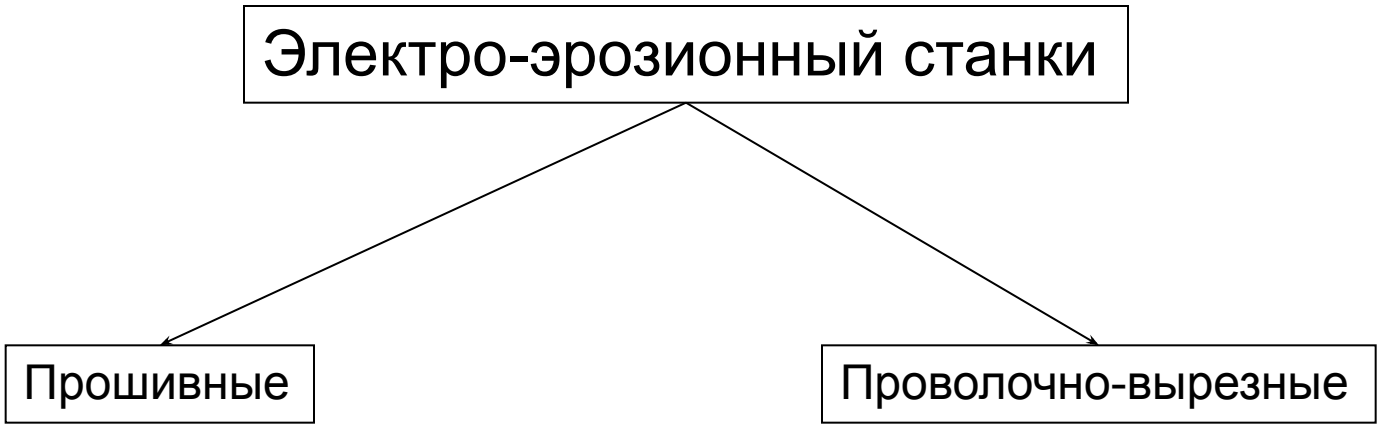
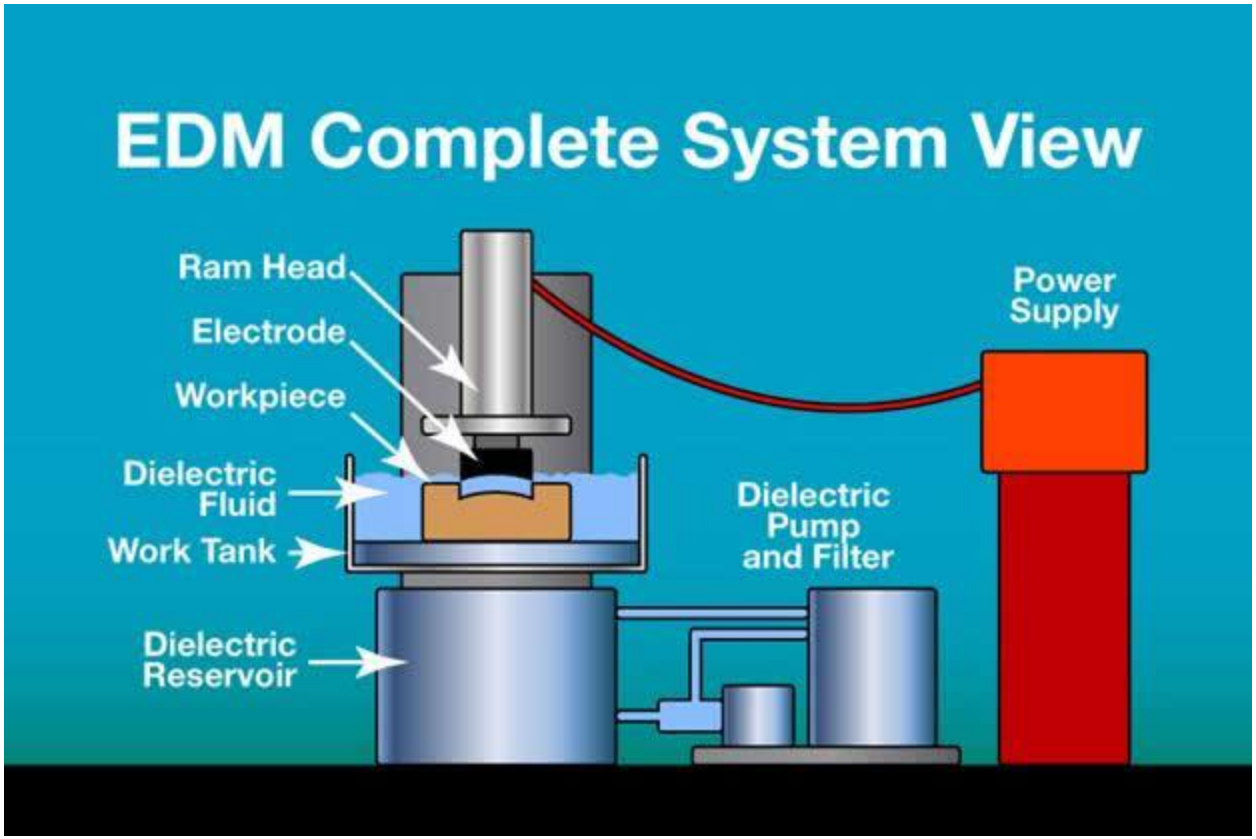
Электро-эрозионный станки

Программирование

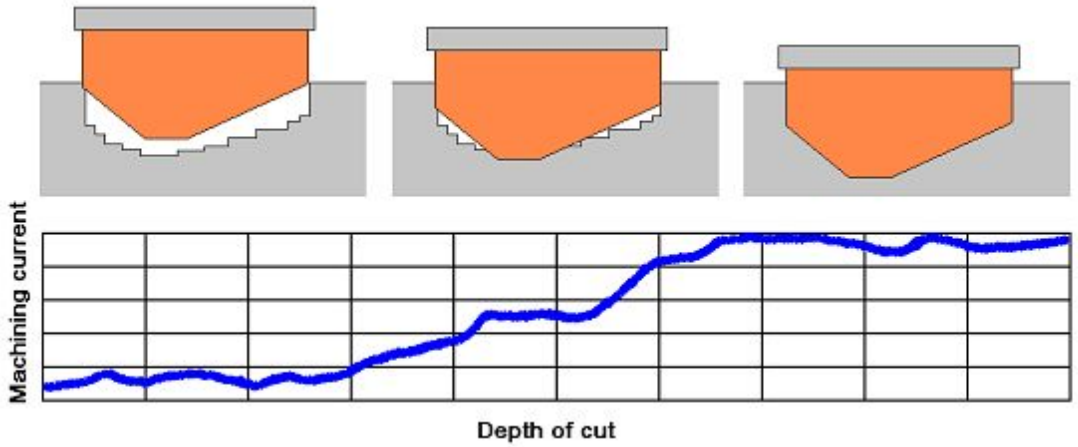

Электро-эрозионный станки
Прошивные
Проволочно-вырезные

Прошивные электро-эрозионные станки

Элементы станка

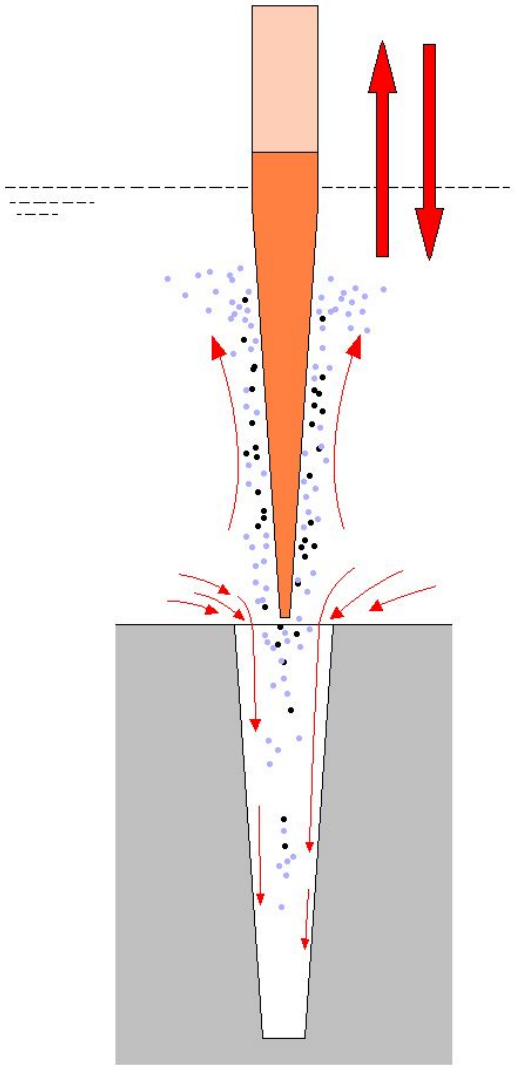


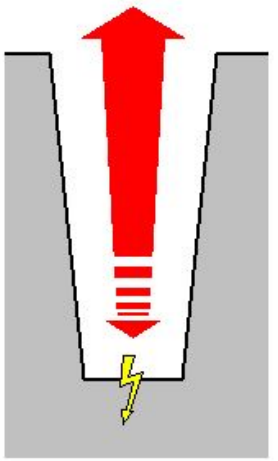
The machining current is optimally controlled according to the change in the electrical discharge area as machining proceeds.



