THE DYEOX

CO_2 textile dyeing

THE WORLD'S FIRST INDUSTRIAL PROVEN
CO_2 TEXTILE DYEING SOLUTION.
WATER FREE AND PROCESS CHEMICAL FREE.

THE NEW STANDARD

A revolution in textile
processing technology

ZERO WATER — Only reclaimed CO_2

ONLY RECLAIMED CO_2 — Zero water

PURE DYES — No process chemicals

VIBRANT COLOURS — Deep colour penetration, pure dyes

QUICK — Fast colour absorption

ENERGY EFFICIENT — Short batch cycles, dry process

ZERO WASTE WATER — Clean process

FABRIC VERSATILITY — Continious development

ZERO WATER

DyeCoo is the world's first industrial proven CO_2 textile dyeing solution, water-free and process chemical-free. This revolutionary CO_2 dyeing process, makes textile dyeing sustainable, efficient and profitable. Providing geographical freedom from water sources and offering textile manufactures a head start on legislation that restricts the use of hazardous chemicals.

CO_2

DyeCoo technology uses reclaimed CO_2 as the dyeing medium in a closed loop process. When pressurized, CO_2 becomes supercritical. In this state CO_2 has a very high solvent power, allowing the dye to dissolve easily.

PURE DYES

CO_2 dyeing does not need added process chemicals to dissolve dyes. The technology uses 100% pure dyes, with more than 98% uptake so there is no waste. The pure dyes are used in powdered form.

VIBRANT COLOUR

100% pure dyes are giving beautiful, vibrant colours. Due to the high permeability of supercritical CO_2 the dyes are easily and deeply transported into the fibres. This is creating intense colours with excellent quality characteristics.

QUICK

CO_2 is circulated through the pressure vessel to transport all dye to the fabric and evenly distribute in the fabric. At the end of the dye cycle CO_2 is transferred via the integrated separator to the integrated CO_2 work tank. In the separator the CO_2 (dye liquor) is completely cleaned and made ready to be reused for the next dye batch.

ENERGY EFFICIENT

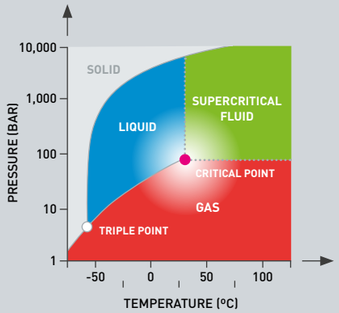
All process steps from dissolving dye, dyeing, cleaning and reclaim of the CO_2 are integrated in DyeOx. The fabric is completely dry when it leaves the vessel.

ZERO WASTE WATER

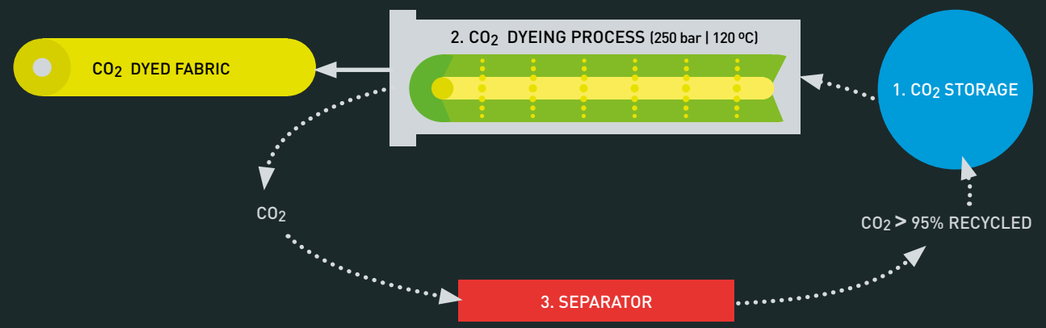
No process chemicals, zero liquid discharge, no water, no waste water treatment is necessary.

FABRIC VERSATILITY

CO_2 dyeing is suitable for synthetic PET fabrics and yarn. CO_2 dyes various fabric constructions and permeability. A wide range of PET fabric (virgin and recycled) can be dyed.



Colours represent the different phases of CO_2, as represented in the phase diagram.



