单位 Manufacturer	湖北孚龙管业科技有限公司	检验项目 Test Item	共 5 项 (详见续页)
抽样单位 Sampling Body	/	送样单位 Client	湖北孚龙管业科技有限公司
抽样日期 Sampling Date	/	抽样地点 Sampling Site	/
样品数量 Samples Quantity	40 米	抽样基数 Sampling Base	/
到样日期 Receipt Date	2012-04-05	样品等级 Sample Grade	合格品
样品特性和状态 Sample Character & Condition	样品正常, 包装无损坏	原编号或生产日期 Serial No. /Manufactured Date	2011 年 10 月
检验依据 Test Criterion	GB/T 19812.3-2008《塑料节水灌溉器材 内镶式滴灌管、带》		
检验结论 Test Conclusion	(详见续页)		
备注 Note			

主检: 宋光宇 审核: 高本虎 批准(技术负责人): 高本虎

Tested by: 宋光宇 Audited by: 高本虎 Approved by: 高本虎

2012 年 4 月 10 日 2012 年 4 月 10 日 2012 年 4 月 10 日

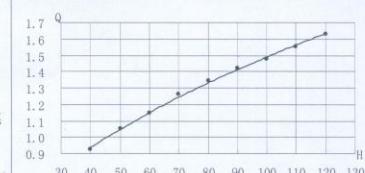
国家农业灌排设备质量监督检验中心  
National Center for Quality Supervision and Test of Agricultural Irrigation and Drainage Equipment

检验报告

TEST REPORT

共 2 页 第 2 页

委托单位: 湖北孚龙管业科技有限公司 样品名称: 内镶式滴灌带  
型号规格: MGD16×150-1.38-100 试验编号: X12044  
检验依据: GB/T 19812.3-2008 试验日期: 2012-04-09

序号 Serial No.	检验项目 Test Item	技术指标 Technical Requirement	检验结果 Test Result	单项判定 Judgement
1	公称内径及极限偏差 Nominal Internal Diameter and Tolerance	$16_{-0.3}^{+0.2}$ mm	$16_{-0.02}^{+0.2}$ mm	合格
	公称壁厚及极限偏差 Nominal Wall Thickness and Tolerance	$0.30_{-0.05}^{+0.05}$ mm	$0.30_{-0.01}^{+0.05}$ mm	合格
2	流量均匀度 Flow Uniformity	$Q$ 相对于 $q_n$ 的偏差 (C 值) %: A 类 $\leq 5$ B 类 $\leq 10$	3.51% (C <sub>v</sub> 值) %: A 类 $\leq 5$ B 类 $\leq 10$	合格
	变异系数 (C <sub>v</sub> 值) %: A 类 $\leq 5$ B 类 $\leq 10$	7.92%	合格	
3	耐静水压性能 Water Resistance Performance	在 1.2 倍最大工作压力, 即 120kPa 压力下保压 1 小时不损坏 At 1.2 times the maximum working pressure, i.e. 120kPa, no damage occurs after 1 hour	未损坏 No damage	合格
	试验前后每个滴头流量偏差应不大于 10% The relative deviation of the flow rate of each emitter before and after the test should not be greater than 10%	1.37%	合格	
4	耐拉拔性能 Tensile Strength Performance	滴管带应能承受 130N 试验拉力不出现断裂现象 The irrigation tape should be able to withstand a tensile force of 130N without breaking	未断裂 No breakage	合格
	试验前后标线间距的变化不大于 5% The change in the spacing of the markings before and after the test should not be greater than 5%	1%	合格	
5	压力与流量关系 Pressure and Flow Rate Relationship	 $Q = 0.1444 \times H^{0.5970} \quad (r = 0.9991)$ <p>其中: <math>Q</math>—流量, L/h; <math>H</math>—工作压力, kPa; <math>r</math>—相关系数</p>	/	/

备注: 本报告有效日期截至 2012 年 4 月 10 日  
Note: The report is valid until April 10, 2012.

