



**Owner's Manual  
of the  
RED LINE  
Hyper Cyclone type  
powder recovery booth system**



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**RED LINE INDUSTRIES LIMITED**

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## INTRODUCTION

Dear Sirs,

The **RED LINE HYPER CYCLONE** powder recovery booth you have purchased is one of the finest powder recovery systems. It is based on the hyper cyclone recovery technology – specifically designed for recovering powder coatings, and is today considered to be one of the most efficient means of recovery of oversprayed powder.

Please do go through this Owner's Manual so that you may maximize the utility of this system.

Should you require any further assistance or information on **RED LINE HYPER CYCLONE** powder recovery booths or any other RED LINE powder coating application equipment or system, please feel absolutely free to write to us directly or contact your nearest local Authorized RED LINE Sales & Service Center. It will be our pleasure to be of assistance to you.

We wish you all success.

With warm regards,

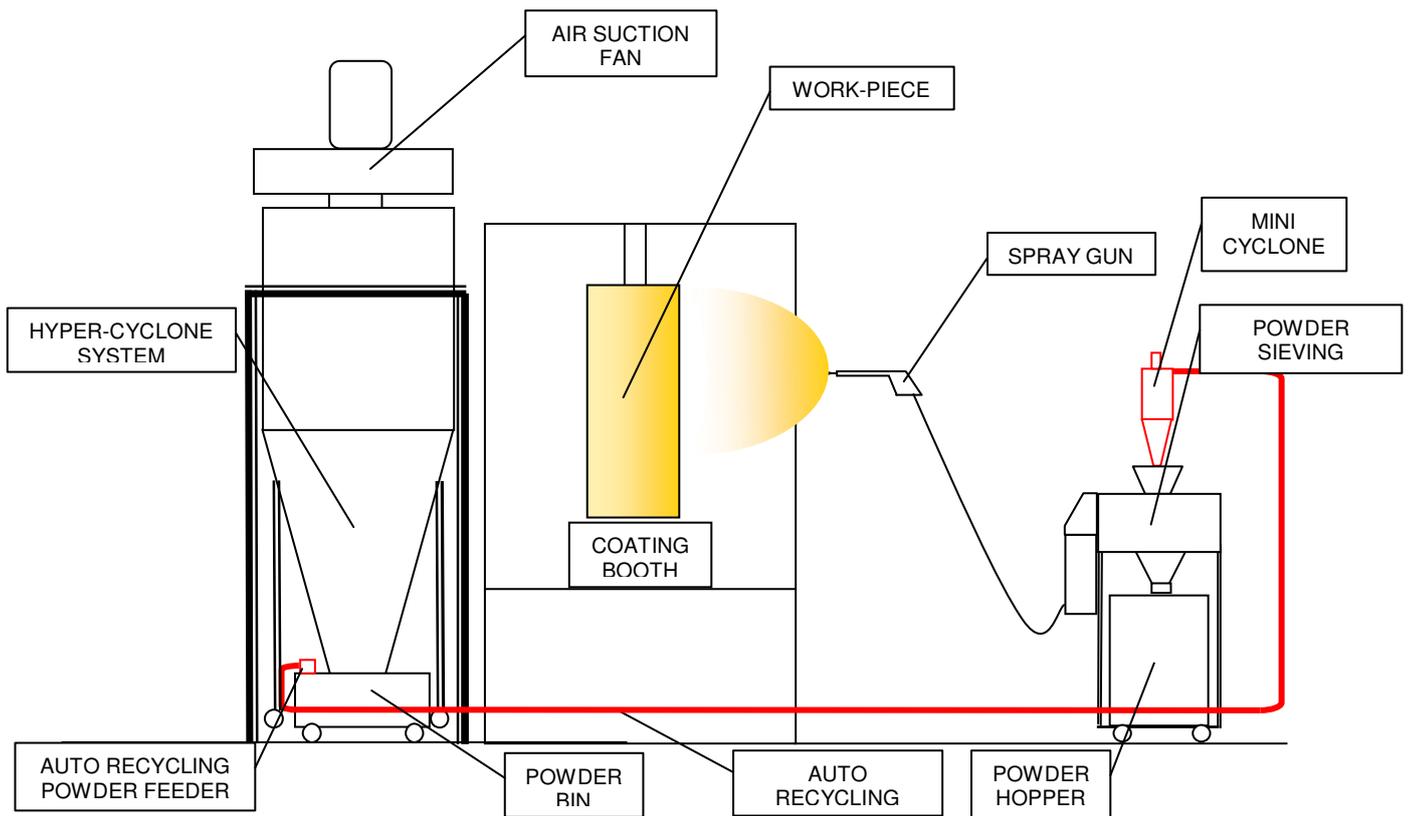
Himanshu Shah, Director  
**RED LINE INDUSTRIES LIMITED**

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## HOW YOUR POWDER RECOVERY/RECYCLING SYSTEM WORKS



### **SCHMATIC LAYOUT OF POWDER AUTO-RECYCLING SYSTEM BETWEEN POWDER RECOVERY SYSTEM & POWDER SIEVING SYSTEM**

#### Working of Hyper Cyclones:

The Hyper Cyclone (one or more) represent the powder overspray recovery system of the powder coating booth (the spray section). The work-pieces, duly jugged are hung on the jig-holder in the coating booth (manually or pass on a conveyor line) and sprayed with powder. A specially designed low-pressure, high capacity air extraction fan sucks air and the powder overspray through the coating booth, through the ducts to the Hyper Cyclone recovery system. Hyper Cyclones have a critical design factor as they are designed and built to work specifically for powder coatings and the normal particle size distribution associated with powder coatings.