CO_2:

- Solvent for dyes & affinity with synthetic fabric.
- Safe: non-flammable and non-toxic.
- Sustainable & recyclable.
- Inexpensive & abundantly available.
- The same quality anywhere in the world.

FEATURES:

- Closed loop, beam dyeing process.
- Excellent batch to batch reproducibility.
- More than 98% dye take up.
- Easy fabric loading.
- No reduction cleaning needed.
- Fully automated door handling.
- Integrated CO_2 separator for CO_2 recycling.
- Integrated CO_2 process tank.
- Mechanical Cleaning Machine (MCM).
- Dye Cartridge Preparation System (DCPS).
- CO_2 Labdye system for colour development.

OPERATING SYSTEM:

- Control with industrial HMI.
- Advanced automation.
- Remote monitoring and control possible.
- Interactive control.
- Touch screen.

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IMPACT:

- Zero water.
- Used reclaimed carbon dioxide as dye carrier.
- Closed loop system, >95% of CO_2 is reclaimed.
- No waste water, no waste water treatment.
- Zero liquid discharge.
- Use pure dyes, no additives, process chemical free.
- Fits the circular textile supply chain.

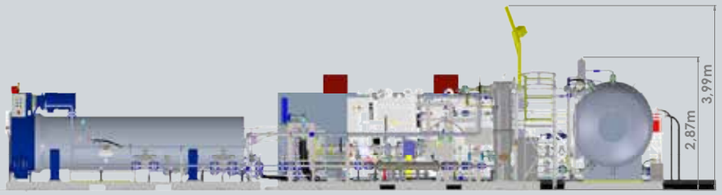
ENERGY:

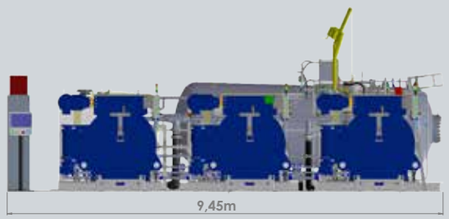
- Energy efficient dyeing process, including CO_2 cleaning and recovery.
- No additional energy required for additional processes such as waste-water treatment.

SAFETY:

- ASME design standard.
- Customised software to prevent operating errors.
- Integrated CO_2 detection system.
- Built in Emergency Stop Buttons.
- Dedicated safety software.
- Certified by Veritas and Lloyd's.

BUREAU VERITAS





CAPACITY:

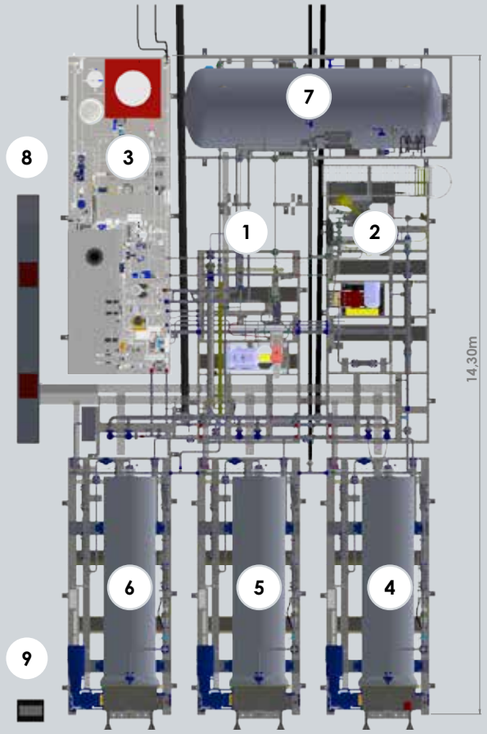
- Three dyeing vessels.
- Parallel dyeing of 3 separate colours, divers material types.
- Batch capacity 20kg-200 kg (per vessel).
- Average 24 batches per day (24h | 3 vessels).
- Nominal daily output 4.000 kg.

WEIGHT:

- Total shipping weight: 130.000 kg.
- Required floor load: 2.500 kg/m2.