- **Rough machining time is reduced.**
- **Eliminate abnormal electrode wear and arcing.**

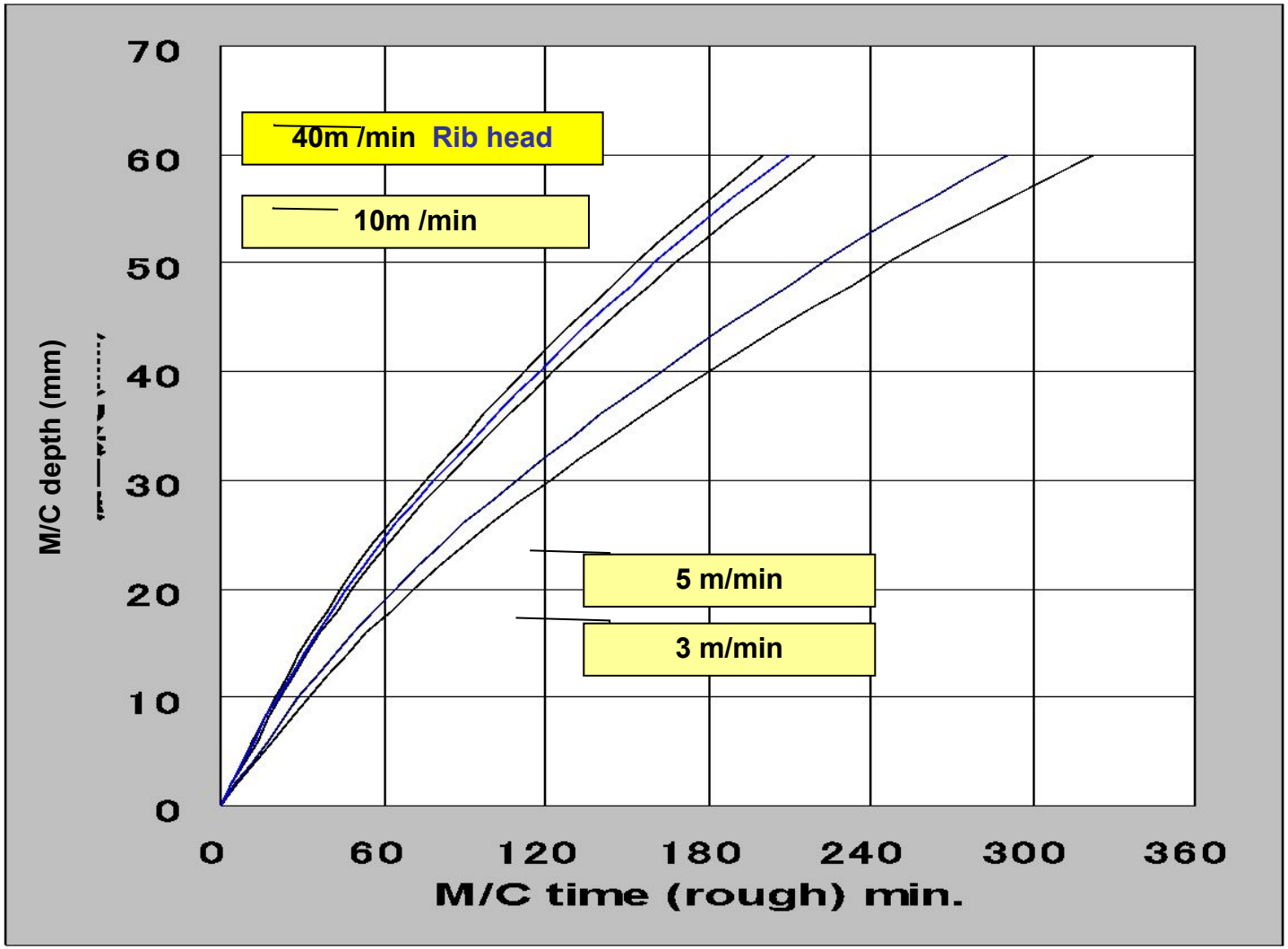
Технологии

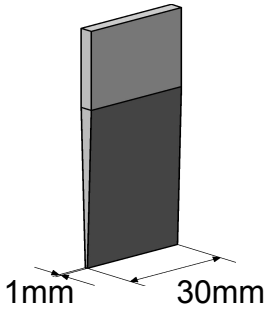


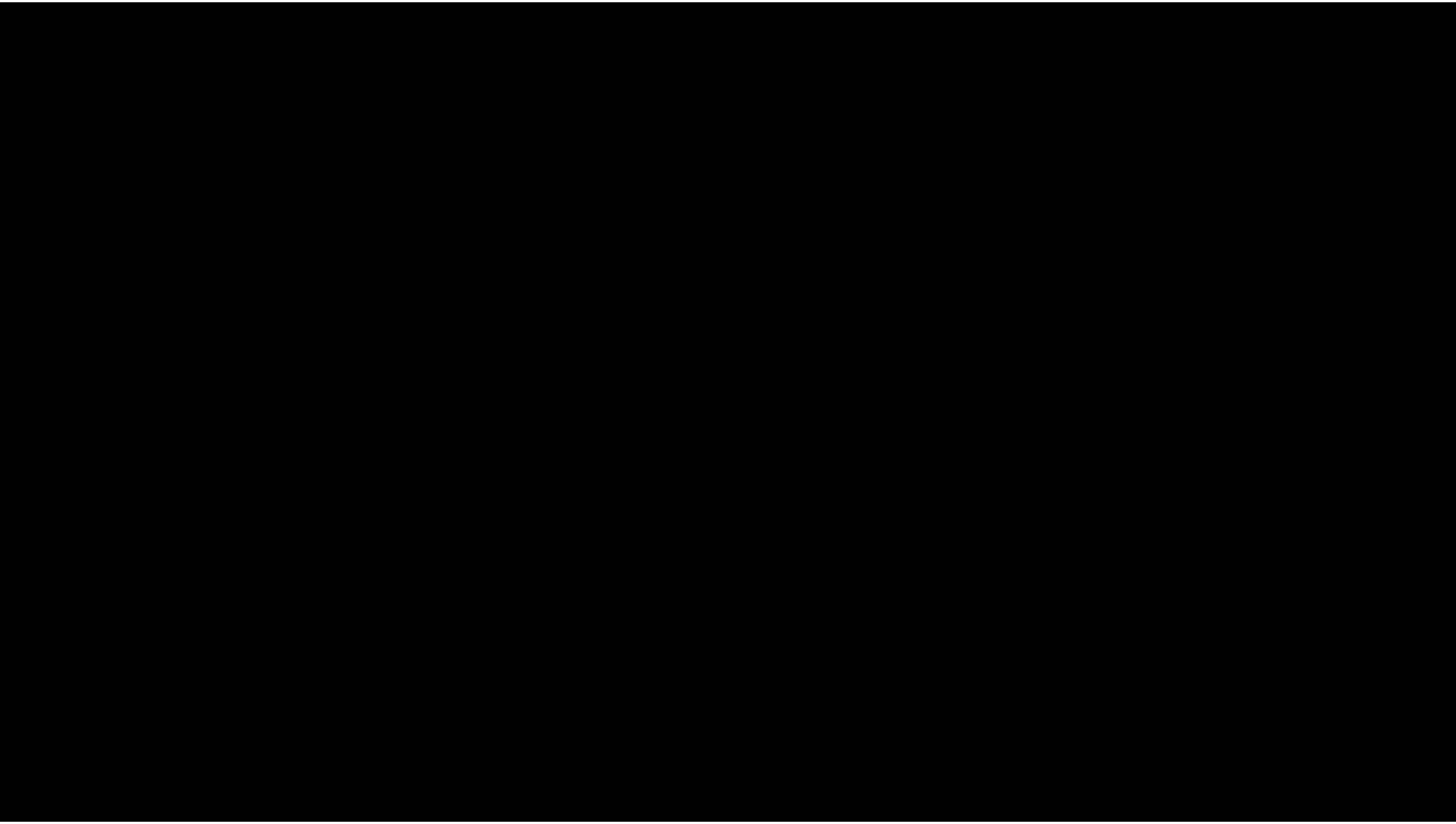


- **Eliminate gas and chips that collect alongside the electrode.**
- **Stabilize machining and reduce rough machining time.**
- **Effective for deep machining.**

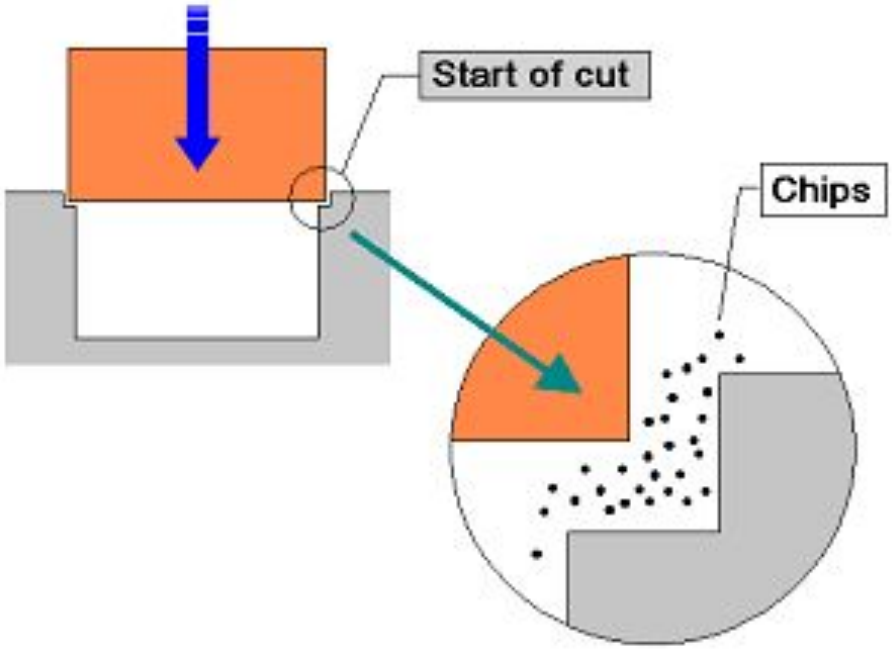
Rough machining time depends on jump Speed

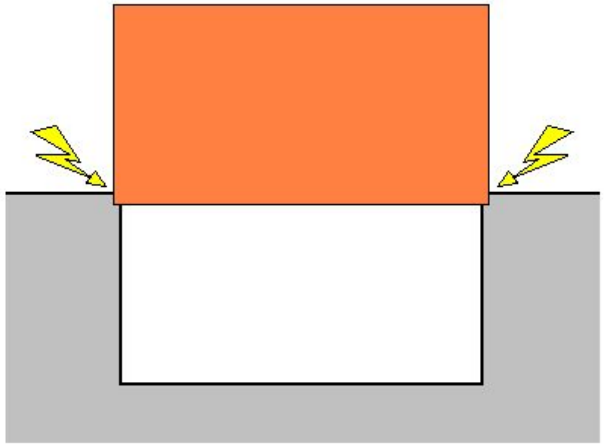






Технологии





Machining condition and jump motion are optimally controlled at chamfer (lead in), thereby she reaches a stable machining state quickly.

