

2023年ITMF可持续发展与创新奖

2023 ITMF Sustainable Development and Innovation Awards

超临界CO₂流体染色

Supercritical CO₂ Assisted Dyeing of Polyester

青岛即发集团股份有限公司

Qingdao JIFA Group Co., Ltd.

王 健 Wang Jian

01

获奖单位及个人简介

Profiles of the Award-Winning
Organization and Individuals

青岛即发集团股份有限公司

Qingdao JIFA Group Co., Ltd..



◆ 始建于1955年，位于山东青岛

The company was established in 1955 and based in Qingdao, Shandong Province.

◆ 拥有纺纱、织布、印染、成衣完整产业链的大型纺织服装企业

It has evolved into a major player in the textile and clothing industry and had built up a complete industrial chain from spinning to garment.

◆ 与国内外多家知名服装品牌建立了长久紧密的合作关系

It has established long term and close cooperation with major foreign and domestic Fashion Brands.



青岛即发集团股份有限公司 Qingdao JIFA Group Co., Ltd..



◆ 社会责任的践行者 (Social Responsibility Practitioner)

- 《ISO9001》
- 《ISO14001》
- 国家级绿色工厂 (National Green Enterprise)



◆ 科技创新的先行者 (Leader in Innovation)

- 《GB/T29490》
- 高新技术企业 (High-Tech Enterprise)
- 制造业单项冠军企业 (Champion Enterprise of Single-Item-Manufacturing)
- 国家科技进步奖获得者 (Winner of the National Science and Technology Progress Award)



王健 Wang Jian



王健 (Wang Jian)

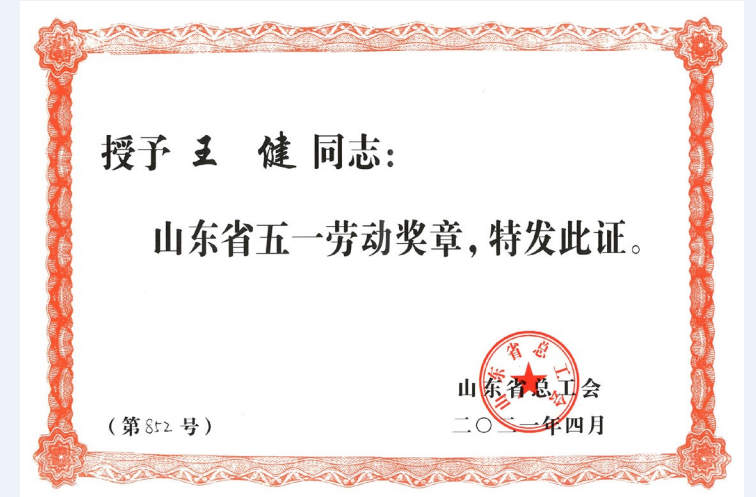
出生日期：
1963年12月

Date of birth:
Dec., 1963

青岛即发集团有限公司 副总工程师

Deputy Chief Engineer of Qingdao JIFA Group Co., Ltd..

- ◆ 1984年7月 进入即发集团工作,四十年专注于纺织印染工作
In July 1984, I started working for the company.
- ◆ 2014年 专职研究超临界CO₂无水染色技术
In 2014, I started dedicatedly working on water-free supercritical CO₂ dyeing techniques.
- ◆ 山东省五一劳动奖章获得者
I was awarded the May 1st Labor Medal of Shandong Province.
- ◆ 中国纺织大工匠
I won the honorary title of China's Great Textile Craftsman.



