

## **Balcan TL2000 Information Pack**

At Balcan we believe our recycling systems are the best in the world, offer the best return on investment, as well as user experience. We also believe that when making an investment in such equipment it is important to know how much things cost. The true cost of purchasing this type of equipment from other manufacturers can significantly increase with add-ons, which are not supplied as standard. Balcan lamp recycling systems process many different types of lamps, as well handling crushed lamps and drums of lamps, so we do not have these extra add-ons. Our simple pricing structure makes calculating your return on investment easy. We also offer a return on investment analysis, whereby we calculate the return on investment through our customized spreadsheet. If you would like to take advantage of this all we require is the typical price per lamp you charge as well as anticipated quantities.

Enclosed in this package is:

1. General Description of TL2000
2. TL2000 sections
3. Floor plan - Changable
4. Installation & Commissioning
5. Warranty
6. Assembly prior to shipment
7. Equipment for provision by client
8. Utility Requirements
9. Spares & Servicing
10. Output fraction details
11. Emissions



BALCAN GAINED MILLENNIUM PRODUCTS STATUS FOR THREE DESIGNS  
HYPODERMIC NEEDLE AND SYRINGE DESTROYER  
PNEUMATIC SPLITTER FOR EMPTYING PLASTIC VIALS  
BELL-Q THROWING LINE FOR EMERGENCY WATER RESCUE  
Directors J H T Rinfret, E M Rinfret, A J Rinfret, J P Rinfret & M A Rinfret  
Company Registration N° 1037378





### **General Description for TL2000 Lamp Recycling Plant**

The Balcan TL6000 Lamp Recycling Plant has a capacity to process in excess of 2,500 x 4ft fluorescent tubes per hour (approx 8 million per annum based on a single 8hr shift). Lamps are loaded on to a conveyor which transports them into a fully encased unit where they are crushed.

Unlike other systems the TL2000 allows linear fluorescent tubes of various lengths to be processed at the same time. Different diameter lamps may require segregation prior to processing to allow for a simple adjustment to be made to ensure lamps do not pass through unbroken. Where linear lamps have been broken and 'lengths' still remain intact these can also be placed on the belt for processing. There is also an input to allow for small pieces of broken lamps to be emptied into the system for processing.

## The TL2000 Lamp Recycling Plant comprises:

- 1. Loading Flat bed conveyor leading to encased unit comprising of second conveyor and crusher unit.** All lengths and diameters of linear fluorescent tubes can be placed on the belt. Various lengths of lamps can be processed at the same time. Different diameter lamps may require segregation prior to processing to allow for a simple adjustment to be made to ensure lamps do not pass through unbroken. Where linear lamps have been broken and 'lengths' still remain intact these can also be placed on the belt for processing.
- 2.** The crushed debris is conveyed evenly to the Main Separator. This causes agitation of the debris and allows the resultant mercury bearing phosphor powder to be drawn off by two Air Extraction Filter Units. The debris discharges from the end of the Separation Unit over a Magnet that separates the glass from the metal components, which are conveyed to suitable collection bins. Additional metal separation equipment may be incorporated to ensure 100% metal removal.
- 3. Additional Conveyors: -**
  - One between Main Hopper and Main Separator
  - One for glass debris to collection container
  - One for aluminium end caps to collection container
- 4. Air Extraction Filter Units** are used to draw off all mercury bearing phosphor powder and vapour from the contents of the lamps down to 5 micron size. These ensure the plant operates at negative pressure. All finer dusts and vapours that pass through the filters are ducted to our Main Filter Stack containing approximately 2 cubic metres of Sulphur based Activated Carbon, with which the mercury reacts and allows the exhausted air to be mercury free and ducted to atmosphere.  
**Maximum permissible emissions from exhaust 0.025mg/m<sup>3</sup>**  
**Typical emissions 0.0001-0.002mg/m<sup>3</sup>**

- 5. Electrical Control Cabinet:** for the sequential operation of the plant. This ensures all electrical equipment is switched on and off in the correct sequence and also allows for complete shutdown of the plant in an emergency (Emergency Stop switches are fitted around the plant). In the case of a fault overloads and proximity switches are fitted to all components to provide controlled shutdown. Safety interlocks prevent the machine operating in an unsafe manner. For maintenance purposes it allows each component to be individually operated when necessary.

