



Colenta® Photo processing Equipment

D&D RoboLine 9T Universal - C41, B/W & E6

As a result of the increased use of analogue cameras and film, by both amateur and professional photographers and the resulting increase in the amount of film being required to process daily, **Colenta** saw the opportunity to design a new film processing system using our robotic technology that allows it to be used to develop **C41**, **B/W** and even **E6** film - providing a flexible, compact and cost effective universal film processor

Colenta® D&D RoboLine 9Tank Universal.



The concept of the **D&D RoboLine 9T Universal** Film processor system is to allow a customer to freely organise his film processing demands for **C41**, **B/W** and **E6**.

The unit supports a **9 Tank design - 7 chemical tanks & 2 Wash tanks.**

→ in operation mode 1A

→ in operation mode 1B

→ in operation mode 2

the 6 Tanks are used to process **C41**

the 4 Tanks are used to process **B/W**

the 9 Tanks are used to process **E6**

(C41 - B/W chemicals are to be removed and replaced by E6)

All the required different processing parameters for **C41**, **B/W** and **E6** are factory pre-set and of course programmable from the operator via a 24" monitor subject to the chemicals and film in use.

for each individual tank, the software allows to programme:

- a specific temperature
- a specific timing
- a specific replenishment rate

A totally open and flexible architecture - providing Photo Lab's with total flexibility to cover their film processing demands

- all in one unit - „3 in 1“

Colenta®

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D&D RoboLine 9T Universal - C41, B/W & E6

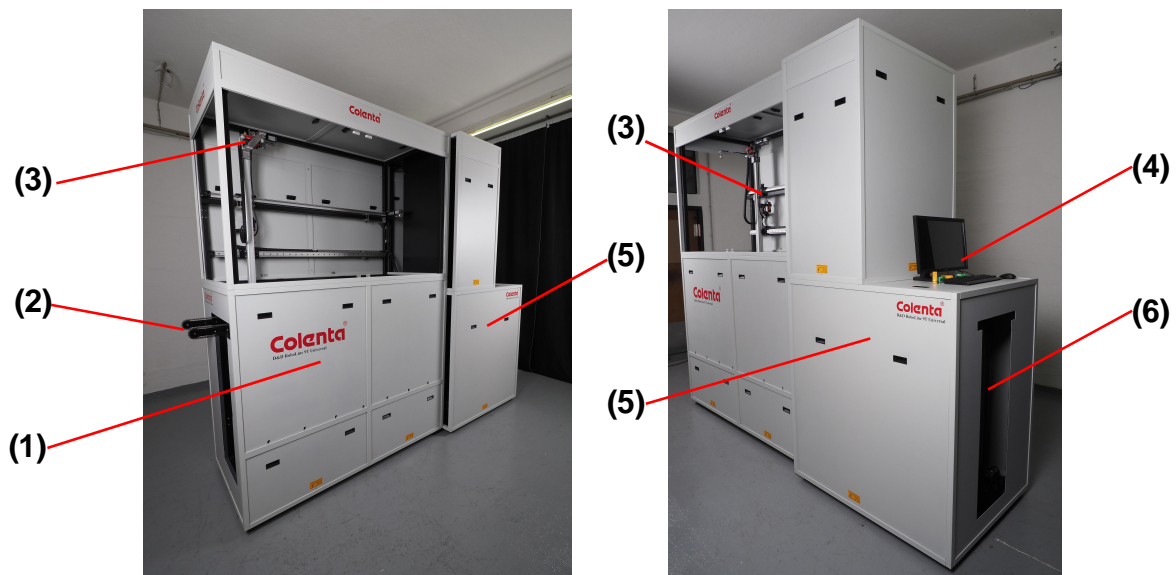
1) Introduction:

This **New Generation of Colenta's Photo Film Processor** range incorporates all the skills, experience and knowledge of Colenta's 50+ years in designing and manufacturing developing systems for photosensitive emulsions.

State of the Art technologies meets 50 year of film processing experience!

