



WASTE WATER TREATMENT &
ZERO LIQUID DISCHARGE PLANTS

ITALY

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WATER TREATMENT AND INNOVATIONS:

- DRAMATIC REDUCTION OF **C.O.D.** BY COOLANT REMOVAL
- **Z.L.D.** WITHOUT RECOVERY MEMBRANE SYSTEM

KNOWLEDGE, COMPETENCE, EXPERTISE

- CIE DESIGNS AND DEVELOPS TECHNOLOGIES AND PRODUCTS FOR IT'S OWN USE (NO LICENSED TECHNOLOGIES)
- CIE PROJECT AND REALIZE DIRECTLY ANY INDIVIDUAL UNIT OF ITS PLANTS (U.F.,R.O.,X.I.,D.I. AND EVAPORATORS)
- 36 YEARS OF EXPERIENCE: ESTABLISHED IN 1981
- TURNOVER: 5 MILLION EURO/YEAR
- RESEARCH AND DEVELOPMENT INVESTMENT: 5% OF TURNOVER
- A YOUNG BUT HIGHLY QUALIFIED TEAM
 - AVERAGE AGE: 38 YEARS
 - UNIVERSITY DEGREE: 41%

TARGET MARKET

Aluminium



**BEVERAGE
CANS**



**COIL COATING
& PICKLING**



EXTRUSION



AEROSPACE



CASTING



RADIATORS

Steel & Galvanizing



AUTOMOTIVE



APPLIANCES



**STEEL
MAKING**



**COLD
FORMING**



GALVANIZING



**GENERAL
INDUSTRY**

WASTE WATER PLANTS SPECIFICALLY DEDICATED TO METAL FINISHING LINE

ACTIVITIES FOR ALUMINIUM FINISHING LINES

- 1) REVERSE OSMOSIS UNITS
- 2) DEIONIZING AND MIXED BED UNITS
- 3) COALESCER DEOLING UNITS
- 4) CHEMICAL DOSING AND CONTROLLING UNITS
- 5) WASTE WATER PLANTS (PUR-ALL TECHNOLOGY)
- 6) ZERO LIQUID DISCHARGE PLANT
- 7) TELESERVICE AND TELEASSISTANCE

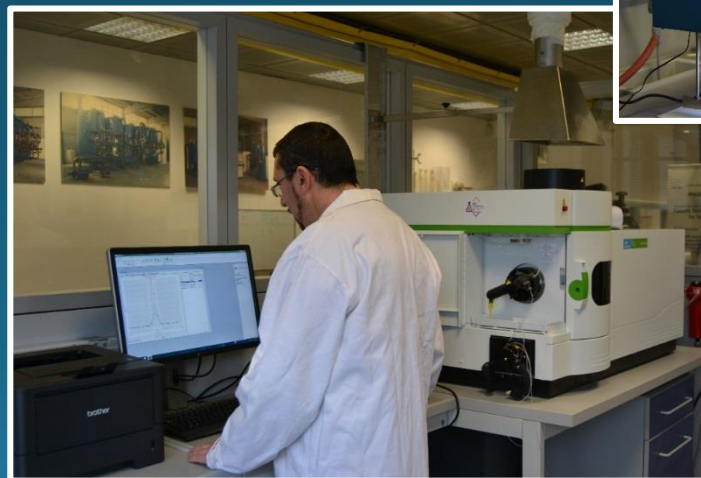




LEADER IN CHEMICAL SPECIALTIES

For Waste Water Treatment and ZLD plants

-  **PARTNER FOR CHEMICAL SPECIALTIES**
- **INTERNAL LABORATORY EQUIPPED WITH:**
 - Inductive coupled plasma (I.C.P.)
 - Spectrophotometers with variable and fixed wavelength
 - Liquid Chromatography
- **PILOT PLANTS**
 - R.O., D.I., Evaporator
- **CHEMICAL SPECIALTIES DEVELOPMENT & PRODUCTION**
- **TECHNICAL ASSISTANCE**





LEADER IN CHEMICAL SPECIALTIES

For Waste Water Treatment and ZLD plants

■ PUROSORB™

Specific powder products and blend for adsorption on WWTP of:

- ✓ COD < **150 ppm**;
- ✓ Oils;
- ✓ Surfactants;
- ✓ Organic substances.

