

## Q&A

**Q-1** What is the most recommended condition for MSR?

**A-1**  $V_c=150\text{m/min}$ ,  $f_z=0.2\text{mm/t}$ , larger cutting depth and smaller cutting width

**Q-2** Required equipments for MSR?

**A-2** Maximum spindle revolution should be lower than  $4000\text{min}^{-1}$ . BT50 or larger.

\*MSR is not only for Double column machining center.  
The reason why not recommended for high RPM spindle machine is its less torque.  
\*Although MSR works with BT40 shank, maximum available  $f_z$  is about  $0.1\text{mm/tooth}$ .

**Q-3** What is the points to remember in case of less power machine?

**A-3** Do not use large size cutters.  
 $\Rightarrow \phi 63$  or  $\phi 80$  is recommended  
 Set up conditions to get the largest available torque by checking torque curve of the machine.  
 Tried under condition of  $V_c=150\text{m/min}$ , enough torque was not gained because of high gear.  
 In this case, it has to be prioritized using  $V_c$  which can exert enough torque as  $V_c=120\text{m/min}$ .  
 Please increase cutting speed and decrease feed rate.  
 \*Machine torque curve will be prioritized.

**Q-4** In case of unstable workpiece.

**A-4** Decrease feed ratio at start cutting workpiece. \* Almost all cases of moving workpiece happens when start machining

◎Effective for increasing cutting speed and decrease feed rate.

$V_c=150\text{m/min}$ ,  $f_z=0.2\text{mm/t}$   
 $\downarrow$   
 $V_c=200\text{m/min}$ ,  $f_z=0.15\text{mm/t}$

**Q-5** What is the tool life?

**A-5** Chip weight: 700kg/Corner (Result by PR660)  
 Machining time: 90min. (calculated value)  
 Machining distance: 65m (calculated value)  
 • How great 1000cc/min?  $\Rightarrow$  About 7.8kg chips removed per minute  
 • Tool life time =  $700\text{kg (Chip weight)} \div 7.8\text{kg (Chip evacuation amount per 1min)} = 90\text{min}$   
 • Machining distance =  $90\text{min (Time by the end of tool life)} \times 717\text{mm/min (Table feed ratio per 1min)} = 65\text{m}$   
 \*In case of machining  $V_c=150\text{m/min}$ ,  $ap \times ae$ :  $20 \times 70\text{mm}$ ,  $V_f=717\text{mm/min}$ .  
 \*Tool : MSR100R-2 (6 Flutes)

**Q-6** How to reduce chattering.

**A-6** If chattering is caused under.  
 ●In case of chattering machining environment, following condition is recommended.  
 $\Rightarrow$  Reduce cutting speed and increase feed rate.

In case of Steel  
 $\cdot V_c=80\text{m/min}$   
 $\cdot f_z=0.25\text{mm/t}$

In case of Cast Iron  
 $\cdot V_c=80\text{m/min}$   
 $\cdot f_z=0.35\text{mm/t}$

In case of MSR100R-2

e.g.) Load meter 120%

|          |                                                                                     |
|----------|-------------------------------------------------------------------------------------|
| 1st Pass | $ap \times ae$ :<br>15×75mm                                                         |
| 2nd Pass |  |
| 3rd Pass |                                                                                     |

e.g.) Load meter 90%

|                           |                                                                                     |          |
|---------------------------|-------------------------------------------------------------------------------------|----------|
| 3rd Pass                  | 2nd Pass                                                                            | 1st Pass |
| $ap \times ae$ :<br>45×25 |  |          |
|                           |                                                                                     |          |

M



Milling