王健 Wang Jian

◆ 以第一发明人申请专利43项

Applied for 43 patents as the first inventor

◆ 中国纺织工业联合会专利金奖

Winner of the Gold Patent Medal by China National Textile and Apparel Council (CNTAC)

◆ 青岛市科技进步一等奖

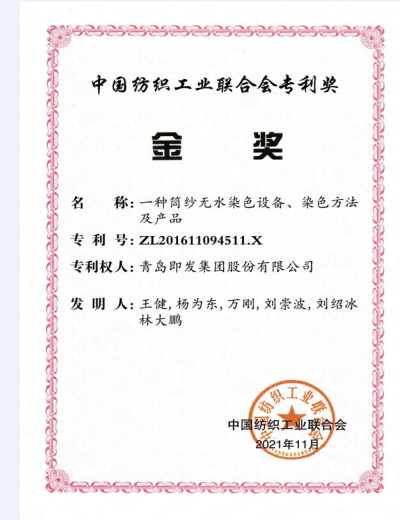
Winner of the Qingdao Science and Technology Progress First-class Prize

◆ 山东省技术发明奖1项

Winner of the Shandong Province Technology Invention Award

◆ 国家科技进步二等奖1项

Winner of the National Science and Technology Progress Second-class Prize



02

获奖项目简介

**Brief Introduction of the
Award-Winning Project**

ScCO₂流体无水染色发展历史

A Brief History of ScCO₂ Dyeing

1988

德国西北纺织研究中心

Northwest Textile Research Center, Germany

1991

德国西北纺织研究中心开发了超临界CO₂染色工艺

Developed supercritical CO₂ fluid dyeing process

1996

美国北卡罗莱纳州立大学开发带有双向循环的超临界CO₂染色设备