■ PUR-ALL™

Chemicals Specially formulated for WWTP to remove:

- ✓ Sulphate < **50 ppm**;
- ✓ Fluoride < **4 ppm**;

■ PUROFLOC™

Anionic Flocculants for WWTP:

- ✓ Medium and Heavy TSS concentration.

■ PUROSMO™

Chemicals Specially formulated to manage:

- ✓ Ultra Filtration Units;
- ✓ Reverse Osmosis Units;
- ✓ Evaporators Units

POLLUTANT LIMITS FOR WASTE WATER



■ MAIN POLLUTING AGENTS OF CAN WASHER WATER (60 m³/MC):

- Aluminium (Al): 100-150 ppm
- Sulphates (SO_4^-): 400-800 ppm
- Fluorides (F^-): 200-300 ppm
- Oils and surfactants (COD): 1500-2000 ppm

■ EUROPEAN LIMITS FOR DUMPING IN SEWERS:

- Sulphates (SO_4^-) ≤ 1000 ppm
- Fluorides (F^-) ≤ 10 ppm
- C.O.D. ≤ 500 ppm

■ LOCAL AUTHORITIES MAY REQUIRE TO DROP THIS LIMITS TILL:

- Sulphates (SO_4^-) ≤ 500 or 300 ppm
- Fluorides (F^-) ≤ 6 or 4 ppm
- C.O.D. ≤ 160 ppm

PUROCOOL (OIL REMOVAL SYSTEM) **TECHNOLOGY TO REMOVE OILS AND COOLANT FROM CANS**



PURPOSE & ADVANTAGES

- **PREVENT COOLANT CARRY-OVER IN WASHING STAGE**
- **STRONG REDUCTION OF COD IN THE WASTE WATER**
- **DRAMATIC REDUCTION OF CHEMICAL ADDITIVE IN WASTE WATER**
- **BETTER SLUDGE QUALITY (NO STICKY SLUDGES)**
- **POSSIBILITY TO TREAT AND REDUCE VOLUMES OF BODY-MAKERS**

WASTE COOLANT

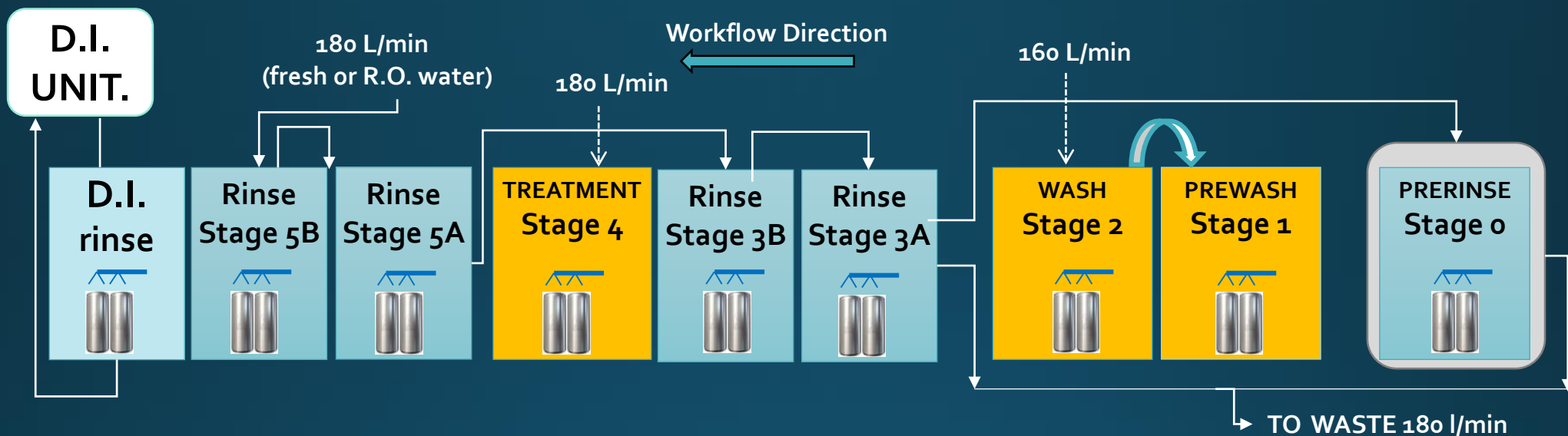
PUROCOOL (OIL REMOVAL SYSTEM)