# Test facility



Test hall

# Test facility

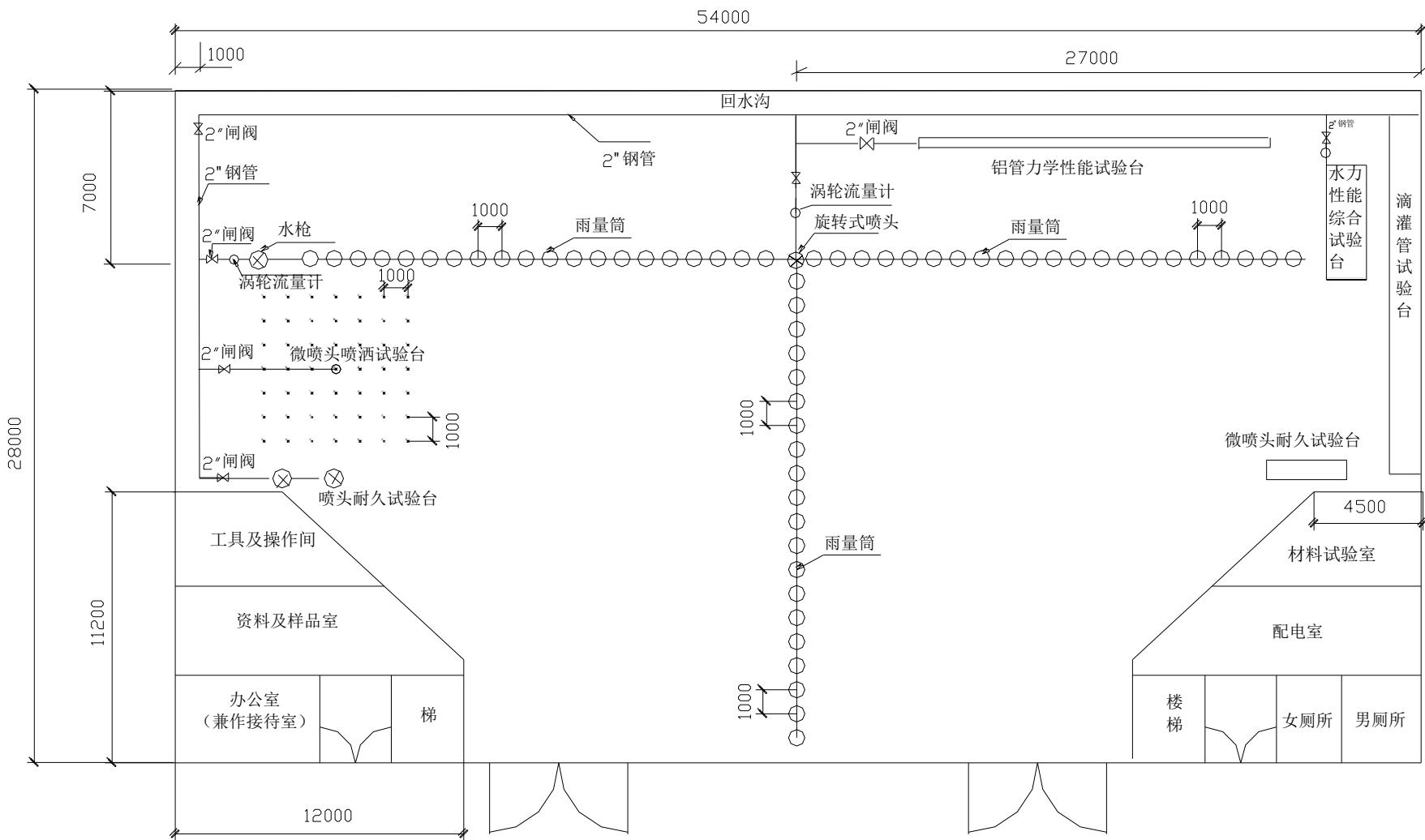


Pump station



Control panel

# 国家农业灌排设备质量监督检验中心实验大厅平面图



检测大厅试验装置平面布置图

注：二层为样品室、仪表室等。

# Test facility



Tester for durability and blasting of pipes



Universal computer-controlled electronic tester

# Test facility



Automatic tester for  
flowrate-pressure



