SWABBING ROBOT SR200 V1.2

THE BEST SOLUTION FOR SWABBING BLANK MOULDS ON I.S. MACHINES

CHANGE FOR AUTOMATIC SWABBING

+50 Swabbing Robots SR200 since 2005

www.novaxion-robots.com
In the past 12 years, NOVAXION has installed more than 50 SR200 Swabbing Robots into glass bottle manufacturing plants in Europe, Japan, South Korea, USA...

NOVAXION’s Swabbing Robot’s success story began in 2005 when the first swabbing robot prototype was created in co-operation with Saint-Gobain Emballage.

Worldwide patent license

This innovative solution has been registered in numerous countries around the world. NOVAXION has a license to implement the process, to manufacture and to sell the system worldwide.

Swabbing Robot SR200 replaces manual swabbing

The goal of SWABBING ROBOT SR200 is to completely replace the manual swabbing on the blank side. It is able to lubricate any type of blank, from NNPB lightweight bottles to heavy Blow-Blow bottles, and even large mouth press § blow jars. Not only the blank moulds are swabbed, but also the neck rings. It can be used on single or tandem IS machines from 6 to 20 sections.

Operating principle

SWABBING ROBOT SR200 comprises a compact 6 axis robot, travelling on a small rail in front of each section of the IS machine. The spraying tool applies a coat of graphite oil into the blank moulds and the neck rings.

Each selected time interval (for instance 20mn), the robot starts and comes in front of the 1st section of the IS machine. The robot sends a request for swabbing to the section, which goes into a special swabbing cycle. When the section is ready, it calls the robot. The robot moves above the blank moulds and then goes down into the moulds. The SWABBING ROBOT SR200 is swabbing on the fly, without any gob, nor any lost of bottles. Once every 2 or 3 cycles, the neck-rings are swabbed when the mould is opening. The robot moves out of the section and goes in front of the next section until all the sections are swabbed. Then the robot comes back to its parking position.

Integration on the IS machine

In most cases, the rail on which travels the SWABBING ROBOT SR200 is fixed on the valves blocks. Its compact size permits a very good integration on the IS machine. Some free place is needed between the buttons box and the chute to place the energy chain cable carrier to feed the robot and peripherals.

Swabbing of the neck rings

The SWABBING ROBOT SR200 is able to lubricate the full profile of the blank and even the neck rings. See the diagram to the right: Nozzle with external spraying.

Swabbing on-the-fly

The SWABBING ROBOT SR200 is swabbing the blanks on-the-fly (no section stops, no gob rejected, no bottles lost).
Efficient lubricant application

The swabbing of the blanks is standardized with equal application of lubricant in each blank. 85% less lubricant is applied compared to manual swabbing. This allows the blank temperature to keep constant. Logically this results in significant gain in efficiency with less defects produced. The pack to melt ratio is improved from 2% to 5% ! depending on production lines and factories.

In addition, the operator, relieved from his swabbing task, is gaining time to control the IS-Machine more effectively. Usually, on 3 shifts, 2 operators are removed from swabbing task.

Another side effect is that blanks stay cleaner for a longer period of time. Besides an increased stand time, the blanks require less maintenance and repairs at the mould shop.

Results are clear evidence of performance improvements

Constant glass distribution

Checking with infrared cameras shows constant glass distribution.

After manual swabbing, glass distribution is 45-50% on the shoulder, and 100-120% at the bottom.

After automatic swabbing, glass distribution is 25%-30% on the shoulder and 30%-40% at the bottom.

Even after swabbing cycles, glass distribution is still good (right)

Savings

<table>
<thead>
<tr>
<th>Number of swabbing per shift is decreased by 30%</th>
<th>Bottles loss due to swabbing defaults is decreased by 30%</th>
<th>Lubricant consumption is decreased by 85%</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Number of swabbing" /></td>
<td><img src="image2" alt="Number of rejected bottles" /></td>
<td><img src="image3" alt="Oil consumption" /></td>
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</tbody>
</table>

The above values are not contractual values.

Graph legend: \[\text{With manual swabbing} \quad \text{With Swabbing robot SR200}\]
One led panel display is installed at the blowing side of the IS machine to allow the operators to check the system status in real time from the operator’s room. They can swab the finishing moulds while the robot is swabbing the blanks and the neckrings.