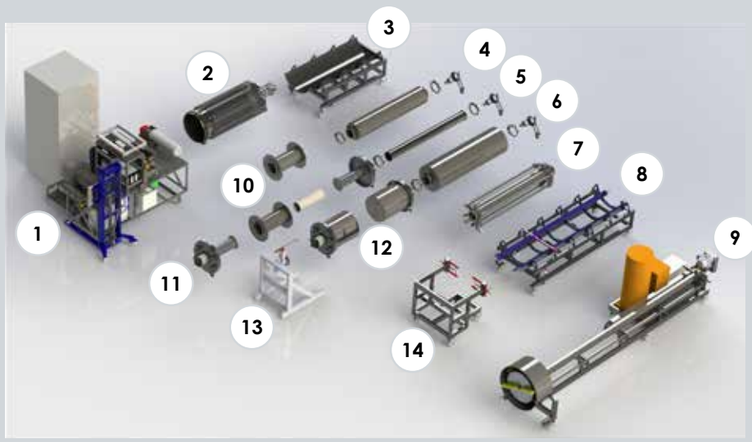
DIMENSIONS:

- Total CO_2 dyeing system(Netto): 14,30m x 9,45m x 3.99m.



1. Supply Skid
2. Separator Skid
3. Heating and Cooling Skid
4. Dye Vessel Skid 1
5. Dye Vessel Skid 2
6. Dye Vessel Skid 3
7. Process Vessel Skid
8. Electrical Cabinet
9. Touch Screen Control Panel

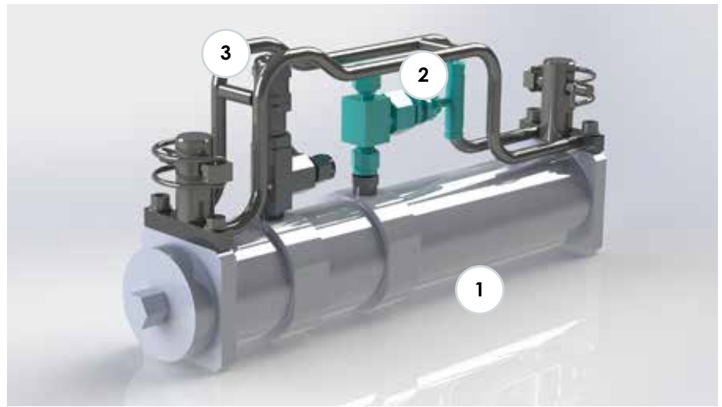
1. Dye Cartridge Preparation System (DCPS)
2. Spare Internal
3. Maintenance Trolley
4. Textile Beam Ø400
5. Textile Beam Ø200
6. Textile Beam Ø600
7. Yarn Beam
   Multi Spindle: 42 cones
8. Textile Trolley
9. Mechanical Cleaning Machine (MCM)
10. Dye Cartridge
11. Dyeholder, Dye Cartridge
12. Swirl
13. Dyeholder Parking Yoke
14. Dyeholder Trolley



MATERIAL TYPE	KNIT	WOVEN	YARN
Beam Type (max dyeable fabric width)	Ø 200mm : 200cm	Ø 200mm : 200cm Ø 400mm : 182cm Ø 600mm : 182cm	Multi Spindle: 42 cones Mono Spindle: 7 cones
Capacity (Depending fabric weight, cone type)	• Max weight: ± 200Kg • Average load: ± 160Kg	• Max weight: ± 200Kg • Average load: ± 140Kg	• Max cone weight: 4,7 Kg • Max Load: 198Kg
Dyeable material	• 100% PET • No CD-PET • Blend only PET dyed		

	FABRIC	YARN
No. Batches | 24Hr (indicative)	20 : dark colours 24 : medium 28 : light | white	16 : dark colours 17 : medium 18 : light | white
Capacity (Depending fabric weight, cone type)	• Max weight: ± 200Kg • Average load: ± 160Kg	• Max cone weight: 4,7Kg • Max Load: 198Kg
CO_2 Usage	Reclaim rate >95%	
Electrical Usage	Average 160 kWh per batch	
Steam Consumption	250 Kg per batch	
Total Energy Usage (Electrical usage + steam consumption)	Average 320 kWh per batch	
Average Dyestuff	1% wof	

THE CO_2 LABDYE



1. Labdye
2. Hand valve
3. Safety relieve valve

TECHNICAL SPECIFICATIONS:

- Maximum operating pressure: 250 bar.
- Maximum Design Pressure: 350 bar.
- Net content: 290 millilitres.
- Maximum operating temperature: 120 °C.
- Maximum design temperature: 150 °C.
- Capacity: A4 size fabric.
- Beam type: Ø 38 mm.
- Operates in a standard oil bath.

