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Rigid and Precise Turning Center NLX 2500



※Design and specifications are subject to change without prior notice

Highlights

Slideways are used for all axes

Coolant circulation inside the castings controls thermal displacement

With BMT (Built-in Motor Turret),
milling capability is comparable to machining centers

Target workpiece

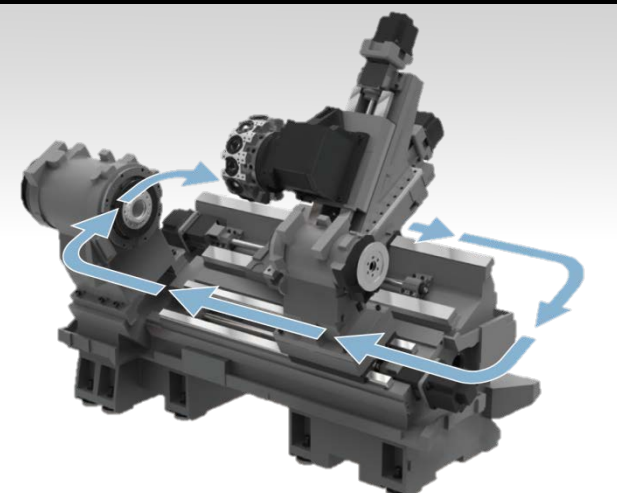


Technical highlights

Slideways for all axes



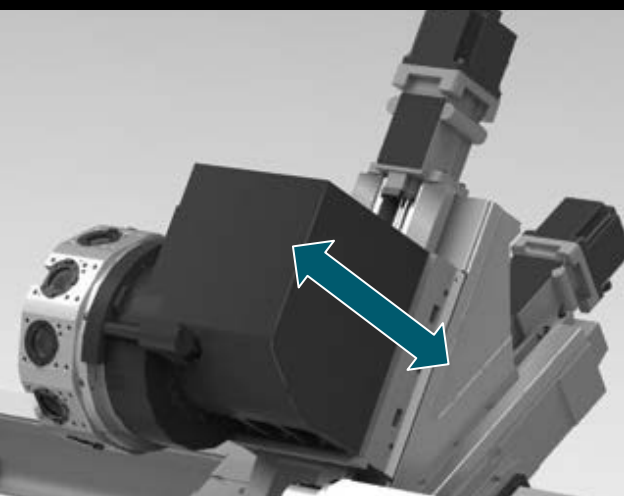
Coolant circulation for casting parts



BMT (Built-in motor turret)



Y-axis



Magnescale (option)

Resolution: 0.01 μm



CELOS



Specifications 1/2

※1 For O.D. cutting tool with an overhang of 35 mm (1.4 in.)
 ※2 For O.D. cutting tool with an overhang of 40 mm (1.6 in.) []OP

			NLX 2500 500	NLX 2500 700	NLX 2500MC 700	NLX 2500Y 700	NLX 2500MC 1250	NLX 2500Y 1250
Capacity	Max. turning diameter	mm	460		366※1, 356※2			
	Max. turning length	mm	450	728	705		1,255	
	Bar work capacity	mm	80		80		80 [90,102]	
Travel	X / Y / Z axis	mm	260 / - / 500	260 / - / 795		260 / ±50 / 795	260 / - / 1,345	260 / ±50 / 1,345
Spindle	Max. spindle speed	min ⁻¹	4,000 [4,000]		4,000 [4,000, 2,500]			
	Spindle nose		JIS A2-8					
	Through-spindle hole diameter	mm	91		91 [111]			
Turret	Number of tool stations		10 [12]		10 [12] [16] [20]	12 [10] [16] [20]	10 [12] [16] [20]	12 [10] [16] [20]
	Max. rotary tool spindle speed	min ⁻¹	-		10,000			
Feedrate	Rapid traverse rate	mm/min	X: 30, Y: 10, Z: 30 Tailstock: 20 (Retract), 7 (Extend)					
Tailstock	Tailstock travel	mm	380	650	734		1,284	
	Taper hole of tailstock spindle		MT5 (live center) [MT3 (built-in center), MT4 (built-in center)]					
Motor	Motor for Spindle	kW	18.5 / 18.5 / 15 (25%ED / 50%ED / cont) [26 / 26 / 22 (10min / 30min / cont)]		18.5 / 18.5 / 15 (25%ED / 50%ED / cont) [26 / 26 / 22 (10 min / 30 min / cont): 4,000 min ⁻¹ [22 / 18.5 (30 min / cont): 2,500 min ⁻¹]			
	Rotary tool	kW	-		5.5 / 5.5 / 3.7 (3 min / 5 min / cont) [10.7 / 8.5 / 6.1 (15%ED / 30%ED / 100%ED)]			

