SMF®

EXTRUSION
NON FERROUS DIVISION

e:stretch

Electromechanical Stretcher

www.smf.it

PASSION MEETS COMPETENCE SINCE 1984

SOCIETÀ METALMECCANICA FRIULANA

The soul of SMF is in never stopping in the technical improvement of machines.

The historical culture of the company sees the owners and the new generation working ‘hands-on’ on technical solutions, listening to the extruders, receiving advice from the maintenance staff and improving, improving and making their machines more effective and efficient.

40 years is not a few years. 40 years of **experience** in the industry is very rare in aluminium extrusion plants. Very few companies can boast such a long experience.

Nowadays, there are improvised companies that promise fantastic solutions that have never been validated in the field, which, when the facts are proven, turn out to be failures, causing the customer enormous problems in terms of production downtime and loss of money. This is only natural as they cannot boast the experience that SMF has, having worked with renowned industry brands over decades.

Our technical, mechanical, electrical and programming departments are the pride and joy of our company: with a view to constant improvement, they learn in the field, with the customer’s operators and technicians, making our production systems the best, precisely by working alongside the customer and understanding their problems and helping them with new solutions that are then produced by our company.

FINAL USERS' ERGONOMY

The controls and visualization of the remote head have been designed with the invaluable input of the end users. This ensures that operators are at ease when using the machine, significantly reducing their learning time.

ROBOUSTNESS

Every machine designed and constructed by SMF is robust and withstands increased loads without failure. The machine is designed to operate continuously at peak performance. This product stands out from others, as it is designed to withstand maximum force consistently, ensuring reliability and performance every time you need it.

e:stretch
PANTENT PENDING

The design of the innovative **e:stretch** relied on an iterative cycle that harnessed the extensive expertise at SMF.

Continuous feedback and refinement allowed the team to test ideas, overcome challenges, and implement solutions effectively.

This approach not only facilitated **innovation** but also ensured that every aspect of the design was meticulously considered. By combining innovative thinking with deep knowledge, the project addressed technical specifications and anticipated market needs.

The team engaged in regular evaluations, which fostered a culture of collaboration and creativity.

Ultimately, this comprehensive approach led to a successful and transformative design for the **e:stretch** that stands out in the industry.

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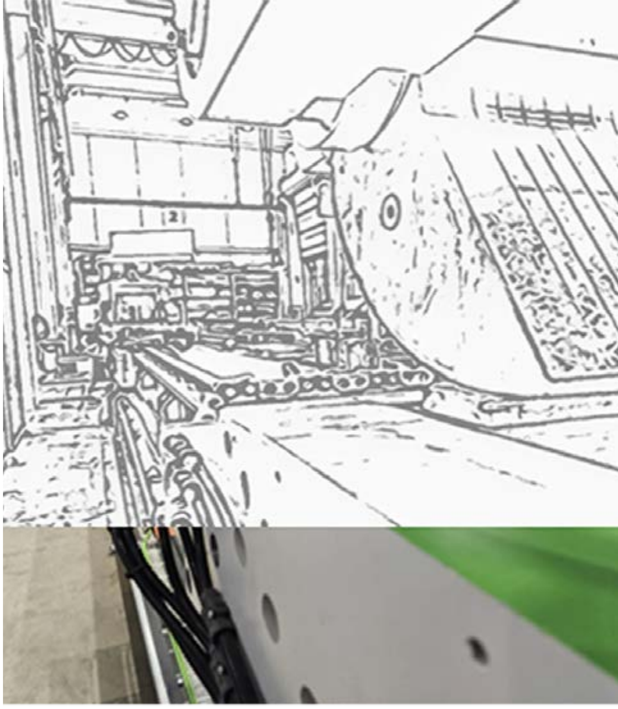
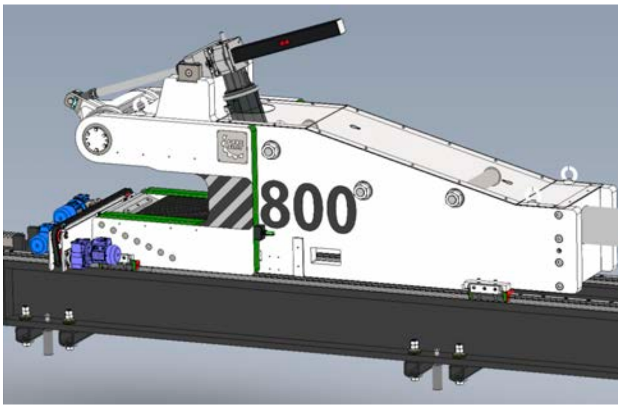
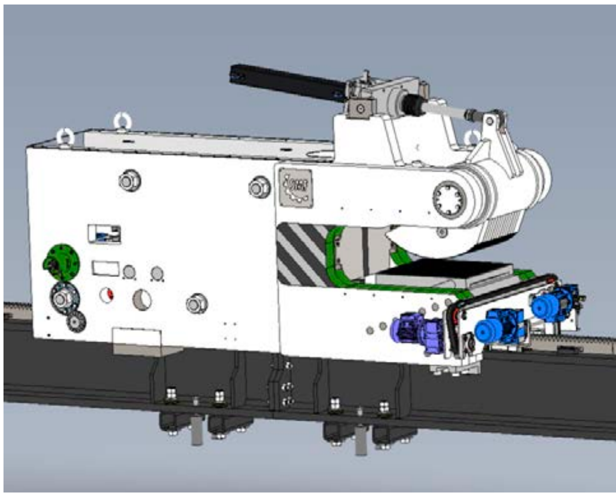
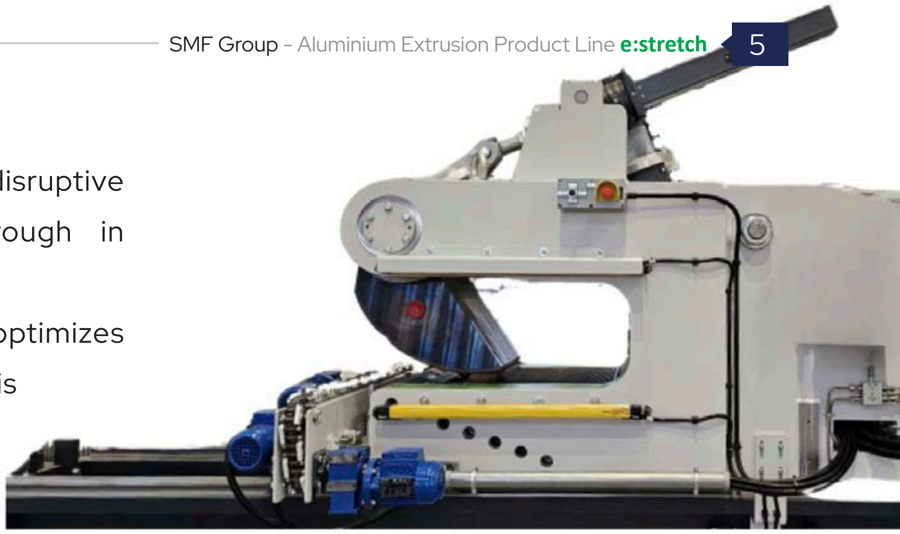




