All recirculating paint booth systems require some means of removing the detackified/coagulated paint overspray. If the paint solids are allowed to build up without removal, the system will begin to suffer from a myriad of problems, including:

- Sludge build-up on booth equipment – resulting in booth balance issues, loss of water flow in critical areas in the system, high maintenance costs, etc.
- Odors emanating from bacteria hiding in the sludge
- High suspended solids in the booth water – could lead to excessive foaming
- High costs to remove accumulated sludge – sludge may be wet/hazardous

A well designed paint booth system will have some type of paint solids/sludge removal system tied to it. This design feature will minimize the potential issues described above and will allow the system to run for prolonged periods of time while keeping overall operational costs to a minimum.

This technical bulletin will take a brief look at three conventional approaches that can be taken to deal with the paint solids in a recirculating paint booth system – **Float, Sink, or Disperse**.

**What does each approach accomplish?**

**Float** – This approach is utilized where the cleanest booth water is desired and the sludge is going to be removed on a continuous basis with the appropriate sludge handling equipment. Flotation units followed by a dewatering step are normally used here.

**Sink** – Utilized where semi-clean is acceptable and no continuous or semi-continuous sludge removal equipment is in place.

**Disperse** – Utilized where semi-clean to dirty booth water is acceptable and the paint solids are going to be removed on a continuous or semi-continuous basis with the appropriate sludge handling equipment. Centrifuges are normally used in this approach.

Some additional details on how each approach is implemented along with advantages, disadvantages, and conditions required are summarized next.
**Float**

**How** – Feed detackifier/coagulant to “kill” the paint, feed flotation/dewatering polymer to flotation unit and potentially an optional feed point to the booth return water stream.

**Advantages:**

- Cleanest booth water of the three approaches
- Less deposition, and foaming
- Continuous sludge removal keeps system cleaner for longer periods of time
- Antifoam usage is minimized
- Lowest potential for biological growth in sludge

**Disadvantages:**

- Initial capital outlay for flotation unit and related equipment
- Some manpower required to operate and maintain equipment
- Need flotation/dewatering polymer and feed equipment

**Conditions/Equipment Required:**

- 5 to 7 minutes (desired) of retention time* in the system
- Dissolved/entrained air in recirculation water (normally occurs naturally) and in stream feeding the flotation unit (typically injected)
- Sump/pit design that facilitates flow to a skimmer unit
- Flotation unit

**Sink**

**How** – Feed detackifier/coagulant to “kill” the paint, and nothing else to condition the sludge

**Advantages:**

- Semi-clean water
- Generally no feeding of flocculation/dewatering polymers
- No sludge removal equipment or operators required
- No secondary chemical feed equipment

*Retention Time – the amount of time it takes for the recirculating pumps to turn over the system volume once – i.e. Retention Time = System Volume (Gal) divided by Recirculation Rate (GPM)
Disadvantages:

- Highest deposition potential in booth system
- Foam potential increases – potential need for (more) antifoam
- Increased biological activity and resultant odors
- Higher ongoing system maintenance costs
- Higher sludge clean-out/disposal costs

Conditions Required:

- Longer system retention times (10+ minutes)
- Generally due to the above, the sump/pit will require a very large footprint in the plant
- Large quiet zones in the sump/pit

Disperse

How – Feed detackifier/coagulant to “kill” the paint, feed dewatering polymer to sludge removal equipment (i.e. centrifuge).

Advantages:

- Smaller sludge removal equipment – smaller footprint
- Less operator involvement
- Periodic maintenance of equipment

Disadvantages:

- Dirty water
- Deposition potential is higher
- Foam potential is higher
- Higher potential for biological activity

Conditions Required:

- Short retention time (< 4 minutes) to keep solids moving
- No quiet zones in sump
- Better to have individual/smaller sumps versus one large central sump
- Sludge dewatering device such as a centrifuge