

IMMEDIATE – March 2005

HOW STRONG

Would you like this to be?

FOR PEEN FORMING AND SHOT PEENING

Just become a member of our

“SISSON LEHMANN - AEROSPACE

MP User Club”!

Sisson Lehmann product technologies from the Wheelabrator Group* excel in the development and the manufacturing of highly accurate and innovative Airblast Shot Peening Systems.

The Center of Excellence based in Charleville, France has completed its “MP RANGE” of advanced CNC and/or ROBOTIC peen-forming and shot-peening machines program for answering all the needs of the worldwide Aerospace Industry, for new parts manufacturing and for maintenance operations.

Representing the latest developments in aerospace peen forming, strengthening and shot peening processes, these new “**MP**” **systems** can process the widest variety of aircraft structures and wing skin panels, jet engine parts and landing gears to improve their resistance to fatigue.

In the spotlight - our latest Peen Forming machine: MP 20 000

Sisson Lehmann has successfully delivered and commissioned the MP 20 000 system for the XAIC Aircraft manufacturing company located in X'ian, China.

The new equipment will be mainly used for peen forming and saturation strengthening of wing skin panels of large-sized civil airplanes.

The machine was required to shot peen chord-wise, wing spread direction and sectional bending part of wainscot in wings; additionally, it will be used for shape correcting and strengthening of airplane structural parts including stringers, spars and flange integral beams.

The machine is designed as an “airblast peening pass-through system”, and is fully programmable and operates automatically to the highest standards of precision, meeting the strict requirements of the latest aerospace specifications.

This installation has a CNC-driven longitudinal monorail conveyor system on which the workpieces are located on a steel gantry with convenient and reliable clamping devices.

Single wing panels or multiple parts arrangements are possible on the gantry within the following maximum workpiece dimensions:

- 20 000 mm (L) x 2 500 mm (W), variable thickness in section, with maximum thickness of 25 mm and minimum of 2 mm for aluminium alloys, with bi-directional processing.

The machine is operated through one GE FANUC CNC system with two operator screen stations and two operator hand-held controls for easy programming of this nine interpolated multi-axis system. The CNC is programmable in ISO language and has a capability for “off-line” programming.

The following quote is the **XAIC Project leader's** conclusion, while signing the final acceptance protocol:

"We have all appreciated both the warm welcome extended to us in France and the high level of qualification and professionalism demonstrated by the Sisson Lehmann/Wheelabrator Group team for engineering, building and training XAIC engineers on such an advanced peen forming system. This will help increase XAIC production capability and final product quality for building the aircraft of the future."

[The Reference for shot peening aircraft engine components: MP 1500](#)

Developed in close co-operation with aerospace specialists worldwide, the "**MP 1500**" CNC shot peening machine range is designed to offer the most efficient productivity and utilises the ultimate computerised process control and automatism technologies that can handle even the most complex components' geometries.

Representing the state-of-the-art in aerospace shot peening, the "**MP 1500**" range can process the widest variety of parts from aeroengines of any manufacture to improve or restore their resistance to fatigue. These include turbine discs, fan discs, compressor rotor disks, spools, blade aerofoils and roots, as well as some structure components made from Inconel, steel, aluminium or titanium alloys.

The "**MP 1500 Ti**" version includes an accurate turntable mounted on a revolving arm, allowing the loading of the components outside the blast chamber. The table accepts components of 1500 mm maximum diameter, 1000 or 1500 mm height and 500 kg.

Alternatively, the "**MP 1500 Tx**" version offers a similar turntable mounted on one linear axis providing an extra working stroke of 600 mm, as well as a total sliding stroke of 300 mm for easy loading and unloading of the components.

The four axis robot fitted on the roof of the machine allows moving and accurate positioning of the blast nozzle with a horizontal stroke of 1500 mm, a vertical stroke of 1000 or 1500 mm, and a rotating wrist equipped at its bottom end with a tilting axis (+/- 180°).

The large blast chamber is fitted with doors for easy access and programming with a pitless pneumatical recovery. The standard shot recycling system includes dedicated devices for size and shape calibration of different kinds of steel shots in accordance with SAE and MIL standards. Other classification systems for glass beads, ceramic beads, aluminium oxide or mix are available. High precision peening generators are ensuring an accurate peening process with their dedicated air pressure, airflow and shot flow closed loop regulator.