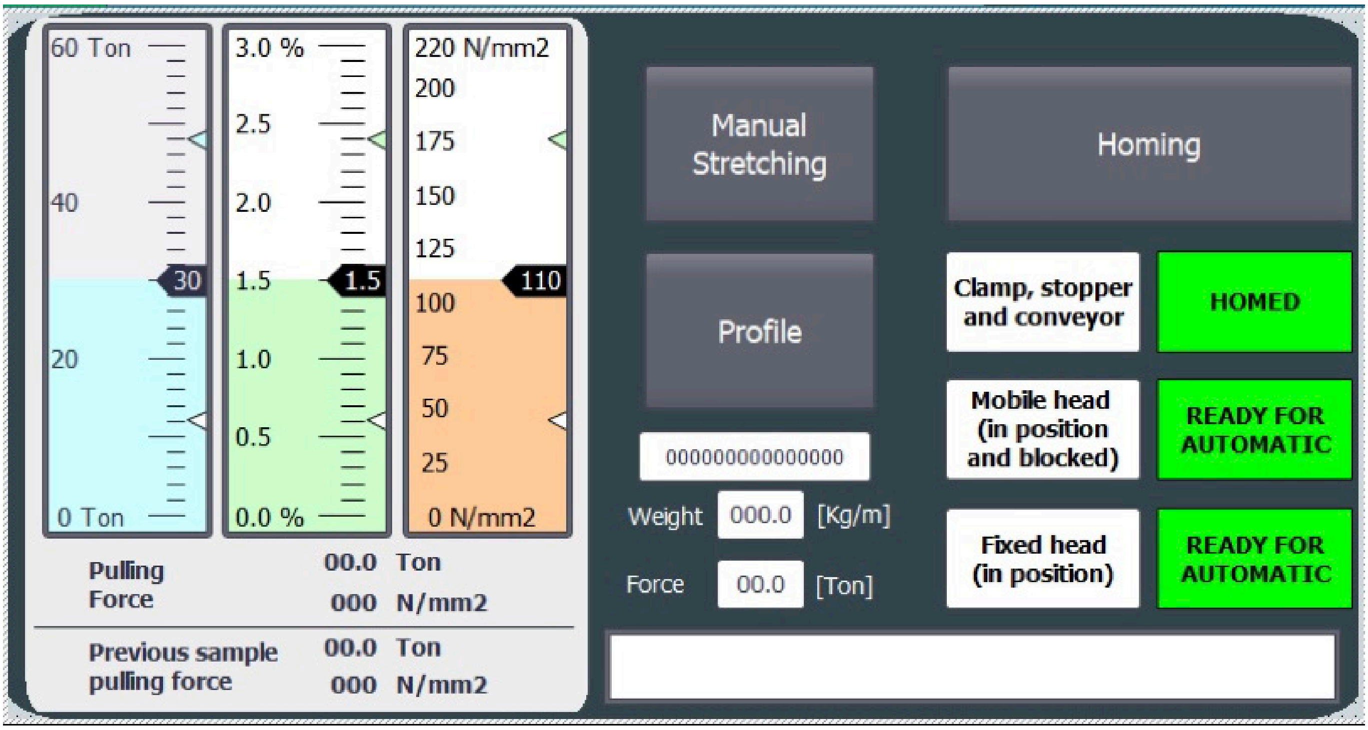


The advanced automation of this disruptive industrial machine marks a breakthrough in efficiency and productivity.
With cutting-edge AI and robotics, it optimizes operations through real-time data analysis and seamless integration.



