

# Seal Manufacturing Systems



# Complete turn-key CNC Seal Manufacturing Systems

UTEC Sealing Solutions offers you the latest technology in CNC machining systems, state-of-the-art computer technology and seal production software as well as high-performance sealing materials – the complete solution for modern seal production up to 1500mm OD.

UTEC CNC lathes are custom-made, fully integrated systems, for the instant production of various seals used in hydraulic and pneumatic applications, as well as engineered plastic parts.

Machine, software, semi-finished materials and tools are precisely tuned to guarantee efficient machining and top-quality products.

Lathe-cut seals gain an ever-increasing market share in today's sealing industry and are widely accepted in OEM and MRO applications – UTEC Sealing Solutions contributes its part to the success of this manufacturing technology.



## High-end Technology

The machines are based on custom-designed lathes for metal machining and are modified and upgraded in our factory with all the features necessary for the machining of seals and plastic parts.

All machines are equipped with high-end mechanical and electrical/electronic components. The high precision guides, disc turret, bearing, drive systems and control unit are without exception produced by world-wide, well-known brands who define the standards of modern CNC machining technology.

These top-quality components in combination with a sturdy machine design guarantee a long service life of UTEC Seal Manufacturing Systems.

In order to guarantee the smooth operation of your UTEC CNC lathe, our customers will receive training on their machine, in our factory. After technical acceptance of the machine, it will be commissioned and installed on site by one of our engineers.

# Technical Features

## UT250E



### UT250E at a glance

- √ Machine system for seals up to 250mm/9.8" OD
- √ Pragati 8-station electric tool turret
- √ Quick tool clamping system
- √ Latest FANUC Oi-TF drive and control system
- √ PC with UTECFLEX software

- √ Chip cutter & suction unit
- √ Material clamping system
- √ Cutting tools & holders
- √ Automatic lubrication system
- √ Coolant (cutting fluid) system

### Machining Capacity

- Max. machining diameter: 250mm/9.8"
- Swing over bed: 300mm/11.8"
- Max. travel X-axis: 300mm/11.8"
- Max. travel Z-axis: 235mm/9.3"
- Max. machining length: 155mm/6.1"
- Max. billet length: 155mm/6.1"

### Machining Accuracy

- Cylindrical accuracy: IT6
- Surface roughness: Ra 0.4-1.6 $\mu$ m
- Roundness:  $\leq$ 0.003mm
- Positional accuracy: X: 0.005mm / Z: 0.008mm
- Repeated pos. accuracy: X: 0.002mm / Z: 0.004mm

### Main Spindle Drive

- Max. speed: 3000rpm
- Through-hole diameter: 38mm/1.5"
- Power: 3.7kW
- Max. current: 25A
- Noise level normal/max.: 78/82dB

### Tool System

- Electric tool turret (Pragati, India)
- Tool positions: 8
- Tool holders: "FAST Insert"

# Technical Features

## UT400E



### UT400E at a glance

- ✓ Machine system for seals up to 400mm/15.7" OD
- ✓ Pragati 12-station electric tool turret
- ✓ FAST Insert tool clamping system
- ✓ Latest FANUC Oi-TF drive and control system
- ✓ PC with UTECFLEX software

- ✓ Chip cutter & suction unit
- ✓ Material clamping system
- ✓ Cutting tools & holders
- ✓ Automatic lubrication system
- ✓ Coolant (cutting fluid) system

### Machining Capacity

- Max. machining diameter: 400mm/15.7"
- Swing over bed: 450mm/17.7"
- Max. travel X-axis: 250mm/9.8"
- Max. travel Z-axis: 260mm/10.2"
- Max. turning length: 155mm/6.1"
- Max. billet length: 240mm/9.4"

### Machining Accuracy

- Cylindrical accuracy: IT6
- Surface roughness: Ra 0.4-0.6 $\mu$ m
- Roundness:  $\leq$ 0.005mm
- Positional accuracy: X: 0.006mm / Z: 0.009mm
- Repeated pos. accuracy: X: 0.004mm / Z: 0.006mm

### Main Spindle Drive

- Max. speed: 3500rpm
- Through-hole diameter: 50mm/2"
- Power: 5.5kW
- Max. current: 32A
- Noise level normal/max.: 78/82dB

