



smart

INDIGO

**ELECTRICITY INSTEAD OF CHEMICALS
THE MOST SUSTAINABLE WAY TO DYE DENIM**

**SMART-INDIGO
MAKES THE DIFFERENCE**

Is textile sector ready for sustainable denim?

February-2023

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WW Sales Manager
Sedo Engineering SA

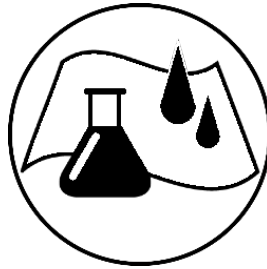
BECAUSE IT MAKES THE DIFFERENCE

DENIM SYNONYMOUS OF POLLUTION? THE 19/20TH CENTURY DENIM HISTORY



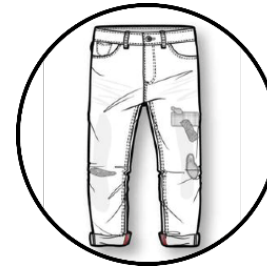
Cotton

- Pesticides
- Hazardous fertilizers
- Intensive agriculture



Indigo-Dyeing

- Hazardous Chemicals
- Free waste water discharge



Finishing

- More than 200 liters Water per garment
- Extreme Toxic Garment treatments



Demand

- Just Oriented to Fashion Trends

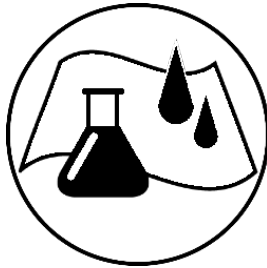
CLASSIFIED AS 3RD MOST POLLUTING INDUSTRY WORLD-WIDE

CLEAN DENIM DEMAND SINCE 2010 THE NEW CENTURY DENIM HISTORY



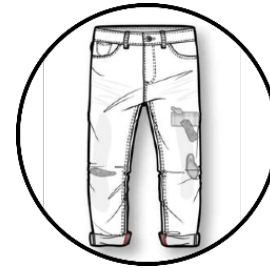
Cotton

- BCI
- Organic
- Recycled



Indigo-Dyeing

- Request no chemicals
- Restricted water usage



Finishing

- Laser
- Ozone
- Avoid any type of chemicals and water usage



Demand

- Just Oriented to HOW IT IS MADE?

**BE A TOP TREND ITEM MEANS FAST CHANGE TO ANSWER TO DIFFERENT DEMANDS....
DENIM INDUSTRY IS THE FASTEST CHANGING IN GREEN INDUSTRY**