This innovation enhances precision, reduces downtime, and allows businesses to adapt quickly to market demands while maximizing output.

PROFILE RESISTING FORCE INSTANT READING



The following can be in real time selected

- The yield strength of a chosen alloy
- The relationship between the yield strength and elongation of profiles
- The tonnes of force application
- The acceptable resistant yield strength limit of a profile and the consequent alarm if this is not reached: if an elongation with an 'X' resistant force is detected when the force should have been higher, this means that the profile tends to resist less and the profile yield strength is lower than expected. In this case, the system generates an alarm or pop-up message informing of the anomaly. Alternatively, this anomaly can be immediately sent to the ERP where it is analysed and, if necessary, a signal sent to production to stop because there are problems with the alloy itself or with the treatments upstream of the stretching process. The stretcher becomes a **'process filter'** that did not exist before.

The role of the operator is eliminated: it is no longer necessary to touch the profile with the hand to check its stretchability.

e:stretch
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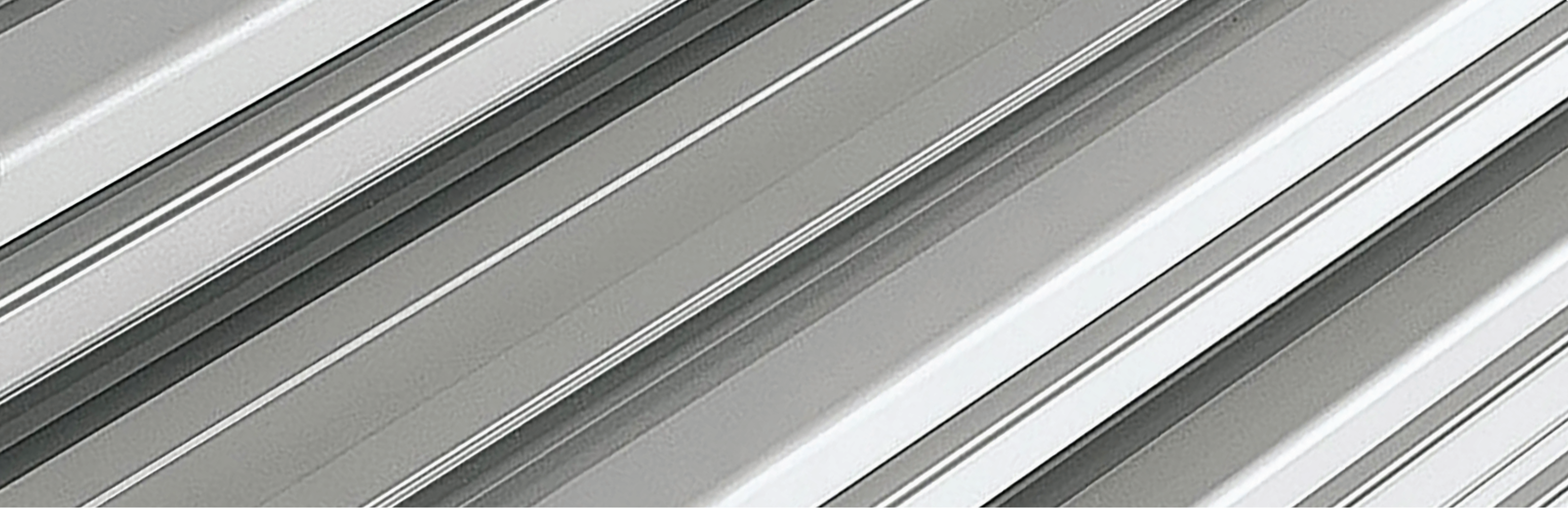


Yield read fine
ok to stretch !

Yield too low
do not stretch!

EASY AND SIMPLE

MAINTENANCE (visual, not instrumental)

In addition, the **e:stretch** system requires no oil replacement, filter cleaning, sensor control, pump inspections, pressure regulator checks, or inspections to establish cleanliness.
The power generation system is simpler than hydraulics, lacking pipes, gaskets, solenoid valves, proportional valves, filters, heat exchangers, motors, motor circuits, flexible hoses, steel piping, pipe connections, welded parts, temperature transducers, and oil level controllers.
Overall, an **e:stretch** has none of these components.

RELIABILITY

System never clogs.
Particle-induced hydraulic set blockage is impossible. No chance of production stops due to hydraulic set clogging. With the same reliability of each individual component, considering a significantly large number of components, the summed reliability of a hydraulic system is considerably higher than a mechanical system with a fraction of the number of components when compared to a hydraulic system. Thus, even the most reliable hydraulic stretchers in the world will always have lower reliability than an e:stretch. Nevertheless, mechanical systems mounted on an e:stretch are infinitely more reliable than hydraulic systems because they lack a hydraulic control chain for machine operation. This control chain is much more straightforward: it starts at the motor, passes through the transmission and ends at the clamp.

SPARE PARTS INVENTORY

The inventories are enormously smaller and well identifiable. Their cost is reduced accordingly. Last but not least, inspection of the presence of O-rings, micro gaskets, valve parts, large and small filters can be costly and time-consuming. All it takes is for one small component of these (e.g. an o-ring) to be missing so that, in the event of a stoppage, the machine cannot restart.