### Tool System

- Tool turret: electric (Pragati, India)
- Max rotating/indexing time: 0.16s/30°
- Tool positions: 12
- Tool holders: "FAST Insert"

## UT400



### UT400 at a glance

- √ Machine system for seals up to 400mm/15.7" OD
- √ Diplomatic 12-station hydraulic tool turret
- √ VDI20 tool clamping system
- √ Latest FANUC Oi-TF drive and control system
- √ PC with UTECFLEX software

- √ Chip cutter & suction unit
- √ Material clamping system
- √ Cutting tools & holders
- √ Automatic lubrication system
- √ Coolant (cutting fluid) system

### Machining Capacity

- Max. machining diameter: 400mm/15.7"
- Swing over bed: 430mm/16.9"
- Max. travel X-axis: 280mm/11"
- Max. travel Z-axis: 518mm/20.4"
- Max. turning length: 155mm/6.1"
- Max. billet length: 310mm/12.2"

### Machining Accuracy

- Surface roughness: Ra 0.4-0.6 $\mu$ m
- Roundness:  $\leq$ 0.005mm
- Positional accuracy X/Z: 0.002mm
- Repeated pos. accuracy X/Z: 0.0008mm

### Main Spindle Drive

- Max. speed: 3500rpm
- Through-hole diameter: 45mm/1.8"
- Power (S1 / S3): 11 / 15kW
- Max. current: 63A
- Noise level normal/max.: 78/82dB

### Tool System

- Tool turret: hydraulic (Diplomatic, Italy)
- Max rotating/indexing time 30°: 0.08s / 0.21s
- Tool positions: 12
- Tool holders: VDI20

# Technical Features

## UT750 / UT750DT\*



### UT750 at a glance

- √ Machine system for seals up to 750mm/29.5" OD
- √ Diplomatic 12-station hydraulic tool turret
- √ VDI20 tool clamping system
- √ Latest FANUC Oi-TF drive and control system
- √ PC with UTECFLEX software

- √ Chip cutter & suction unit
- √ Material clamping system
- √ Cutting tools & holders
- √ Automatic lubrication system
- √ Coolant (cutting fluid) system

### Machining Capacity

- Max. machining diameter: 750mm/29.5"
- Swing over bed: 780mm/30.7"
- Max. travel X-axis: 450mm/17.7"
- Max. travel Z-axis: 650mm/25.6"
- Max. turning length: 230mm/9.1"
- Max. billet length: 460mm/18.1"

### Machining Accuracy

- Surface roughness: Ra 0.4-0.6 $\mu$ m
- Roundness:  $\leq$ 0.005mm
- Positional accuracy X/Z: 0.002mm
- Repeated pos. accuracy X/Z: 0.0008mm

### Main Spindle Drive

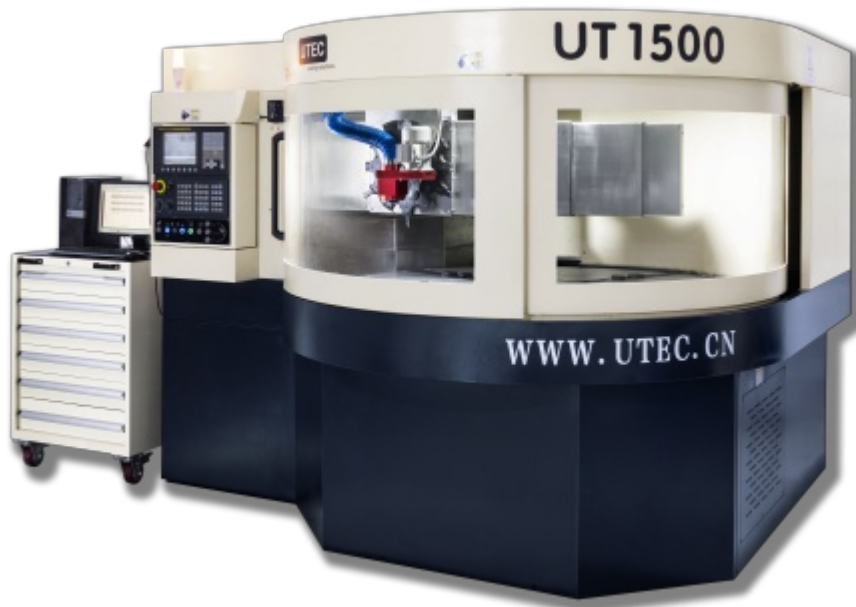
- Max. speed: 3500rpm
- Through-hole diameter: 60mm/2.4"
- Power (S1 / S3): 11 / 15kW
- Max. current: 63A
- Noise level normal/max.: 78/82dB

