Introducing Hydro Italia

WHY TURN TO HYDRO ITALIA SYSTEM?

In the Spray booth working with forced water circulation there are two
Unavoidable problems:

1. Because of their high adhesive power, paint particles dispersed in the water tend to cause
   blockages and encrusted pumps, nozzles and piping.

2. The circulating water, destined to become waste water, must pass through expensive purifying
treatments because of the extraneous and noxious substances contained.

HOW DOES HYDRO ITALIA SYSTEM WORK?

It acts on substances in suspension which are removed from the water by a coagulation process through absorption.

HYDRO ITALIA system purifies continuously the water, which is thus put back in circulation clean and neutral, avoiding encrusted blockages of the plant.

The Spray booth is always ready to be used, with a greater working life cycle.

HOW MACHINERY AND SOLUTIONS CAN BRING THIS TECHNOLOGY TO YOU?

We are the local distributor for Hydro Italia along with many other associated product lines with an
international background in Italian, English and Spanish.

Optimum machine performance depends on proper installation and training. Optimal alignment and
correct mounting are equally vital. Correct installation not only means good product quality, but often
reduced energy consumption as well.

Training will be arranged in your local manufacturing facility and the programs includes: proper use of
the equipment, daily weekly and monthly maintenances, how to request mechanical parts, how to
maintain optimal filtration, reclamation of water and disposal of by-products.

Machinery & Solutions LLC

Domenico Cavallo
(336) 880-8771
info@machineryandsolutions.com

Angelo Cavallo
(480) 823-1237
service@machineryandsolutions.com

www.machineryandsolutions.com
Introducing Hydro Italia

WASTE WATERS TREATMENT

Toyota Turkey towards zero discharge in painting shops

In 2004 Toyota, Adapazari (Turkye) site, contacted Hydro Italia, a well-known Italian company operating in the automotive industry. Hydro Italia is particularly appreciated for its innovations in the field of waste waters coming from spray booth.

Thanks to a whole range of special systems allowing to constantly segregate denatured paint from water, Hydro Italia is capable of insuring full recovery of water coming from spray booths, thus obtaining the continuous flowing of the water wall. The following aims should be achieved:
- suppress the need to change water in the pit;
- obtain sludge with dry residue ranging from 50% to 70%;
- limit the concentration of solvents and noxious substances to be found in air emissions, thanks to a more efficient of the water wall;
- reduce the cabin maintenance costs up to 90%, avoiding the formation of scales and waste sludge. This can be obtained by means of a turnkey, simple and automatically controlled pland, ensuring very low maintenance costs. After studying any possible solutions and performing several tests with different paint samples, an exhaustive solution was proposed to the Toyota’s specialists who validate it. The first plant was installed for the bumper 1 line.

**Technical data**

**Solvent paint data**

<table>
<thead>
<tr>
<th>Paint</th>
<th>Overspray</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primer</td>
<td>27 kg/h</td>
</tr>
<tr>
<td>Base Coat</td>
<td>27 kg/h</td>
</tr>
<tr>
<td>Clear Coat</td>
<td>27 kg/h</td>
</tr>
</tbody>
</table>

**Treatment data**
- Volume of water in the tank after making the recommended modifications: 70 m^3
- Overspray quantity: approx. 81 kg/h

- Hours of work: 20h/24h
- Plant delivery: min. 24 m^3/h

Goal: 0.4% of maximum residue of suspended solid substance, i.e. denatured paint, into the water pit.

**Denaturation**

The first step of the treatment consists in a very quick denaturation process of the small paint particles (“overspray”) captured by the water wall. Denaturation consists in transforming sticking and coloring paint into inert particles, similar to moist sand. This aims at preventing pipes and pumps from being clogged and at avoiding the formation of scales, although denatured paint particles drop in the water wall. To obtain this type of reaction, Hydro Italia use a suitable product - in this case in cooperation with Henkel Germany - which will be completely mixed with water. This is the reason why the specialist changed the tank configuration and installed submerged mixers. Because the tank volume was limited from 70 m^3 to approx. 50 m^3, he installed a Hydrofloty 24M plant ensuring a min. delivery of 24 m^3/h and capable of changing the entire amount of water in the pit every two hours.

**Sludge continuous drainage and particle separation**

The second step consists in separating the denatured particles, which are transformed into large flakes that can easily float. The water to be treated is continuously taken from the tank located underneath the cabins. Water is delivered to the treating plant by a special pump: flow is adjusted by means of a safety valve. The safety valve is controlled by a level gauge located inside the re-delivery tank; if the water level in the tank remarkably increases due to whatever reason, the safety valve will stop pumping. After entering the mixer (3), water is mixed with the flocculent agent held in the container (1), which is measured through the pump (2). An agitator is installed in the tank.
Test of coagulation-floatation on paint particules.

Clarified water return to the pit.

The agitator keeps mixing the flocculant agent to avoid clot formation.
Water/flocculant agent flow is delivered to the flotation unit through a coiled pipe. The coiled pipe is specially designed to optimize the treatment effects.

Inside the tank, flowing water is enriched with minute air bubbles, which adhere to the surface of the paint particles, thus enhancing surfacing (flotation) and allowing them to be easily transferred through skimmer (6).

The skimmer pushes floated sludge from the surface of the tank to the sludge collector (8). The pneumatic pump (9) takes water from the sludge collector at alternate intervals and delivers it to the re-delivery tank (10).

Clarified water is then delivered to the cabin tank by means of the redelivery pump (5).

The sludge thickener (11) is located on the bottom of the main tank; it is electrically controlled and pneumatically activated. It acts as an agitator for the sludge settled on the bottom of the main tank.

Particles tending to settle are retained by the pump (7) and stocked in the sludge collector (8).

Results
After installing Hydrofloty 24M, the advantages are:
- no water drainage from the pit;
- no formation of scales;
- no sludge sediment in the cabin circuits and water walls;
- no production halt due to Hydro Italia technological process.