Accelerated weathering tester  
for rubber and plastic material

# Test facility



**Test equipment for hydraulic performances of metal pipe**



**Test equipment for micro-sprayer durability**

# Test facility



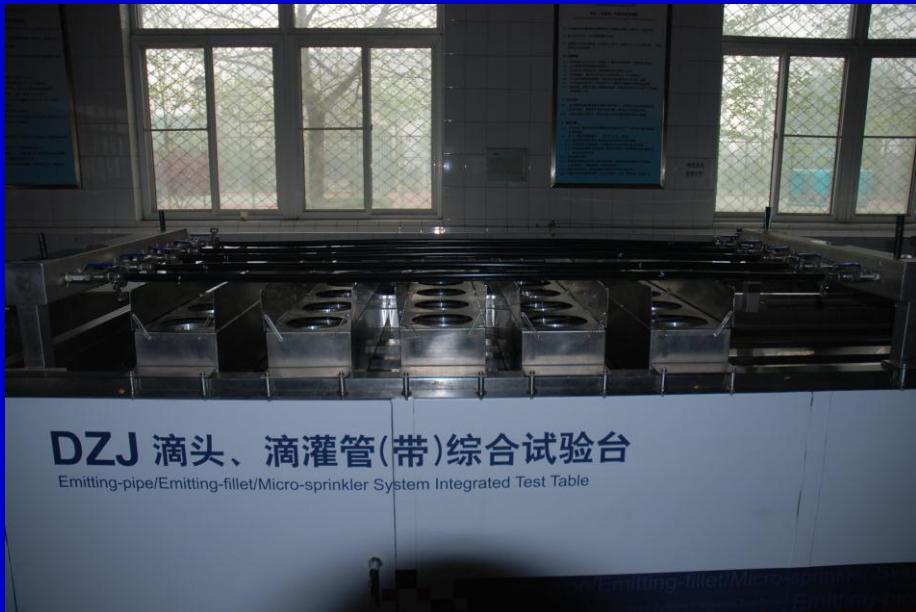
Test bench for Emitters (Manual)

# Test facility



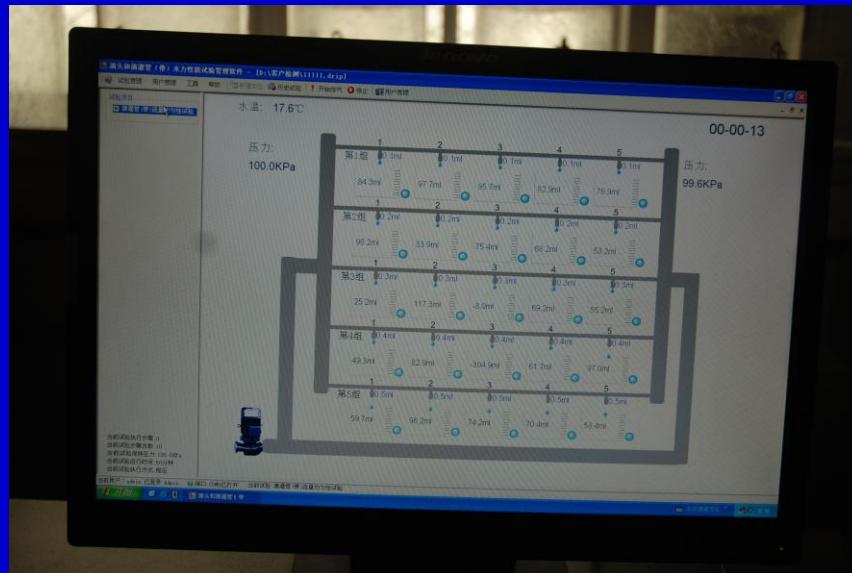
Test bench for Emitters (Automatically)