### Tool System

- Tool turret: hydraulic (Diplomatic, Italy)
- Max rotating/indexing time 30°: 0.08s / 0.21s
- Tool positions: 12
- Tool holders: VDI20

\*DT = Driven Tools – optional

## UT1500



### UT1500 at a glance

- ✓ Complete machine system for seals measuring between 600mm/23.6" and 1500mm/59.1" Ø
- ✓ Pragati 12-station electric tool turret
- ✓ FAST Insert tool clamping system
- ✓ Latest FANUC Oi-TF drive and control system

- ✓ PC with UTECFLEX software
- ✓ Chip cutter & suction unit
- ✓ Cutting tools & holders
- ✓ Automatic lubrication system
- ✓ Coolant (cutting fluid) system

### Machining Capacity

- Machining diameter: 600-1500mm/23.6-59.1"
- Swing over bed: 1700mm/66.9"
- Max. travel X-axis: 800mm/31.5"
- Max. travel Z-axis: 450mm/17.7"
- Max. turning length: 160mm/6.3"
- Max. billet length: 300mm/11.8"

### Machining Accuracy

- Cylindrical accuracy: IT6-7
- Surface roughness: Ra 1.6µm
- Positional accuracy X/Z: 0.009mm
- Repeated pos. accuracy X/Z: 0.008mm

### Main Spindle Drive

- Max. speed: 150rpm
- Power: 37kW
- Max. current: 63A
- Noise level normal/max.: 78/82dB

### Tool System

- Tool turret: electric (Pragati, India)
- Max rotating/indexing time: 0.16s
- Tool positions: 12
- Tool holders: "FAST Insert"

# Machine Components

## Control & Drive System

UTEC machines are equipped with the latest technology of FANUC, the world-wide leader of control systems for machine tools. The FANUC Oi-T\* 2-axis control and the iServo-Drive System offer a state-of-the-art, high precision machine control system with high efficiency and reliability.



## Tool System UT400E / UT1500



The electric turret disc from Pragati on the UT400E and UT1500 models comes with the "FAST insert" tool clamping system for up to 12 tools and guarantees a fast tool change.

## Tool System UT400 / UT750



These models are equipped with the DUPLOMATIC "FAST" servo-motor turret with bi-directional logic. The bi-directional logic in combination with hydraulic clamping/unclamping without lifting mechanism drastically reduces tool positioning times. The turret disc with VDI clamping system for 12 tools guarantees fast tool changing.

## Tools & Holders

The quality of cutting tools is of highest importance in the production of lathe-cut seals. A complete set of high-precision cutting tools made of fine-grain carbide is supplied with every UTEC machine. In order to cover the complex, complete range of existing seal profiles, most tools have a special geometrical shape and are custom made for seal production.



## Material Clamping System



In order to efficiently clamp the raw material billets, special clamping jaws are mounted on to the steel body of the high-precision 3-jaw machine chuck. These sets of multi-range clamping jaws are made of high-grade aluminum and are designed to clamp certain diameter ranges of semi-finished billets.





## Chip Cutter & Suction Unit

A well working chip cutter and suction unit play an important role in the manufacturing process of seals and engineered plastic parts, as they contribute to preventing swarf buildup around the tool and thus to a better surface finish of the end product.

The chip cutter is made of high-grade aluminum, using HSS tools to hack up the chips and keep the tools clean for optimal machining performance.



## Optional Accessories

UTEC recommends the Accu-Finish tool lapping machine in combination with a microscope to sharpen, and verify the state of, tool tips. This tool lapping technology is highly efficient, as it substantially increases the service life of a cutting tool, and guarantees optimal tool sharpness, which in turn assures excellent surface quality of your end product.



Other accessories, such as measuring devices, bevelling shears, band saws for cutting guide rings etc can be supplied on request.

