

## CASE STUDY



### M6 mechanical thread control station

The new M6 thread control station performs the 360° mechanical functionality control of a threaded portion of the shank. It's designed to pinpoint imperfections like bubbles, chips, burrs, and defects dependent from the rolling dies mismatching.

This station is optimized to check a M6 threaded portion of 14mm on headed screws up to 30 mm long below the head. It has been applied for the first time of the **Dimac MCV1 serial 968** together with an eddy current station for head side crack detection and a side profile digital camera for dimensional controls around 360° with a mechanical recess inspection penetrating device.

### Project

This mechanical functionality check method has been developed to meet the dual requirements of a meticulous inspection process and a seamless re-rolling procedure for the thread. The thread control is carried out by coupling the threaded shank with a threaded buffer roller. It simulates the screwing process and discards only those pieces with truly critical screwing defects.

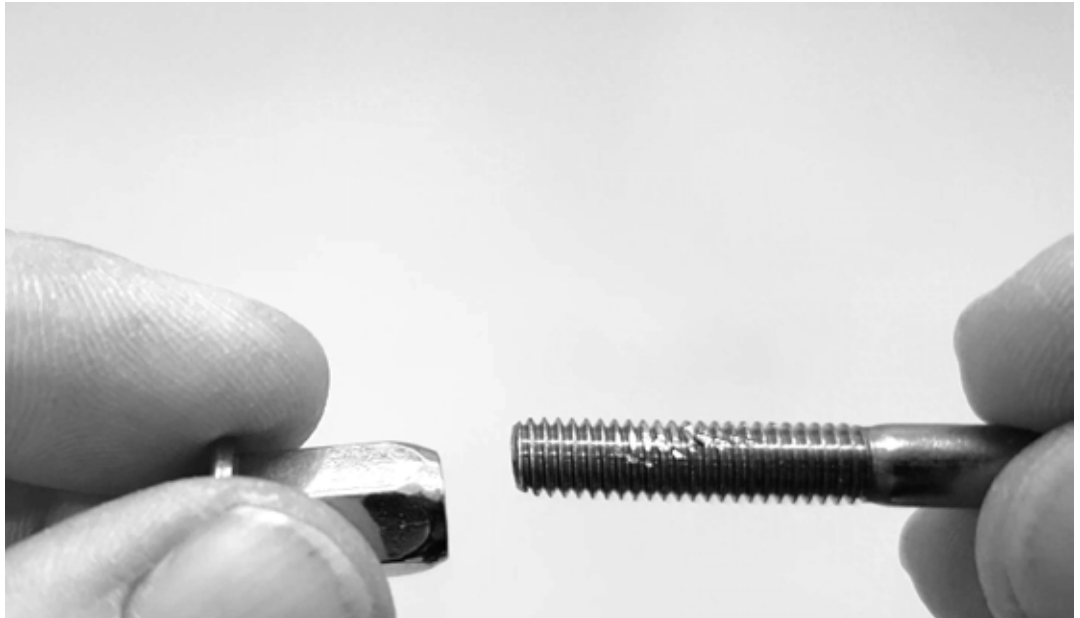
Moreover, this station offers an indirect measurement of screwing force and facilitates progressive pseudo-rejects recovery, with benefits for small threaded diameters and soft materials.

Remarkably, this system it's been proven effective even on materials with hardness exceeding 50 Rockwell.

The station operates with a rate >100 pp/min and represents the fastest mechanical thread inspection solution available on the market. Its reliability surpasses optical controls, remaining unaffected by dirt, grease, or material shortages on the thread.

We're proud to announce that this solution is **patent pending (Dept. No. 102023000022908)**, marking a significant advancement in quality assurance technology.

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### The control method

The inspection method employed by the new station is conceived to detect defects that conventional optical methods often miss, including:

1. Thread profile defects that impact the screwing process without exceeding tolerance limits.
2. Core ovalization of the thread.

The station integrates electro-pneumatic mechanical actuators with two motion rollers and one gauging-thread roller. During the rotary table index stop, the shank of the screw is held by the two motion rollers against the gauging-thread roller. Mounted on a sliding guide, the gauging roller detects even the slightest load differences via special sensor. The station's software allows for sensitivity adjustment by configuring the screw's revolution count and tolerance threshold.

### In summary, the new Dimac electro-mechanical thread control station for M6 offers:

- Rejection of components with critical defects only.
- Elimination of pseudo-rejects caused by material absence, core ovalization, dirt, and chips
- Indirect monitoring of screwing effort.
- Thread re-rolling capability, saving most rejects

This solution proves ideal for scenarios requiring thread tests that reflect real-world usage, minimizing pseudo-rejections compared to optical control methods while achieving higher throughput rates than screwing tests.