# Test facility



Test bench for Emitters (Automatically)

# Test facility



Test bench for Emitters (Automatically)

# Test facility



Machine for cooling water  
(Automatically)



Resistance to hydraulic pressure  
at elevated temperature (60°C) for  
Emitters

# Test facility



Test facility for Rotating sprinkler (Manual)

# Test facility



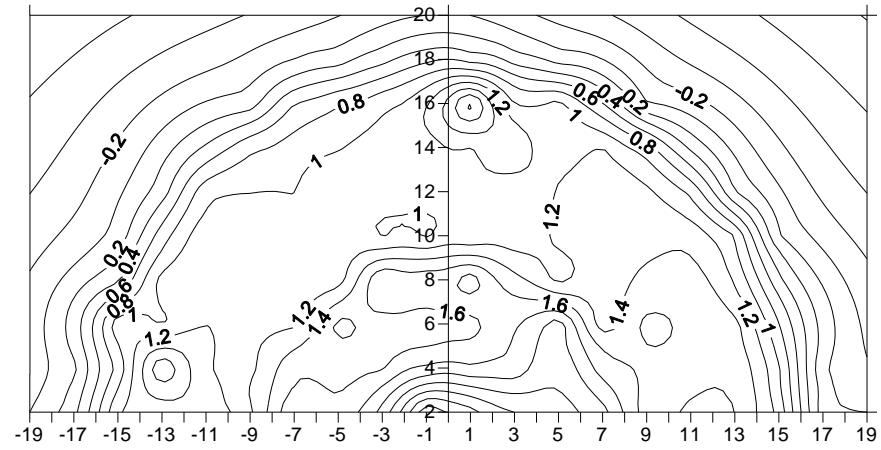
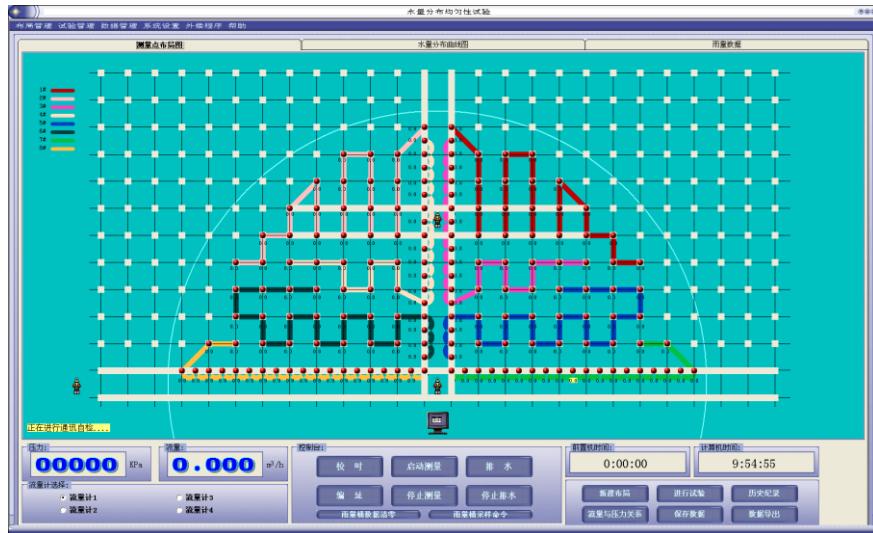
Test facility for Rotating sprinkler (Automatically)

# Test facility



Test facility for Rotating sprinkler (Automatically)

# Test facility



试验压力 : 0.3MPa

坐标轴单位 : m

喷灌强度单位 : mm/h

Test facility for Rotating sprinkler (Automatically)

# Test facility



Test bench for Sprayers (Automatically)

# Test facility



Test bench for valve (torque & fatigue strength, Automatically)

# Routine Test



Filters test

In 1999, 2003, 2008 and 2012, our center had carried out 4 times supervision and inspection on the irrigation products all over China. The management level had improved and the awareness of product quality had enhanced through the supervision and inspection