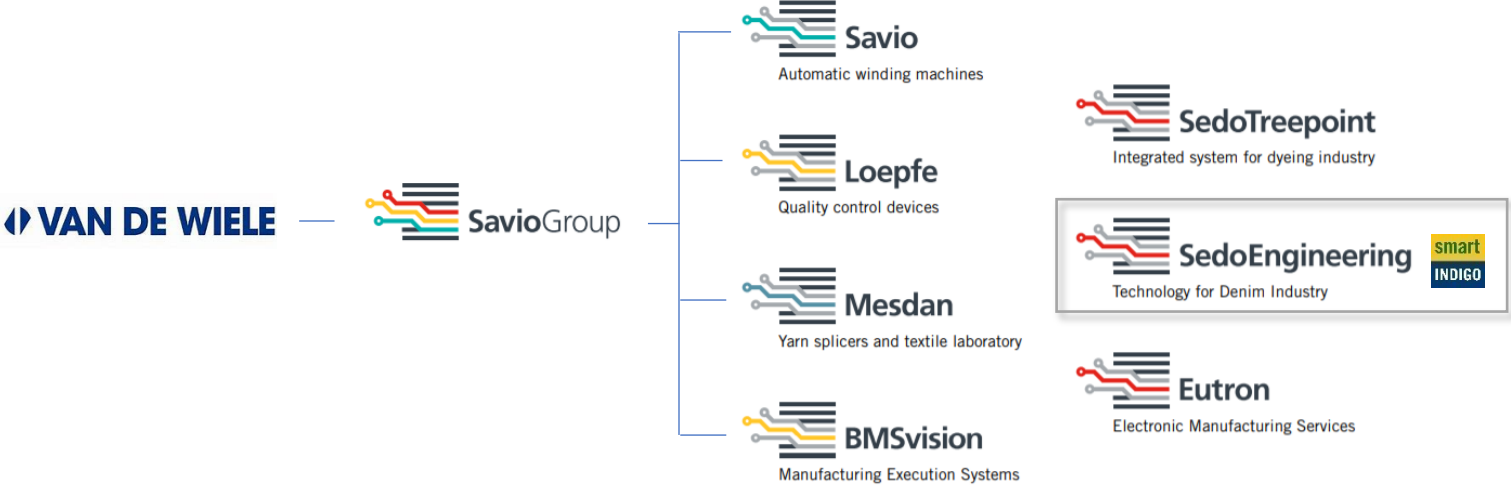
NO COMPETITIVITY FOR “OLD TYPE” DENIM INDUSTRY

“SUSTAINABILITY BATTLE IS ALREADY IN PROGRESS”

1. Users and Brands request daily greener innovations
2. The continuous greener demand means continuous greener innovative offers from industry
3. World-Wide Textile trading restrictions will become year after year more mandatory regarding environmental conditions.
4. Sustainability in 21st century means more economic more competitive
5. R&D competition will be based on sustainability of products
6. Higher Deep consciousness of final denim users

**...TEXTILE COMPANIES MUST BE READY TO GREEN INDUSTRY
TO BE COMPETITIVE AND SURVIVE AND PROSPER FOR NEXT FUTURE...**

SMART-INDIGO™ ORGANIZATION CHART



Savio Group part of Van De Wiele group since April 2021 provides peak technology and excellent solutions for textiles to optimize consumes and monitor process.

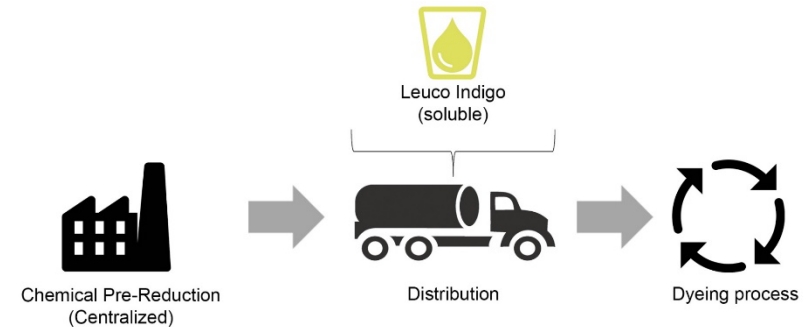
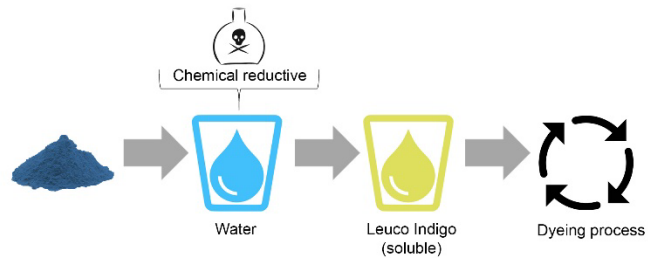
CONVENTIONAL LEUCO-INDIGO PRODUCTION



Chemical leuco-indigo production on-site



Chemical leuco-indigo production centralized

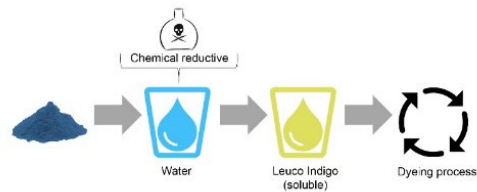


BECAUSE IT MAKES THE DIFFERENCE

COMPARISON



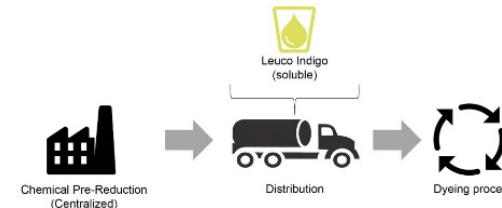
Powder Way



- Cheap Raw Material
- 93% concentrate
- unlimited storage because inert
- 85% in weight Hydrosulfite required to solubilize
- Human preparation required
- Inconstant concentration due to human error
- High waste water salinity and pollution
- Indigo shade very Grey not pure