ENVIRONMENTALLY SUSTAINABLE

1. OIL PRODUCTION AND ENVIRONMENTAL IMPACT

• **Extraction Processes:** Oil extraction can lead to habitat destruction, oil spills, and water contamination, contributing to greenhouse gas emissions

• **Refinement:** Refining oil is energy-intensive and produces pollutants that affect air and water quality.

• **Leakage and Spills:** Hydraulic systems can leak fluids, causing soil and water contamination. Hydraulic oils often contain toxic additives harmful to aquatic life.

• **Resource Depletion:** Continuous oil use increases the demand for fossil fuels, contributing to resource depletion.

2. DISPOSAL ISSUES

• **Hazardous Waste:** Improper disposal of used hydraulic oil can lead to contamination of soil and water, as it may contain heavy metals and other harmful substances.

• **Recycling Challenges:** Recycling used hydraulic oil is complex, and regulations complicate disposal methods.

3. MATERIAL USE: POLYMERS AND COMPONENTS

• **Production Impacts:** Polymers in hydraulic systems are derived from petrochemicals, contributing to pollution during production and a significant carbon footprint.
• **Microplastics:** Decomposition of polymers can contribute to microplastic pollution, affecting ecosystems.

4. COMPARATIVE ANALYSIS WITH ELECTROMECHANICAL MACHINES

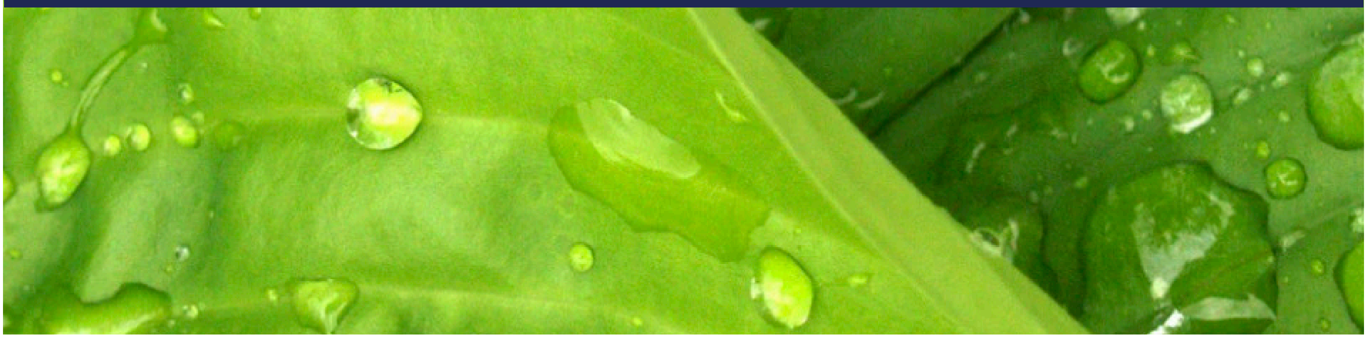
• **Energy Consumption:** Electromechanical machines typically have higher efficiency and lower emissions, especially when powered by renewable energy.
• **Maintenance and Lifespan:** Electromechanical systems often require fewer resources for maintenance and have longer lifespans, resulting in less waste.

5. LIFE CYCLE ASSESSMENT

• A life cycle assessment may show that electromechanical machines produce less overall environmental impact compared to hydraulic machines, particularly concerning emissions and resource use.

CONCLUSION

Hydraulic machines present ecological challenges related to oil usage, production, disposal, and materials. Transitioning to electromechanical systems can mitigate many of these issues, providing a more sustainable alternative.



MACHINE SAFETY

FIRE HAZARDS

• **Electromechanical Machines**: Generally present a lower risk of fire due to the absence of flammable hydraulic fluids. Electrical components must be properly insulated and maintained to prevent electrical fires.
• **Hydraulic Machines:** Higher fire risk due to the potential for hydraulic fluid leaks, which are flammable and can ignite from hot surfaces or electrical sparks.

NOISE LEVELS

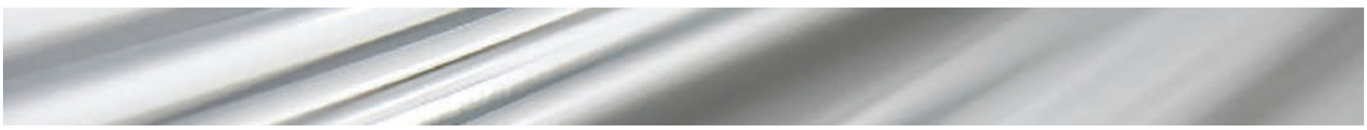
• **Electromechanical Machines:** Typically operate quieter due to the absence of hydraulic pumps and motors. Reduced noise levels improve workplace safety and comfort.
• **Hydraulic Machines:** Often produce higher noise levels from pumps and fluid movement, which can contribute to hearing loss and increased stress.