Processing applications	:	C41, B/W and E6 film in roll & sheet format
Film transport via hanger	:	for 35mm and 120/220 film or sheet format 4x5", 5x7" and 8x10"
Capacity E6 @ 6min Dev Time	:	6 hanger assemblies per hour
Capacity C41 @ 3min15s Dev Time	:	8 hanger assemblies per hour
Capacity B/W @ 4min Dev Time	:	7 hanger assemblies per hour

The main sections of the **D&D RoboLine 9T Universal** are defined as following:



(1) Wet-Section	9Tank design
(2) Film-Entry	a chain drive system transports the hanger to its pick up spot
(3) Robotic-System	X/Z linear transport system
(4) User-Interface	a 24" monitor to control and display all parameters
(5) Dryer-Section	a warm air dryer cabinet for gentle and even film drying
(6) Film-Exit	a chain drive system delivers the processed and dried film hangers

Colenta® Photo processing Equipment

D&D RoboLine 9T Universal - C41, B/W & E6

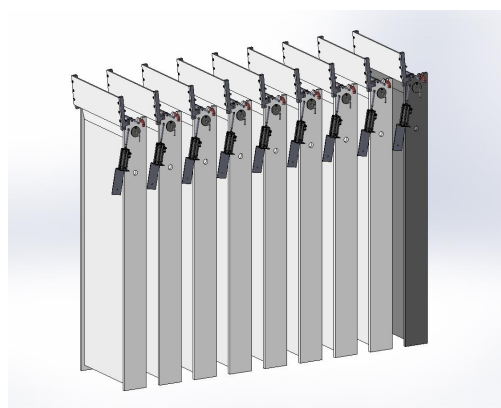
1.1) Wet-Section: (9Tank Universal)

The Wet-Section includes 9 Tanks (7 chemical tanks and 2 wash tanks) - each tank has a volume of **23 litres**. All tanks are safely positioned within a metal frame. All required components, such as pumps, heaters, solenoids and filters (!) are easy accessible for service or maintenance.



wet-section (processing section)

7 processing tanks / 2 wash tanks



Consistent and stable film development results are being generated there!

The **9 Tanks**, are holding the processing chemicals and 2 Wash tanks which are shared. The unit offers 3 standard operation modes for processing **C41**, **B/W** and **E6**.

operation mode 1A : **C41** required chemicals & processing sequence as below
operation mode 1B : **B/W** required chemicals & processing sequence as below
operation mode 2 : **E6** required chemicals & processing sequence as below
 (C41 - B/W chemicals are to be removed and replaced by E6)

	C41	B/W	E6
Tank1 : Chem1	1. Developer	#	1. First Developer
Tank2 : Chem2	2. Bleach	#	3. Reversal
Tank3 : Wash 1	3. Wash1	#	2. Wash1
Tank4 : Chem3	4. Fixer	#	4. Color Dev
Tank5 : Chem4	6. Stabilizer	#	5. Conditioner
Tank6 : Wash 2	5. Wash2	3. Wash	8. Wash2
Tank7 : Chem5	#	1. Developer	6. Bleach
Tank8 : Chem6	#	2. Fixer	7. Fixer
Tank9 : Chem7	#	4. Wetting	9. Stabilizer

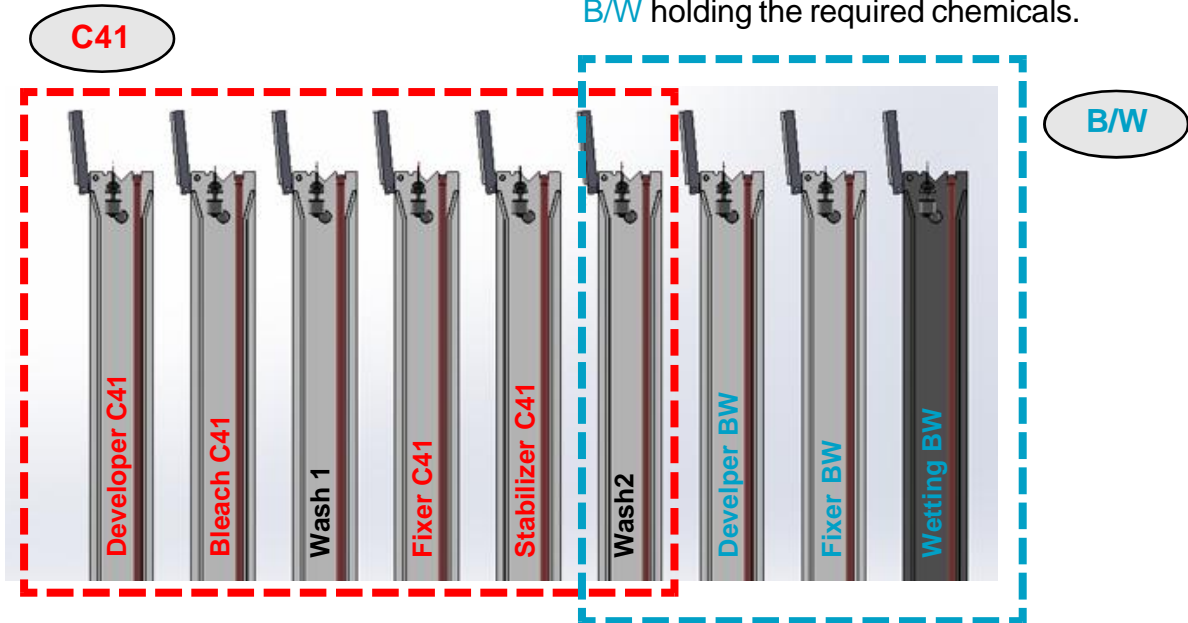
operation mode 1A or 1B

operation mode 2
 (chemicals are to be changed)