Specifications 2/2

※1 For O.D. cutting tool with an overhang of 35 mm (1.4 in.)
 ※2 For O.D. cutting tool with an overhang of 40 mm (1.6 in.) []OP

			NLX 2500SMC 700	NLX 2500SY 700	NLX 2500SMC 1250	NLX 2500SY 1250
Capacity	Max. turning diameter	mm	366※1, 356※2 [348: 16-station Turret] [278: 20-station Turret]			
	Max. turning length	mm	705		1,255	
	Bar work capacity	mm	80		80 [90,102]	
Travel	X / Y / Z / B	mm	260 / - / 795 / 734	260 / ±50 / 795 / 734	260 / - / 1,345 / 1,284	260 / ±50 / 1,345 / 1,284
Spindle 1	Max. spindle speed	min ⁻¹	4,000 [4,000, 2,500]			
	Spindle nose		JIS A ₂ -8			
	Through-spindle hole diameter	mm	91 [111]			
Spindle 2	Max. spindle speed	min ⁻¹	6,000 [5,000]			
	Spindle nose		JIS A ₂ -5 [JIS A ₂ -6]			
	Through-spindle hole diameter	mm	43 [73]			
Turret	Number of tool stations		12 [10] [16] [20]			
	Max. rotary tool spindle speed	min ⁻¹	10,000			
Feedrate	Rapid traverse rate	mm/min	X, Z, B: 30	X: 30, Y: 10, Z: 30, B: 30	X, Z, B: 30	X: 30, Y: 10, Z: 30, B: 30
Motor	Motor for Spindle 1	kW	18.5 / 18.5 / 15 (25%ED / 50%ED / cont) [26 / 26 / 22 (10 min / 30 min / cont): 4,000 min ⁻¹] [22 / 18.5 (30 min / cont): 2,500min ⁻¹]			
	Motor for Spindle 2	kW	11 / 7.5 (25%ED / cont)			
	Rotary tool spindle drive motor	kW	5.5 / 5.5 / 3.7 (3 min / 5 min / cont) [10.7 / 8.5 / 6.1 (15%ED / 30%ED / 100%ED): (Y, SY)]			