TECHNOLOGY TO REMOVE OILS AND COOLANT FROM CANS

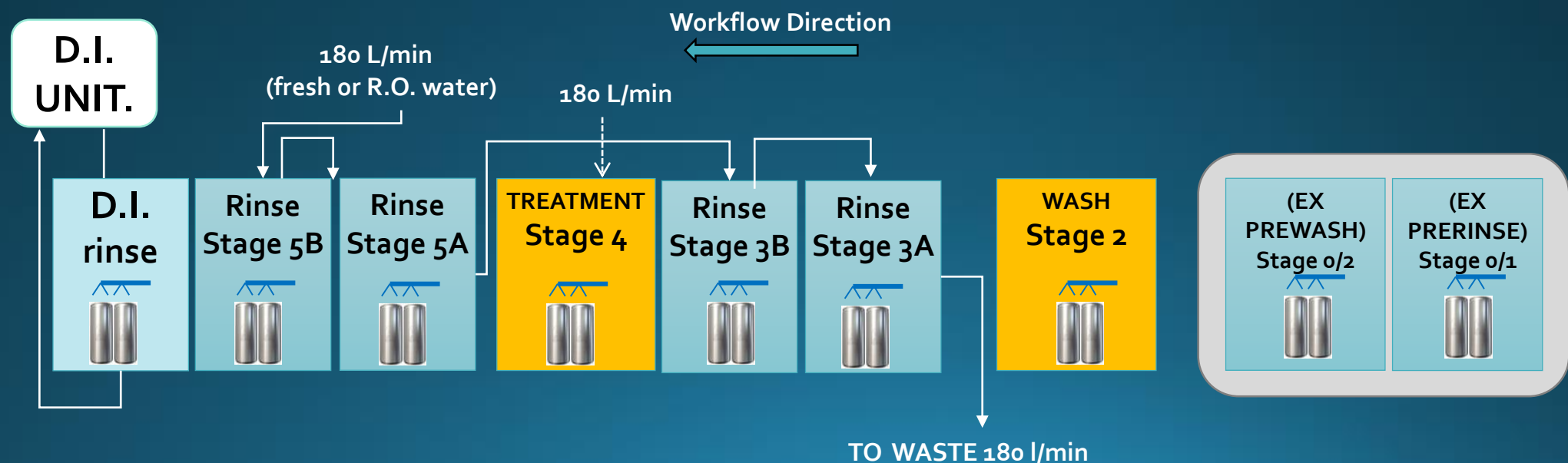


– Line production: 3000 cans/min. – Rinse flow rate: 10,8 m³/h (180 l/min)