Colenta® Photo processing Equipment D&D RoboLine 9T Universal - C41, B/W & E6

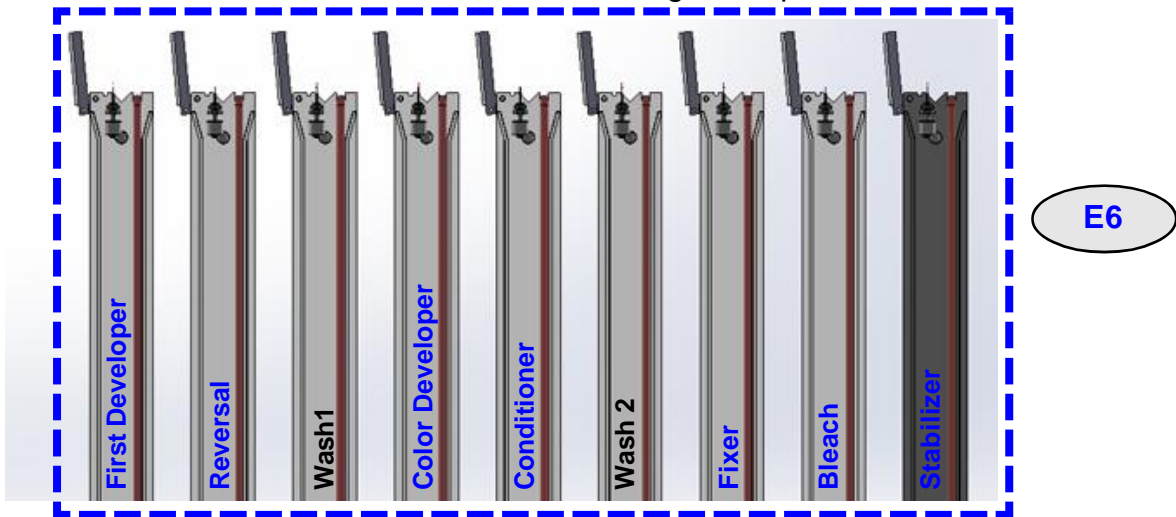
1.1) Wet-Section: (9Tank Universal)

When used in operation mode 1A or 1B: The **9Tanks** are used as below for **C41** or **B/W** holding the required chemicals.



When used in operation mode 2:

All 9 Tank are used as below for **E6** holding the required chemicals.

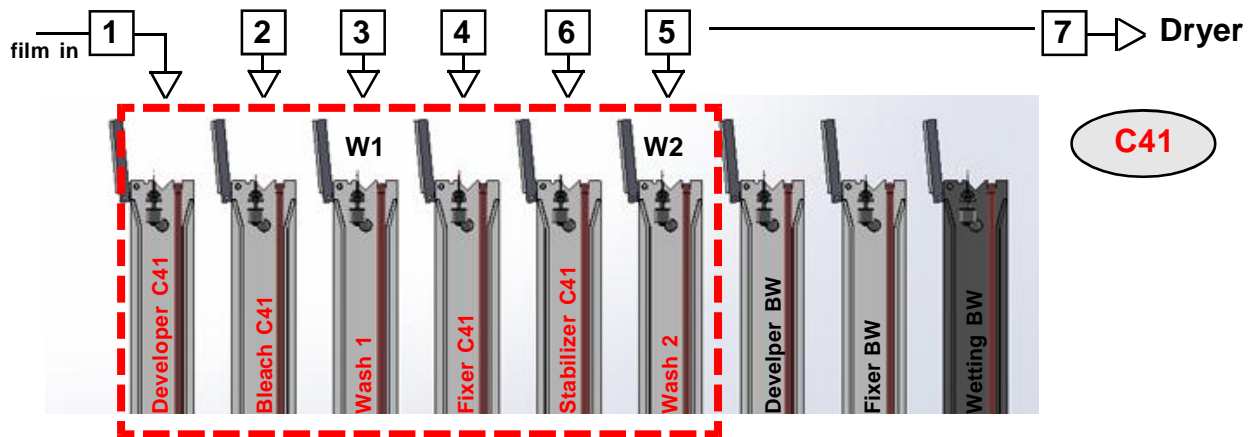


Certainly other operation modes can be considered (for example C41 RA), or different developers for B/W applications. The tanks are to be filled with the required chemicals and the required processing parameters and the processing sequence can be easily programmed.