North Carolina State University developed supercritical CO₂ dyeing facility with bi-directional circulation

1998

日本福井大学开发100L和350L (已拆除) 超临界CO₂染色设备

Fukui University (Japan), developed 100 L and 350 L supercritical CO₂ dyeing equipment (dismantled)

2017

韩国建成200L超临界CO₂经轴染色机 (未产业化)

Korea built 200 L supercritical CO₂ warp beam dyeing machine (not industrialized)

2009

DyeCoo公司超临界CO₂经轴染色机在泰国建设

DyeCoo's supercritical CO₂ warp dyeing machine constructed in Thailand

2008

荷兰DyeCoo公司开发可染100-150磅织物的超临界CO₂经轴染色设备

Dutch company DyeCoo developed supercritical CO₂ warp beam dyeing machine for 100-150 lb fabrics

2001

东华大学戴瑾瑾课题组开发中国第一台超临界CO₂染色设备

Dai Jinjin's group (Donghua University) developed China's first supercritical CO₂ dyeing machine.

即发集团
东华大学
苏州大学
山东大学

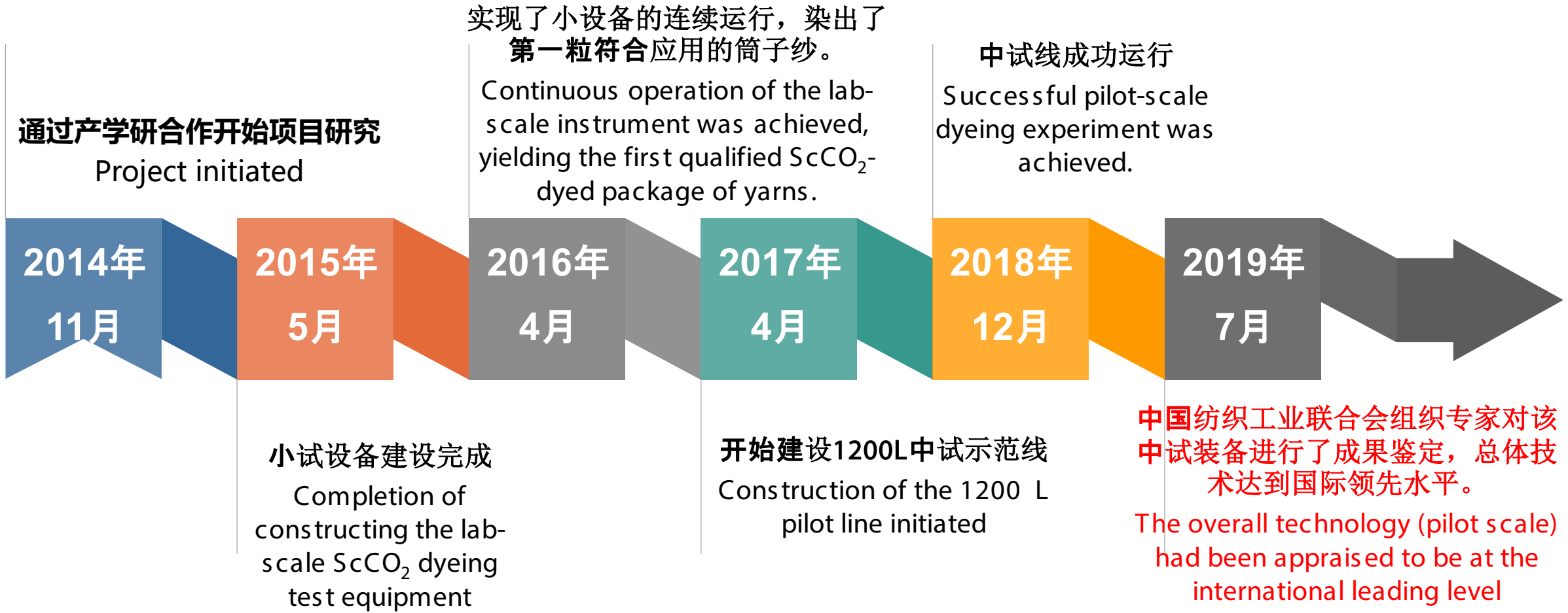
大连工业大学
浙江工业大学
香港生产力促进局
.....