CURRENT



PUROCOOL

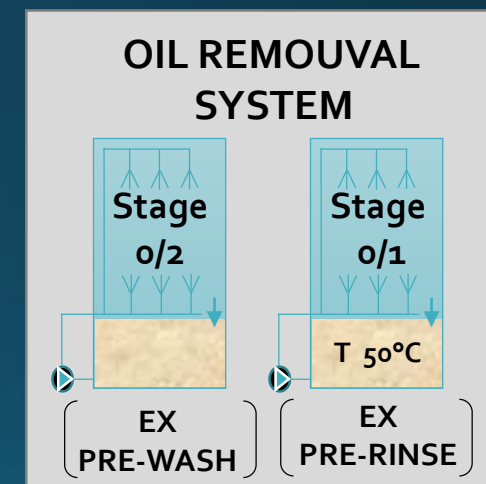
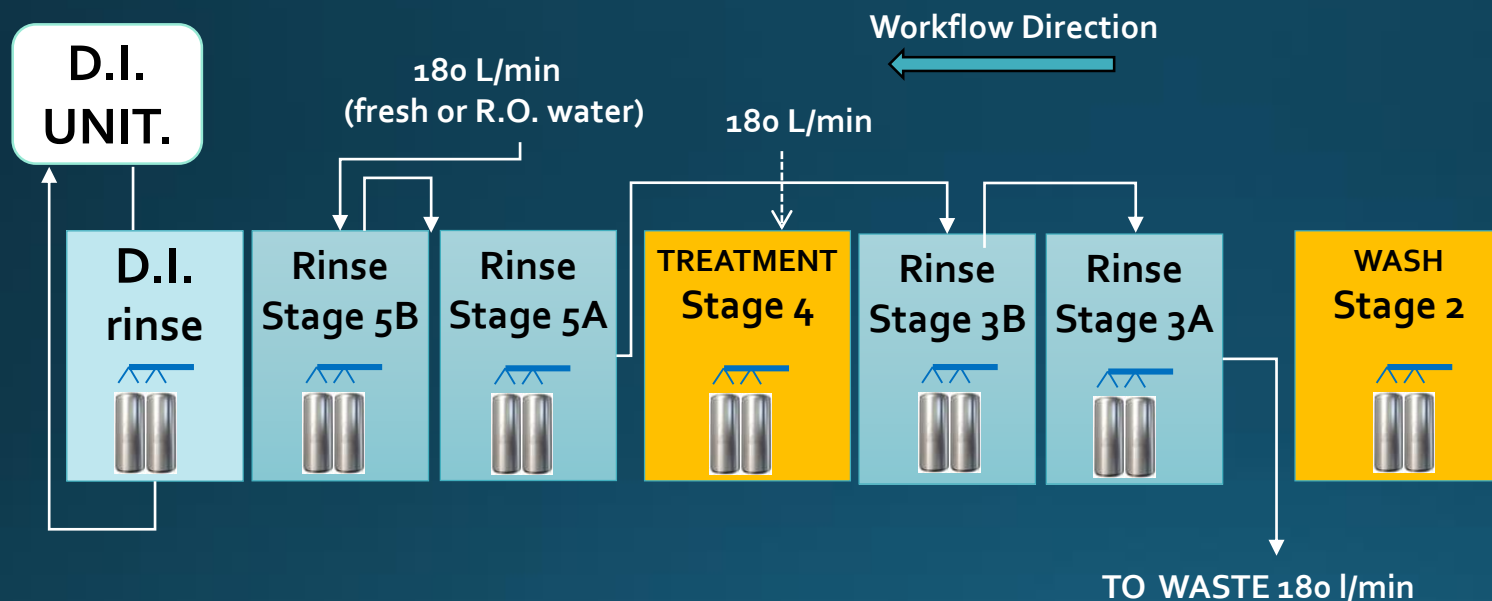