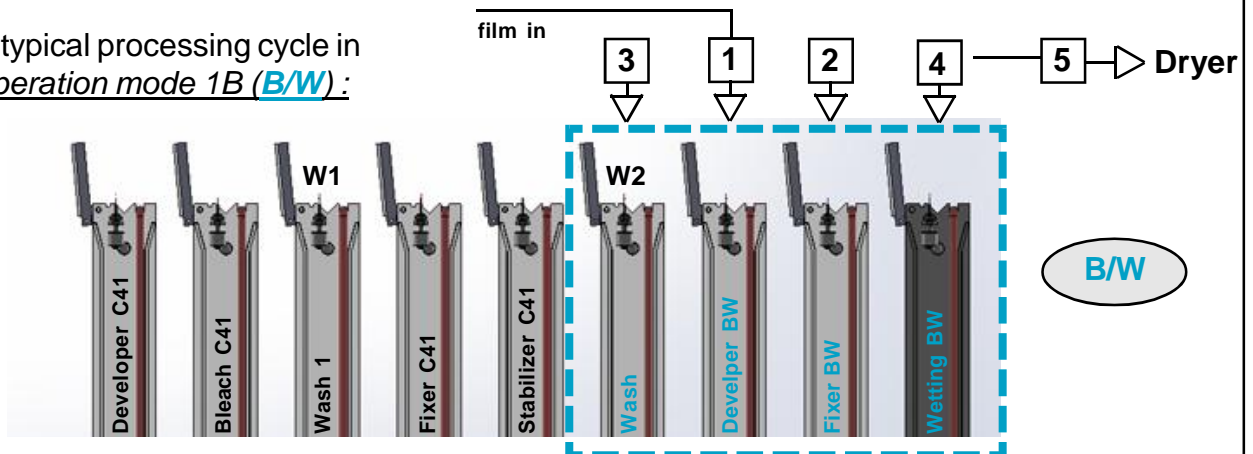
Subject to the demand, internal lab organisation as well to other already existing processing equipment, the Colenta **D&D Robo Line 9T Universal** unit can be integrated in any existing photo lab infrastructure - **flexible & versatile!**

1.1) Wet-Section: (9Tank Universal)

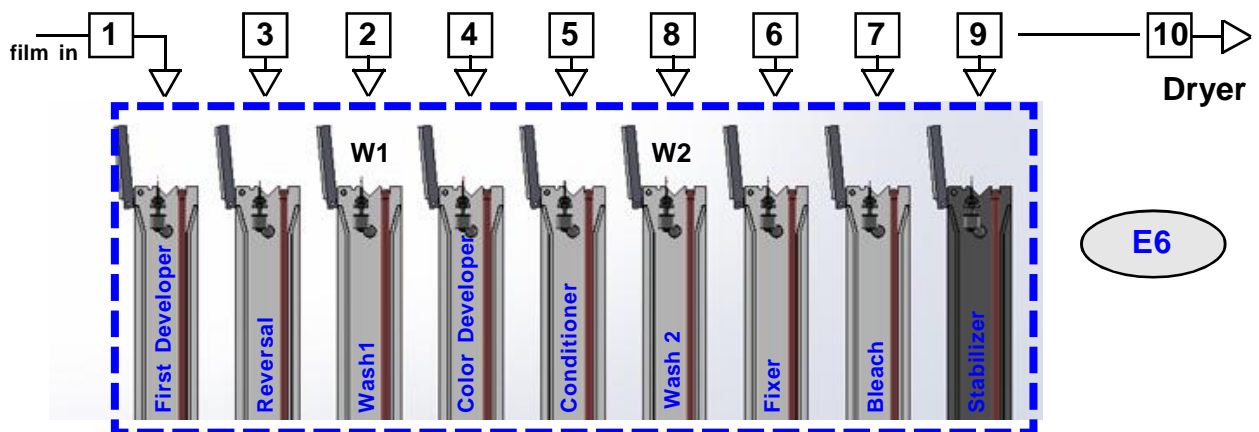
A typical processing cycle in operation mode 1A (C41):



A typical processing cycle in operation mode 1B (B/W):