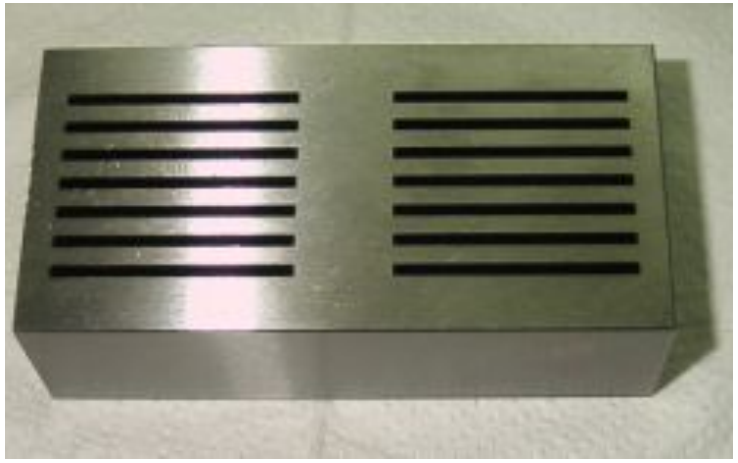
Примеры деталей

Work-piece material: NAK80
Machining depth: 20mm
Rate of high speed jump: 5m/min
Surface finish: 5μmRy

Electrode: Gr(EX70) **200×50mm**
Width of Rib: 1mm
Number of electrode: 2
Electrode reduction: 0.15mm

	conventional	Super Spark	Super Spark II
Overall	44H 52min	32H 22min (-28%)	27H 52min (-38%)
Roughing	26H 32min	14H 02min (-47%)	14H 02min (-47%)
Finishing	18H 20min	18H 20min (-0%)	13H 50min (-25%)

Примеры деталей

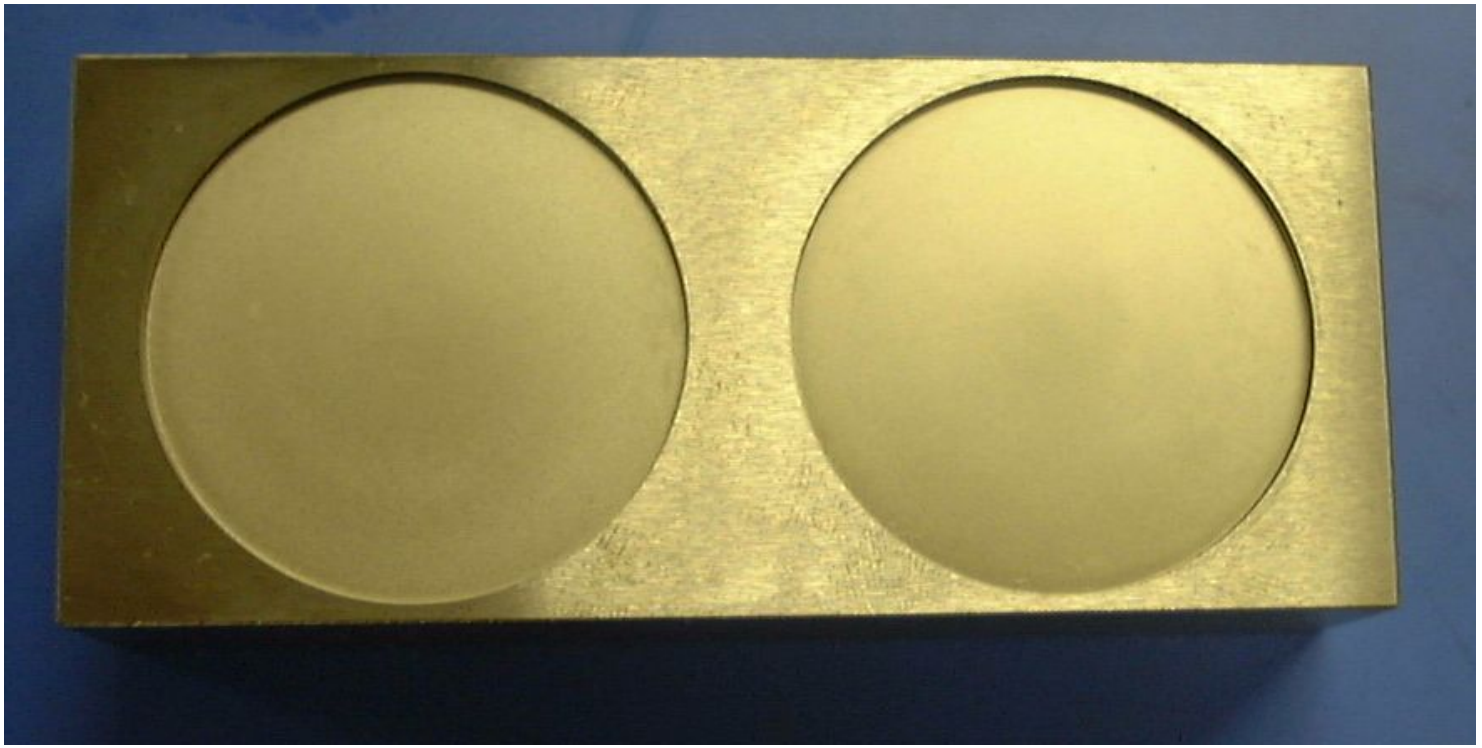


Work-piece material: NAK80
Machining depth: 20mm
Rate of high speed jump: 5m/min
Surface finish: 5μmRy

Electrode: Gr(EX70) **90×30mm**
Width of Rib: 1mm
Number of electrode: 2
Electrode reduction: 0.15mm

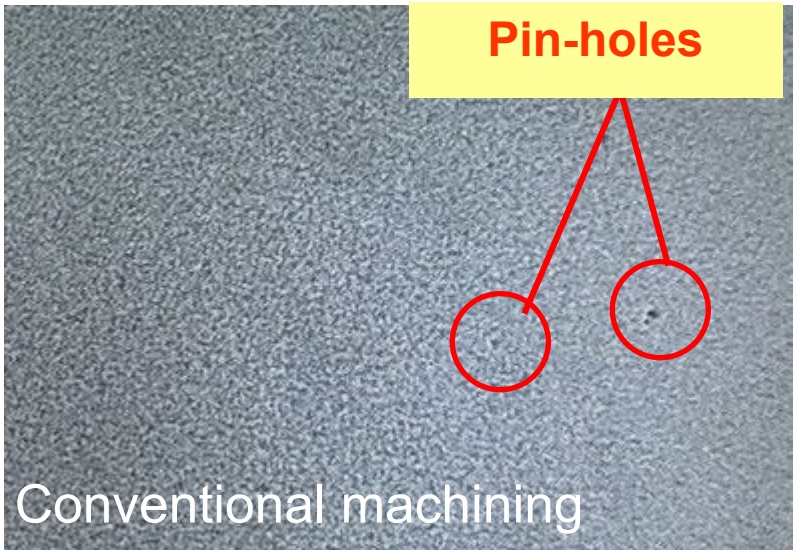
	conventional	Super Spark	Super Spark II
Overall	17H 20 min	11H 22min (-34%)	9H 12min (-47%)
Roughing	11 H	5H 22min (-51%)	5H 22min (-51%)
Finishing	6H 20min	6H (-5%)	3H 50min (-39%)

Примеры деталей



No pin holes on the surface.

Magnification rate : 50

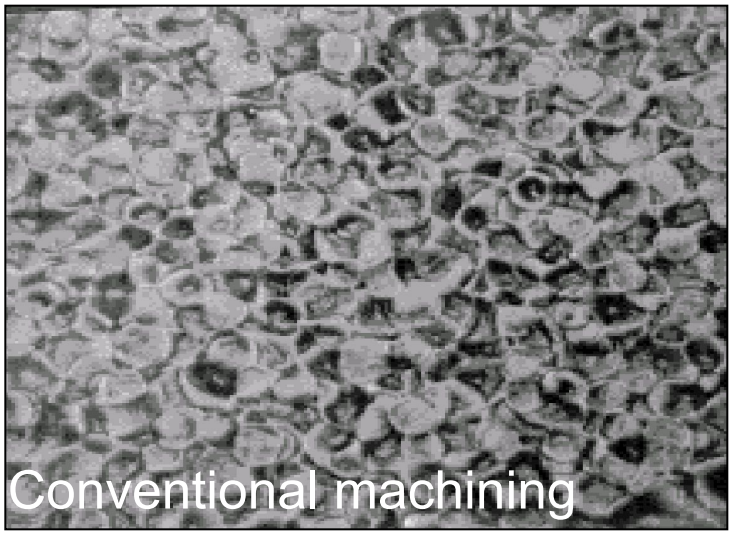


(0.21μm Ra, 1.70μmRy)

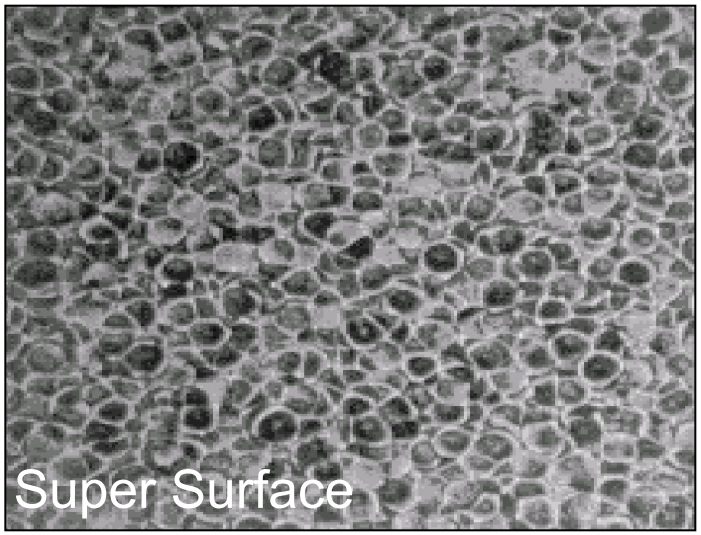
(0.18μmRa, 1.34μmRy)

Different of grain diameter.

