

# MANURHIN K'MX NEWSLETTER

Innovative technology

## CHIP BREAKING DURING MACHINING (discover SLO - Servo Learning Oscillation)

### When to choose SLO technology?

Are you dealing with an unbreakable chip? Do you have chips winding up on your tools or work? Doesn't changing the cutting conditions or tool type help? Are service costs, downtime and broken tools crushing your economy? SLO machining technology is just for you, bringing you back to multi-machine operation and satisfied machining. The optional SLO function is suitable for side turning, grooving and drilling.

### Why choose SLO technology on the MANURHIN K'MX machine?

In April 2022, with the participation of engineers from TAJMAC-ZPS and FANUC representatives headed by Mr. Makoto Yamadate, servo drive control tuning for the best possible profit margin, phase response, bandwidth and system stability on Manurhin K'MX machines took place in Zlín so that our the machines were able to make maximum use of the possibilities of the Servo learning oscillation - SLO function. The function is therefore not a plug and play solution for any drive with a control system and Fanuc. SLO machining technology is designed to eliminate long chipping problems when machining on automatic lathes, which can significantly reduce labor, tooling and manufacturing process costs. **On MANURHIN K'MX machines, the SLO chip breaking function can be used on all supports and both spindles simultaneously.**

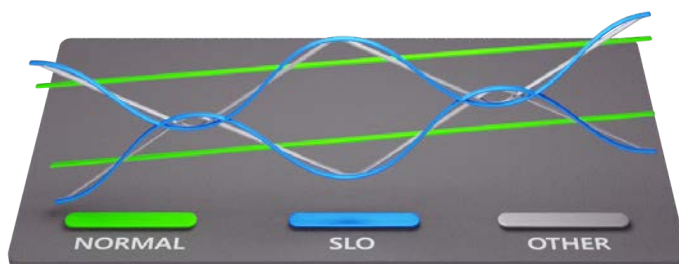
SLO on



SLO off



### Features of SLO technology compared to other solutions.



Three main types of toolpaths in turning (expanded shape of the path 360° around the circumference of the cylinder):

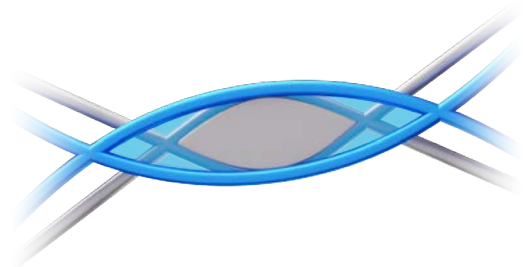
- ordinary turning
- turning with SLO
- competitive solutions

The path trajectory of some machine manufacturers is similar to a deep drilling cycle, which performs a sharp reciprocating motion and can cause shocks in the carriage system.

**The SLO trajectory** is a mathematically calculated sine wave that provides a smoother motion without getting stuck.

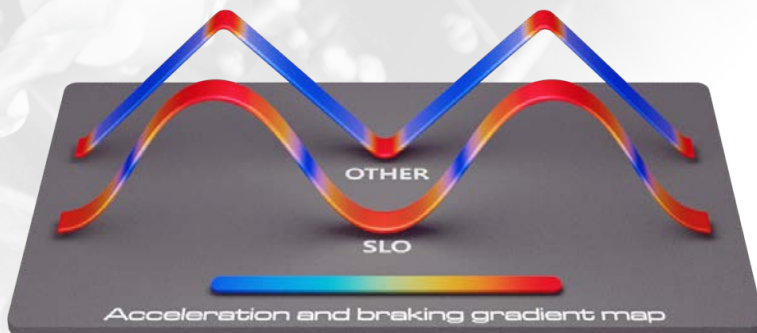
Which results in significant benefits such as:

- **smooth oscillation versus jerky vibration**
- **longer service life of tool edges**
- **better surface quality of machined surfaces**
- **lower noise and vibration**
- **more favorable impact on the service life of ball screws and other mechanical parts of the supports**



*Note: The comparative measurement took place in December 2022 with customer in the Czech Republic, which operates both solutions.*

## Acceleration and braking gradient maps

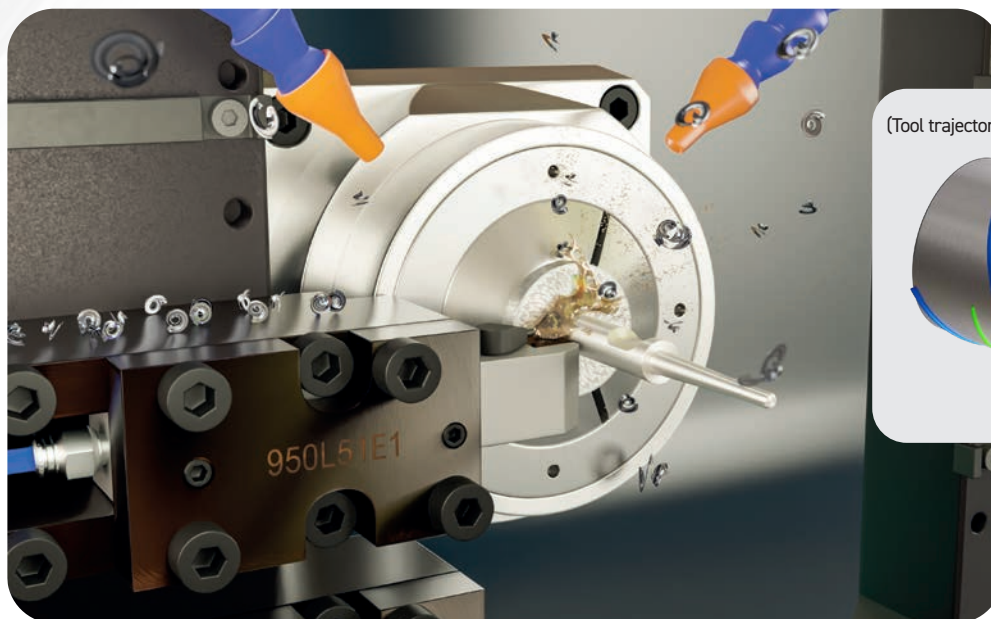


**SLO** - acceleration and braking take place gradually, which ensures an even load on machine components

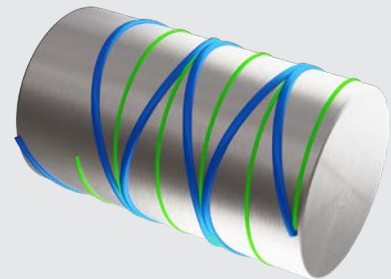
**OTHER** - acceleration and braking is performed in shocks

## Are you still deciding?

When using the SLO option, no major effects on the mechanical components of the machine or significant deterioration of the surface quality of the machined parts were detected. Flexible and simple setting of parameters in the NC program and visualization directly on the machine monitor allows you to correctly choose the necessary values of each oscillation. SLO may not improve the life of overloaded tools while increasing the machining time, but instead it will increase your daily production without further interrupting the automatic cycle and removing chips from the machine operator area. All our machines produced today are SLO READY.



(Tool trajectory for turning in **NORMAL** and **SLO mode**)



Chip breaking presentation  
[click here](#)

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