## Sampling



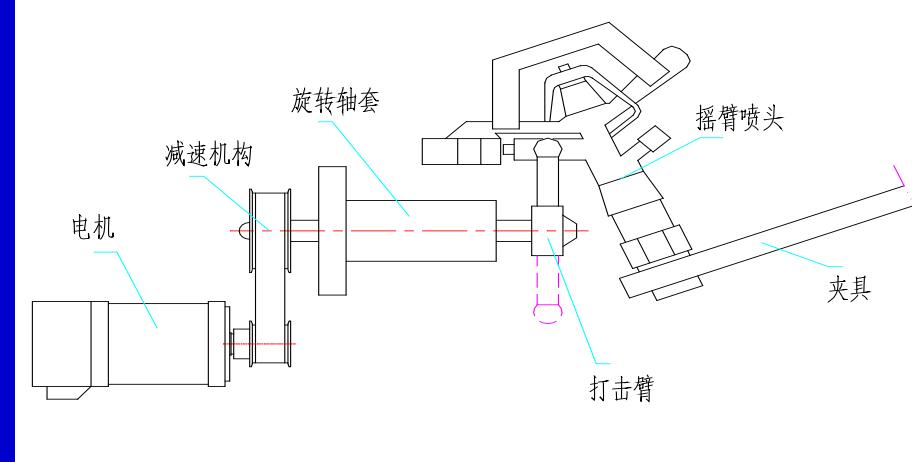
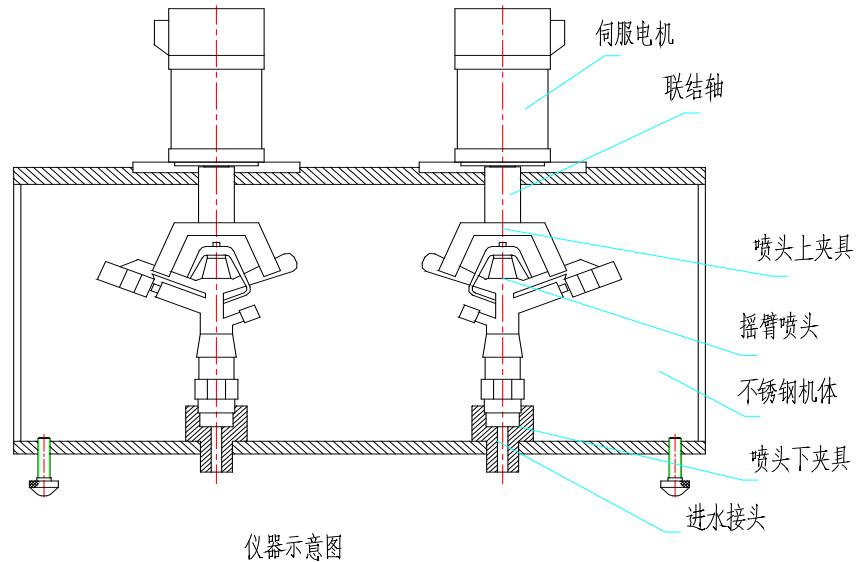
# Standard Formulation

- 《Technical Code for Rubber Dam》 SL227-1998, GB/T50\*\*\*-2012 and English version
- 《Rubber dam bag》 SL554-2011
- 《Test Guidance for irrigation equipment》 SL
- 《Technical Code for Landscape and Turf Irrigation》 SL
- 《Code for Amelioration of the Large-Sized Irrigation and Drainage Scheme》 SL418-2008
- 《Unplasticized poly(vinyl chloride) (PVC-U) pipes for low-pressure conveyance in irrigation》 GB/T13664-2006
- 《General technical conditions for water saving products》 GB/T18870-2011