Various options are available such as:

- Second nozzle manipulator (3/4 axis) on top or side wall
- Table with 4, 6, 12 or 20 numerical satellites for fan blades and airfoil batch treatment
- Special spindle BR1-10 system for high precision processing of small holes and slots
- Hydraulic vertical sliding door
- Low height recovery arrangement

*Today several major Aerospace companies are operating the most advanced versions of the Sisson Lehmann **MP 1500** shot peening facilities every day. **With over 50 machines in operation** the family range includes now **7 machine models** and covers all sizes of jet engines from the smallest **MP 600** model to the largest **MP 2200**.*

Flexibility and Precision for blade peening: MP 2 TR 4 N

The **MP 2 TR 4 N** machine type is designed to offer the highest flexibility and accuracy in blade peening treatment while minimizing tooling and set-up time.

This peening machine is equipped with two sets of two satellites able to handle components with a maximum envelope of 150 mm diameter x 300 mm height (400 mm optional).

Each set of satellites is located on both sides of a high speed revolving door, allowing loading / unloading of two blades at the external protected station while peening two other blades in the insulated projection chamber.

The satellites, when operating in peening position, are numerically driven. Continuous rotation at variable speed, accurate angular positioning or interpolation with gun manipulator can be selected to optimise treatment.

The gun manipulator includes a 3 linear axis robot (X, Y, Z) completed with a wrist movement of the nozzle holder. Strokes, speed and precision of the 5 CNC movement enable the guns to peen all the blade & root surfaces with right incidence angle and determined coverage.

The shot peening is ensured by two or four pressure nozzles. The pressure generators allow peening using glass bead, ceramic bead or steel shot, with a very accurate regulation of shot flow and air pressure and with an overall air flow control.

Various options are available such as:

- Recovery and classification for two or three medias including glass bead/steel shot or ceramic bead/steel shot mix,
- Automatic shot flow calibration unit,
- Masking and Almen fixtures
- Noise level below 75 dBA

*Following current trends of productivity, polyvalence and fully controlled peening process cells, the **MP 2 TR 4N** machine completes the wide range of Sisson Lehmann peening machines and offers a global solution to a wide variety of peening applications requested for the manufacturing and repair of blades.*

All these “**MP**” machines are supplied with Sisson Lehmann supervision software including the following facilities:

- Maintenance assistance with real time flow-charts
- Equipment and process control procedures

- Storage / transfer of part programs with graphic identification facilities
- Dynamic recording and storage of quality reports for each part processed.

Servicing “MP” machines: A network of support

To support these “MP” equipment, Wheelabrator Group has dedicated and well-trained support teams throughout all continents to provide our customers with:

- Regular site visits for expertise and repair works
- Machine performance checks
- System maintenance and updating machine software
- Service contracts
- Fast availability of original parts
- Training programmes

This effort is in line with the Wheelabrator Group customer satisfaction “Customer for Life” policy.

*Sisson Lehmann was founded in 1911, and is at the leading edge of airblast shot peening, peen forming and precision blasting technologies.

Sisson Lehmann is a division of the Wheelabrator Group. Wheelabrator Group was formed at the end of the 1990's, as a merger of a number of leading global surface preparation companies. The Wheelabrator Group is today the leading surface treatment provider in the world, and counts amongst its brands Sisson Lehmann, Matrasur, Vacu-Blast, Impact Finishers, Schlick, Pangborn Europe and Spencer Tilghman, as well as many others.

With over 1200 employees in 16 manufacturing facilities and several sales and distribution centres worldwide, the Wheelabrator group is committed to offering the broadest and best range of technologies, products, services, technical know-how and after sales support. The overall goal is to be customer-focused and to ensure that we offer the best and most efficient surface preparation solution to match the customer's specific application.

Wheelabrator Group was formally known as International Surface Preparation (ISPC), and is still a division of this Corporation.

“SISSON LEHMANN – AEROSPACE / MP Club of Users” !

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