SCM automated suture crimping machines
Highly flexible suture crimping machines

The sysmelec® range of SCM machines has been specifically designed for the automated assembly and crimping of multivariant surgical sutures. A wide range of needles and threads can be handled and a fast product changeover time provides the flexibility of producing large or small batches.

Well established on the market and with its proven capabilities since its introduction, the SCM machine range consists of 3 main models:
- SCM30
- SCM50
- SCM80

Each suture is subjected to a pull test to guarantee a constant high-quality thread-needle combination (SCM50 and SCM80). The finished and tested product is then unloaded into stainless steel receptacles for easy handling.

Advantages of automated suture production

The SCM machines continuously produces a stable quality of sutures from start to finish and reliably guarantees a cost effective production in multishifts of up to 24/7. During the machine operation, the needles can be loaded in bulk and the finished product unloaded without interruption. A machine standstill is required only to change the thread spool or the product variant.

Despite the high degree of automation, the machines are very flexible and suitable for almost all common surgical sutures. This core advantage of the SCM machines leads to a minimum downtime and a maximum efficiency in production.

Machine specifications & performance

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
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<tbody>
<tr>
<td>Typical throughput</td>
<td>~500 products/hour</td>
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<tr>
<td>Instant cycle time</td>
<td>6-8 seconds</td>
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<tr>
<td>Autonomy</td>
<td>approx. 2’000 products</td>
</tr>
<tr>
<td>Product changeover time</td>
<td>less than 10 minutes</td>
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<tr>
<td>Sutures</td>
<td>one armed suture with drilled end needles</td>
</tr>
<tr>
<td>Needles</td>
<td>D- &amp; H-types (3/8 &amp; 1/2)</td>
</tr>
<tr>
<td>Needle design</td>
<td>R=Round-bodies, S=cutting, etc.*</td>
</tr>
<tr>
<td>Threads</td>
<td>mono- &amp; multifilament / PA, PP, PGA, PVDF, PE*</td>
</tr>
<tr>
<td>Thread diameter &amp; length</td>
<td>USP6/0 to 2 (EP 0.7 to 5)* from 350 to 900mm</td>
</tr>
<tr>
<td>Thread length deviation</td>
<td>&lt; 1% of the thread’s length</td>
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<tr>
<td>Noise level</td>
<td>&lt; 75 dBA</td>
</tr>
<tr>
<td>Dimensions</td>
<td>2’800 x 2’200 x 2’350 mm (LxWxH)</td>
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<tr>
<td>Weight</td>
<td>1’750 kg</td>
</tr>
<tr>
<td>Power requirements</td>
<td>3x 400 VAC / 50/60 Hz / Pre-fuse 16A</td>
</tr>
<tr>
<td>Interface</td>
<td>HMI on handheld touchscreen &amp; screen/keyboard</td>
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*Upon request, other needle shapes/lengths, thread materials/ diameters/lengths and coatings could also be used.
Process sequence depending on the machine model

Loading & stiffening of the thread
The spools are manually loaded into the numerical unwinding station. During the entire spool unwinding operation, a small constant force is applied to the thread in order to guarantee a consistent length. Knots detected in the thread are ejected automatically.

The multifilament thread is stiffened by means of an adjustable thermal process and is then precisely cut to the chosen length. The stiffening system is composed of a special designed heating source in a ceramic housing.

Cutting of the thread
The thread is cut with a dedicated angle to get an optimal insertion of the thread into the needle hole later on. During the cutting operation, the thread is held in position by two grippers. These grippers and holders have been designed to prevent any damage on the product.

Loading of needles & assembly on the thread
The needles are fed into the machine by means of a vibratory feeder with a storage container for a maximum autonomy. The storage container is refilled during the operation, ensuring the machine's continuous performance.

The needles are detected by a vision system and brought to the thread end. The precise adjustment of the drilled needle hole to the thread end is performed under the control of a vision system.

Crimping of the thread into the needle
This single or multiple crimping operation is performed with a monitored force. The needle is turned between each crimping to ensure the best quality results.

The specific crimping forces and number of operations are easily configurable. The machine can integrate most crimping tools available on the market.

Pull test for quality check
Once the crimping process is complete, a pull test is performed to check the quality. A gripper, mounted on a numerical axis, holds the thread and pulls the suture until the maximum required force is reached, i.e. 1N to 20N. A destructive test can be performed on demand.

All the data related to lot material, crimping and testing forces is stored in logfiles for traceability and statistical evaluation purposes.

Unloading of the product
The product is unloaded in two stainless steel receptacles. The two drawer system allows the operator to unload one of them, while the second one is used to unload finished sutures.
THE ART OF PRECISION

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