# Standard Formulation

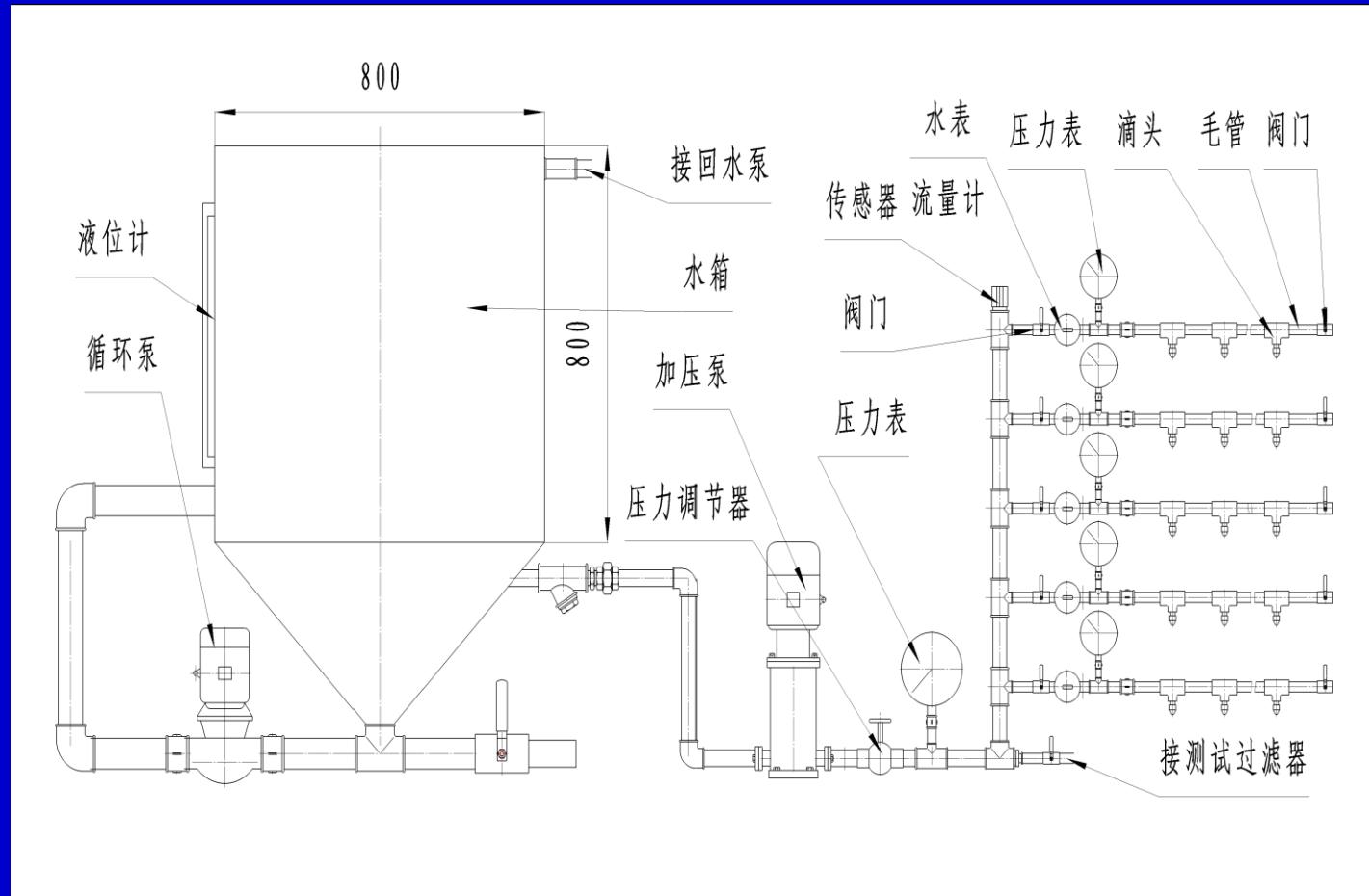
- 《Technical specification for irrigation projects with low pressure pipe conveyance》 GB/T20203-2006
- 《 Technical code for sprinkler engineering》 GB/T50085-2007
- 《 Technical code for micro irrigation engineering》 GB/T50485-2009
- 《Specification for water measuring of irrigation canal system》 GB/T21303-2007
- 《Technical terminology for rural water conservancy》 SL56-2005
- 《Acceptance code of practice for water-saving irrigation equipment on the site》 GB/T21031-2007