The HC entry is such that the powder particles are forced in a cyclonic pattern through the side near the top in the cylinder of the Cyclone. As these powder particles spin round the cylinder in their specific pattern, they descend due to gravity. Horizontal and vertical force-mix on the powder particles ensures that they drop down into the powder bin below the conical part of the cyclone. Virtually clean air is sucked out through the central outlet in the top of the cyclone. More than 95% (often as high as 98-99%) of the powder particles get collected in the powder bin.

Powder particles, referred to as 'fines' (very low weight and sized particles) where the horizontal cyclonic and vertical gravitational force-mix do not match also get sucked out with the air. These remaining powder particles are trapped in the after-filters, allowing virtually clean air back to the shop-floor atmosphere.

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### **Working of auto recycling system:**

This is recommended for high production systems where the powder recovered in the bin needs to be recycled back into the master powder hopper of the coating equipments. The powder bin under the Hyper Cyclone has a fluidizing bed facility underneath. Using compressed air, powder in the bin is fluidized and using a venture powder feed pump arrangement, the powder is extracted from the bin and transported to a sieving system. On top of the sieving system is mounted a specially designed mini-cyclone which separates the compressed air from the powder particles so that only powder coatings is dropped into the sieving system – and compressed air escapes from the top of the mini-cyclone (carrying with it a very small proportion of 'fines').

The sieving system sieves the recovered powder (as well as fresh powder) and deposits this cleaned powder into the master hopper form where it is used by the coating equipments.

### **Normal operations:**

Specific controls have been provided to control the rate of flow of powders from the bin to the sieving system. This is done using the pressure regulators mounted on the master control panel. For a triple-point recycling system, 3 independent pressure regulators have been provided – one for each powder bin. A pressure setting of approx 5 – 5.5 bar should give you a throughout of approx 25 - 30 kgs/hr through that particular recycling system.

Once these pressures have been set, the entire system is operational. This being a fully automated system requires no human interaction, save for switching the system ON or OFF.

### **Routine maintenance:**

The entire recovery system is maintenance-free and should not create any downtimes or interruptions to your production – as long routinely, the following is done.

#### Hourly:

'Fines' – very light and small sized powder particles collect in the after-filters (a pollution-control facility to ensure virtually clean air being let out back onto the shop-floor). Depending on the powder being used and the rate of spraying and recovery, these fines may collect inside the after-filters and begin to choke them. This choking process begins to reduce the air flow, powder flow and the overall efficient working of the cyclone recovery system. Left to choke, this can lead to a situation of a complete collapse of the recovery system. After-filters should be cleaned on an hourly basis simply by 'hammering' the filters with a long wooden stick – to dislodge powder collected on the inside walls of the filters.

#### Daily clean up:

At the end of every day, it is suggested and recommended that the entire system be cleaned – including the booth (spray section), the cyclone itself, the venture feed pumps, the mini cyclone, interconnecting powder pipes, the sieve itself and the hopper and powder bins. A clean system will ensure trouble-free performance. Experience has shown that most problems faced by users find their source in an unclean system.

#### Weekly:

Clean thoroughly and also check the following for wear and tear (where applicable) and replace only with original equipments spares:

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Sleeve inside the outlets of all venture feed pumps. At the time of refitting these pumps back on the powder bin, please ensure the O rings under these pumps are in place and the pumps have a tight fit.

The powder pipes (tubings) from the venture feed pumps to the mini-cyclone should be cleaned to prevent any kind of choking of the powder flow.

Sieve mesh in the sieving system must be fitted with the finer mesh on top and the supporting wire-mesh underneath (in case of reversal, powder may get trapped between the two meshes and the mesh may need to be replaced)

Dismantle the mini-cyclone and clean the insides thoroughly and put back again ensuring correct and proper fitment of the various parts (particularly the top)

Remove the after-filters from their housings and thoroughly clean the inside to remove all residual powder – in case of very high powder throughputs, this process may be required to be done twice a week instead of weekly.

#### Monthly:

Please clean the inside of the air extraction fans every month to remove all residual powder coatings that may get stuck there

### **Trouble-shooting:**

These systems are trouble-free once installed and in operation. The only time they may give trouble is in case the system has not been cleaned.

In case recovery is poor, and powder appears to bounce back out from the booth, very likely the after-filters are choked. Cleaning these after filters should take care of the problem.

In case the powder bins are overflowing, leading to powder being forced out from cyclone through the after-filters, either [1] the venture pumps and their associated powder pipes are choked or blocked with contamination or [2] the pressure settings for the venture pumps (on the control panel) is too low. Appropriate remedial measures should take care of this.

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