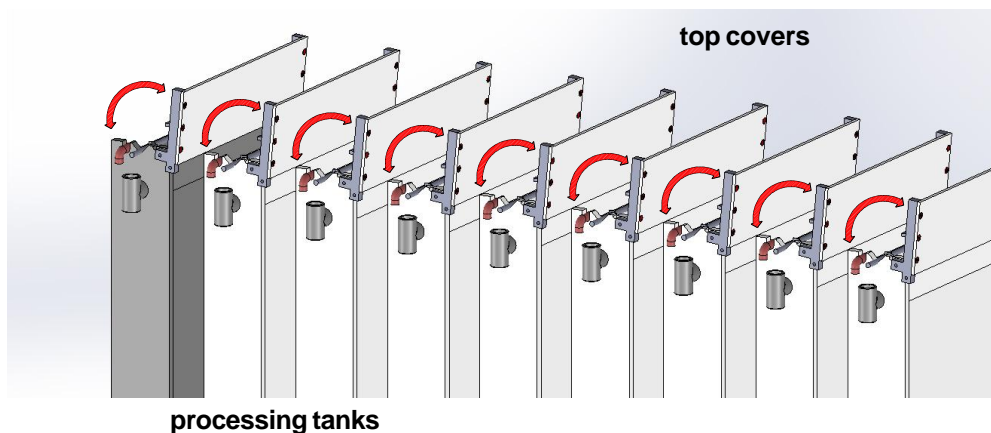


A typical processing cycle in operation mode2 (E6):



1.1) Wet-Section: (9Tank Universal)

The nature of a D&D unit is to transport film via hangers from to tank to tank. To prevent any possible contamination, automatic opening & closing top covers of each tank are in place. These covers also protect the chemicals against oxidation!



Within the wet-section, all components to ensure stable chemical conditions (which is the base for stable & clean film processing results) are positioned:



7 tanks for process chemicals including

- # circulation, heating and cooling*
- # temperature probe
- # auto replenishment
- # air / nitrogen agitation
- # filtration
- # automatic covers
- # over flow & drain
- # low level switches for all tanks

2 wash tanks supporting

- # circulation
- # fresh water supply (when film in tank)
- # over flow & drain
- # low & high level monitoring

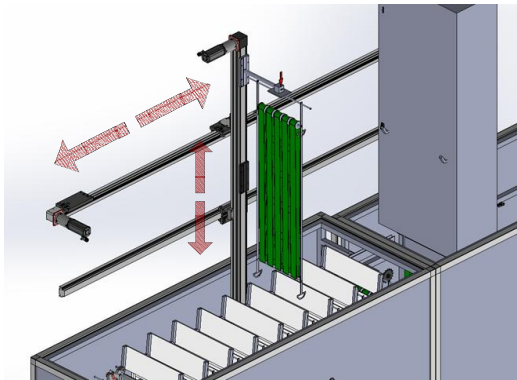
****Stable processing temperatures are essential for film processing!***

Each processing tank supports a heating element (flow heater with NO direct contact with chemicals!) and a cooling coil - this ensure stable processing temperatures at all times! Temperature probes are positioned to monitor and to "report constantly" the measured temperatures to the main controller.

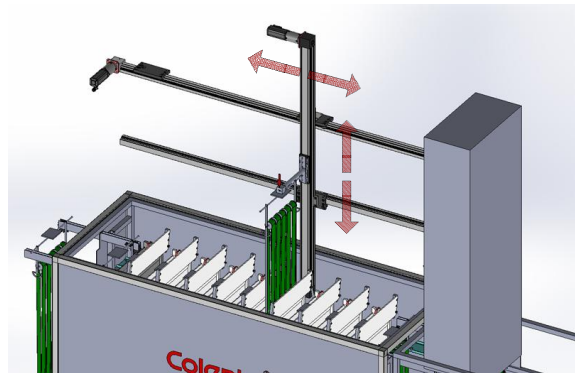
An alarm and display warning will bring any irregularities to the attention of the operator

2) Robotic-System:

A modern and state of the Art X/Z robotic system is in use to ensure precise, reliable and smooth film hanger transport following the processing sequence, bringing the film hanger assembly from the loading section into each of the chemical / wash tanks and dryer.



X/Z robotic system



X/Z robotic system

The motion control of the robotic system is totally under the control of the main computer of the processor - all movements are constantly monitored.

X/Z robotic system



3) Film-Hanger:

Film hanger assemblies are in use to hold the film(s) - safely and easy, the operator attaches the films accordingly. Hanger assemblies are available for roll film and sheet film formats.