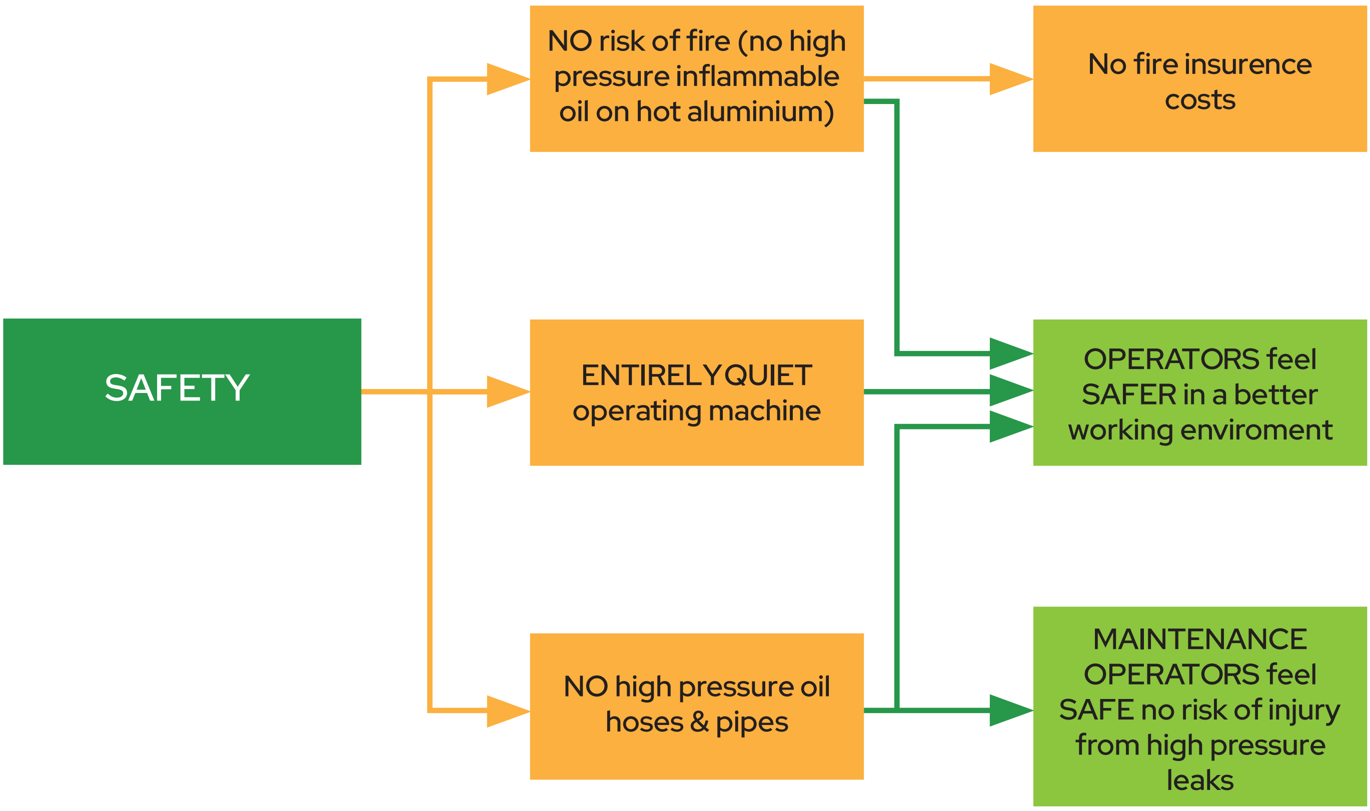
SLIPPERY FLOORS

• **Electromechanical Machines:** Less likely to cause spills; therefore, the risk of slip hazards is lower. However, maintenance on electrical components may still pose risks if water or coolant is used.
• **Hydraulic Machines:** Fluid leaks can create slippery surfaces, increasing the risk of slips and falls, necessitating regular maintenance and clean-up procedures.

OPERATIONAL STABILITY

• **Electromechanical Machines:** Generally offer better control and stability during operation, reducing the risk of accidents due to unexpected movements.
• **Hydraulic Machines:** Can be prone to sudden pressure losses or hydraulic failures, leading to unexpected machine movements and potential hazards.