Magnification rate : 400

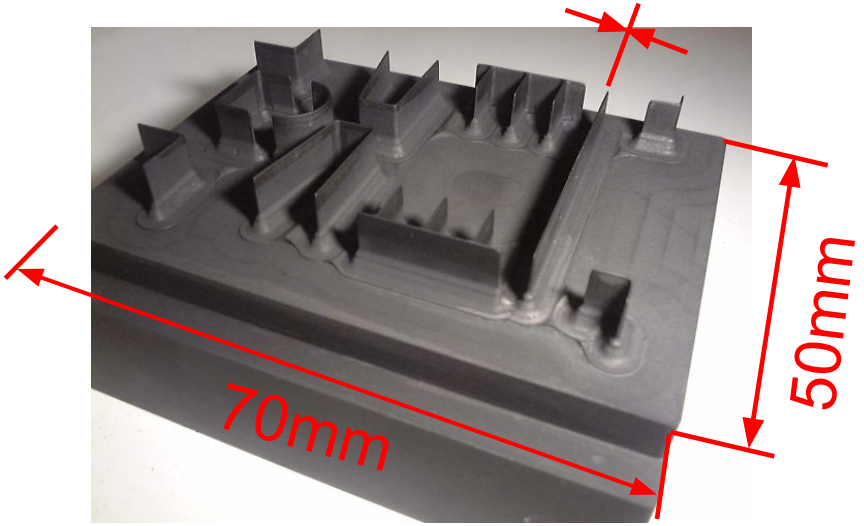


(0.21μm Ra, 1.70μmRy)



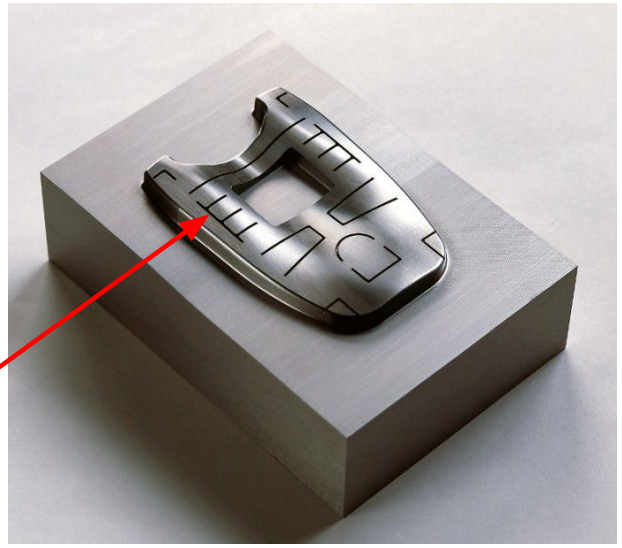
(0.18μmRa, 1.34μmRy)

Reducing polishing time … Superior surface finishes can be achieved with a graphite electrode.



A multi-rib for mobile phone machined by V56

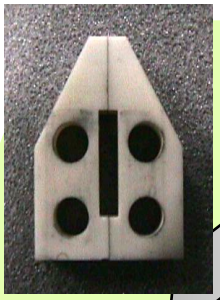
Electrode : Poco EDM3
Electrode reduction : 0.1mm
Number of electrodes : 2
Machining depth : 4.0 mm
Work-piece : HPM50
Machining time : 4hr30min.

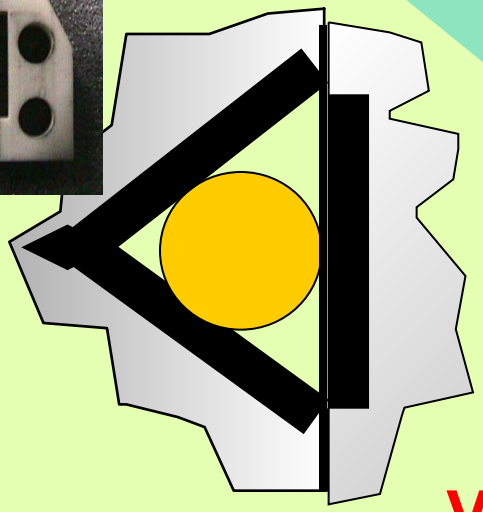


Surface finish : Ra 0.16um

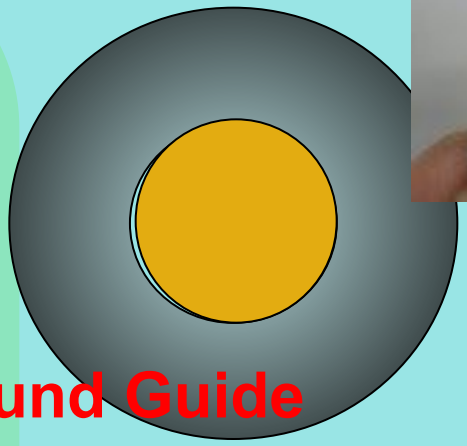
Проволочно-вырезные электро-эрозионные станки

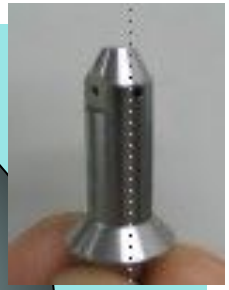
Элементы станка





SP43/SP64





Round Guide

V-Flat Guide

UPH-2/UPJ-2

U32j/U53j/U53Tj

U86

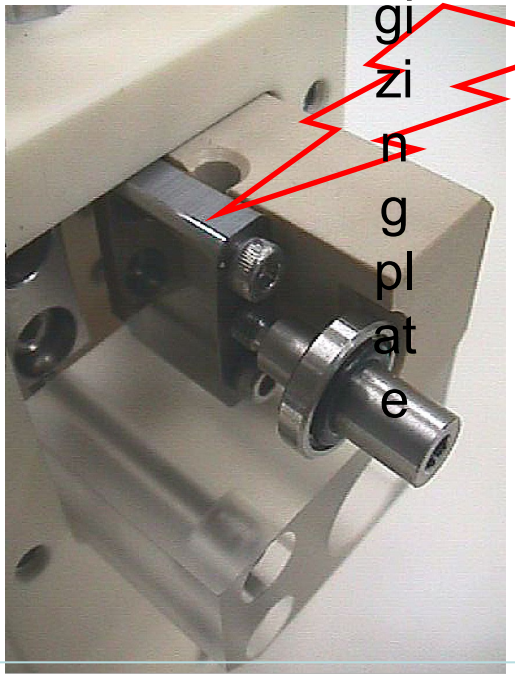
W32FB/W53FB

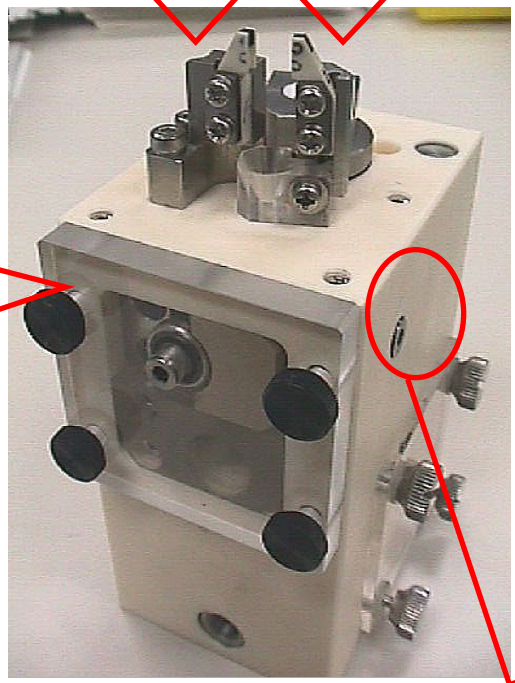
Элементы станка

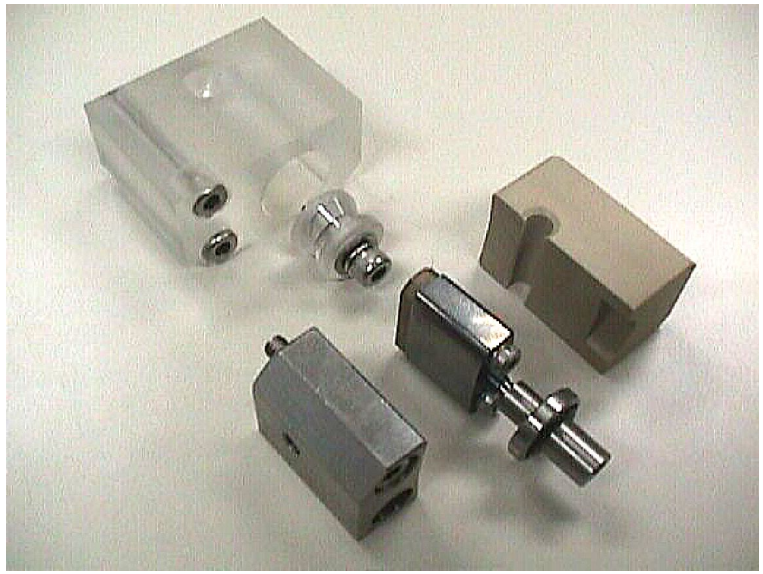
V-guide (Wire guide)