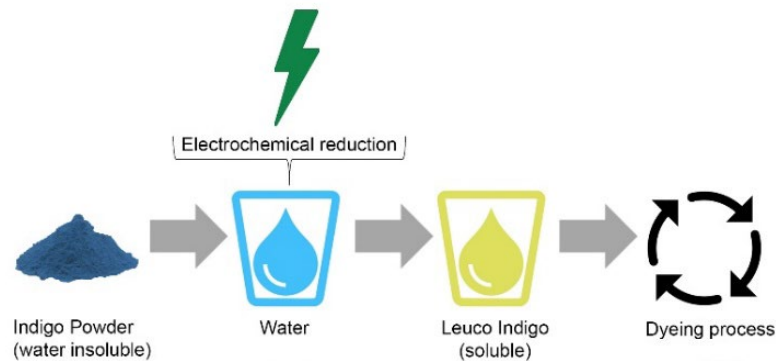
Liquid Pre Reduced Way



- No hydrosulfite added – Hydrogenation of powder
- Dyeing Uniformity
- Low Salinity in Waste Water
- Greener than powder
- 30-40% concentrate (60-70% Water)
- High pollution and costs related to transports
- Very high price
- Hydrogen Gas very Dangerous to be managed
- Fixed storage capacity (30 to 60 Tons under Nitrogen)

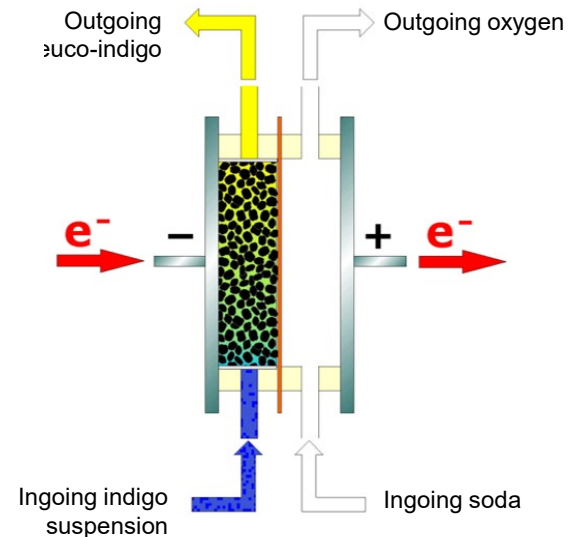
A NEW WAY TO SUSTAINABLE DENIM

Electrochemical Synthesis – use electricity instead of chemicals



Smart-leuco-indigo production on-site

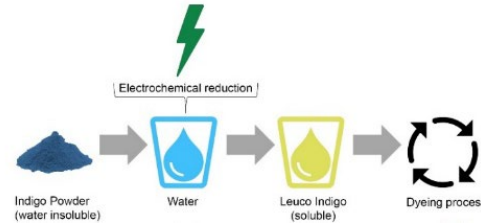
- Electricity does the Indigo Reduction Reaction



3-dimensional carbon electrode technology

Patented Swiss Technology

COMPARISON



= Powder Way + Liquid Pre Reduced Way

- Cheap Raw Material
 - 93% concentrate
 - Illimited storage because inert
 - No hydrosulfite added – Hydrogenation of powder
 - Dyeing Uniformity
 - Low Salinity in Waste Water
 - Greener than powder
- +
- Additional 30% reduction of Salinity in waste water
 - Around 30% Cheaper than Liquid (ROI 3 years max)
 - Additional 30 to 40% chemicals saving during dyeing

ELECTRICITY INSTEAD OF CHEMICALS

Without

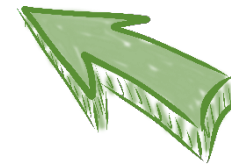
- Polluting Chemicals
- Waste Water
- Health hazards
- Long transportation ways