**Led panel display**

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**Spraying device**

**SWABBING ROBOT SR200** is equipped with a high performance spraying device, which allows to deposit a thin and constant layer of graphite oil into the moulds. The spraying tool is interchangeable. It can hold 1, 2, 3 or 4 spraying nozzles depending of the number of moulds per section. Different lengths of lances are available, from 100 to 350 mm length depending on the mould height. Any oils can be used regardless of their viscosity, meaning specific oils can be used for each type of manufacturing (NNPB, P-B, B-B, etc.)

**Safety**

**SWABBING ROBOT SR200** is CE certified or responding to UL norm. When the robot is working, a safety laser scanner is protecting an area around the robot to avoid possible collision with the operators. Different protection areas can be defined, depending on the robot position on the machine in order not to interfere with the staff circulation around the IS machine. Therefore operators still have free secured access to the IS machine. A special software option allows to reduce the working area of the robot to the minimum required, so the installation of a cage around the robot is not necessary. Light beam cells are also installed above the valves blocks to protect an operator who should stand on them. Thanks to these safety devices, there is no need for a cage around the robot, which is an advantage to look to swabbing operation.

**Installation**

Installation of SR200 is very easy and fast. It can be done while the IS machine is running. Machine down-time is only 20 mn to connect the communication cables and download the special software. Possibility to swab on a tandem producing 2 different types of bottles or jars.

**Technical specifications**

- Robot model: **FANUC LRMate** + auxiliary axis
- Robot speed: up to 4 m / sec.
- Repeatability: 0.02 mm
- Swabbing oil tank capacity: 10 L = 4 weeks autonomy.
- Power supply: 2 KW - 220V single-phase – 50/60 Hz
- Compressed air: 4 bar
Advantages of Novaxion Swabbing Robot SR200 V.1.2

Safety
- Specific safety software.
- Laser scanner.
- Light barriers.
- Easy to watch over.
- Decrease of operators exposure time to smoke and noise.
- Increased operator safety.

Quality
- High performance spraying device.
- Constant swabbing of the full profile of the blank and the neck rings.
- Uniform lubricant application into the moulds.
- Targeted application across the entire profile of the mould.
- No oil sprayed onto the plunger.
- Constant glass distribution.

Savings
- Inexpensive and easy-to-maintain spraying system.
- Saving on labour costs: less operators needed for swabbing.
- Reduced graphite oil consumption by 85%.
- Blank moulds less prone to fouling.

Productivity
- Only 20mn IS down-time for robot installation.
- Number of swabbings per shift reduced by 30%.
- Swabbing on-the-fly.
- Increase of the “pack to melt” ratio by 2% to 5%.

Quick payback: 1 to 1.5 year

The above values are not contractual.
Our satisfaction is yours! Customer testimonials:

“**Parkcam** has 4 Swabbing robots in 4 Bottero 8+8 tandem lines. Robots proved their benefits in few weeks after commissioning. If we would choose some key words to describe the robots we can simply choose safe movements, standard swabbing, thrifty oil consumption, Clean environment. We should also give credit to Novaxion for innovative efforts depending on customer demands. In conclusion Novaxion robots assist Parkcam to keep high quality and high efficiency. We are happy to be a part of this partnership.”

“**Gallo Glass Company**, North America’s largest wine and spirits facility, partnered with Novaxion in 2017 to install its first swabbing robot. The installation was completed on an Emhart I.S. machine manufacturing blow and blow wine containers for the Californian market. With the support and expertise of Novaxion, Gallo has seen significant benefits from the technology. Pack and quality have improved, while swab oil use has decreased by around 70% providing housekeeping improvements. Another key benefit of the technology is improved safety as employees do not need to interact with the forming machine to swab the blank side. During an upcoming furnace rebuild project, Gallo Glass will install three more Novaxion robots demonstrating its commitment to the technology.”

“**Verallia** had the first swabbing robot installed in 2006. Over the past ten years other robots were installed across verallia. All of these robots were integrated on the I.S. Machines by Novaxion. For ten years, Novaxion has been proposing and supporting enhancements which have led to superior performance. Thanks to this long experience, Novaxion is now the perfect robot integrator on I.S. Machine to provide the hollow glass industry with reliable systems able to deliver all the awaited benefits from an automated swabbing process.”