Flat-guide (Clamp guide)

Energizing plate

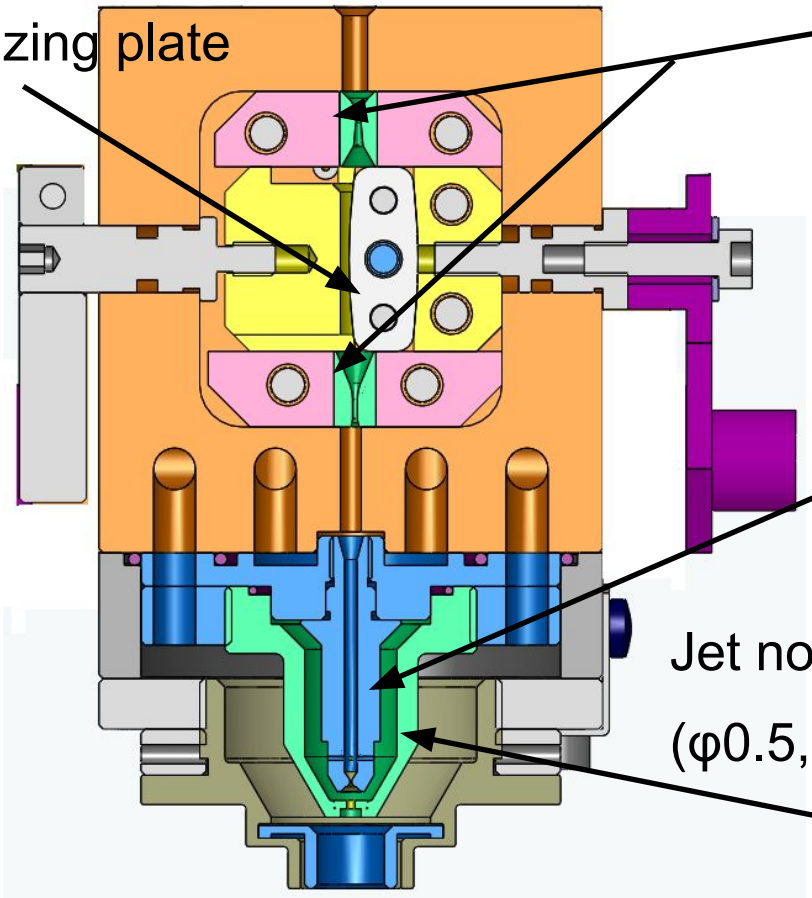






Close/Unclose

Элементы станка



Energizing plate

V guide

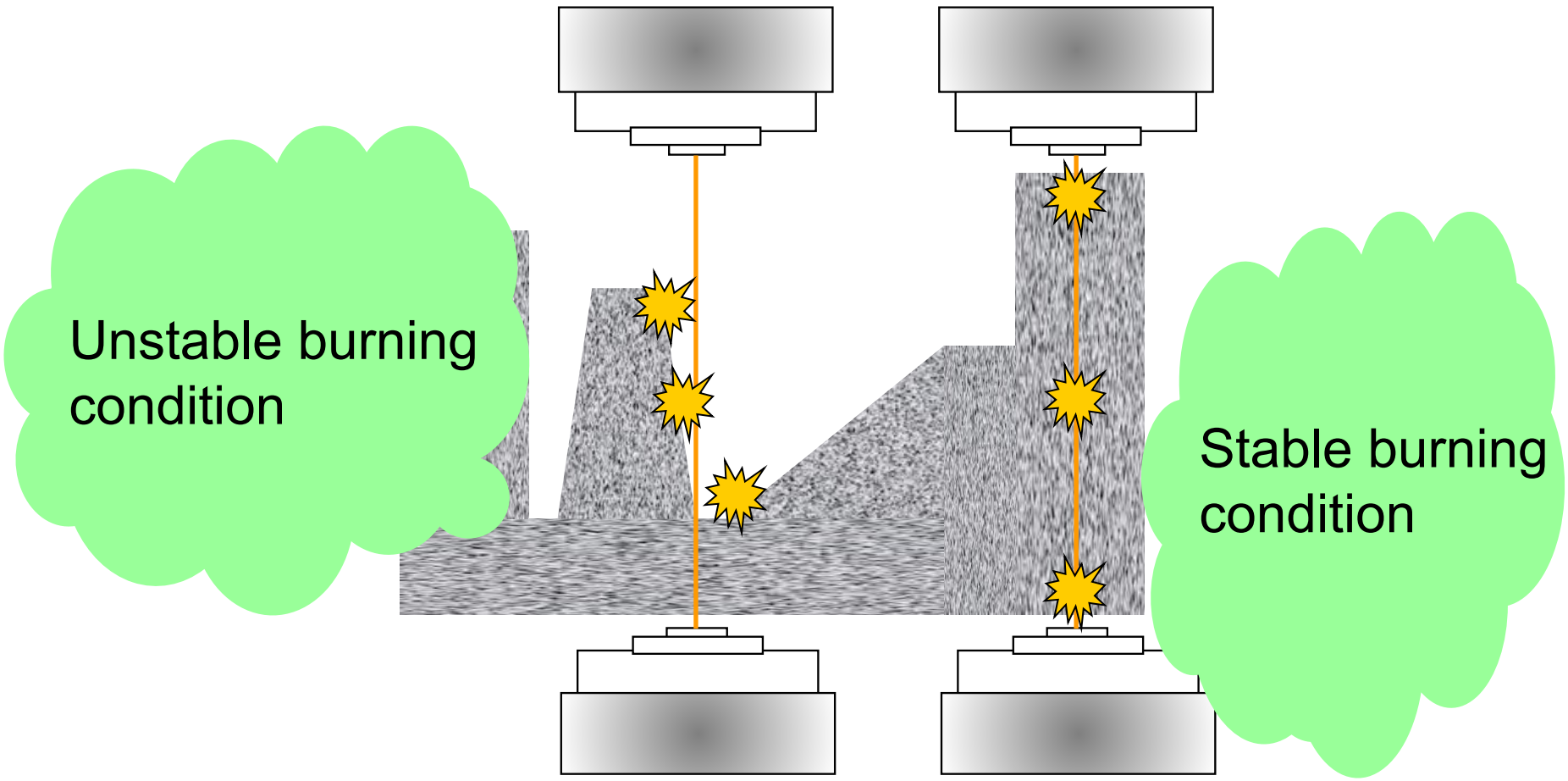
Round guide

(For φ0.07, 0.1, 0.15, 0.2, 0.25mm)

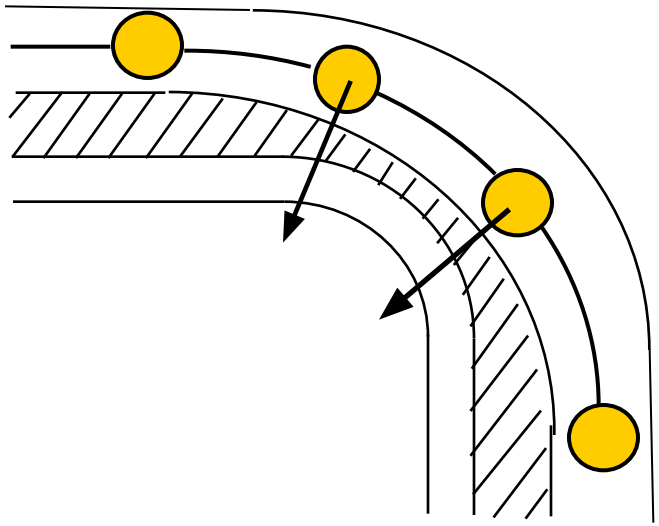
Jet nozzle

(φ0.5, 0.7, 1.0, 1.5mm)