# Test facility in build



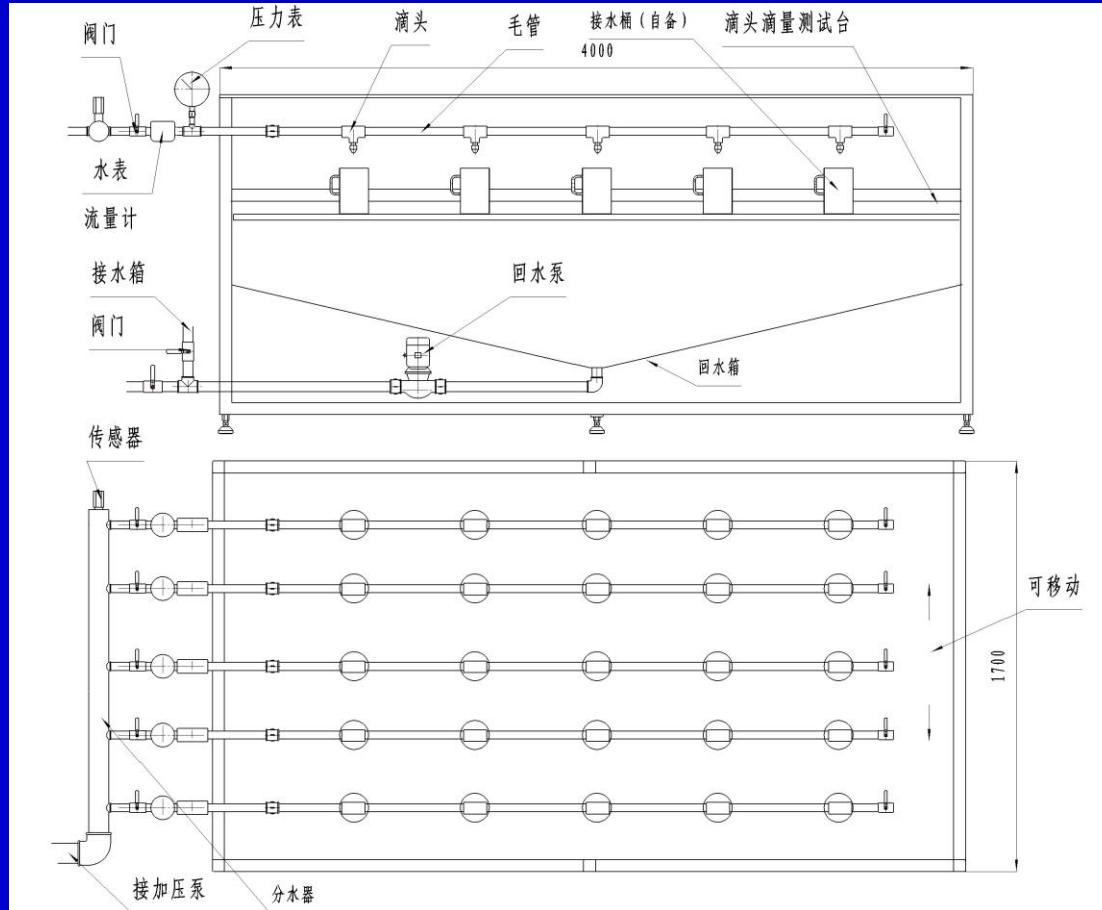
Accelerated Test bench for Rotating sprinklers