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TECHNOLOGY TO REMOVE OILS AND COOLANT FROM CANS



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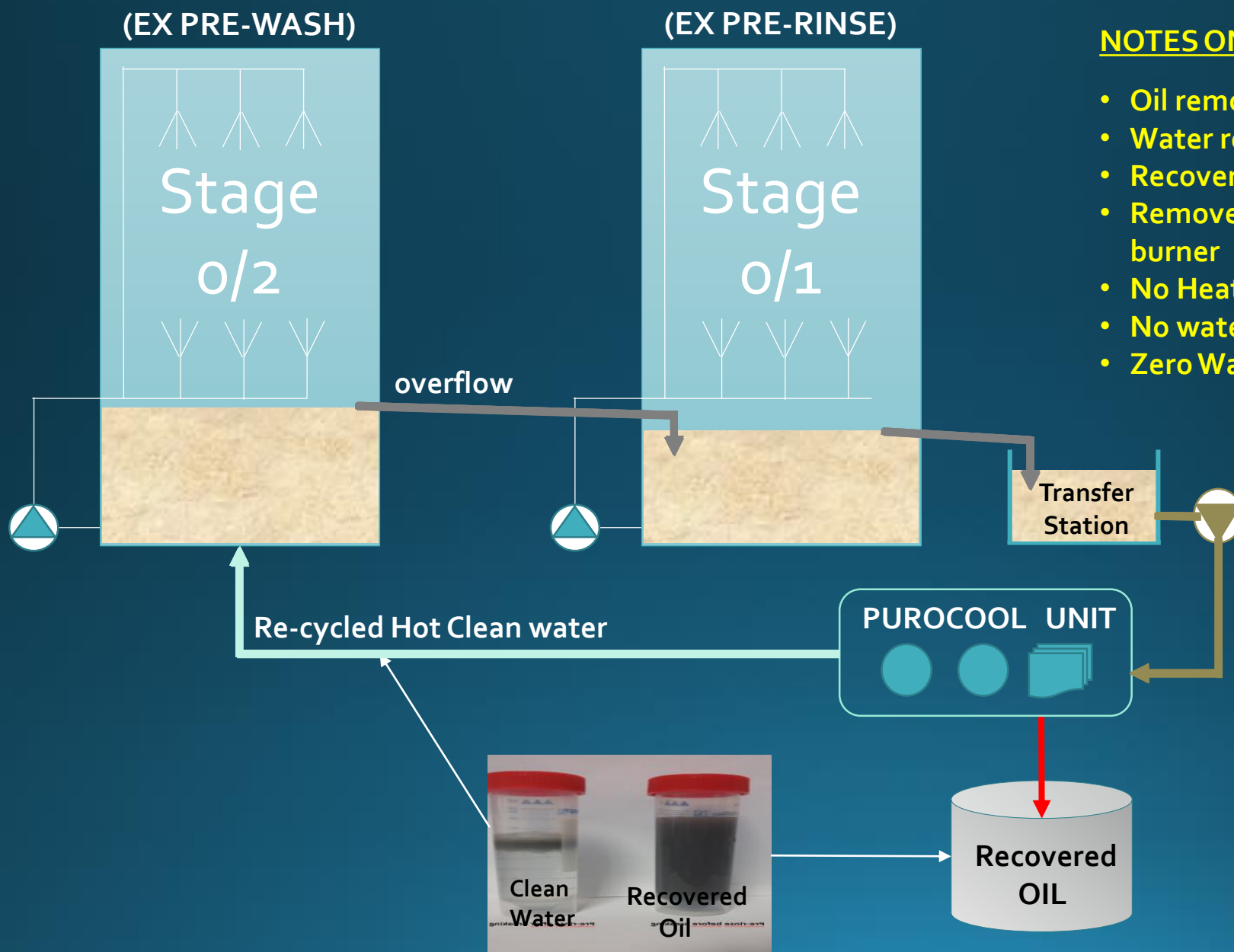


NOTE: - All rinses counterflow to Stage 3

- Pre-Wash and Pre-Rinse dedicated to the Oil Removal System

PUROCOOL (OIL REMOVAL SYSTEM)