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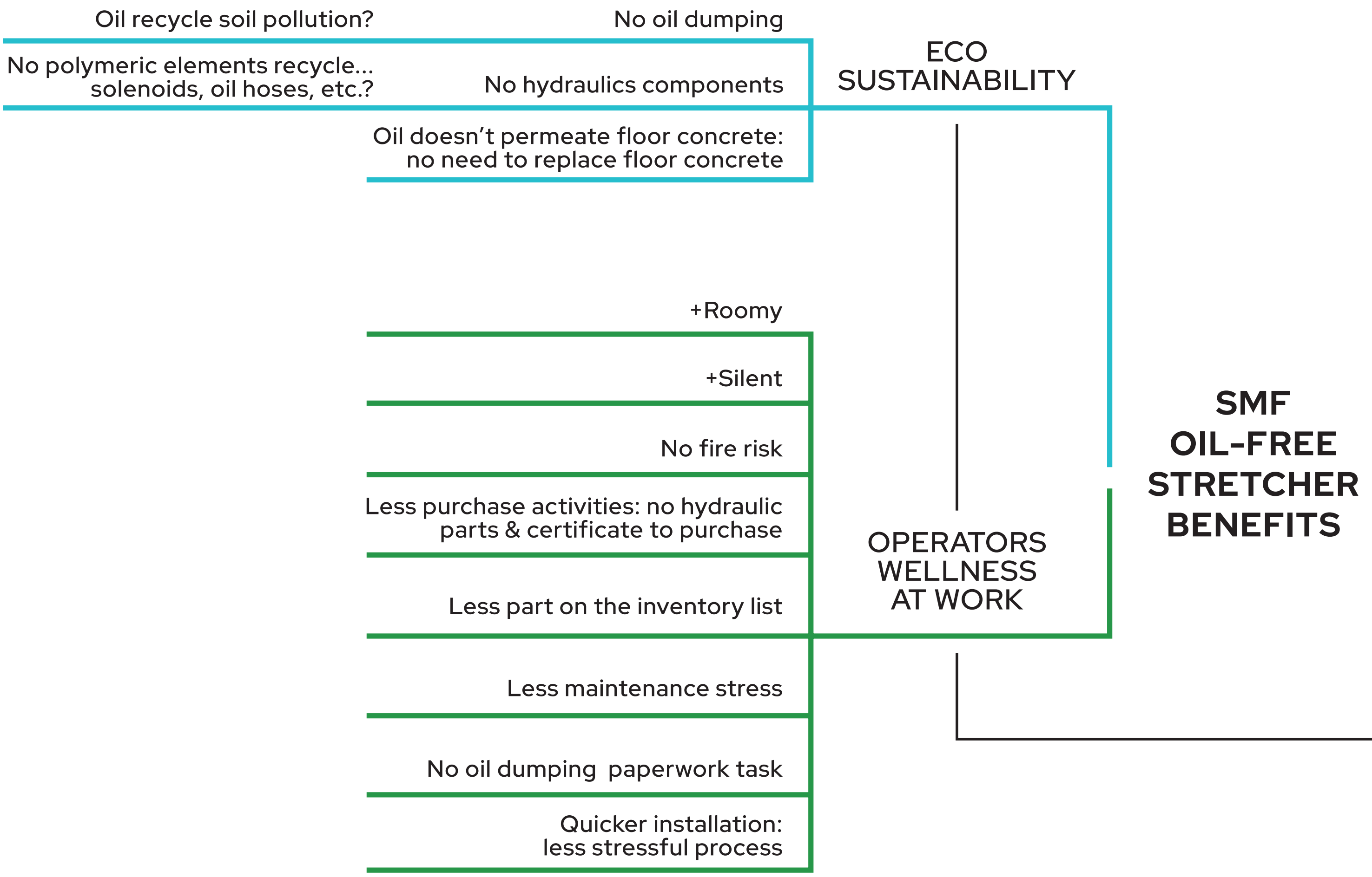
STRETCHER BENEFITS



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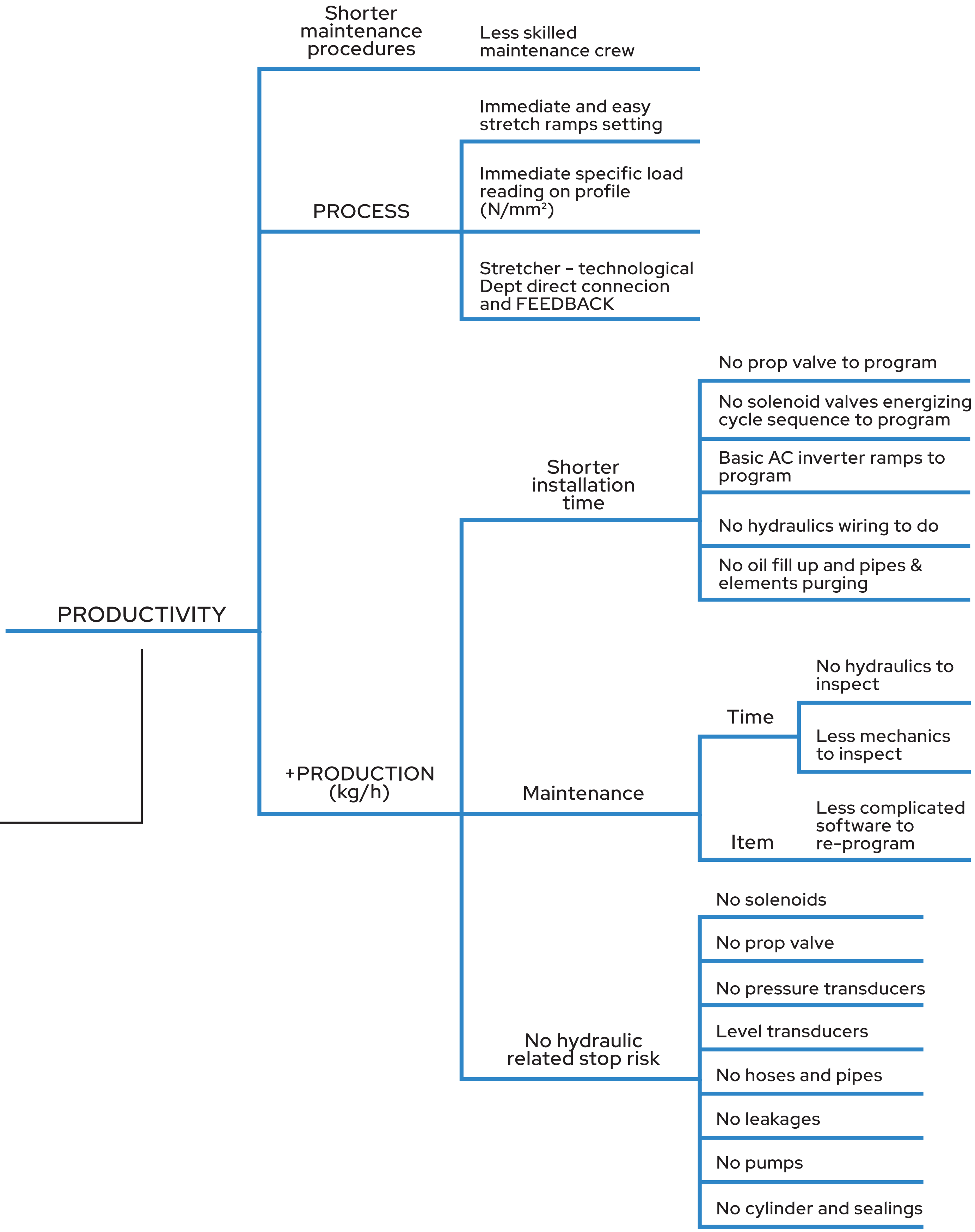
PRODUCTIVITY
Shorter maintenance procedures
Less skilled maintenance crew
PROCESS
Immediate and easy stretch ramps setting
Immediate specific load reading on profile (N/mm²)
Stretcher - technological Dept direct connecion and FEEDBACK
+PRODUCTION (kg/h)
Shorter installation time
No prop valve to program
No solenoid valves energizing cycle sequence to program
Basic AC inverter ramps to program
No hydraulics wiring to do
No oil fill up and pipes & elements purging
Maintenance
Time
No hydraulics to inspect
Less mechanics to inspect
Item
Less complicated software to re-program
No hydraulic related stop risk
No solenoids
No prop valve
No pressure transducers
Level transducers
No hoses and pipes
No leakages
No pumps
No cylinder and sealings

