ELECTRO TECNOLOGY
CONSULTING & AUTOMATION

UV / UV LED / IR / AUTOMATION SYSTEMS

# The process guides the technology.

## FROM THE SOURCE TO LINE CONTROL

New machines.
Systems to upgrade.
Problems to solve.



## Custom design, manufacture and integration.

Technologies, applications and real projects. A guide for industrial users, OEMs and consultants assessing their next intervention.

TECHNICAL AND CORPORATE BROCHURE / ENGLISH

# Start with your needs.

You do not need to read in sequence. Choose the problem, review a relevant case and use the worksheet on page 18 to prepare the technical discussion.

**04-07** New system or new line
Method, technologies and integration

**08** Machine down or system to upgrade
Retrofit, service and spare part identification

**09-13** Application to assess
Marble, wood, printing, cosmetics and footwear

**14-16** Explore real projects
Müller Martini, plastic bottles and Rotary

**17-18** Compare a proposal
Scope, tests and data to collect

**19-20** Sources and contacts
Technical references and company contact

### User, OEM or consultant?

This brochure distinguishes the required product result, the subsystem to supply and the interfaces to agree. A similar case helps frame the discussion; it does not replace verification on your machine.

# Workshop experience. System-wide thinking.

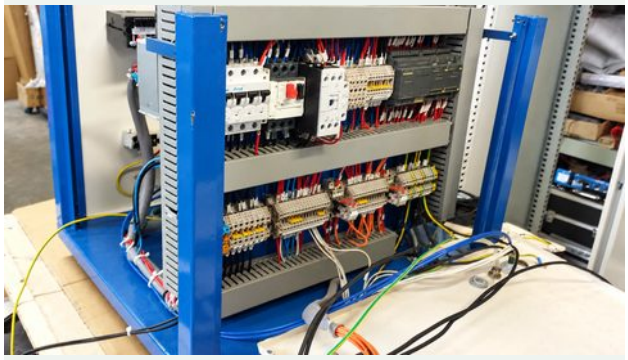
Electro Tecnology SRLS designs and builds industrial systems, coordinating the source, power supply, thermal management, mechanics and control.

## 2006 / ELT Electro Tecnology

The business began with ELT, following early experience in electromechanics and UV systems. Design, assembly and service developed together.

## 2023 / Electro Tecnology SRLS

Experience continues in the new company. Continuity concerns people and expertise: ELT and Electro Tecnology SRLS are distinct legal entities.



Wiring and components: photograph from the technical archive.

## A partner close to the machine

From the component to the panel, from control to the result on the product: technical discussion starts with real constraints, beyond the choice of a lamp.

### Expertise working together

UV and UV LED, lamp housings, power supplies, electrical panels, PLC/HMI, retrofit and service. The supply boundary is defined in the proposal, according to the machine and the parties involved.

Specialist technologies and supply-chain collaboration: HPE Power for electronic power supplies and UV LED; Unionprint for UV applications in printing and industrial treatment. The scope of each project is defined together.

# Understand first. Then design.

An effective intervention has a clear objective, a defined scope and agreed verification criteria. A request with partial data can also be a starting point.

**01**

## Define the result

Material, formulation, defect or objective. What must change on the product, and how will an acceptable result be recognised?

**02**

## Survey the configuration

Machine, space, sources, electrical supply, cooling, transport and control. Separate available data from surveys still required.

**03**

## Agree the scope

Components to retain, assemblies to replace and interfaces. The proposal distinguishes supply, integration, documentation and tests.

**04**

## Integrate and fine-tune

Source positions, thermal management, adjustment, permissive signals and diagnostics are addressed as parts of the same cycle.

**05**

## Verify on the product

Configuration, test conditions and acceptance criteria must accompany the result, especially when materials or speeds change.

The activities and documents actually included are agreed in the proposal. This sequence is not a time commitment, a safety procedure or a test already completed.

# UV, UV LED and IR: different roles, one process.

Selection depends on the formulation and required result. Electrical power, radiation on the workpiece and final quality are different information.

| Technology | Role in the process | Checks before selection |
|---|---|---|
| UV discharge lamps | Spectrum and configuration selected for the photoreactive ink, coating or resin. | Formulation, reflectors, distance, exposure, temperature and extraction. |
| UV LED | Narrow-band emission for compatible formulations. Pinning and final curing have distinct objectives. | Chemical compatibility, spectral band, irradiance, dose, uniformity and cooling. |
| IR and air | Heat input and management of preparation or drying stages where the cycle requires them. | Applied film, any volatile phase, temperature, ventilation, timing and process safety. |