# Test facility in build



Clogging Test bench for Emitters

# Test facility in build



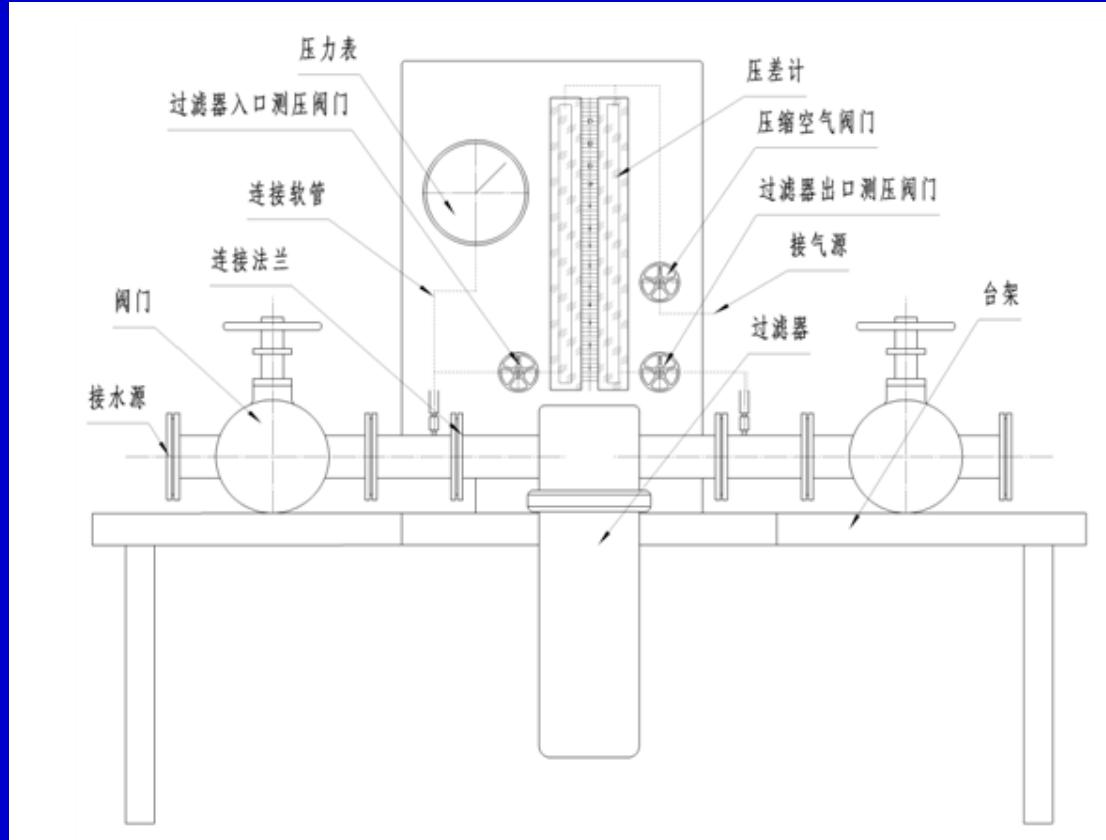
## Clogging Test bench for Emitters

# Test facility in build



Mechanical test bench for filter

# Test facility in build



Clean pressure drop test bench for filter

# Research works

- Study on the quality monitoring, assessment and test system of efficient irrigation products
- Strategy study on development of coordination between technical standards and research and development practice
- Study on Technical System of Water-Saving Irrigation

# Problems encountered



# Problems encountered



# Problems encountered

## Why?

- Extension quickly, low management;
- Raw materials (tape reused );
- Too many plants (e.g. only in Xinjiang Province, there are about 500 emitters production plants);
- Low price (Drip tape with labyrinth : 0.14~0.16 CHY yuan per meter);
- Low cost (1 set of drip tape with labyrinth production line: 100000~120000 CHY yuan );
- Low quality.

# Problems encountered

**Action: Standards review and edit**

**《Plastic equipment for water saving irrigation-Drip tape with labyrinth on one side》 GB/T 19812.1-2005**

**《Plastic equipment for water saving irrigation-Pressure compensating emitter and emitting pipe》 GB/T 19812.2- 2005**

**《Plastic equipment for water saving irrigation-Drip pipe and tape inlaid with emitters inside》 GB/T 19812.3- 2008**

Thanks a lot !

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Engineering Society**