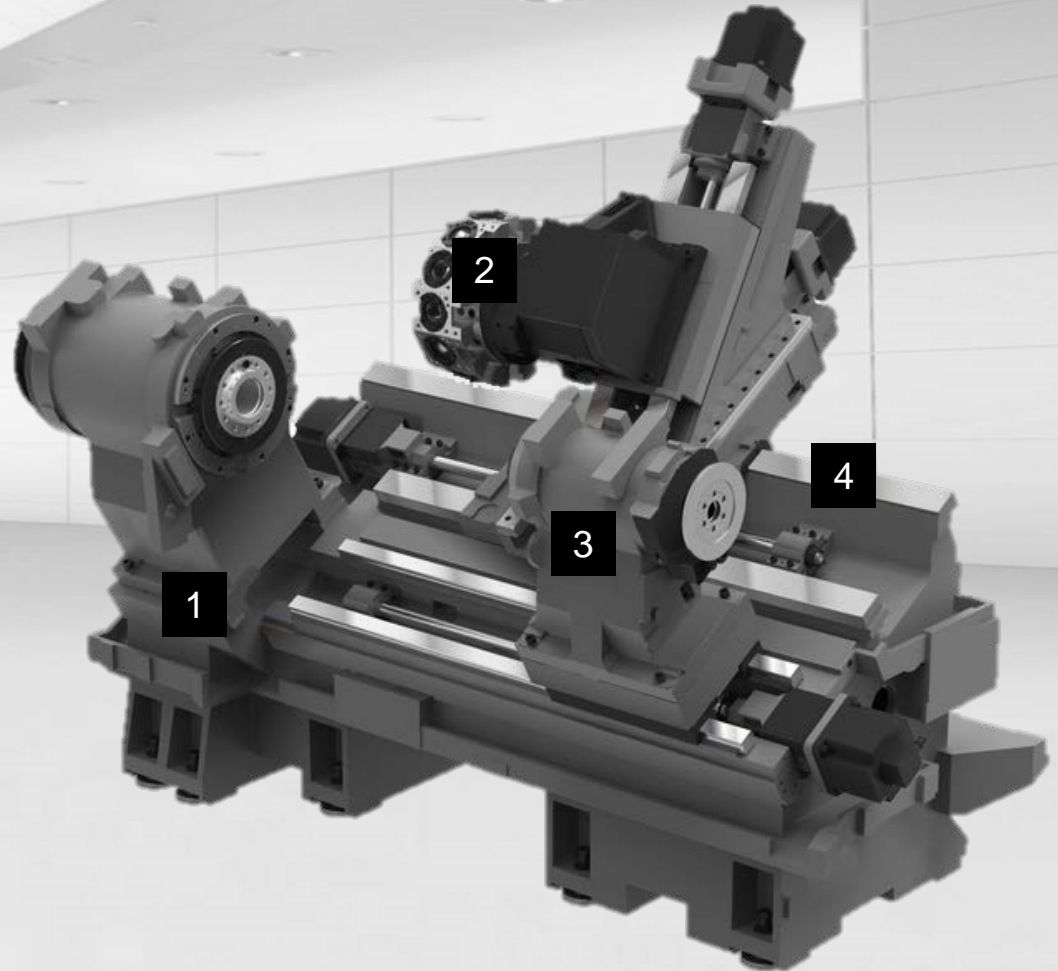
Machine structure

1 High rigidity bed

2 Heavy Milling by BMT

3 Digital tail stock

4 All axis box way



High Rigidity



Z-axis guide

Area 171%



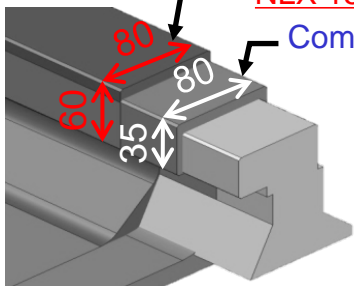
Slideways for all axis

Area 150%

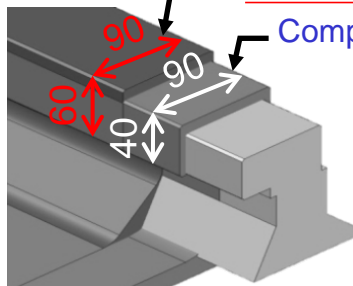
Area 164%

Area 147%

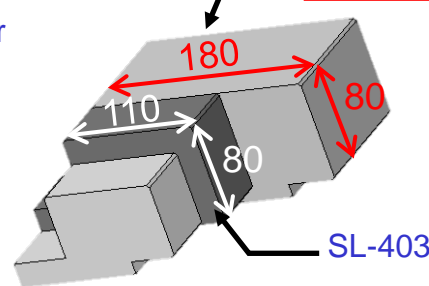
NLX 1500~2500
Competitor



NLX 3000
Competitor