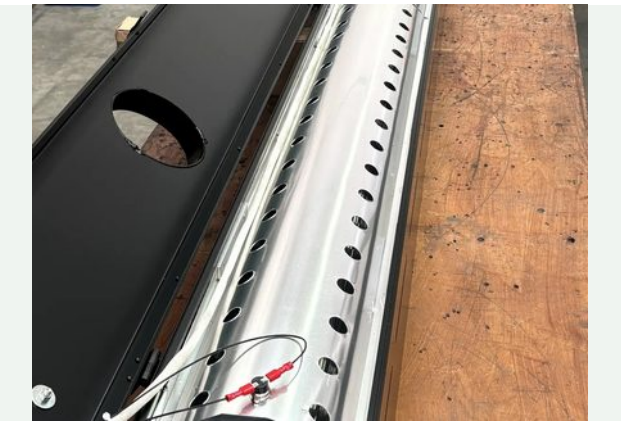
**Switching to LED is not a direct replacement.**

A formulation suited to a discharge lamp is not necessarily suited to LED. Energy comparisons cover the entire cycle, including auxiliaries, rather than a standard savings percentage.

Reading the data: W/cm of length is not W/cm² on the product; dose is normally expressed in J/cm². Technical references and glossary on page 19.

# From light to source control.

Housing and power supply must suit the source, product and machine cycle. The same rated power does not establish interchangeability.



Lamp housing and reflector: construction detail.



Electronic power supply: component from company materials.

## Lamp housings and reflectors

Useful geometry, maintenance access, shielding, cooling and shutters where specified. The PLE and ES families in company materials are configured for the process: length alone does not determine selection.

## Power supply and adjustment

Lamp or module type, electrical data, ignition, mains, wiring and controls. Electronics must interact with machine permissive signals and clearly display status, power setting and alarms.

### To identify an assembly or spare part

Share available nameplates, machine model, source, diagram, observed defect and photographs. Do not reconstruct illegible values or choose a component solely because its power rating matches.

More on service and spare parts / page 08

# The UV assembly must speak the machine's language.

Electrical panels, PLCs, HMI panels, sensors and drives coordinate sequences, stops, restarts and diagnostics. The integration boundary is defined with the OEM.




Panel and drive detail, already included in the brochure.

## For the OEM

The subsystem may include source, power supply, cooling and controls. Dimensions, mountings, access and interfaces must be clear before manufacture.

## For the consultant

The proposal must distinguish required performance, Electro activities and those of other parties. A shared drawing is better than an implicit boundary.

| Information to share | Points to define together |
|---|---|
| Layout and access | Dimensions, positioning, maintenance and workpiece passage. |
| Available controls and signals | Start/stop, power demand, ready, status and fault. |
| Cycle and product criteria | Sequences, test conditions and responsibilities to agree. |

Integration does not automatically transfer responsibility for, or conformity of, the entire machine. The technical and documentation scope must be explicit.

# Keep what works.
# Act where needed.

First identify the limitation: source, power supply, cooling, control or product. The observed symptom alone does not identify the failed component.

## Repair or replacement

A localised fault requires part identification, compatibility checks and investigation of the cause. A photograph guides the request; it does not certify the replacement.

## Retrofit or revamping

When process, adjustment or reliability requirements change, work may involve several assemblies. The proposal separates retained parts from upgrades.

## Restart and maintenance

Access, operator information and post-intervention tests form part of the discussion. Response times and service coverage are agreed case by case.

### First request: four useful details

Machine model and configuration; alarm and when it occurs; available photographs and nameplates; last known material or cycle change. The worksheet on page 18 helps organise the request.

**An example in Veneto. A screen-printing intervention retained the machine structure while updating power, control and extraction and overhauling the lamp housings. No standard speed or savings are attributed here.**

# Marble and natural stone: working with slabs.

Resin application and treatment are assessed with the formulator and line manufacturer. The scope described covers slabs, rather than block treatment.

## The problem to define

Resin, applied quantity, slab condition, useful width, speed and temperature. The criterion concerns the result on the material before subsequent operations.

## Electro's contribution

UV and, where required by the cycle, IR; lamp housings, airflow, shutters, power supply and PLC/HMI panel. The assembly must follow line transport, pauses and restarts.

## A useful test

Define the sample, expected result and operating conditions. Do not extend the outcome for one resin to other formulations or slabs.



Lamp housing maintenance and installation on a marble line, archive 2025.

### UV LED for marble: a study, not a validated solution.

Assessment remains tied to resin chemistry and testing on the material. It is not presented as a standard conversion already validated for every line.

# Panels, edges and profiles: the finish shapes the test.

We work on the treatment subsystem for photoreactive coatings, coordinating it with application, flash-off, transport and subsequent operations.