120 film format
(3 tracks per hanger)



220 film format
(3 tracks per hanger)

sheet film
hanger for 10
pcs of 4x5"
sheet film



sheet film
hanger for 5
pcs of 5x7"
sheet film

sheet film
hanger for 2
pcs of 8x10"
sheet film



35mm roll film
(5 tracks up to
36 exp per
track)



Once the films are positioned onto the hangers, the robotic system then systematically transfers them through a programmed sequence of development stages to produce consistent high quality developed image production with the minimum of operator involvement

hanger loading section



hanger exit section

4) User-Interface:

A modern, easy to use, self explaining graphic user interface (GUI) is the bases of the user interface. A 24" monitor is in place to allow the operator to programm and monitor all fuctions of the processor. Behind the display, a computer is doing all the controlling and calculations of the total system - the user has the option to use the display :

to monitor the process

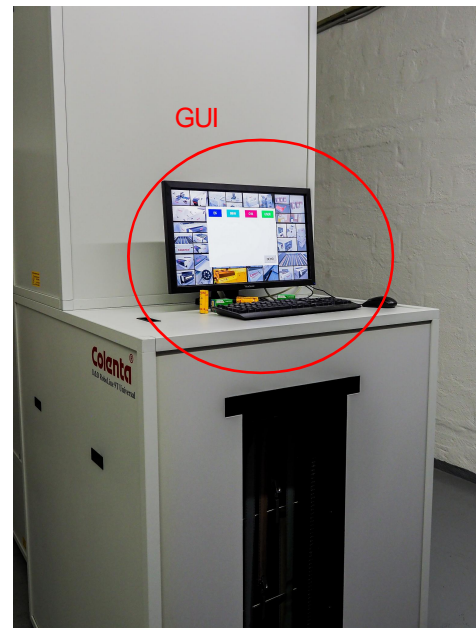
to set and to define operation modes

- 1A for C41
- 1B for B/W
- 2 for E6

to set processing parameters such as processing timings & temperatures and replenishment rates

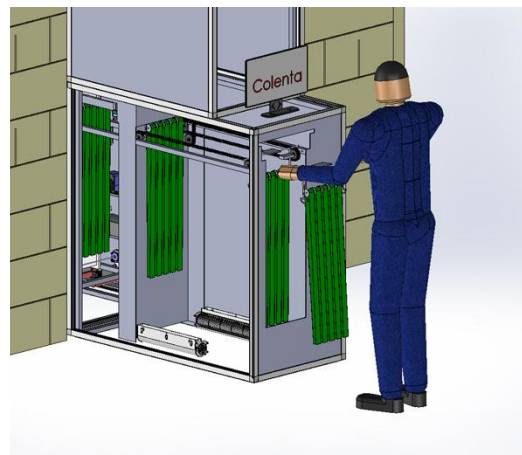
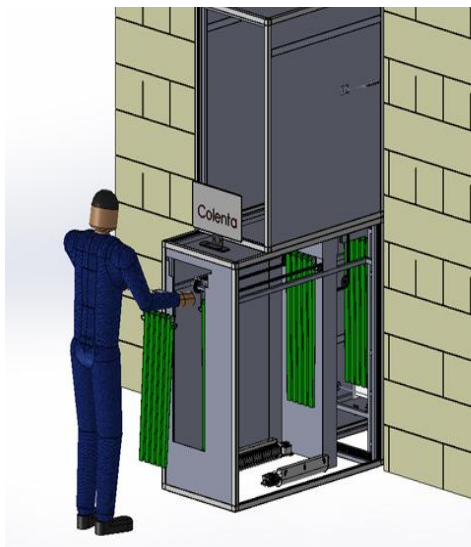
to check alarm messages