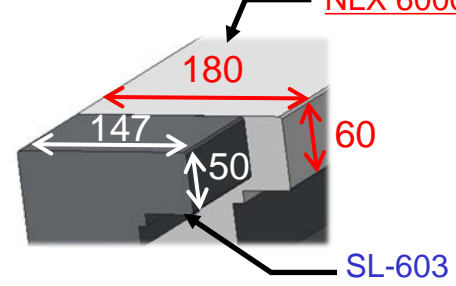


NLX 4000



SL-403

NLX 6000



SL-603

BMT (Built-in motor turret)



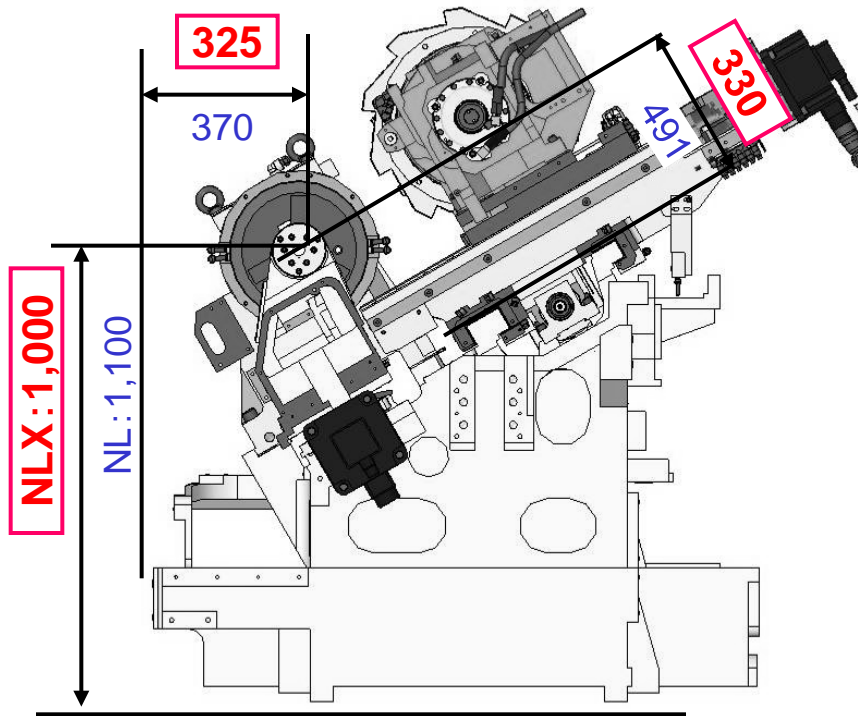
Effects of BMT

- + Improved milling power
- + Improved milling accuracy
- + Controls the turret's heat and vibration
- + Reduced energy loss
- + Turret temperature increases: Compared with conventional machine 1/10 or less
- + Vibration amplitude: Compared with conventional machine 1/3 or less

