

The percentage of oxygen is checked, in stay, in 4 drawing points, so controlling the deliveries and the operations, to avoid any excessive increase in the rate of nitrogen in those areas accessible to the staff.

THE GRIT BLASTING MACHINE

It is a traversing grit blasting machine, of the "suspended load" kind, with a slow rotation (of about 20 revolutions per minute) in the area of mechanical pickling.

The chamber of the grit blasting machine is provided with 4 propelling turbines of 7.5 Kw each one. A purification unit enables to recycle the metallic grit, once the paint from the small scales has been separated. The 4 turbines are fed by steel, round grit with a diameter of 8/10mm.

Special care is due to treat the grit, in order to avoid its "mottage".

The grit blasting chamber is provided with manganese steel plates, that can be easily changed in those areas where the turbines are directly propelling. On the other hand, in the areas of indirect propulsion, the plates are replaced by corrosion-proofing maskings of caoutchouc.

A longitudinal fissure provided with a seal lets the rod of the trolley pass. The selected frequency of 20 cycles per hour, is in consideration of the maintenance time of the painting supports, reaching 24 cycles/h in the industrial running.

After the grit blasting, the painting supports are moved in a blowhole chamber, where they are heated before being carried to the unloading place.

THE CONVEYER

It is totally unuseful cooling the parts if they are not brought to a temperature, which is cold enough, that is if they are carried too quickly to the grit blasting process.

The grit blasting process can only begin, as the paint is brittle; the paint is not worn away by the thrown grit, but affected by hammering.

The sequence of the process needs to be automatically connected, that's why Talbot PSA decided for a solution with a programmable automaton.

A synoptic control board showing the different stages let you look at the progressive shifting of the load and control the proper connection between the various stages.

The technical office of Talbot PSA has assured the interface between the different suppliers.

These are the stages:

1 - Loading and unloading of the trolleys.

The number of places as well as their organization depends on the frequency, shape, and volume of the parts to clean; it is enough to plan enough places and the number of trolleys.

2 - The entrance in the cryogenic area and in the grit blasting chamber.

The automatic opening of the sliding doors, the feed through the cooling tunnel, the dipping into the tank of liquid nitrogen, the waiting time inside the chamber before the grit blasting, the feeding in the grit blasting room, the rotation of the trolley, the transfer to the blowhole chamber and the transmission to the unloading area must be co-ordinated.

OPERATING COSTS

The treated tonnage can reach 3t/h, while the consumption ranges between 0.6 and 1 litre per Kg, according to the operating conditions.

It must be added also:

- the amortization of the cost of the plant:
cryogenic area, grit blasting machine, conveyer
- electric energy above all required by the conveyer and by the grit blasting machine (4 turbines of 7.5 Kw each), and the motor of the dust remover

- the consumption of the grit
- the low manpower, which is only required to load and unload the parts.

The solution of the cryogenic grit blasting process offers many advantages in comparison with the present processes such as burning and chemical pickling:

- no effluents to treat
- little manpower
- automated plant
- better working conditions as well as greater security

THE FUTURE OF THE PROCESS

This plant has been the first to be carried out in France, and has been well managed thanks to everybody's co-operation, but it is above all the industrial solution to replace burning, with its black and stinking smoke, as well as to abolish the plants for the chemical pickling, which can be dangerous and produce rejection of solid, liquid and even gaseous effluents.

Such new process can be really interesting for the automotive industry, as well as aeronautics, electronics, electric household appliances, tools, and therefore for all those industry sectors which are provided with a painting department.

The process is really suitable for those big plants, which have to treat regular quantities of parts to automatically clean, but its intrinsic qualities of novelty and cleaning are also suitable for lighter chains of treatment.