Using

- Indigo pigment
- Water
- Caustic soda
- Electricity

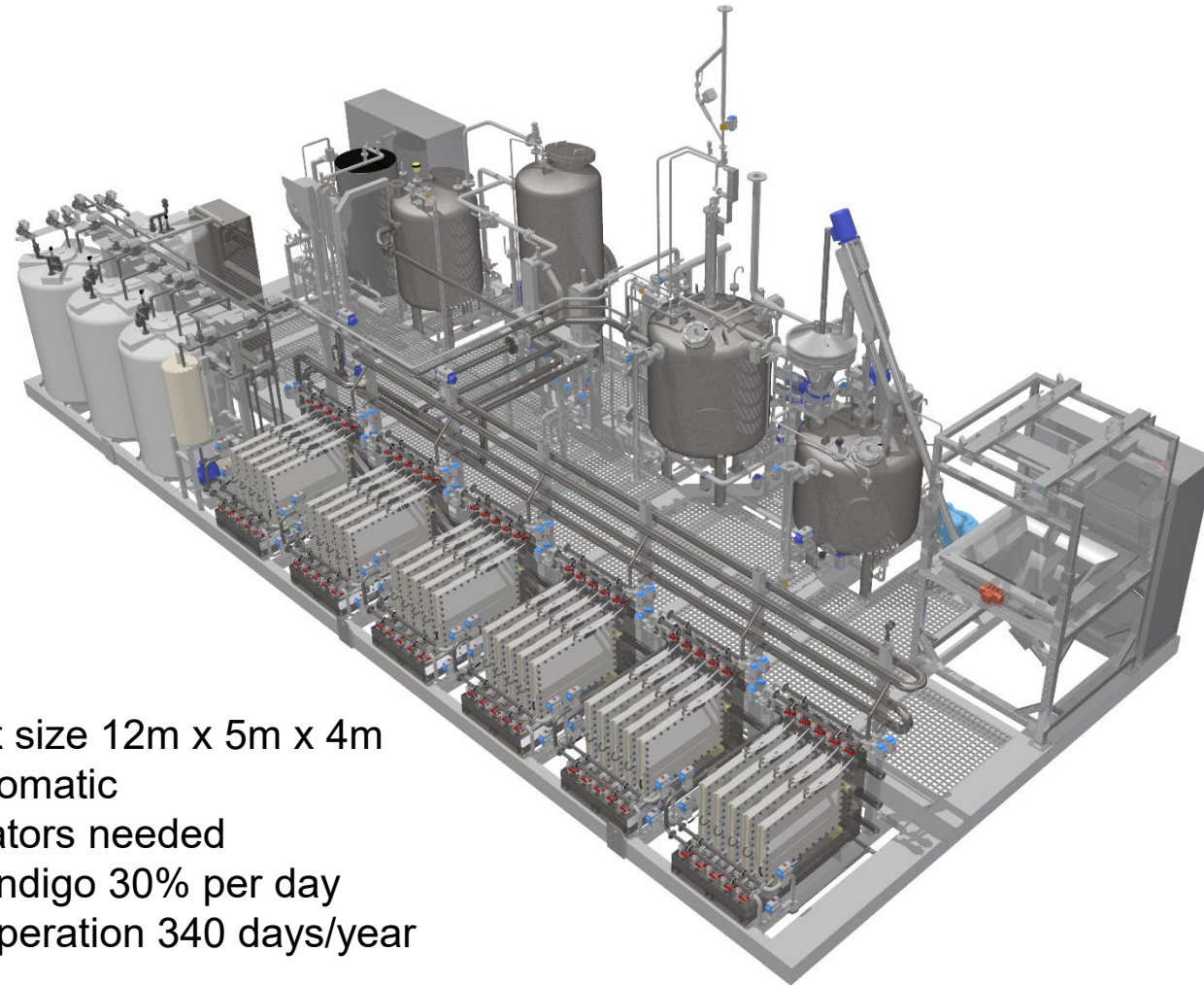
Discharging only

- Oxygen



= Ecologic Liquid Indigo on site on demand

SMART INDIGO LAYOUT



- Compact size 12m x 5m x 4m
- Fully Automatic
- No operators needed
- 1.1 Ton Indigo 30% per day
- 24/7 in operation 340 days/year