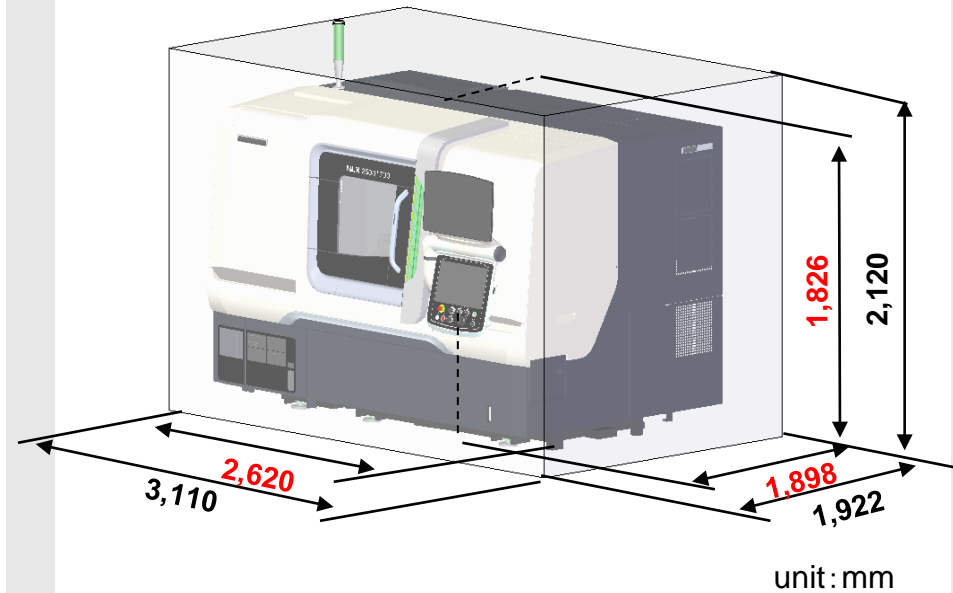


Effect of optimal design for each spec. (NLX 2500 turning spec)

X-axis rigidity **36%** UP from NL



Floor space **17%** DOWN from NL



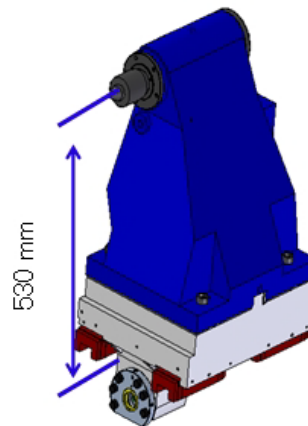
Improved rigidity

Rigidity improved by optimized design for each specification

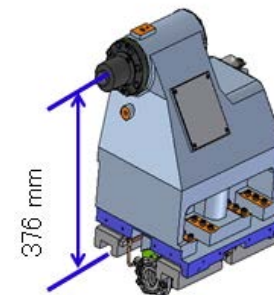
Height of tailstock center

(Turning spec: 530 ⇒ 376 mm)

(MC spec : 501 ⇒ 430 mm)



NL2500



NLX 2500

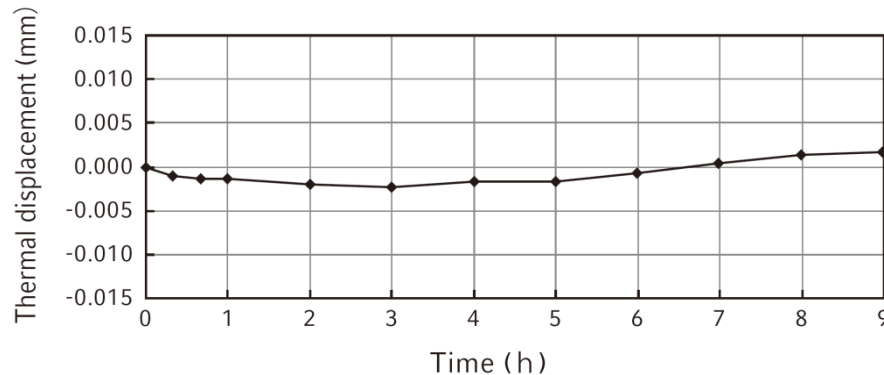
Higher rigidity of ball screw

Ball screw size	NL	NLX (turning)	NLX (MC)	NLX (Y)
X-axis (mm)	32	36	36	40
Z-axis (mm)	36	40	40	40
Y-axis (mm)	32	—	—	36