ENERGY EFFICIENCY

1. HIGHER EFFICIENCY

Electromechanical machines generally offer higher energy efficiency than hydraulic machines. The conversion of electrical energy to mechanical energy is more direct and involves fewer losses, especially in the form of heat. In contrast, hydraulic machines frequently experience energy losses due to fluid friction, leakage, and pressure drops.
Electromechanical systems reduce these losses by eliminating hydraulic fluids. Additionally, the e:stretch is designed to consume minimal power when not in use, whereas hydraulic systems often require constant energy input to maintain pressure in fluid reservoirs.

2. INSTANTANEOUS RESPONSE

Electromechanical systems offer rapid response times, allowing for quick adjustments in speed and torque. This can lead to optimized energy consumption and reduced waste during operation.
Faster Response: Electromechanical systems can provide quicker response times to changes in control signals compared to hydraulic systems, which can be limited by fluid dynamics.

3. FLEXIBILITY IN ENERGY SOURCE

Electromechanical machines can be powered by renewable energy sources, such as solar or wind power, facilitating a more sustainable energy profile. In contrast, hydraulic systems primarily rely on fossil fuel-derived electricity for operation.

4. COMPACT DESIGN

Smaller Footprint: Electromechanical systems usually occupy less space than their hydraulic counterparts, making them suitable for applications where space is limited.
Flexible Layout: Their compact nature allows for greater flexibility in the design and layout of production facilities. This eliminates the redundancy and keeps the key points intact.

CONCLUSION

Overall, electromechanical machines offer significant energy advantages over hydraulic machines, primarily through higher efficiency, lower energy losses, and the ability to integrate with renewable energy sources.

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SIMPLICITY AND FEWER COMPONENTS

• **Reduced Complexity:** Electromechanical stretching systems typically have fewer components than hydraulic systems, which involve various valves, tubes, and other hydraulic components. This simplicity leads to lower chances of malfunction.

• **Easier Installation:** With fewer parts, the installation process is often faster and more straightforward.

• **Lower Operating Costs:** Reduced maintenance and energy savings can lead to lower operational costs over the system's lifetime.

• **Initial Cost Savings:** Although the initial purchase price can sometimes be higher for electromechanical systems, the long-term savings in maintenance and energy can make them more cost-effective.

• **Lower Maintenance Needs:** Electromechanical systems require less frequent maintenance. There are no hydraulic fluids to check, and concerns about leaks or fluid degradation are eliminated.

• **Simplified Service:** Fewer parts mean easier access for maintenance and repairs. This can result in lower labor costs and reduced downtime.

CLEAN AND ENVIRONMENTALLY FRIENDLY

• **No Hydraulic Fluids:** The absence of hydraulic fluids reduces the risk of spills and contamination. This promotes a cleaner working environment.

• **Sustainability:** Reduced materials and waste associated with hydraulic systems promote sustainability and can reduce the system's overall environmental footprint.

CONCLUSION

In summary, electromechanical stretching systems present numerous advantages over hydraulic systems, particularly in terms of simplicity, maintenance, energy efficiency, precision, reliability, and environmental impact. These benefits can lead to improved efficiency and performance in industrial applications where stretching operations are critical.

e:stretch
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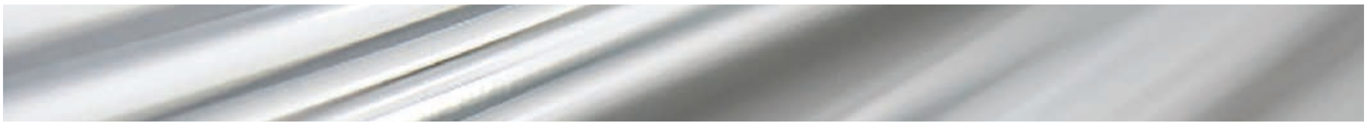


AVAILABLE CONFIGURATIONS UPON REQUEST

Additional Liftable Longitudinal Rollers to Raise Profiles During Stretching

1) For heavy profiles, the extrusion tail has been placed offset from the stretcher line.