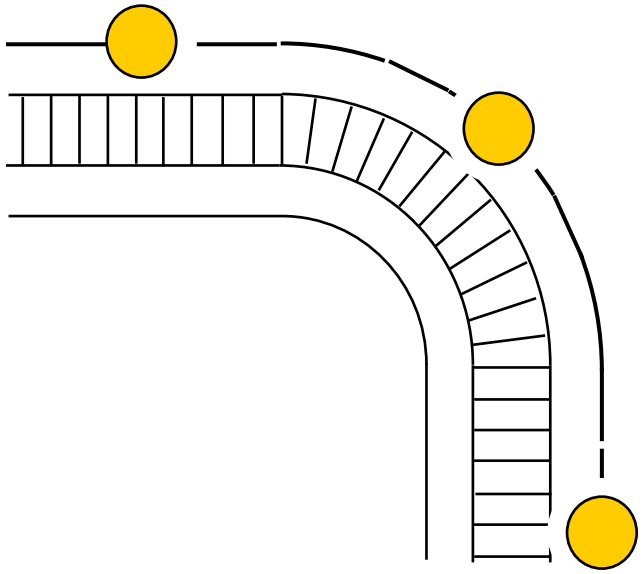
Технологии



V-corner / **OFF**

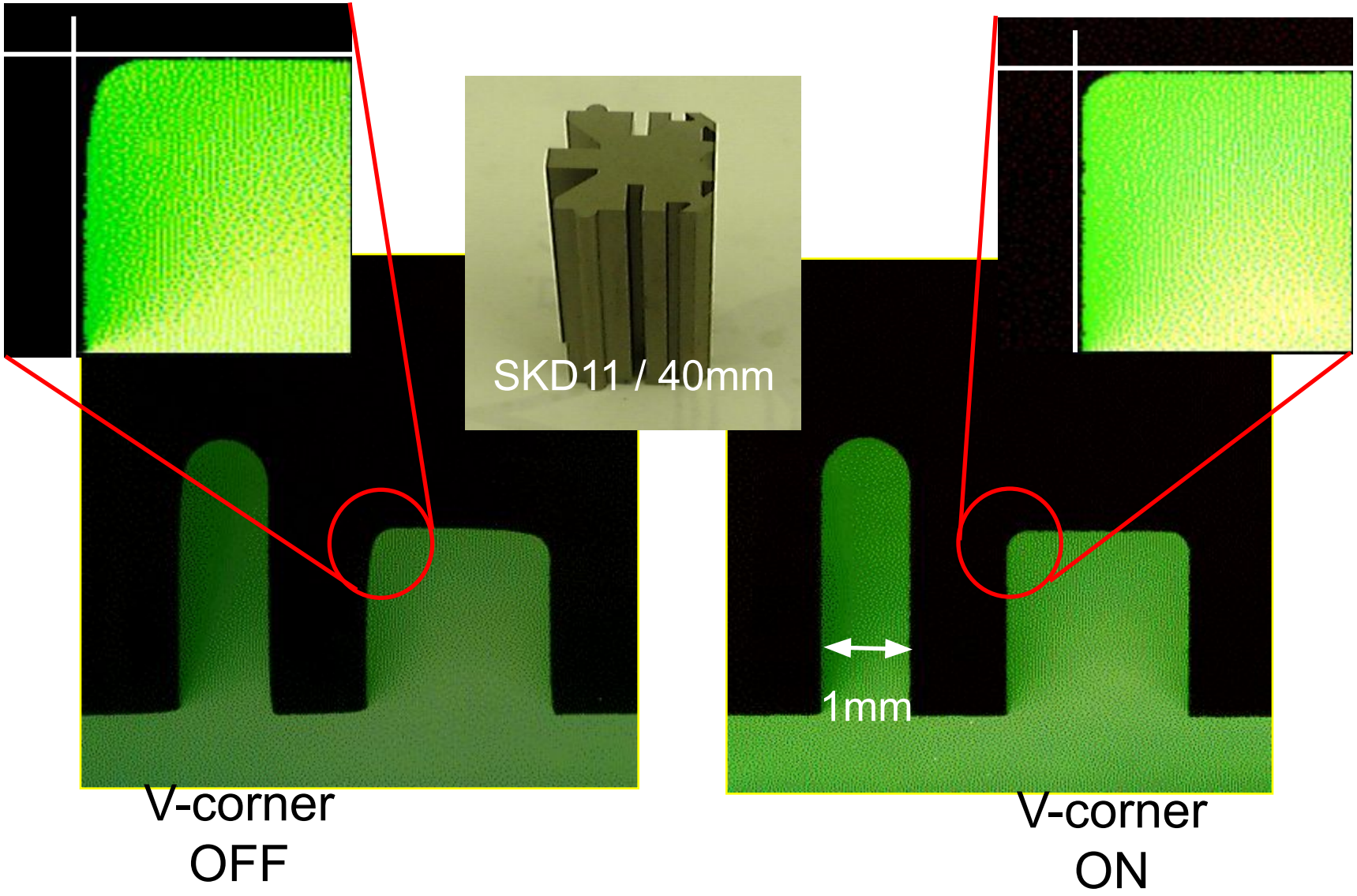


V-corner / **ON**



In the 1st pass, wire feed delay (corner washout) is compensated for in real time so that the same amount of material can be removed consistently in the 2nd pass.

Технологии



Технологии

Total machining time : 14 hrs / 9 pieces

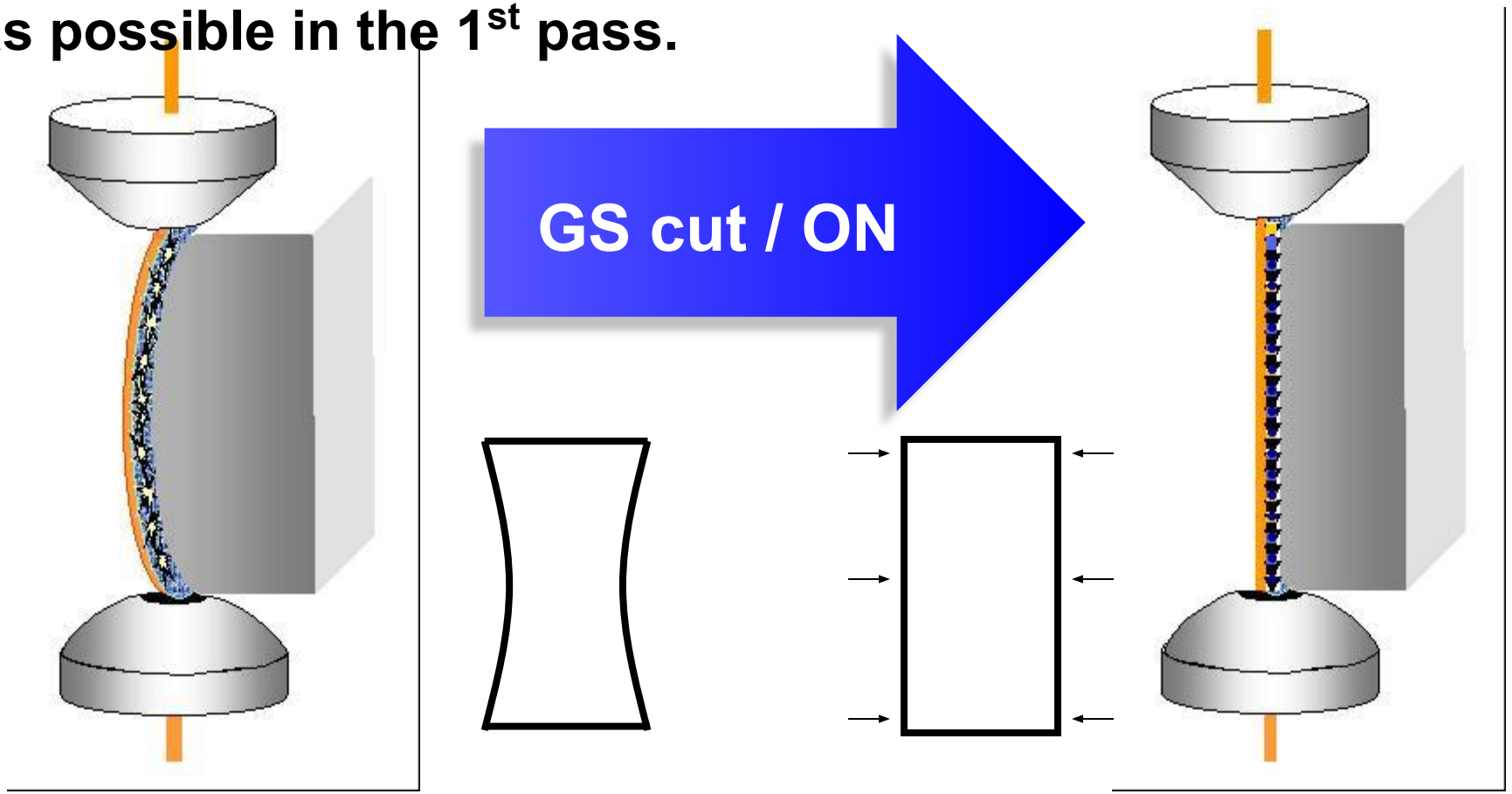
Material : SKD11(JIS) / Similar to 1.2379 (DIN)

Used wire : φ0.2Bs / U32j

Surface roughness : 1.0μmRy / 0.09μmRa

Clearance : 2.5μm

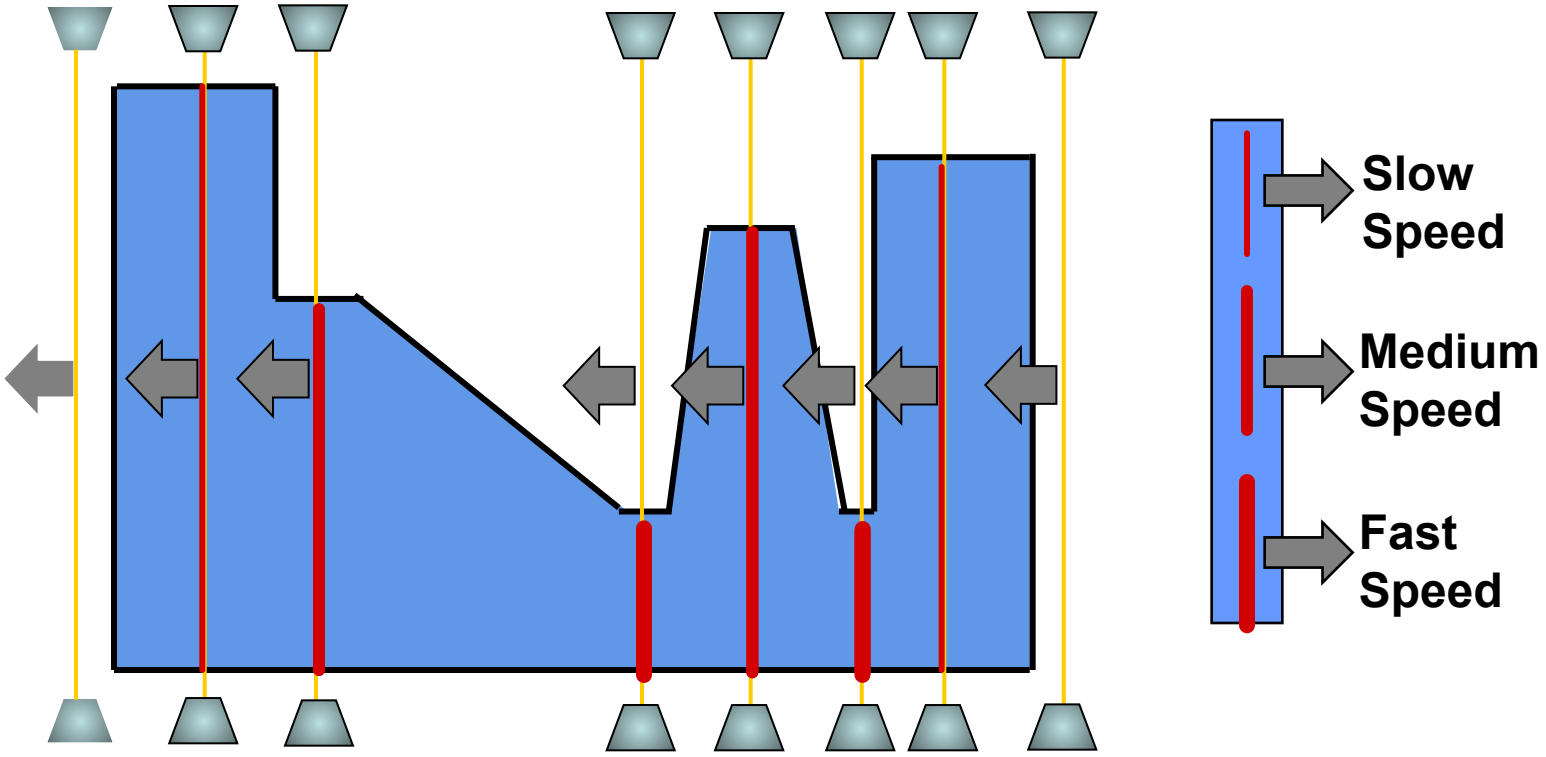
A key technology to achieve superior straightness when cutting a thick work-piece is to minimize the error as much as possible in the 1st pass.