TECHNOLOGY TO REMOVE OILS AND COOLANT FROM CANS

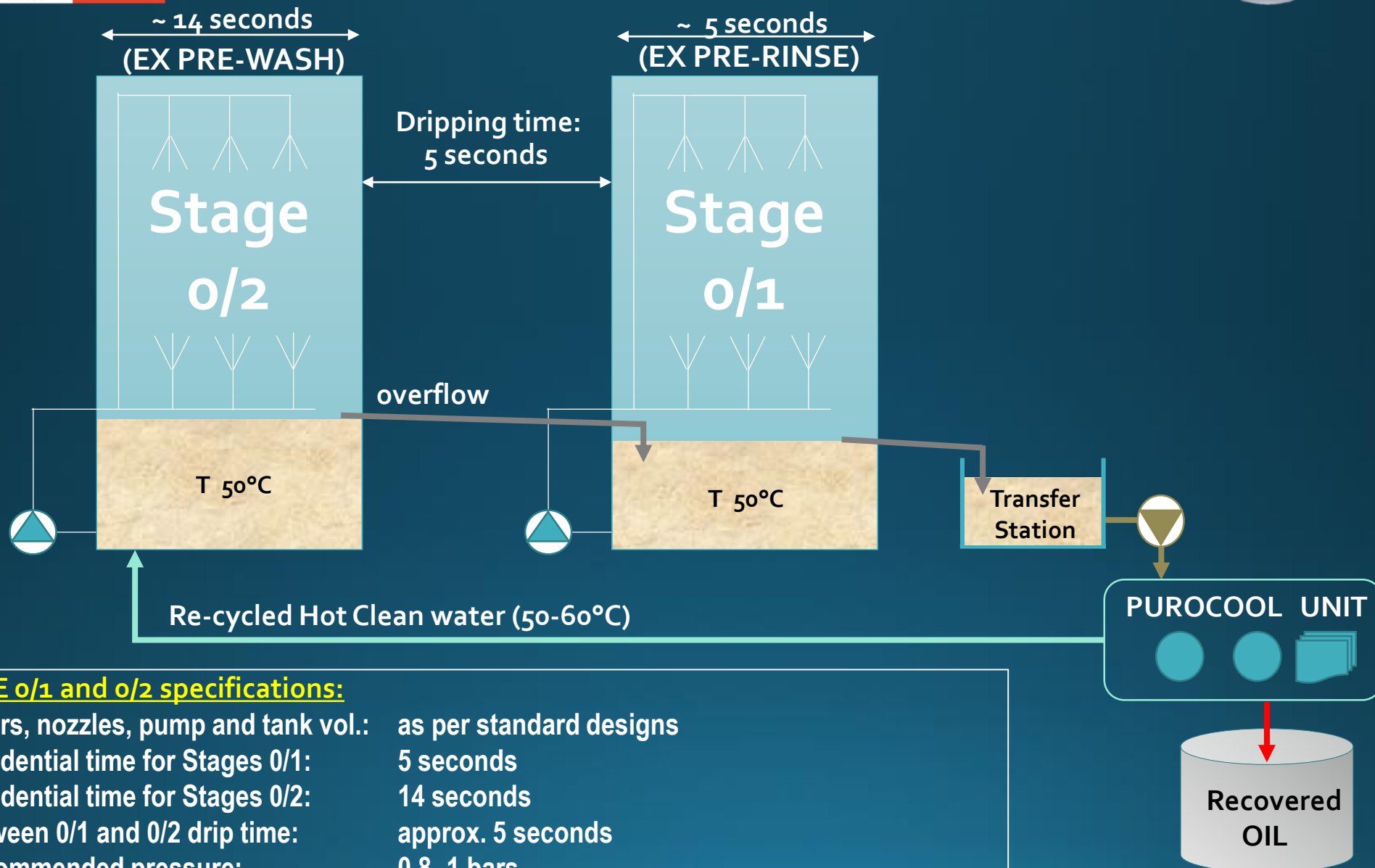


NOTES ON PUROCOOL:

- Oil removal efficiency 80%
- Water recovery temp.: 60° C
- Recovered Oil $\geq$ 50%
- Removed Oil may be sent to burner
- No Heating necessary
- No water consumption
- Zero Waste to the WWTP

PUROCOOL (OIL REMOVAL SYSTEM)

TECHNOLOGY TO REMOVE OILS AND COOLANT FROM CANS



STAGE 0/1 and 0/2 specifications:

- Risers, nozzles, pump and tank vol.: as per standard designs
- Residential time for Stages 0/1: 5 seconds
- Residential time for Stages 0/2: 14 seconds
- Between 0/1 and 0/2 drip time: approx. 5 seconds
- Recommended pressure: 0,8 -1 bars
- Temperature: 50°C - **No extra heating necessary**
- Blowdown: between stage 0/1 and 0/2 and after stage 0/2



LIMITS	TECHNOLOGY
European Limits for sewer discharge	Lime neutralization + Fluorides reduction
European Limits river/lakes discharge or irrigation purpose	Lime neutralization + Severe Fluoride reduction with chemical specialties
Special local limits ■ SO_4 < 300 ppm ■ F^- < 2 ppm	Special equipment and chemical specialties required

- Special dedicated section;
- Expensive chemical specialties required.

PUR-ALL ZEROZERO



- Revolutionary patent pending technology to realize a ZLD with impressive characteristics:
 - **NO** Ultra Filtration or Reverse Osmosis required;
 - **NO** Evaporator required;
 - **NO** final liquor to dump;
 - **NO** Ion Exchange resin technology.
- *PUR-ALL* ZEROZERO technology is applicable exclusively to:
 - Aluminium Cans Lines
 - Aluminium Painting lines
 - Acidic sections of Anodizing lines

PUR-ALL ZEROZERO



- CIE and MST Chemicals R&D;



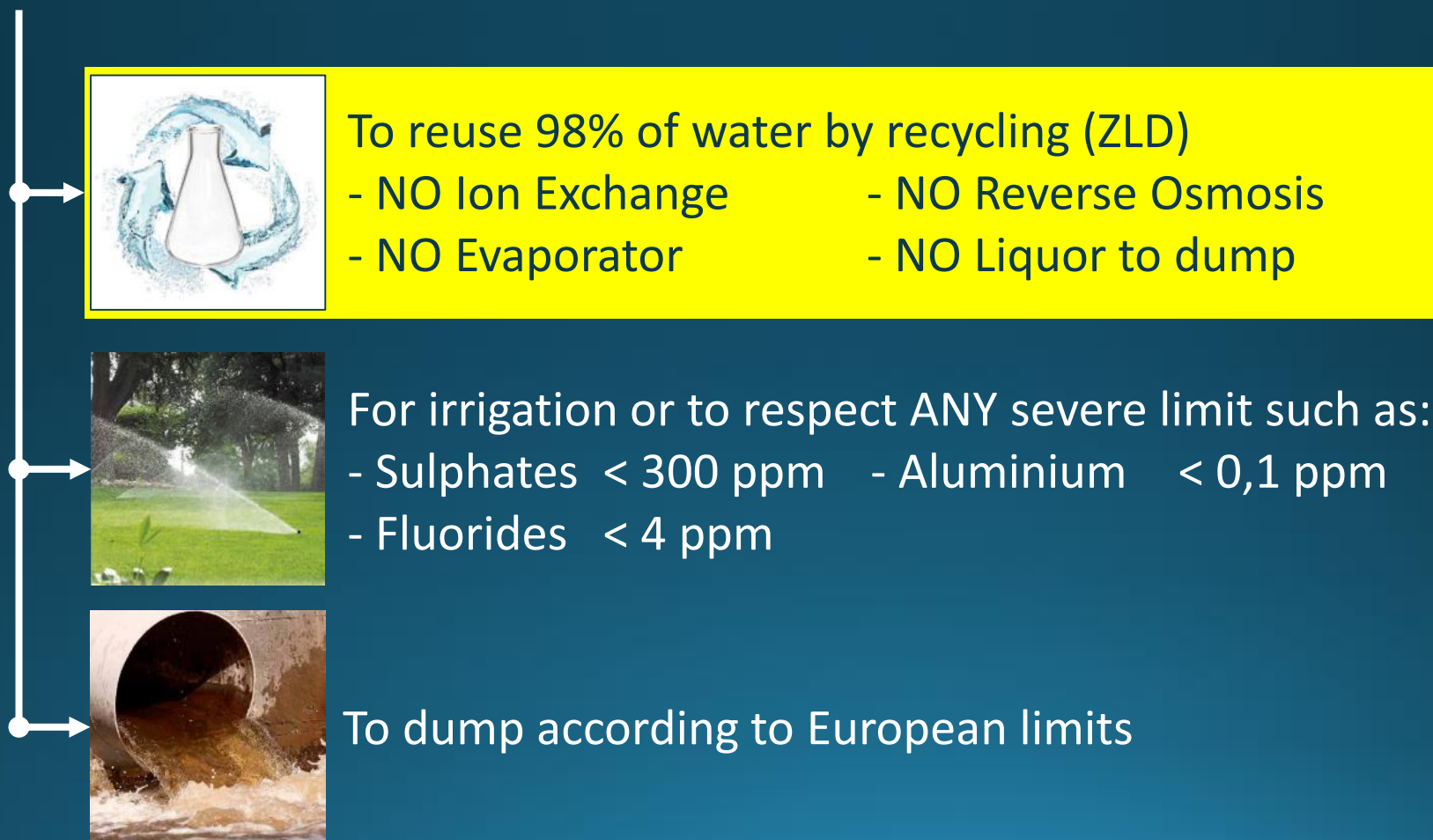
- Sulphates, Fluorides and Aluminium chemical removal;
- NO use of any barium derivate;
- NO I.X. or R.O. or Evaporator equipment;
- 100% of reusable water