## Flat and three-dimensional

A flat panel and a 3D profile do not receive the same exposure. Faces, sides, grooves and edges require positioning, distance control and checks on less exposed areas.

## Edging and visual result

A coated edge and applied edge band are different substrates. Colour, gloss, feel, adhesion and resistance are assessed on both the edge and the panel face.



UV assembly construction detail from company materials. It does not demonstrate testing of every finish.

| Cycle | Point to check |
|---|---|
| Water-based UV coating | Film preparation and evaporation according to the formulator's data sheet, before UV curing. |
| Gloss or matt finish | Formulation, deposit and film uniformity, beyond the source alone. |
| UV LED | Coating compatibility and testing on the actual geometry, rather than direct replacement. |

Air and IR are used where the cycle requires them. An ordinary water-based coating does not become UV-curable simply through exposure to UV.

# Screen, flexo and offset: the source follows the print.

Ink, substrate, thickness, colour and speed affect the result. Exposure must suit the station position and the entire cycle.

01

### Screen printing

Flat or shaped surfaces, deposits and workpiece rotation. Uniformity, shadowed areas and deposit resistance are checked in critical zones.

02

### Flexography

Working width, substrate, speed and position between stations. Film behaviour and thermal management influence subsystem selection.

03

### Offset

Compatibility with paper or other substrates, ink and finish. Curing, colour overprinting and the subsequent process are assessed in the actual combination.

**Spectrum and formulation must be compatible.**

Lamps with different dopants and UV LEDs have different spectral distributions. Selection is discussed with the formulator; testing must include the required adhesion or resistance result, beyond the immediate appearance.

Müller Martini case / page 14

Plastic bottles case / page 15

# The container determines geometry and exposure.

Bottle and packaging decoration: shape, material, rotation and formulation must be considered together. Glass and plastic are not interchangeable when describing a case.

| Element | Question to resolve |
|---|---|
| Material and surface | Which container is being decorated? What preparation or treatments precede printing? |
| Shape and rotation | Which areas need UV exposure? Are shoulders, edges or other areas shielded by the geometry? |
| Ink and deposit | Is the formulation compatible with the spectrum? Does the cycle include several colours or layers? |
| Heat and transport | How do distance, dwell time and temperature vary during passage? |
| Required result | What adhesion, appearance or resistance criteria are agreed for the sample? |

**Experience does not make a configuration universal.**

Company cases use conventional UV lamps; other configurations, including different dopants or LEDs, require specific checks. Treatment is not a declaration that packaging is suitable for its end use.

The bottle case on page 15 concerns plastic for agricultural/industrial use, rather than a cosmetic application. It illustrates screen-printing integration, keeping material and application distinct.

# Soles and sidewalls: the treatment area matters.

Material, primer and bonding sequence guide the test. Surface preparation, photoreaction of a primer and curing of a UV coating are distinct processes.

| Configuration | Documented features | Assess on the workpiece |
|---|---|---|
| Rotary UV4 Compact | Four mercury lamps: two transverse and two longitudinal; height, depth and tilt adjustment. | Surface coverage, orientation, cooling and suction table. |
| Rotary UV2 Compact | Two mercury lamps; a more compact solution for sidewalls and side areas, depending on configuration. | Areas to expose, overall dimensions, source layout and cycle. |
| Static oven for boots | A separate design with an internal support rotating through 360°. | Sole geometry, handling and perimeter treatment. |

### Documented Rotary reference conditions

Operating speed 4.5-7 m/min and workpiece temperature no higher than 40 °C under the conditions described in the technical materials. These are not guaranteed for every material: the operating point must be checked on the sample.

**Rotary UV4 Compact workshop test / page 16**

First request: photo of the sole or sidewall, treatment areas, material, primer or formulation, process sequence and required criterion.

# Müller Martini.
# Upgrading the UV subsystem.

Work on the existing machine. The end customer remains confidential; Müller Martini identifies the machine, rather than a partnership or certification relationship.

| | | | |
|---|---|---|---|
| 7 | UV lamp housings replaced | 7 | power supplies in the new panel |

## Requirement

Upgrade the UV section of a machine with years of service, retaining the existing installation and assessing results on actual print production.

## Electro intervention

Replacement of seven lamp housings and construction of a new panel with seven power supplies, coordinating power delivery and machine integration.

## Result specific to this case

In this application, the machine operated at up to 250 m/min with specific substrate and ink combinations. The figure describes that project under those conditions.

### What the case demonstrates, and its limits

The case documents work on the machine's UV subsystem. It does not demonstrate a universal speed, standard savings or compatibility with any ink. Another installation needs its own survey and test.