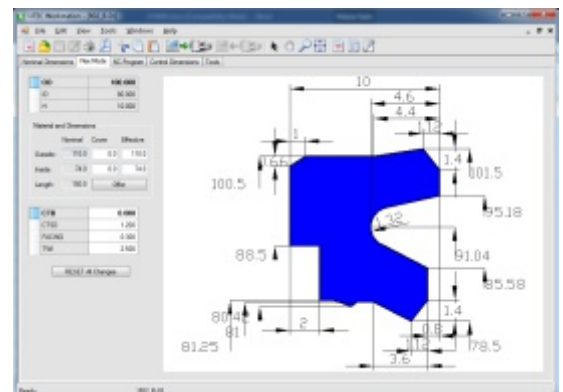


## UTEC "Flex" Software

The production software is developed in-house by UTEC engineers and underlies continuous updates, upgrades and improvements. Each of the more than 180 standard profiles can be easily modified by the user in the "Flex Mode" without the need to make modifications to the NC program itself.

The production process for seals is fast and easy:

1. Select your specific seal from one of the profile groups (wipers, rod seals etc.)
2. Key-in the nominal dimension of the seal as required (any modifications of dimensions can easily be made in the "Flex"-mode).
3. Select the sealing material and billet size from the drop-down list.
4. Suitable cutting tools will be proposed and the NC-program is generated automatically in the background.
5. Transfer the production date (CNC file) to the control unit
6. Set up the CNC machine for production and start the machining process.



This way, an endless number of seal profiles and dimensions can be manufactured. This is what makes lathe-cut seal manufacturing technology the most versatile in seal business.

# Technical Data

Characteristic	UT250E	UT400E
<b>Machine overview</b>		
Machine dimensions (WxDxH) [mm]	1750 x 1350 x 1300/1650	1560x1510x1500
Machine dimensions (WxDxH) [in]	69 x 53 x 51/65	61 x 59 x 59
Total weight (excl. suction unit) [kg]/[lbs]	1800 / 3968	2200 / 4850
Coolant tank capacity [L]	50	50
<b>Machining capacity</b>		
Min. machining diameter [mm]/[in]	N/A	N/A
Max. machining diameter [mm]/[in]	250 / 9,8	400 / 15,7
Swing over bed [mm]/[in]	300 / 11,8	450 / 17,7
Max. travel X-axis [mm]/[in]	300 / 11,8	250±10 / 9,8±0,4
Max. travel Z-axis [mm]/[in]	235 / 9,3	260 / 10,2
Max. turning length [mm]/[in]	155 / 6,1	155 / 6,1
Max. billet length [mm]/[in]	155 / 6,1	240 / 9,4
<b>Main spindle drive</b>		
Max. speed [rpm]	3000	3500
Through-hole diam. [mm]/[in]	38 / 1,5	50 / 2
Power [kW] (S1/S3)	3,7	5,5
Max. current [A]	25	32
Max. positioning / acceleration torque [Nm]		
Rapid feed in X-/Z-axis [m/min]		
<b>Machining accuracy</b>		
Cylindrical accuracy	IT6	IT6
Surface roughness [µm]	Ra 0,4-1,6	Ra 0,4-0,6
Roundness [mm]	≤0,003	≤0,005
Positional accuracy X/Z [mm]	X:0,005 / Z:0,008	X:0,006 / Z:0,009
Repeated pos. accuracy X/Z [mm]	X:0,002 / Z:0,004	X:0,004 / Z:0,006
<b>Tool system</b>		
Electric tool turret (Pragati, India)	√	√
Hydraulic tool turret (Duplomatic, Italy)		
Max. Rotating / indexing time 30° [s]	0,16	0,16
Tool positions	8	12
Tool holder	"FAST insert"	"FAST insert"
<b>Noise level</b>		
Normal / Maximum [dB]	78 / 82	78 / 82
<b>Suction unit</b>		
Suction unit (motor / max. air flow)	4kW / 8600L/min	4kW / 8600L/min
Chip container capacity [L]	100	100
Dimensions (WxDxH) [mm]	650 x 1250 x 1600	650 x 1250 x 1600
Dimensions (WxDxH) [in]	26 x 49 x 63	26 x 49 x 63
Weight [kg]/[lbs]	185 / 408	185 / 408
<b>CNC type / Software</b>		
Fanuc control version	Oi-TF	Oi-TF
UTEC Software	UTEC "FLEX"	UTEC "FLEX"