**Option: The control cabinet can be supplied with touch screen interface if required.**

- 6. Collection points, fully covered and ducted for the collection of glass and end caps (metal & plastic).**





## **INSTALLATION & COMMISSIONING**

Balcan automatically offers a customizing install service for the equipment.

We are able to change and tailor the layout of the plant, depending on the building it is to be installed in.

After an order is placed Balcan will contact you to discuss a potential site visit, or ask for photographs, and/or a layout of the building.

Each recycling plant is unique and being the designer and manufacturer this service allows us to make modifications during the assembly process and provide the correct sizes and quantities of ductwork for the air is supply.

When the unit has shipped and the delivery date is confirmed, we arrange for our team of engineers to attend site. Balcan will unpack the container and assemble the plant.

When the system is operational Balcan will conduct the necessary commissioning tests. Balcan engineers will remain on site for a number of days to train the operatives in the use of the equipment, discuss daily checks, preventative maintenance actions as well as servicing and fault findings.

Balcan normally allows up to 10 working days for a full install with comprehensive hands on commissioning.

## **WARRANTY**

Balcan warrants that the goods supplied under a contract are new, unused, of the most recent or current models, and they incorporate all recent improvements in design and materials unless provided otherwise in the contract. Balcan further warrants that all goods supplied under a contract shall have no defect arising from design, materials, or workmanship (except when the design and/or material is required by the purchaser's specifications) or from any act or omission of Balcan, that may develop under normal use of the supplied goods in the conditions prevailing in the country of final destination.

This warranty would remain valid for twelve (12) months after the goods, or any portion thereof as the case may be, have been delivered to and accepted at the final destination indicated in the contract. The purchaser shall promptly notify Balcan in writing of any claims arising under this warranty.

Upon receipt of such notice Balcan shall, within the period specified in SCC and with all reasonable speed, repair or replace the defective goods or parts thereof, without costs to the purchaser other than, where applicable, the cost of inland delivery of the repaired or replaced goods or parts from ex works or the port or place of entry to the final destination.

If Balcan, having been notified, fails to remedy the defect(s) within the period specified in SCC, the purchaser may proceed to take such remedial action as may be necessary, at Balcan's risk and expense and without prejudice to any other rights which the purchaser may have against Balcan under the contract.

## **ASSEMBLY PRIOR TO SHIPMENT**

The plant will be assembled and run at the premises of Balcan prior to being shipped. It is recommended that clients visit us during this period to ascertain that the plant operates to their satisfaction. Once delivered to the site of client, Balcan will provide engineers to assemble and supervise operation of the plant. The opportunity will also be available for potential operators of the plant to be given full training not only about the operation of the plant but also about any maintenance that may be required.



## **EQUIPMENT FOR PROVISION BY CLIENT**

Balcan supply ventilated covers for the glass and end cap collection points and are adaptable to standard sized collection containers. Please contact Balcan to discuss the size of these containers to ensure covers are manufactured to the correct size.

It is the responsibility of client to provide these containers.

For our own purpose we use self tipping mini skips.



## **UTILITY REQUIREMENTS**

Client to provide the following utilities for the TL2000 Lamp Recycling Plant

- 1. Compressed Air Supply required: 6.0 bar 7.2Nm<sup>3</sup>/h**
- 2. 3 Phase Electrical Supply for connection to Control Panel.  
Electrical supply voltage to be specified by client.**

The client is required to provide a suitably qualified electrician and appropriate cabling for wiring the control box to the main power supply in accordance to local requirements.

Each Balcan Lamp Recycling Plant is supplied to the country specific voltage. All motors and electrical components will be supplied in accordance with the country wiring and electrical requirements.



## **Spares and Servicing – TL2000**

Balcan are one of the UK's largest lamp recyclers as well as being the designers and manufacturers of their range of lamp recycling plants. The advantage of this is the ability to design out faults from their systems and to understand how other lamp recyclers may work thus providing a very efficient, cost effective and low maintenance system.