Prepare the discussion on your machine / page 18

# Plastic bottles. Manual adjustment, integrated cycle.

A special conventional-UV machine in a screen-printing line for plastic bottles used in agriculture/industry. The customer remains anonymous.

## The problem

Part of the existing installation did not allow the required operation. Assessment covered the bottle, ink, housing and lamp housing position.

## The intervention

Lamp housing and support with manual height and depth adjustment, control/power panel, cooling and extraction integrated with transport.

## The result reported by the owner

Three-colour processing in the cycle, with rub checks and product quality checks. This is not a certified production speed.



The machine in this case: plastic bottles and manual adjustment. Photograph already in the brochure.

### The result belongs to this configuration.

The case shows integration of exposure, transport and UV assembly adjustment. Another bottle changes the material, geometry, ink and test conditions: the design must be verified against the intended production.

# Rotary UV4 Compact.
# The sample enters the workshop.

The customer's material is used to verify the process in the actual configuration. Archive photographs show Rotary fine-tuning and acceptance testing with the customer in 2016.



Machine in the workshop during fine-tuning.



Test with a customer's sole, archive 2016.

**Real workpiece.**
**Real geometry.**
**Agreed criterion.**

## Four observable elements

Primer treatment, lamp housing positions, airflow and transport were addressed together. The suction table helps manage the workpiece and airflow in the intended configuration.

## One test does not cover every sole

Composition, colour, primer, geometry and subsequent sequence can affect the result. For a new product, define the sample, conditions and verification of bonding or the required treatment.

### Useful documentation accompanies the outcome.

The discussion must retain material, configuration, speed, positions, workpiece temperature and acceptanc criterion. A photograph shows the work performed; alone, it measures neither dose nor adhesion.

# Compare the scope. Beyond the price.

This outline helps users, purchasing teams, OEMs and consultants compare equivalent proposals. Answers must be included in the agreed quotation, rather than assumed.

| Point to clarify | Useful question |
|---|---|
| Product result | Which property must change, and against what acceptance criterion? |
| Components and retained parts | What is included? Which assemblies remain, and which compatibility checks are still needed? |
| Integration | Who handles wiring, air or liquid, transport, PLC/HMI and machine signals? |
| Installation and downtime | What takes place before shutdown? What conditions are needed for start-up and restart? |
| Tests and documents | Are sample, configuration, methods, results, limitations and documents identified? |
| Operating cost | Does the comparison include auxiliaries, actual cycle, maintenance and spares, as well as the component? |

**A clearer quotation reduces assumptions.**

Compatibility, spare part availability, timing, service and commercial terms must be specified for the supply. The brochure does not replace the quotation or machine manual.

# Prepare the technical discussion.

Enter the data available: perfect answers are not required. The digital PDF has fillable fields; use the paper copy for notes. Nothing is sent automatically.

**Company / plant**

**Contact / role**

**Machine / model / known configuration**

**Product / material / formulation or code**

**Observed problem or required result / when it occurs**

**Known conditions: speed, geometry, temperature, last change**

**Available photos / diagrams / data sheets / criteria to agree**

Share only documents and photographs you are authorised to send. Use existing data: this worksheet does not require dismantling or measurements on live parts.

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# Read a figure. Understand what it shows.

This brochure describes expertise, configurations and specific cases. Design and acceptance criteria remain to be defined for your application.

## Electrical power

Load of the source and auxiliaries. A value in W/cm of length does not describe irradiance on the workpiece.

## Irradiance

Radiant power per unit area, normally W/cm². Measurement also depends on spectral band, distance and position.

## Dose

Radiant energy received per unit area, normally J/cm², during exposure. It does not replace testing on the product.

## Pinning

Intermediate setting of the deposit. This is not verification of final polymerisation.

### TECHNICAL REFERENCES

**HPE Power / UV LED 2203**

Component emission band, geometry and cooling.

hpe-power.it / UV LED / 2203

**IST METZ / UV and LED technology**

Source selection principles and process conditions.

ist-uv.com / Technology

**EIT 2.0 / LEDCure**

Distinction between irradiance, energy per area and spectral response of the measurement.

eit20.com / LEDCure

> **Component data, experience and measurement are distinct.**
>
> Company sources: Electro Tecnology brochures and technical materials; chronology and the owner's accounts. Photographs from existing archives. External references explain principles or components; they do not certify Electro installations.

For every assessment, ask for the source, conditions and scope of the data. A result observed on a project and a performance figure declared by a component manufacturer require different interpretation.

# The next step is a technical discussion.

## Bring the problem. Let us define the scope.

A photo, machine model, formulation and expected result are a good starting point. The worksheet on page 18 helps collect what you already have.


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Contacts and technical discussion


Editorial revision 01 / 17 October 2026
Version to approve before distribution and final printing.