COMPARISON OF THE ENVIRONMENTAL IMPACT

Chemical / Electrochemical



BECAUSE IT MAKES THE DIFFERENCE

PLANET PEOPLE PROFIT

Planet – massively reduced pollution

- No waste water
- 30% savings in water and energy during Dyeing*
- 10 times reduced CO² production*
- 4 times less transports

People – healthier and safer work places

- No health hazards - No fire hazards
- No toxic chemicals to handle
- Cleaner Jeans for consumer
- Climate responsibility

Profit – favorable production

- No costs for chemicals or pre-reduces leuco-indigo
- Lower costs for water, energy & wastewater treatment*
- 20 to 30% cheaper than any liquid Indigo*



* Measured under real production conditions by customers

SMART DYEING – ALL-ROUND THE WORLD

Italy

since 5 years - 1 machine running

Pakistan

since 2.5 years - 7 machines running

China

since 2 years - 5 machines running

Bangladesh

since 1 year - 1 machine running

Vietnam

since 6 months - 1 machine running

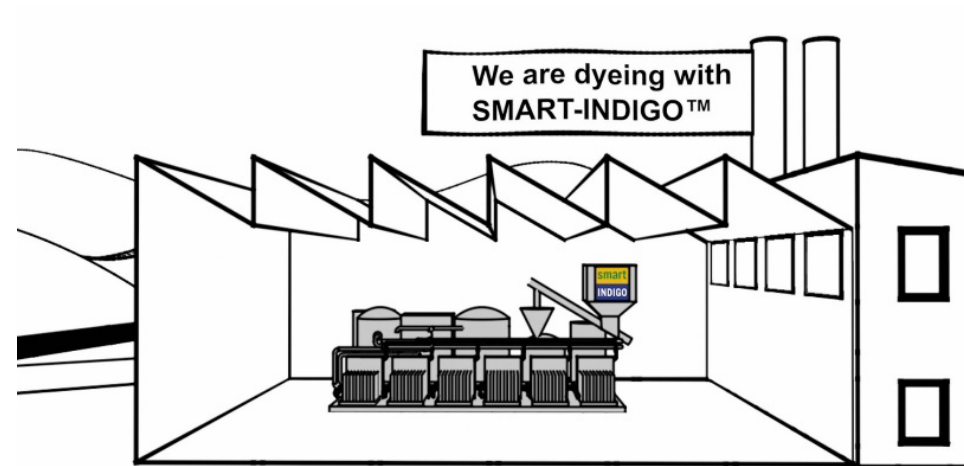
Peru

Starting on 2022 – 1 machine

Mexico – Opening 2022

Egypt – Opening 2022

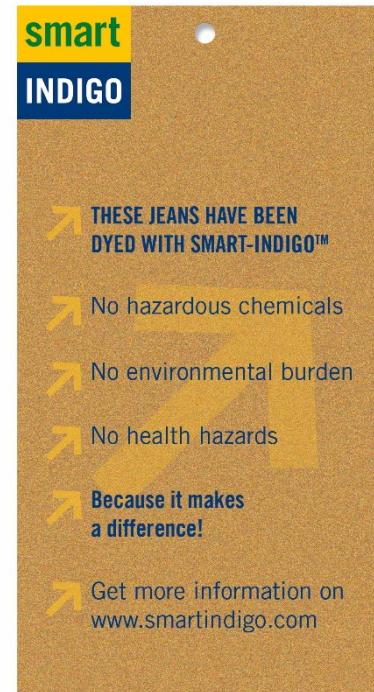
Turkey – Opening 2022



THE SMART-INDIGO™ LABEL STANDS FOR

The most sustainable indigo dyeing

- High sustainability
- Reduced health hazards
- Savings in wastewater treatment and energy
- Better color consistency and performance
- More ecological and economical



Thank you for your attention!

Your questions and suggestions are welcome!