UT400	UT750	UT1500
2100x1600x1600	2600x1800x1850	2600x2300x1900
83 x 63 x 63	102 x 71 x 73	102 x 91 x 75
4000 / 8818	4500 / 9921	7500 / 16535
120	120	100
N/A	N/A	600 / 23,6
400 / 15,7	750 / 29,5	1500 / 59,1
430 / 16,9	780 / 30,7	1700 / 66,9
280 / 11	450 / 17,7	800 / 31,5
518 / 20,4	650 / 25,6	450 / 17,7
155 / 6,1	230 / 6,1	160 / 6,3
310 / 12,2	460 / 18,1	300 / 11,8
3500	3500	150
45 / 1,8	60 / 2,4	N/A
11 / 15	11 / 15	37
63	63	63
2,65 / 5,5	2,65 / 5,5	
12 / 20	12 / 20	
		IT6-7
Ra 0,4-0,6	Ra 0,4-0,6	Ra 1,6
≤0,005	≤0,005	
0,002	0,002	0,009
0,0008	0,0008	0,008
		v
v	v	
0,08 / 0,21	0,08 / 0,21	0,16
12	12	12
VDI20	VDI20	"FAST insert"
78 / 82	78 / 82	78 / 82
4kW / 8600L/min	4kW / 8600L/min	4kW / 8600L/min
100	100	100
650 x 1250 x 1600	650 x 1250 x 1600	650 x 1250 x 1600
26 x 49 x 63	26 x 49 x 63	26 x 49 x 63
185 / 408	185 / 408	185 / 408
Oi-TF	Oi-TF	Oi-TF
UTEC "FLEX"	UTEC "FLEX"	UTEC "FLEX"

# Sealing Material Billet Program

## Sealing Materials

In today's industries, the increasing technical challenges on sealing parts make it ever more important to select the appropriate sealing material for a specific application. Sealing materials are facing ever higher temperatures and pressures, higher sliding speeds and poorer lubrication fluids. Hydraulic fluids such as HFA, HFB and biodegradable fluids (vegetable oils, synthetic esters) present new, and harsher, environments for sealing materials.

UTEC Sealing Solutions offers a wide range of standard compounds, the majority of which have been developed, and are produced, in our own production plant. In addition to our own production, we also supply thermoplastics such as POM, PA, various types of PTFE and advanced engineering plastics, e.g. PEEK.

In sealing technology, the main groups of products are polyurethanes, elastomers and thermoplastics.



## Polyurethanes

Polyurethanes constitute the largest group of sealing materials, and consequently play an immensely important role in today's sealing technology. They are mostly used for piston and rod seals, wipers and as the main sealing material in composite seals.

UTEC Sealing Solutions offers different thermoset polyurethane compounds for a wide range of applications:

**PU | PU-H | PU-HTQ | PU-FG | PU-LT | PU-SL | PU-HT | PU-X | PU-XH | PU-XSL**

## Rubber Elastomers

Elastomers are a group of polymers with very high elasticity and flexibility, and can be considered the oldest group of polymers used in sealing technology. Elastomers are mainly used for piston and rod seals, compact seals, O-rings and preloading elements in composite seals.

UTEC Sealing Solutions offers a wide range of rubber materials to satisfy their customers' needs and requirements:

**NBR | NBR-FDA | H-NBR | H-NBR-LT | EPDM | EPDM-FDA | FPM | FPM-Black | MVQ | TFE/P**

## Thermoplastics

Thermoplastics, or plastomers, are a group of polymers with relatively high rigidity, and are mainly used as back-up rings, guide rings, bushings and engineered plastic parts.

UTEC Sealing Solutions can supply the most sought-after thermoplastics for those uses:

**POM | POM-Black | PA | PA-Black | PEEK | UHMW-PE | Phenolic resin + polyester + PTFE |  
PTFE-virgin / + Glass + MoS<sub>2</sub> / + Bronze / + Carbon / + Graphite / + Ekonol / + PEEK**

# Seals

## Machined seals

UTEC Sealing Solutions have the capability to machine seals with an outer diameter (OD) up to 4.000mm (157in) at our facilities in Suzhou. With 10 machines operational all week long, a quick turnaround on seal orders, large or small, is virtually guaranteed.