JIFA Group
Donghua University
Suzhou University
Shandong University

Dalian University
Suzhou University
Zhejiang
University of Technology....

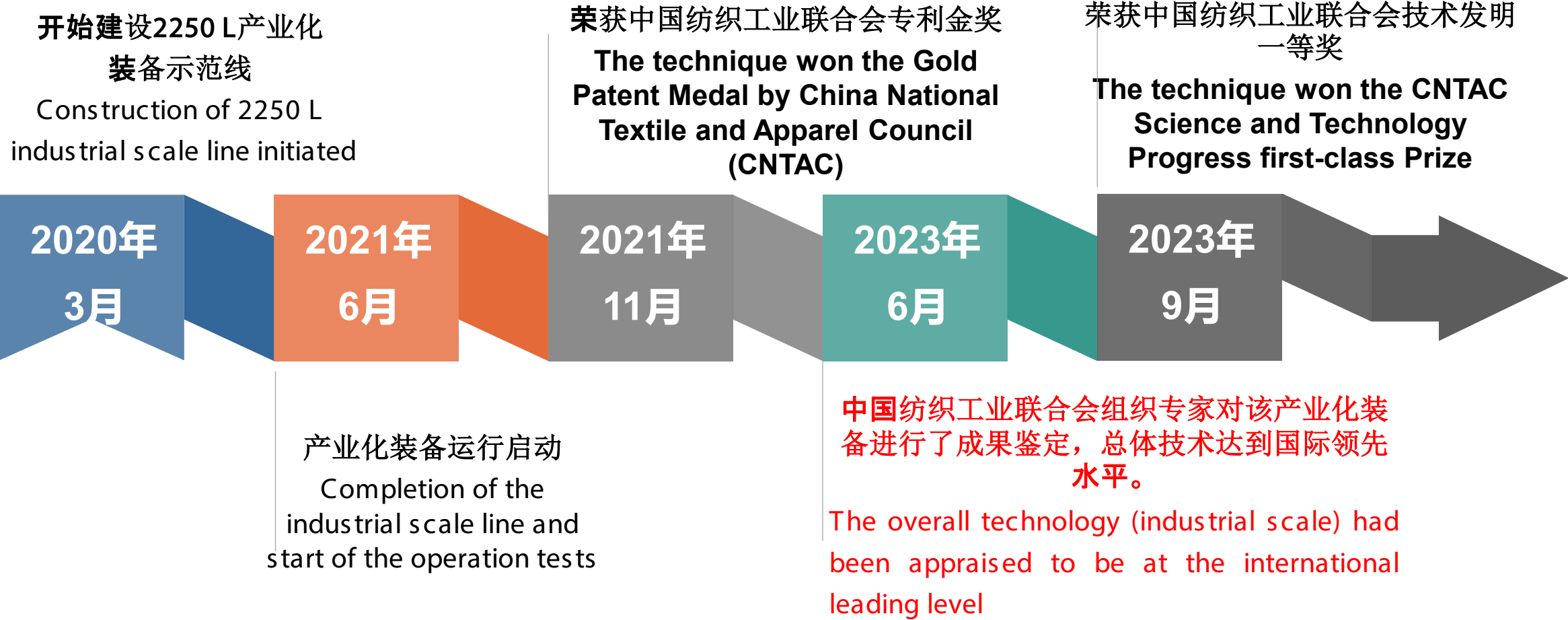
即发集团的研究历程

History of the development of Sc-CO₂ dyeing technology by the JIFA Group



即发集团的研究历程

History of the development of ScCO₂ dyeing technology by the JIFA Group



超临界CO₂流体无水染色技术突破

Technological breakthroughs of Sc-CO₂ dyeing

◆ 通过染料筛选和新染料的设计，实现了聚酯筒子纱全色系染色

Full-color package dyeing of polyester yarns achieved via screening of existing dyes and design of new dyes



浅粉色(96%)



大红色(94%)



深红色(97%)



橘黄色(96%)



橙色(96%)



鹅黄色(80%)



草绿色(90%)



中灰色(96%)



军绿色(96%)



灰蓝色(97%)



天蓝色(95%)



宝蓝色(96%)



浅紫色(85%)



深紫色(85%)



褐色(96%)



黑色(96%)