Balcan is able to offer an annual service contract if requires for their systems, but it is not a requirement. Servicing and maintenance have been kept to a minimum and the systems designed to be easily serviced and maintained if required. The design of the Balcan equipment allows most aspects of servicing and maintenance to be carried out with the machine operating under negative pressure, thereby reducing the need for high levels of personnel protective equipment (PPE).

### **Typical Spares:**

1. Set of Filters for air extraction units – these last between 9 – 24 months depending on usage.
2. Conveyor belts – Balcan recommends a set of spare conveyor belts be purchased with the machine. As the conveyors are a major component of the recycling plant, for carrying the untreated glass as well as the cleaned outputs it is important to be able to obtain spares if required.

### **Other Spares:**

Balcan's recording of spares supply over the years for their systems, has found that apart from the typical recommended spares, which should be readily available, all other components have proved extremely reliable. All other components are readily available from Balcan, however, the systems have been designed to be able to use readily available / universal parts which are available from the individual country, e.g.:

A system supplied to the USA will be fitted with a US brand and spec motor, usually imported. Therefore should that motor ever fail a motor should be immediately available from the US. This has the added advantage of saving on time & shipping costs. It also helps keep the costs of ownership down.

### **Servicing:**

Servicing schedules are kept to a minimum with daily checks usually being all that are required. Weekly & monthly maintenance is dependent on throughput of lamp and usually involves simple cleaning and visual inspections.

Annual service visits or contracts are available if required. Please contact Balcan for more information.

## TL2000 Lamp Recycling Plant - Output Fractions

### Outputs consist of the following:

1. Glass – metal free – Typical particle size <20mm
2. End Caps – Remaining largely intact with wires and pins.
3. Mercury Bearing Phosphor Powder.

Balcan Lamp Recycling Systems produce some of the cleanest output fractions from this type of equipment.

### Typical residual contaminations:

Glass – Hg Residual  
Contamination:

Typically 0.5-3 mg/Kg (0.5-3ppm) 'analyzed as bulk product'  
Max 0.025 mg/l TCLP

Mercury Phosphor Powder – Typical mercury content <1Kg per 1000Kg



## **TL2000 Lamp Recycling Plant Emissions**

Correctly designed lamp recycling plants should operate under negative pressure to reduce emissions of mercury vapour into the workplace. Whilst there should be zero emissions of mercury from a lamp recycling system this is not always the case and therefore these are required under laws to be kept to a minimum level.

Balcan lamp recycling systems use air extraction filter units to draw off all mercury bearing phosphor powder and vapour from the contents of the lamps down to less than 5 micron size. These ensure the plant operates at negative pressure. All mercury bearing vapours pass through the filters and are ducted to the Main Carbon Filter Stack. The vessel contains approximately 2 cubic metres of Sulphur based Activated Carbon, with which the mercury reacts and allows the exhausted air to be mercury free and ducted to atmosphere.

Balcan's philosophy is to work as close to zero emissions as possible and by using a single large carbon vessel we are able to achieve consistently low to zero results. We believe the advantage of a single vessel is in economies of scale with an improved lifetime expectancy of the carbon, over using smaller 'barrel' filters. Using one large high flow, annular carbon vessel, gives a much greater surface area with maximum throughput and removal of mercury from the vapour stream. Through years of regular monitoring you will also be able to see when the emissions start to increase, albeit very slowly, indicating the carbon is beginning to reach its capacity. Due to the size of the vessel this will give the ability of being able to schedule a carbon replacement service before permissible limits are reached. We believe that when using smaller filters the time between levels beginning to increase and saturation can happen quickly and can lead to unnecessary loss of production when not having the time to schedule carbon replacement.

**Maximum permissible emissions from exhaust 0.012mg/m<sup>3</sup>**

**Typical emissions from Balcan TL000 - 0.001 - 0.002mg/m<sup>3</sup>**

**Estimated lifespan of carbon – 5 years based on throughput of 5-10 Million lamps per year.**