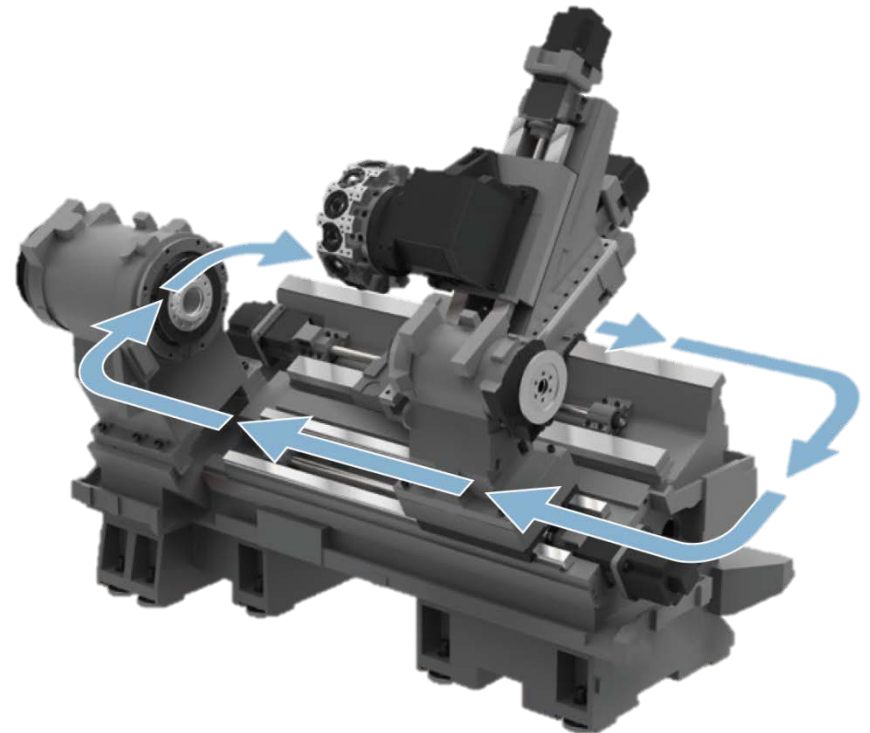
Coolant Circulation inside Castings

- + Uniform thermal displacement
- + Resistance to changes in ambient temperature
- + High-accuracy long-term machining