2) An additional issue is that during stretching, the belts can become damaged due to the heavy weight of the profiles sliding on the Kevlar® belts.

Therefore, a set of vertical rollers mounted on the stretcher bed, which lift to raise the profile, can be offered as an extra item to solve this issue.

Configurable for ferrous or non-ferrous profiles

The stretcher can be configured based on the pulling force, the start and end ramp profiles, specific yield measurements, and the shape of the clamps for ferrous profiles (various types of steel) or non-ferrous profiles (copper, brass, etc.).

Integrable in to an existing equipment or production line

As it usually happens several times, a stretcher is not necessarily installed on its own. Often, it is integrated into an existing system. The machine must therefore be partially redesigned to handle the incoming material and the output of the stretched material

The material input and output are designed according to the customer's requirements

For production needs, a customer may request that the material to be processed enter the machine from below, from one side, exit on the same side, exit from the top, from other angles, or in line with the machine itself. SMF can assess the feasibility of the different requested solutions!

With Existing PLC or Onboard PLC

The stretcher can be delivered turnkey or as "plug-and-play," allowing the customer the option to install it themselves or use it otherwise. In such cases, the PLC will be installed onboard according to standard SMF configurations. Should the customer wish to use an existing PLC, SMF will be pleased to offer a very satisfactory solution both technically and economically to the end customer.

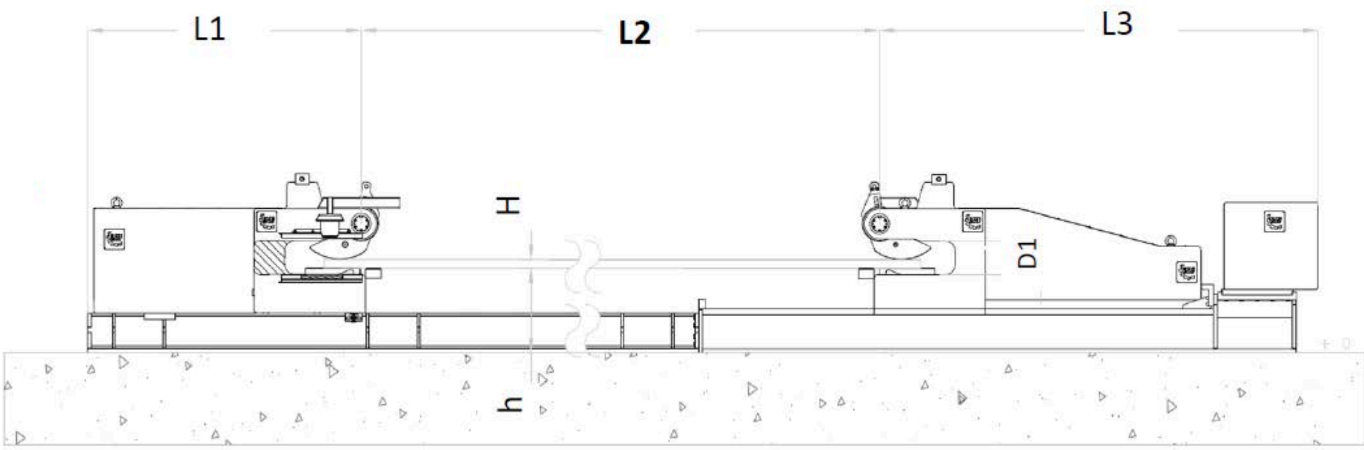
Additional Remote controls

The control commands of the stretcher can be mounted onboard the machine, duplicated with different functions, mirrored functions, or even placed on the main control console. Additional cameras are also included in these possibilities.

Customizable Safety Level

The stretcher is delivered with the necessary safety devices onboard, in compliance with Italian safety regulations. However, we understand that safety requirements can vary based on local regulations or company preferences. If the customer desires different safety standards or less or more stringent measures, SMF is happy to discuss these openly with your technicians.

Our aim is to find a solution that, on one hand, ensures the desired level of safety, and on the other hand, allows the operator to use the machine efficiently and without hindrance. We are committed to offering customized solutions that balance safety and operability, ensuring that your specific needs are met.



e:stretch size	L1 +L2 + L3 (m)	L2 (m)	L3 ca. (m)	D1 (mm)	h (mm)	H (mm)
e:stretch Size (ton)	OVERALL LENGTH	NOMINAL STRETCH	HEADSTOCK LENGTH	VERTICAL CLEARANCE	BENCH TO FLOOR	PRODUCT HEIGHT
40	30 / 40	30 / 40	4.8	200	1000	120
60	40 / 50	40 / 50	4.8	200	1050	150
80	50 / 60	50 / 60	5.0	280	1050	220
100	65	65	5.0	300	1080	250
120	65	65	6.5	350	1080	280
150	70	70	7.2	450	1100	300

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