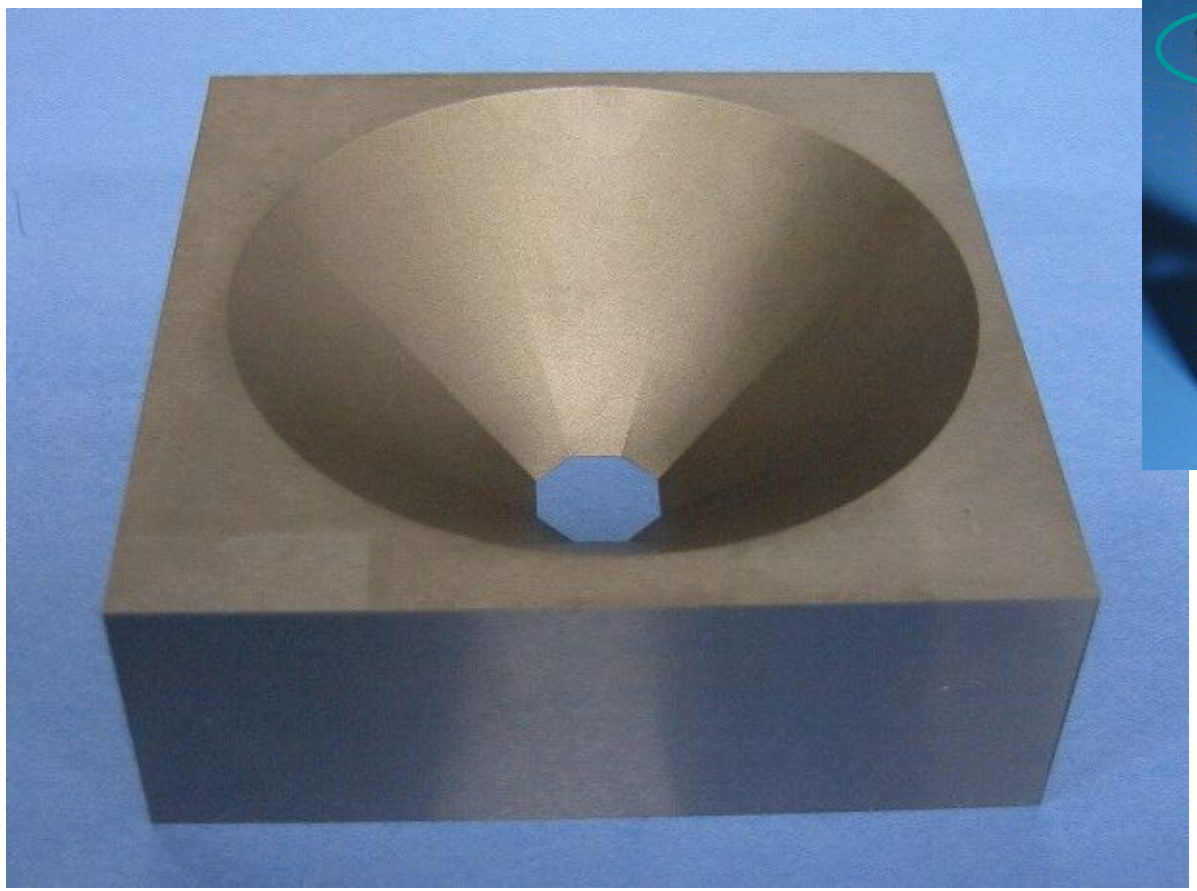
Stable machining

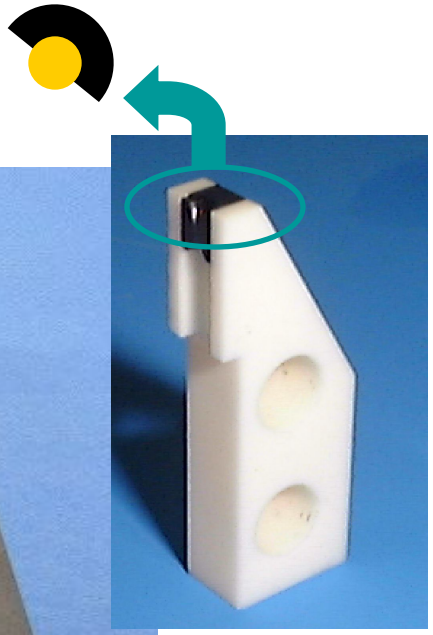
Faster machining speed

Better machining performance



Технологии





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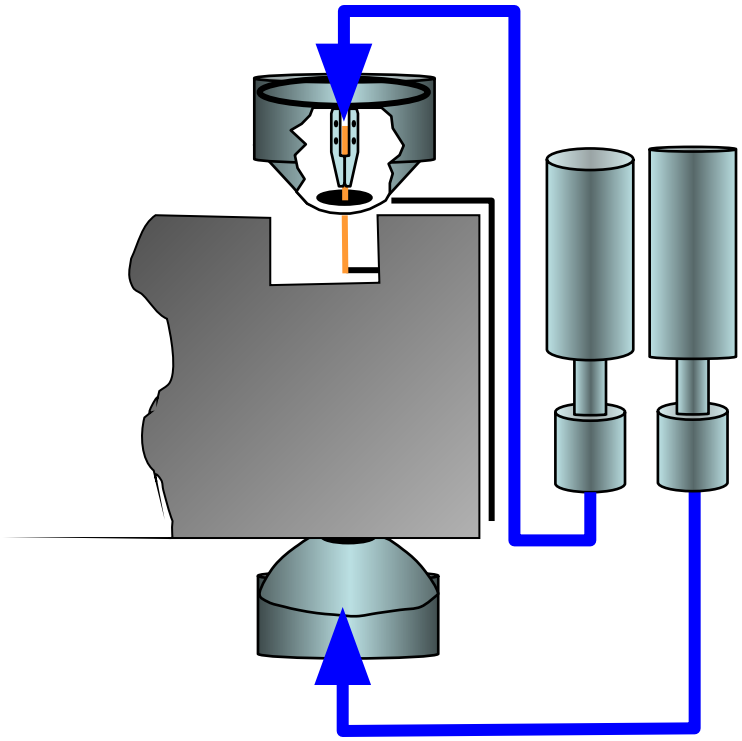
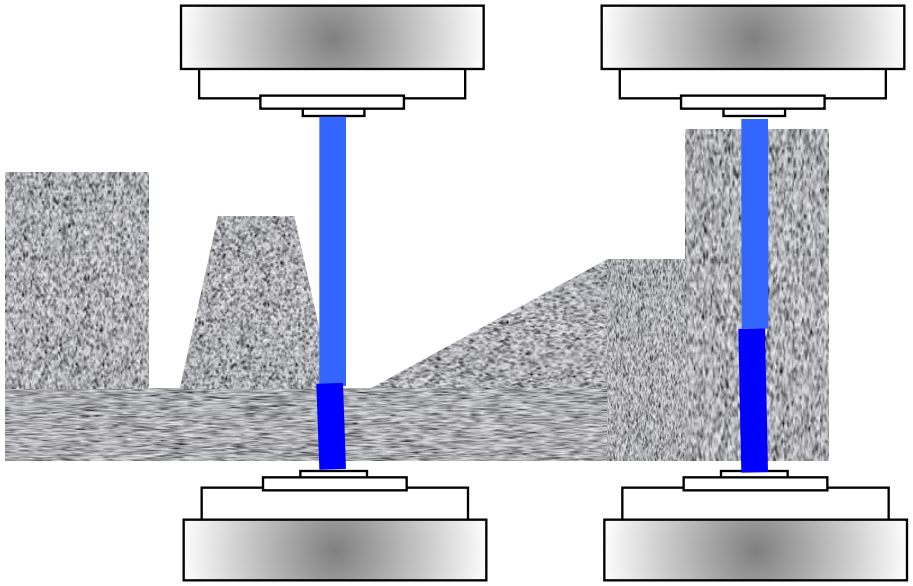




Two sensors installed separately for upper and lower head monitor the flushing condition so that this can provide optimal cutting speed and prevent wire breaks.