PUR-ALL ZEROZERO APPLICATION



- Thanks to its flexibility the plant realized using **PUR-ALL ZEROZERO** can be used in three different versions:





- TALEX (Abu Dhabi) has three lines
 - 1 Anodizing line for 7 meters extrusions
 - 1 Anodizing line for 11 meters extrusions
 - 1 Painting line for 7 meters extrusions, Cr-free equipped
- Total production
 - 650 sqm/h of Anodizing
 - 700 extrusions (7 meters high) per h
- TALEX original water consumption: 50 m³/h
- TALEX water consumption with *PUR-ALL* technology: <25 m³/h



PUR-ALL ZEROZERO
Waste water buffer Tanks

PUR-ALL ZEROZERO
Water purification
and settling station



PUR-ALL ZEROZERO
Lamella settlers battery





PUR-ALL ZEROZERO
Electric control board,
PLC and
Teleassistance unit

PUR-ALL ZEROZERO
Sludge thickeners battery



PUR-ALL ZEROZERO
Filter presses

SOME OF CIE REFERENCES



COMPANY	GENERAL INFORMATION
	Italy – 2006/2007
 	Iran – 2006/2007 Aluminium cans for food and beverage
 	Iraq – 2008/2009 Aluminium cans for food and beverage
	KSA – 2010/2011 Aluminium cans for food and beverage
	Italy – 2012 Aluminium cans for food and beverage
	South Africa – 2012/2013 Aluminium cans for food and beverage
	United Kingdom - 2013 Aluminium cans for food and beverage
	Czech Republic - 2014 Aluminium cans for food and beverage
 	KSA – 2014 Aluminium cans for food and beverage
 	Angola – 2014 Aluminium cans for food and beverage
	KSA – 2014 Aluminium cans for food and beverage

COMPANY	GENERAL INFORMATION
	South Africa – 2014 Aluminium cans for food and beverage
	Czech Republic – 2015 Aluminium cans for food and beverage
	2015 Aluminium cans for food and beverage
 	India – 2016 Aluminium cans for food and beverage
	Iran – 2016 Aluminium cans for food and beverage
 	Hungary – 2016 Aluminium cans for food and beverage
	Iran – 2017 Aluminium cans for food and beverage
	South Africa – 2017 Aluminium cans for food and beverage
	Vietnam – 2017 Aluminium cans for food and beverage
 	India – 2017 Aluminium cans for food and beverage



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Thank you for your attention!

Franco Falcone – CIE Srl CEO and General Manager

Visit us at our table in the exhibition hall