Thermal displacement
2.0 μm



- + Spindle speed: 3,200 min^{-1}
- + Constant ambient temperature

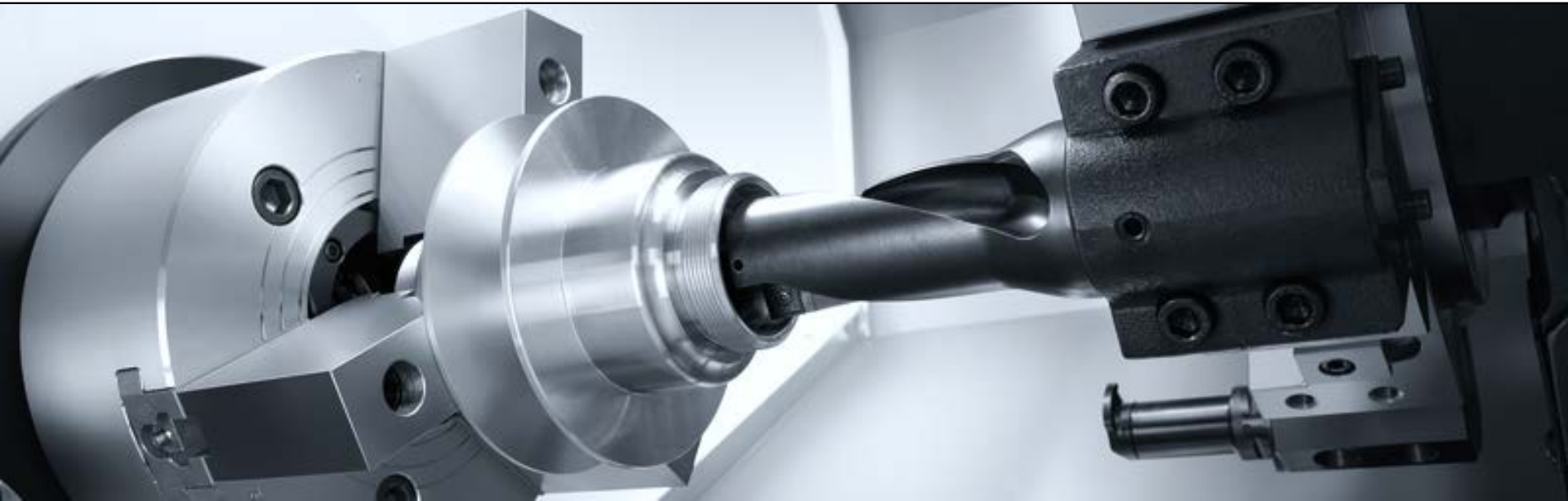


Magnescale (option)



- + Superior precision with the Magnescale absolute linear measuring system featuring a standard resolution of $0.01\ \mu\text{m}$
- + High-resolution, magnetic measuring system
- + Protective structure, oil and condensation resistant
- + Impact resistance of $450\ \text{m/s}^2$
- + Vibration resistance of $250\ \text{m/s}^2$
- + Thermal expansion coefficient as cast iron

Machining ability <Turning>



O.D. cutting Material <JIS> : S45C		Throw-away drill Material <JIS> : S45C		O.D. Grooving Material <JIS> : S45C	
Material removal rate	719 mL/min	Material removal rate	594 mL/min	Width of groove	12 mm
Depth of cut	9 mm	Machining diameter	φ60 mm	Spindle speed	289 min ⁻¹
Spindle speed	635 min ⁻¹	Spindle speed	637 min ⁻¹	Feedrate	0.1 mm/min
Feedrate	0.45 mm/rev	Feedrate	0.33 mm/rev	Cutting speed	100 m/mm
Cutting speed	160 m/mm	Cutting speed	120 m/mm		

Machining ability <Milling>



End mill $\phi 20$ mm Material <JIS> : S45C		Face mill $\phi 80$ mm Material <JIS> : S45C		Drill Material <JIS> : S45C		Tap Material <JIS> : S45C	
Material removal rate	104 mL/min	Material removal rate	57 mL/min	Tool	$\phi 23$ mm	Tool	M20 \times P2.5
Depth of cut	10 mm	Depth of cut	2 mm	Rotary tool speed	345 min ⁻¹	Rotary tool speed	160 min ⁻¹
Rotary tool speed	1,300 min ⁻¹	Rotary tool speed	875 min ⁻¹	Feedrate	104 mm/min	Cutting speed	100 m/mm
Feedrate	520 mm/min	Feedrate	787 mm/min	Cutting speed	25 m/mm		
Cutting speed	80 m/mm	Cutting speed	220 m/mm				

High precision

Circularity data <Turning>

Circularity	0.39 μm
Material	Brass
Tool	Diamond tool <Nose radius 0.5>
Spindle speed	2,000 mm^{-1}
Feedrate	0.07 mm/rev

Surface roughness <Turning>

Surface roughness	1.15 $\mu\text{m Rz}$
Material	Brass
Tool	Diamond tool <Nose radius 0.5>
Spindle speed	2,000 mm^{-1}
Feedrate	0.07 mm/rev



Positioning accuracy

C-axis indexing accuracy has been significantly improved by using a new position compensation method. Positioning accuracy for the X-, Z- and Y-axis has also been secured by increasing the size of ball screws and bearing diameter.