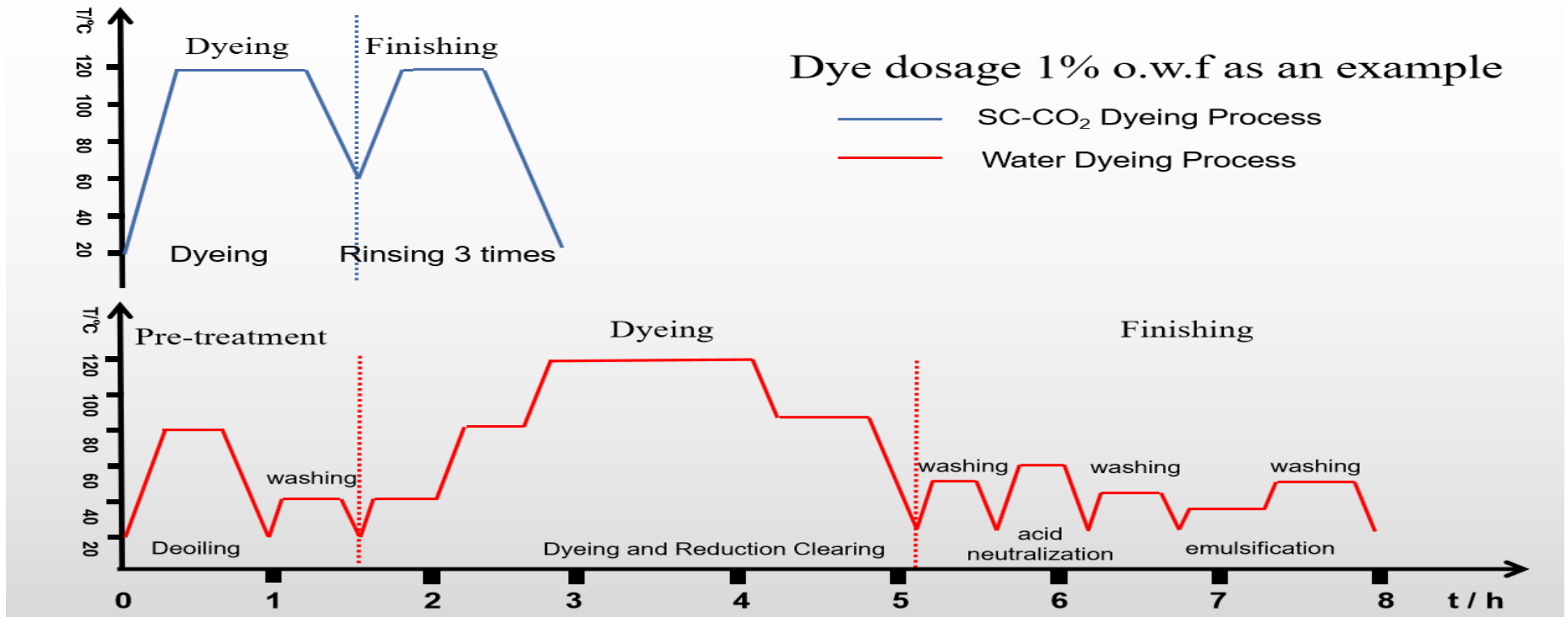


超临界CO₂流体无水染色技术突破

Technological breakthroughs of Sc-CO₂ dyeing

◆ 开发了超临界CO₂流体染色工艺

The Sc-CO₂ dyeing process was developed and optimized



超临界CO₂流体无水染色技术突破

Technological breakthroughs of Sc-CO₂ dyeing

◆ 建成了单釜容量为2250 L的超临界CO₂流体染色整套设备

Construction of an industrial ScCO₂ dyeing line of 2,250 L unit capacity was successfully completed



超临界CO₂流体无水染色技术突破

Technological breakthroughs of Sc-CO₂ dyeing

◆ 获批国家专利20余项，其中中国发明专利8项，欧、美、日发明专利各1项

More than 20 patents granted, including 8 Chinese invention patents, 1 European, 1 American, and 1 Japanese invention patents