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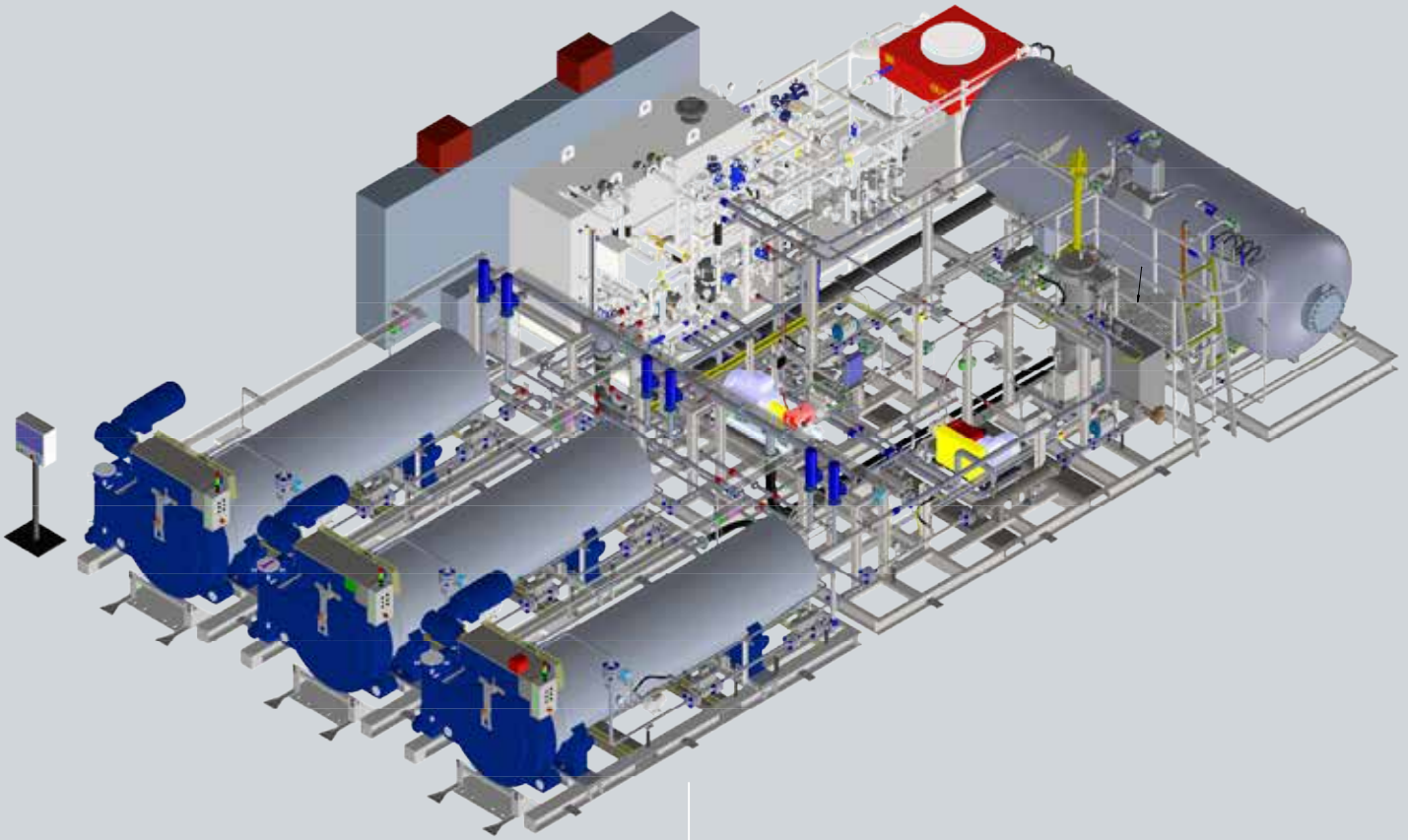

DYESTUFF AND CHEMICAL PARTNERS

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