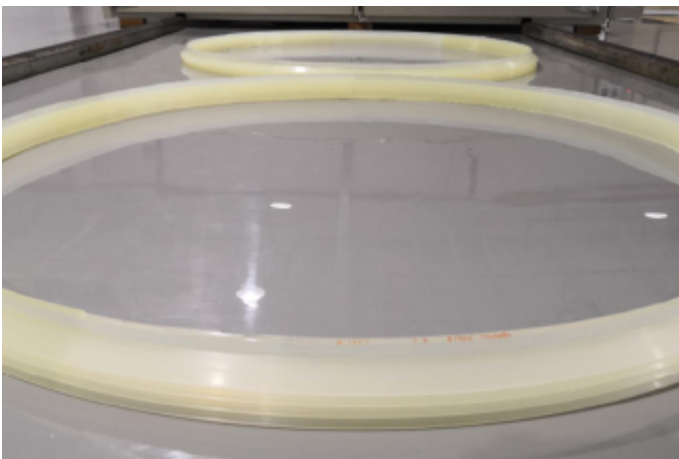


## Molded seals

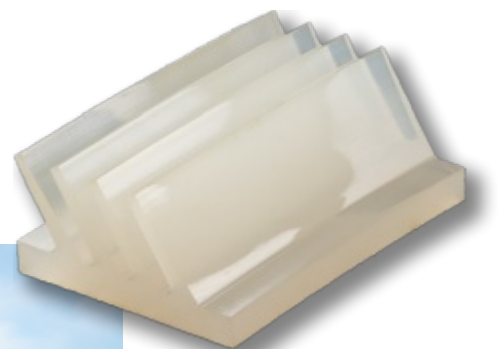
UTEC Sealing Solutions also offer a range of standard sealing components, such as guide rings and guide tapes, but also molded seals: Wiper W02 and compact piston seal type U105.



## TBM seals



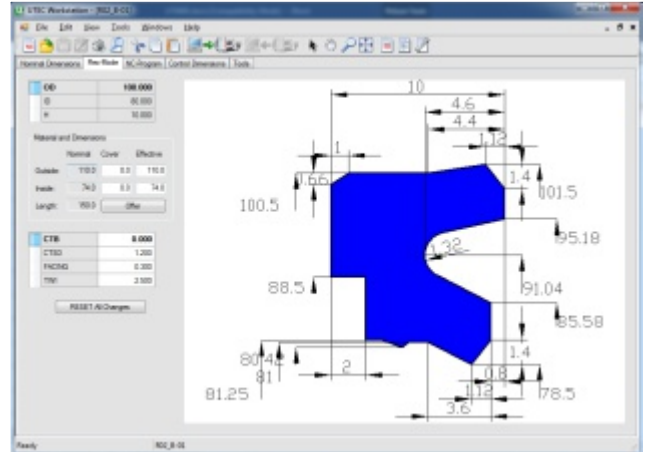
In addition to machined seals, UTEC Sealing Solutions has also improved the production process for seals for Tunnel Boring Machines (TBM). At our facilities in Suzhou, we can produce virtually any seal size for TBMs out of Polyurethane.



# Your Partner for Sealing Technology

UTEC Sealing Solutions is a leading manufacturer and supplier of high quality hydraulic and pneumatic seals, engineered plastic parts, high performance sealing materials and turn-key seal manufacturing technology.

With our extensive expertise, UTEC Sealing Solutions is able to support our customers with design, prototyping, production, test and installation utilizing state-of-the-art technology. UTEC Sealing Solutions fulfills challenging service requirements, supplying standard seals in volumes or single and medium series of custom manufactured parts with shortest delivery times.



## Our Mission

UTEC Sealing Solutions is a strong global partner for our customers and suppliers. We build long-term partnerships by providing leading technology and excellent service.

UTEC Sealing Solutions offers an outstandingly comprehensive range of sealing products, providing the best in elastomer, thermoplastic, PTFE and composite technologies.

UTEC Sealing Solutions provides cost-effective, durable solutions that match the specific requirements of our customers.

## Today and in the Future

UTEC Sealing Solutions is excellently equipped to meet the demands of today's sealing technology. With our policy of product development and our commitment to quality and excellence, we will continue meeting the future demands of the various industries with products at the forefront of technology.



**UTEC**

sealing solutions

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