to check the motion control of the X/Z robotic system



5) Dryer-Section

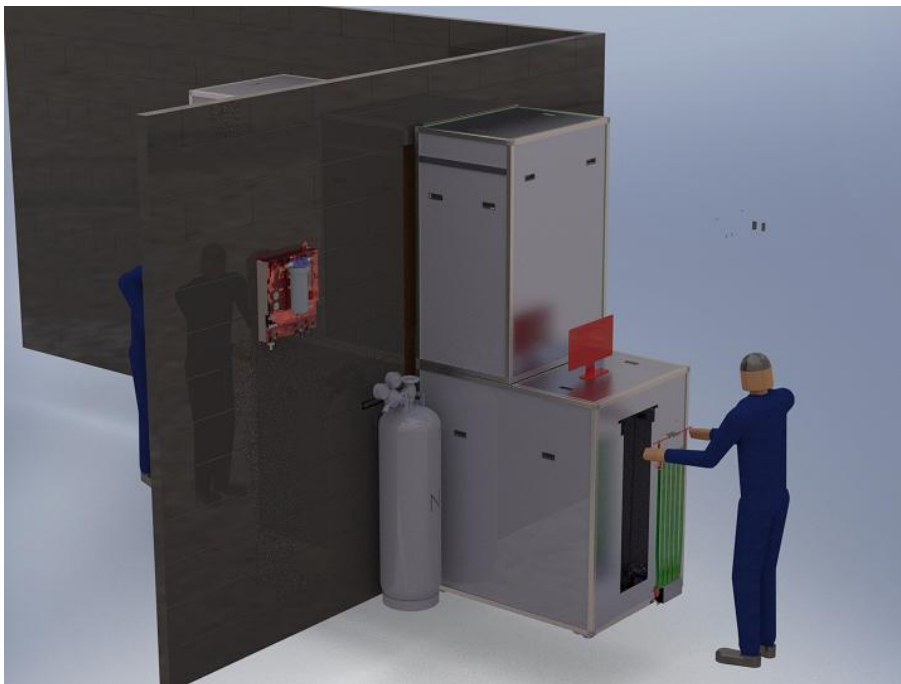
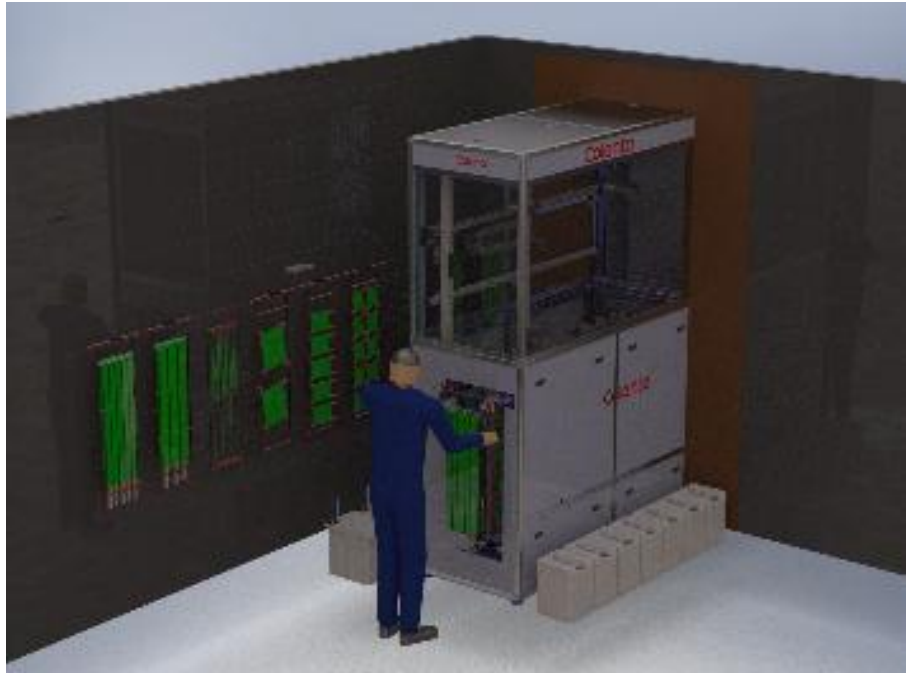
After the development / wet process, the film hangers are being transported automatically into the a drying cabinet. A gentle warm air movement within the dryer cabinet ensure reliable and even film drying. An operator alam is activated once the films are ready and to be removed.



6) Dark room-Setup:

A typical dark room setup / install of a D&D RoboLine 9T Universal processor may look as following:

safe light

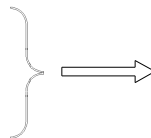


normal light

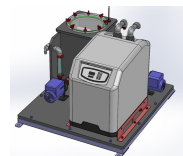
7) Services required for operation:



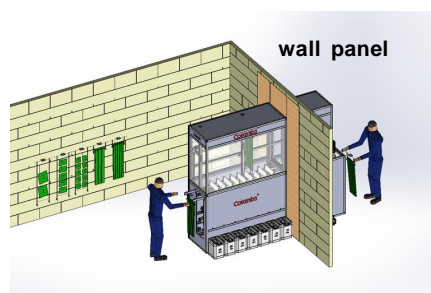
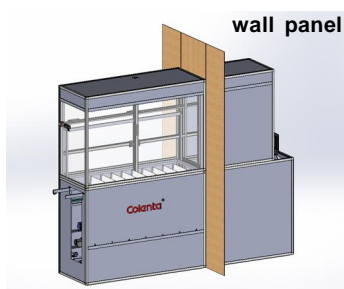
- (A) electrical supply (230/400 VAC plus N plus PE) - 8kW
- (B) Water supply 25°C, 2-6 bar for film washing
- (C) Water supply 8-15°C, 2-6 bar for cooling*
- (D) Water drain D40mm
- (E) Pressurised air supply (a suitable compressor is supplied with the unit)
- (F) Nitrogen (G) processor exhaust (D100mm)