Positioning accuracy (C-axis)

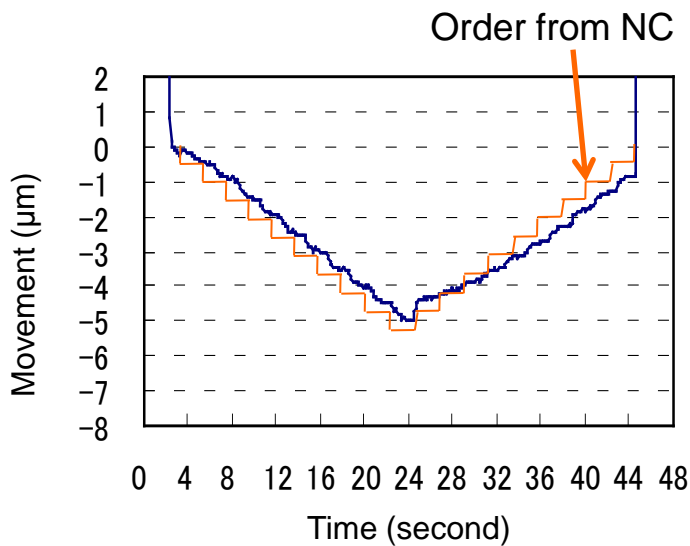
Conventional machine
21.9 sec.



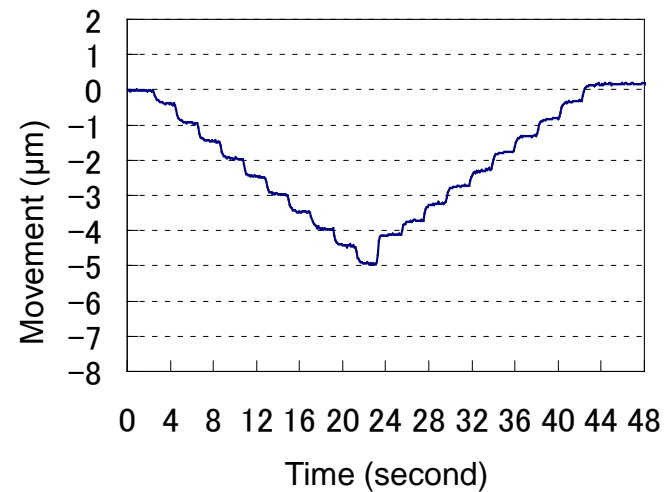
NLX 2500Y
10.4 sec.

Tracking error

Improvement of tracking error (if machine moves as NC order).
for stick-slip, slight taper turning.



Previous model [X-axis]



NLX 2500SY [X-axis]

Automation

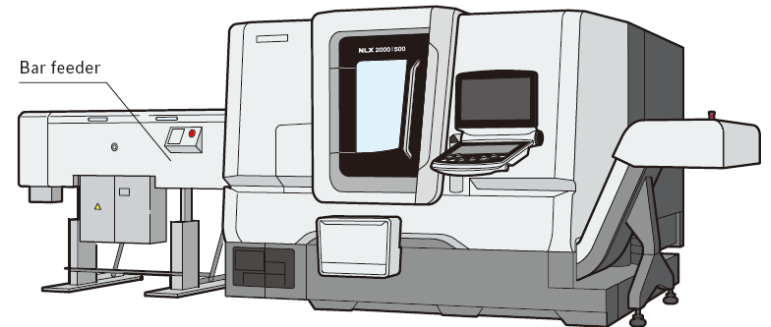


Loader GX-05

Workpiece unloader



Bar feeder



From the Idea to the Finished Product



APP MENU

Central access to all available applications.

21.5" multi-touch screen for quick and easy operation



MULTI-TOUCH SCREEN

The combination of advanced software and hardware enables excellent usability and distinctive functionality.



CELOS Club

CELOS Club offers continuous support for your productivity improvements.



Energy Saving

Power-saving Functions

- + Inverter-controlled coolant supply
- + AUTO shutdown function
- + Energy-efficient Components

Cycle Time Reduction for Lower Power Consumption

- + Optimized M codes
- + Acceleration/deceleration control for spindle and servo motor
- + Shorter machining time in canned cycle



Reduced by **45 %***

*Comparison between the latest “NLX 2500MC” and “SL-250BMC” manufactured in 1997

