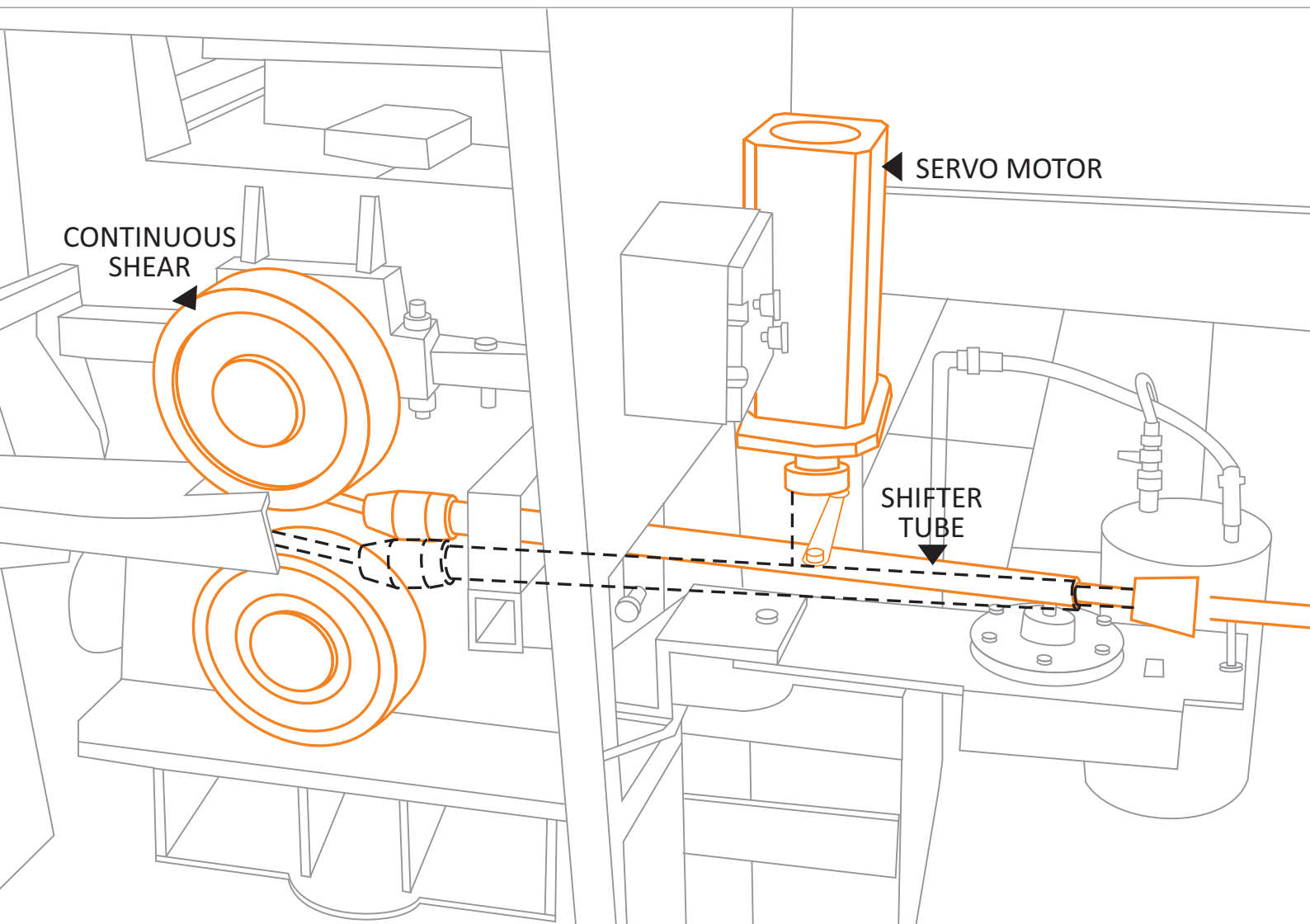


Automation Solution with Servo Shifter for TMT Manufacture



Thermo-Mechanically Treated (TMT) metal bars are high-strength reinforcement bars that have a tough outer core and a soft inner core; this provides superior tensile strength, ductility and elongation point. The manufacturing process also improves corrosion-resistance and weldability. With these characteristics, TMT reinforcement bars play an important role in the construction industry, finding use in buildings, roads, and dams.

TMT bar manufacture is a continuous process and involves passing steel rods through a rolling mill stand, and then through a water cooling system. The process comprises a continuous caster/ reheating furnace, rolling stands, TMT line, pinch rollers, continuous (or flying) shears, tail brakes, and an automatic cooling bed. Because of restrictions on cooling bed length, and for ease of transportation, bars are generally cut in-line to 60 meters. High speed bar mills use a continuous rotating shear; this is a low inertia shear driven by an induction motor, and offers higher productivity than start-stop flying shears. The bars are further cut to 12 meters with cold shears.

A shifter diverts the bar from one channel to another to provide consistent cutting support. Conventionally, pneumatic shifters are used for this process; to improve cutting precision at high speeds and to avoid wastage, these can be replaced with servo shifters. As the bar originates

continuously from the rolling mill, a diverter tube driven by the servo motor moves it into the path of the blades to cut it to the desired length. Using servo shifters improves consistency and precision in cutting, and provides high holding torque at both park positions that guide the bar in the two channels.

The servo motor is mounted vertically through a cam, which moves the shifter in steps of 90° or 180° as per the desired position relative to the continuous shear blades. The control system puts the blade motor in position-synchronization with the bar movement. This enables high accuracy.

Bharat Bijlee's solution matches a KEB servo drive and a servo motor, and ensures conditions in which the shifter can perform at optimal efficiency. KEB drive and automation solutions are designed to provide high performance in exacting applications that demand high speed of response, precise positioning and torque and speed control. This can also be integrated with a multi-axis controller and touch screen HMI.

The servo motor uses an axial fan (instead of a centrifugal fan), improving ruggedness and reducing maintenance.

This is an accurate and cost-effective solution, field-proven in trials up to 27 m/s.

Our solution fulfills key technical needs of TMT cut to length line control:



Two positions switching consistency



Precise positioning accuracy



High holding torque at park position



Shaft seal protects water ingress in the motor from above



Rolling speeds of 20 to 40 m/s



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