超临界CO₂流体无水染色技术突破

Technological breakthroughs for supercritical CO₂ assistant dyeing techniques

◆ 技术得到媒体广泛报道

The technology receives extensive media coverage



◆ 2023年8月，中央电视台新闻联播给予报道

Aug. 2023, reported on CCTV news broadcasts

◆ 2023年8月，山东卫视新闻联播给予报道

Aug. 2023, reported on Shandong TV news

◆ 2023年6月，参加工业绿色发展大会

June 2023, Industrial Green Development Conference

◆ 2021年11月，参加国家“十三五”科技创新成就展

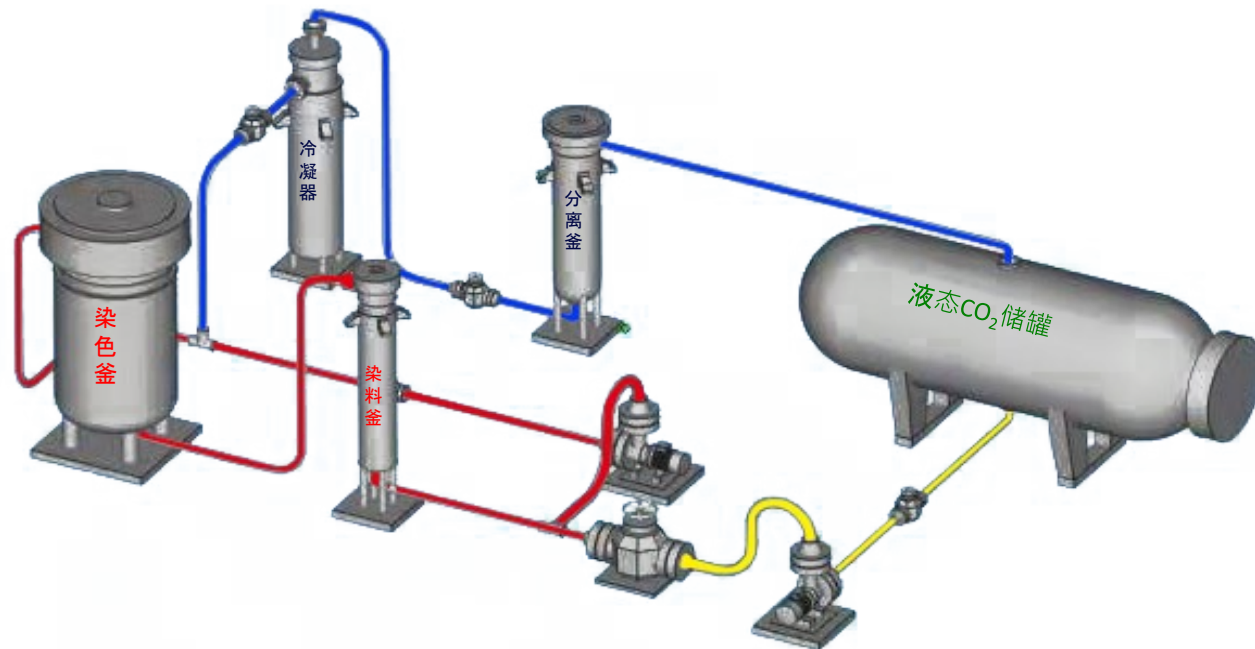
Nov. 2021, National “the 13th Five-Year Plan”
Science and Technology Innovation Achievement
Exhibition

◆ 2022年11月，参加中国国际进口博览会

Nov. 2022, China International Import Expo

超临界CO₂流体无水染色技术突破

Technological breakthroughs of ScCO₂ dyeing



优势：

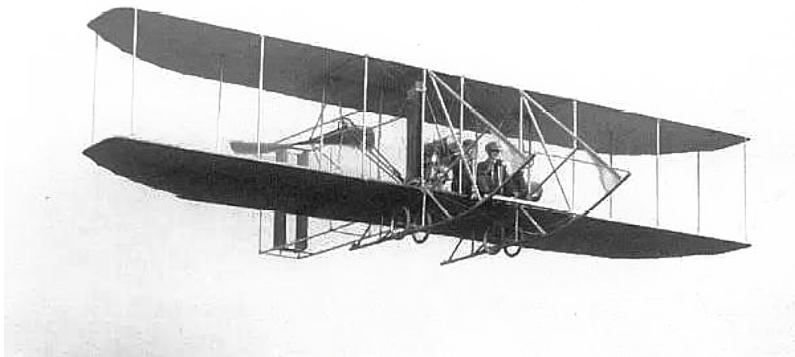
- 不用水、无污水排放；
- No water consumption or effluent discharge
- 染色时间短，2-3h/批次；
- Expedited dyeing cycle (2-3h/batch)
- 产品质量达到传统水染同类产品质量标准；
- Quality meets the standards of the traditional aqueously dyed products.
- 成本较传统水染有显著优势；
- Significant cost advantage over traditional water dyeing
- 具有显著的减碳、固碳效益。
- Prominent benefits of Carbon reduction and sequestration

超临界CO₂流体无水染色技术未来发展规划

Future development plans for ScCO₂ dyeing

项目走到到今天，我们取得了一定的成功，但仍有大量工作要开展研究和验证。

The project has achieved some success so far, but there is still a lot of work to be researched and validated.