*...For low developer temperature **B/W** film processing a chiller unit (optional) is recommended



A suitable wall panel is available as an option from Colenta

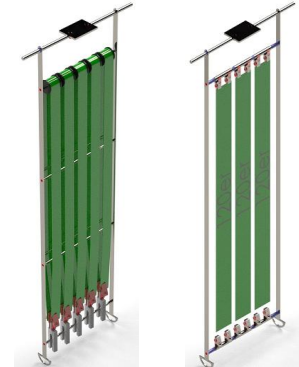


8) Standard Accs.: (supplied with the machine)

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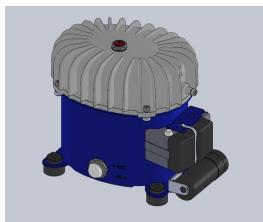
film hanger assemblies:

- 135 film	(5 tracks)	-	3 of each
- 120 film	(3 tracks)	-	1 of each
- 220film	(3 tracks)	-	1 of each
- sheet film 4x5"	(10 per assembly)	-	1 of each
- sheet film 5x7"	(5 per assembly)	-	2 of each
- sheet film 8x10"	(2 per assembly)	-	1 of each



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air compressor



Ethernet connection for software care / maintenance.

Level control for all wet tanks

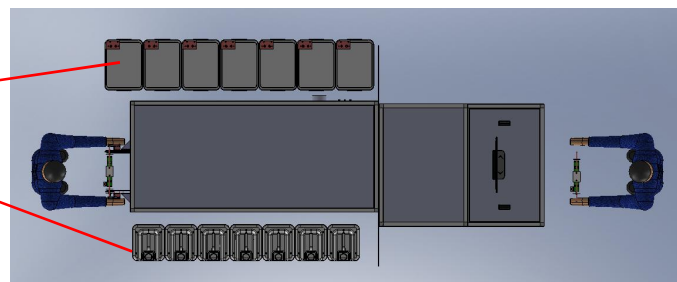
- low level monitoring for chemical tanks (7x)
- low and high level monitoring for wash tanks (2x)



external chemical supply

- 30 litre replenishment containers (7x)

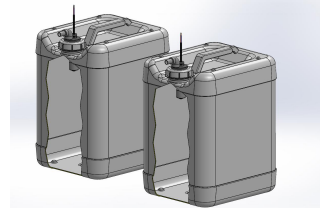
- 20 litre waste containers (2x)



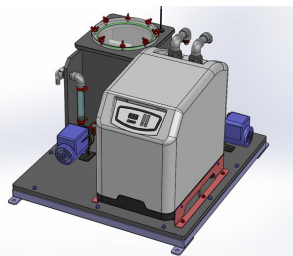
9) Optional Accs.:



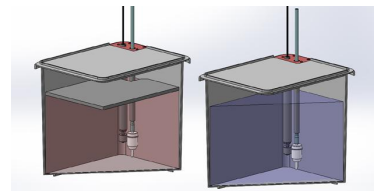
Colenta®
Water Supply Panel assy
(see add. documentation)



Colenta®
External 20 litre chemical
waste container **incl high
level monitoring** (7x units)



Colenta®
External chiller unit - especially
recommend for long cycle / low
developer temperature on BW
processing!



Colenta®
External 30 litre replenishment
container **incl low
level monitoring** (7x units)

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UPS Battery power supply back up system - in case of an external power supply failure the battery provides enough energy to finish developing the films within the machine!

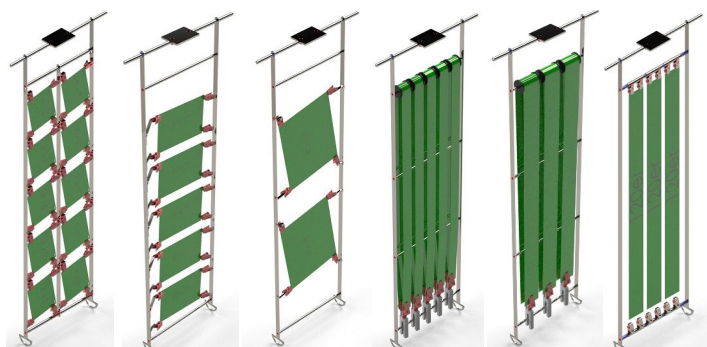


Colenta®
2x40L / 2x80L Mixing Concole
(see extra documentation)
incl low level monitoring

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additional film handler assemblies:

- sheet film, 4x5, 5x7, 8x10
- 135 film
- 120 film
- 220 film



[illegible]