Программирование

Управляемые оси

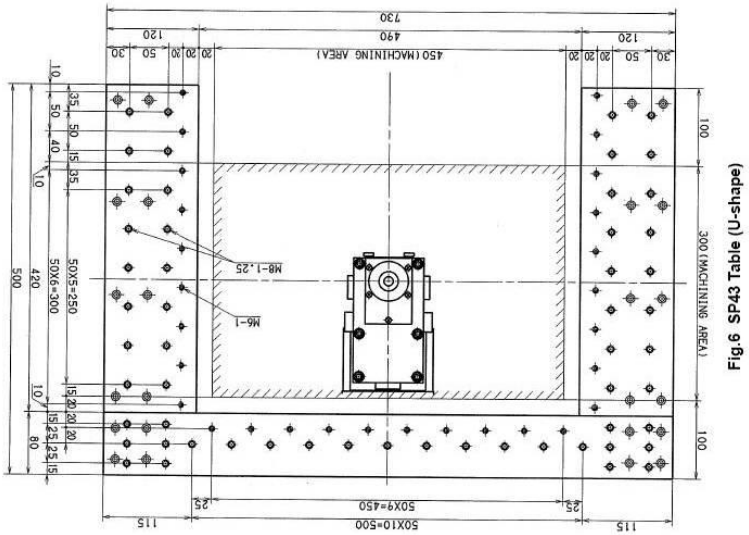
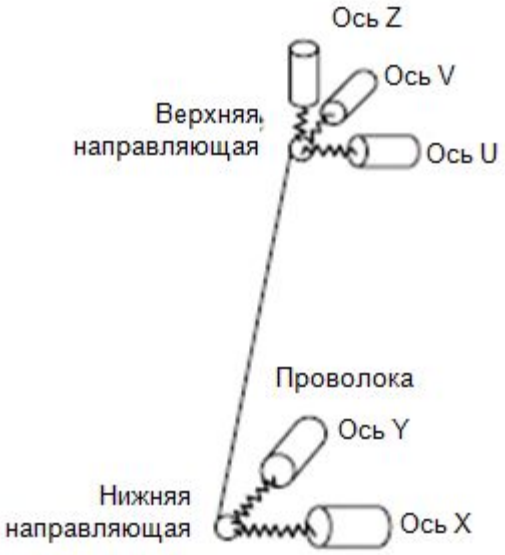


Fig.6 SP43 Table (U-shape)

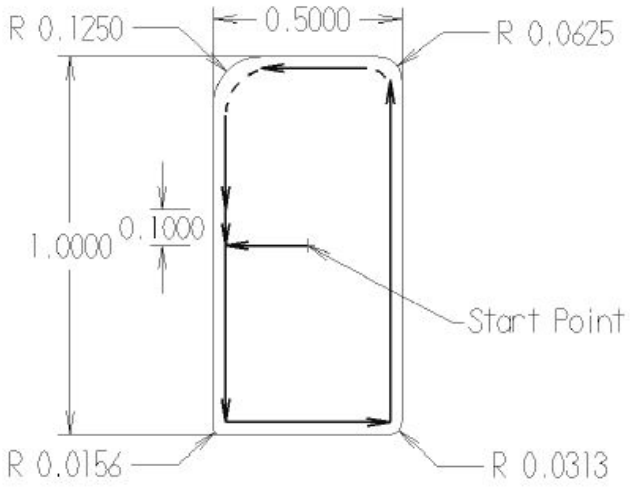


No	Description	Function and format
G00	Быстрый ход	G00 (X_) (Y_) (U_) (V_);
G01	Лин. интерпол.	G01 (X_) (Y_) (U_) (V_);
G02	Круговая интерполяция по часовой стрелке	G02 (X_) (Y_) (I_) (J_); X_Y_: End point coordinates of arc I_J_: Incremental distance to arc center from start point G02 (X_) (Y_) (R_); X_Y_: End point coordinates of arc R_: Radius of arc (R negative is for arc exceeding 180°)
G03	Круговая интерполяция против часовой стрелки	G03 (X_) (Y_) (I_) (J_); X_Y_: End point coordinates of arc I_J_: Incremental distance to arc center from start point G03 (X_) (Y_) (R_); X_Y_: End point coordinates of arc R_: Radius of arc (R negative is for arc exceeding 180°)
G40	Отмена корр.	G40 G01 (X_) (Y_);
G41	Коррекция на радиус слева	G41 G01 D_ (X_) (Y_); D = offset value D0 – D9: Indirect offset command D10 – D9999: Direct command of offset amount D0. – D9.999: Direct command of offset amount Note: Negative offset values are allowed
G42	Коррекция на радиус справа	G42 G01 D_ (X_) (Y_); D = offset value D0 – D9: Indirect offset command D10 – D9999: Direct command of offset amount D0. – D9.999: Direct command of offset amount Note: Negative offset values are allowed

G50	**Отмена конуса**	G50 G01 (X_) (Y_);
G51	**Обработка конуса слева**	G51 T_ (X_) (Y_); T = Taper value Degree → 3°..... T3.0 Deg Min Sec→ 1°25' 10"..... T12510 Note: For input of Deg Min Sec values, the TAPER DMS button on the OTHERS page must be enabled.

No	Description	Function and format
G52	**Обработка конуса справа**	G52 T_ (X_) (Y_) ; T = Taper value Degree → 3°..... T3.0 Deg Min Sec→ 1°25' 10"..... T12510 Note: For input of Deg Min Sec values, the TAPER DMS button on the OTHERS page must be enabled
G500 G54	**Система координат**	G501G55; Valid WCS G500-G515 & G54-G61 There are a total of 128 different user definable WCS.

No	Description	Function and format
M00	**Безусловный останов**	M00; G1 (X_) (Y_) M00;
M01	**Условный останов**	M01; G1 (X_) (Y_) M01; Optional Stop can be selected to ignore the stop by turning off the OPTIONAL STOP button on the OTHERS page.
M06	**Заправка проволоки**	M06; G00 (X_) (Y_) M06;
M07	**Обрезка проволоки**	M07; G01 (X_) (Y_) M07;
M17	**Включение генератора**	M17; The M17 must precede every M06 to turn ON machining power.
M30	**Конец програм.**	M30;
M98	**Вызов подпрограммы**	M98 (O_) (P_) (R_) (B_); O : Subprogram Operation number to be called (O number) P : Subprogram sequence no. to be called (N number) R : Repeat times for calling (default is 1) B : Number of program blocks (lines) to be executed after execution of repeat time Note: O and P cannot be omitted at the same time
M99	**Конец подпрограммы**	M99; M99 (P_) (R_); P : Returns to sequence no. specified by P after execution of a subprogram called by M98 R : Changes R (repeat times) specified by M98

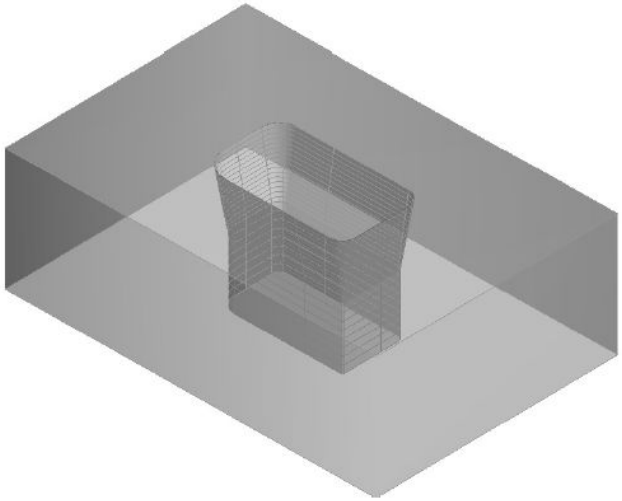


Program	Explanation
%	
O0100	*Operation Number
(Die Cavity 1/2004)	*Program Names & Comments
(Reference Dimensions 1.000 x 0.500)	
G90	*Absolute Position Mode
G500 G54	*WCS Callout
G0 X0. Y0. M06	*Rapid Position to Start Point and thread wire
M17	*Turn Machining Power On (Auto-fills tank)
E1073 D0.0063	*Change Power setting(E-code)and Offset value
G41 G1 X-.25	*Turn Wire Comp Left ON and Machine to X Position
Y-.48438	*Straight Line Machining
G3 X-.23438 Y-.5 I.01563	*CCW Radius Machining
G1 X.21875	*Straight Line Machining
G3 X.25 Y-.46875 J.03125	*CCW Radius Machining
G1 Y.4375	*Straight Line Machining
G3 X.1875 Y.5 I-.0625	*CCW Radius Machining
G1 X-.125	*Straight Line Machining
G3 X-.25 Y.375 J-.125	*CCW Radius Machining
G1 Y.1	*Straight Line Machining
M01	*Optional Stop
Y0.	*Straight Line Machining
G40 X0.	*Straight Line machining and Cancel Wire Comp
M07	*Cut Wire
M30	*End Program
%	

Program Plane: 0.00000

Sub Plane: 0.50000

Machine Z: Z position



```
%
O0100                                   *Operation Number
(Die Cavity 1/2004)                     *Program Names & Ccmments
(Reference Dimensions 1.000 x 0.500)
G90                                     *Absolute Position Mode
G500 G54                                *WCS Callout
G0 X0. Y0. M06                          *Rapid Position to Start Point and thread wire
M17                                     *Turn Machining Power On (Auto-fills tank)
E1073 D0.0063                           *Change Power setting(E-code)and Offset value
G41 G52 G1 X-.25 T9.5                   *Wire Ccmp Left,Taper Right,Machine X Position,Taper Value
Y-.48438                                *Straight Line Machining
G3 X-.23438 Y-.5 I.01563                *CCW Radius Machining
G1 X.21875                              *Straight Line Machining
G3 X.25 Y-.46875 J.03125                *CCW Radius Machining
G1 Y.4375                               *Straight Line Machining
G3 X.1875 Y.5 I-.0625                   *CCW Radius Machining
G1 X-.125                               *Straight Line Machining
G3 X-.25 Y.375 J-.125                   *CCW Radius Machining
G1 Y.1                                  *Straight Line Machining
M01                                     *Optional Stop
Y0.                                     *Straight Line Machining,
G40 G50 X0. T0.                         *Cancel Ccmp,Cancel Taper,Straight Line machining, Taper 0
M07                                     *Cut Wire
M30                                     *End Program
%
```