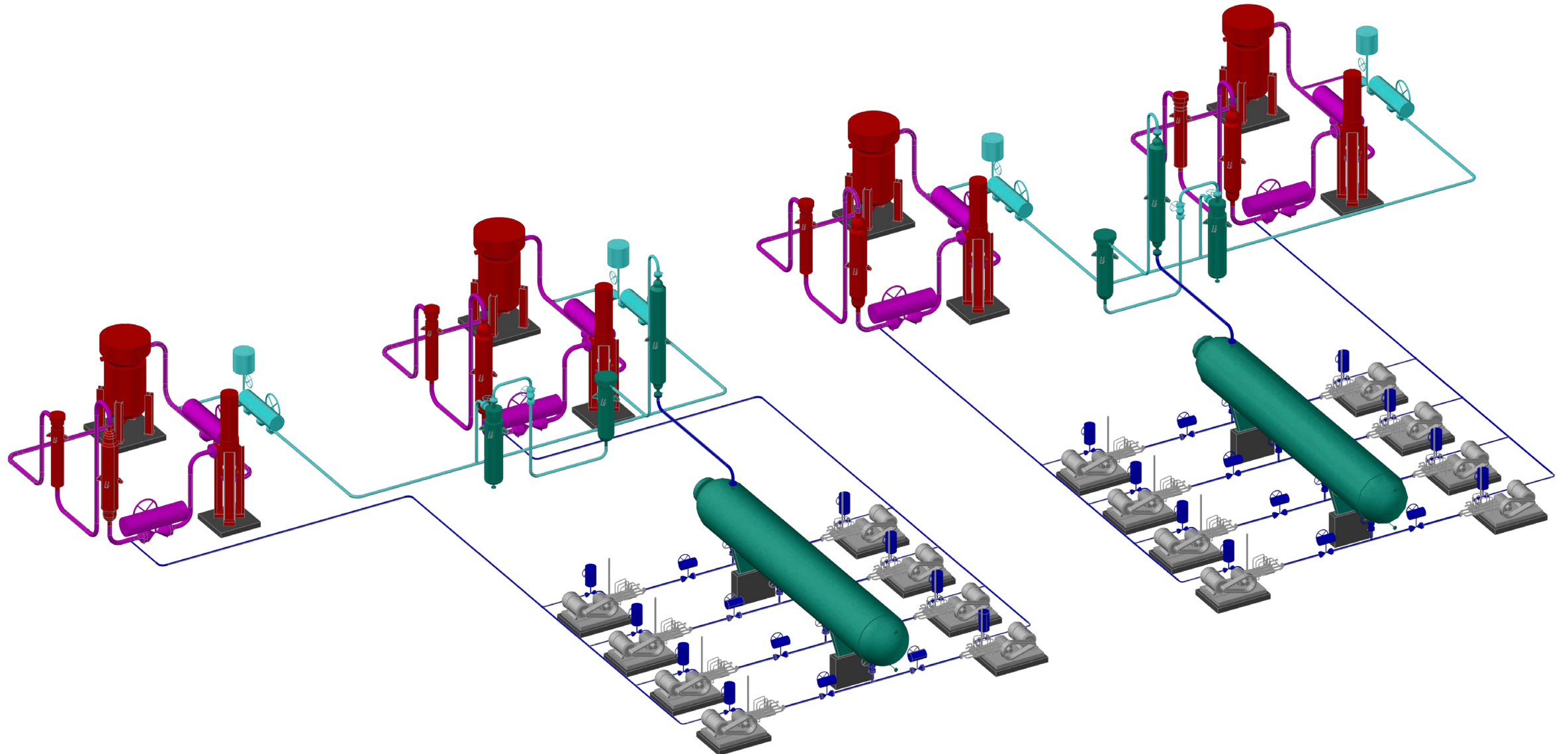


衷心欢迎学校、科研院所、企业等机构从基础理论研究、装备、材料、染料、功能性助剂等相关领域积极参与，共同推动该技术的发展。欢迎更多的知名服装品牌积极参与，共同开发消费者满意的高端绿色低碳环保产品。

We sincerely welcome universities, research institutes, enterprises and other institutions to actively participate in basic theoretical research, equipment, materials, dyes and other related fields to jointly promote the development of this technology. We welcome internationally renowned clothing brands to actively cooperate with us to jointly develop high-end, green and low-carbon environmental protection products that consumers are satisfied with.

超临界CO₂流体无水染色技术未来发展规划

Future development plans for ScCO₂ dyeing





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感谢各位领导及朋友!

Thank you to all the leaders and friends!

