# PRODUCT NEWS

No. PN-E-019

DIJET®

Tuff Modular Heads System

## Solid modular head "Anti-vibration S-Head"

# SMSR type

φ16～φ32 / Corner R: R0.5-R3

For Stainless steel, Titanium alloy, and Inconel

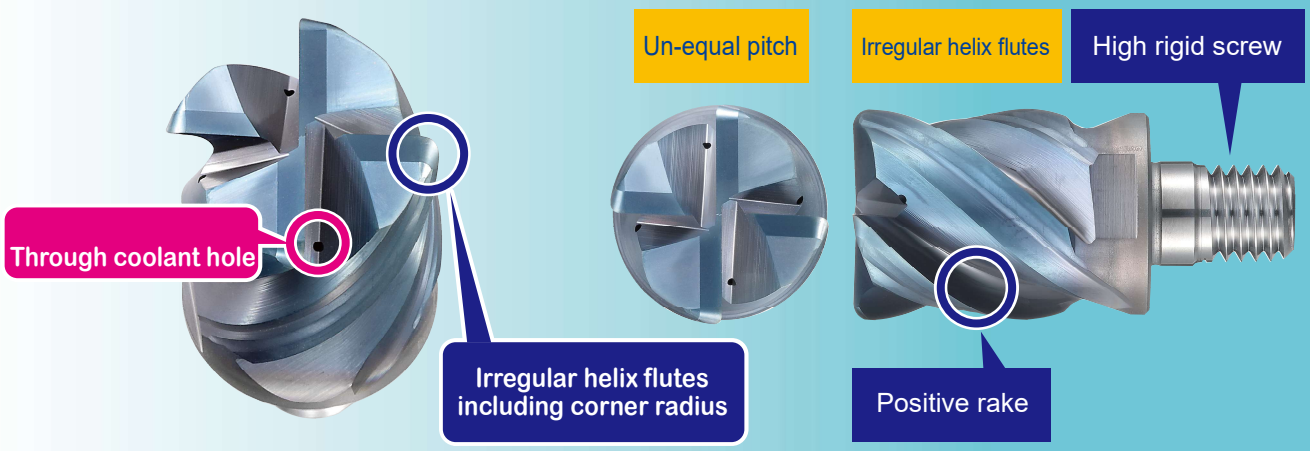
Solid modular head SMSR type showed the same performance as the solid end mill.


DIJET GmbH・www.dijet.de

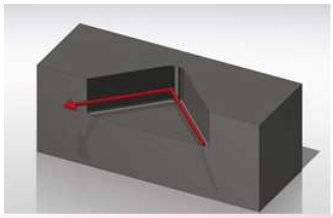
## Solid modular head “Anti-vibration S-Head” SMSR type

## Features

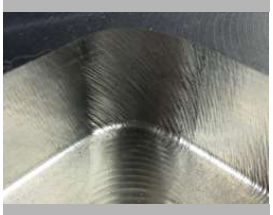
1. Adopted new PVD coated grade “DH115” consisting of the combination of DH COAT & micro-grained carbide.
   Widely applied from carbon & mold steel to stainless steel & Ti-alloy.
2. Un-equal pitch & irregular helix flutes are excellent in anti-vibration and possible to stable machining.
   And, achieved good surface roughness in case of machining very thin plate & corners of pockets, by the combination with carbide shank MSN type.
3. Positive rake & coolant hole prevented welding and improved chip ejection.
   Suitable for machining Ti-alloy & heat-resistant alloy.




## Cutting data



V-shaped machining
Overhung length : 80mm
Shoulder milling, Down cut

| No chatter | Chatter |
|---|---|
|  |  |
| SMSR type | Conventional tool |

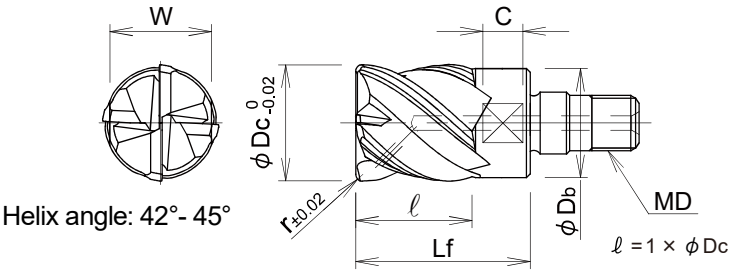
| | | |
|---|---|---|
| Work | Part name | Test piece |
| | Material | Ti-6Al-4V |
| | Hardness | 36HRC |
| Tool | Tool No. | SMSR-4160R10-M8( $\phi$ 16-R1)+ MSN-M8-70-S16C |
| | Insert No. | — |
| Cutting conditions | Vc<br>f | Vc=100m/min<br>f=0.20mm/rev |
| | Ap | 16mm |
| | Ae | 0.8mm |
| | Coolant | Internal coolant |
| | Machine | Vertical MC |
| Result | Achieved no chatter machining and improved surface roughness compared with conventional tool. | |

**Control vibration !**

# SMSR TYPE Solid modular head "Anti-vibration S-Head" SMSR type

**Through coolant hole**

- ●4 flutes / Helix angle 42°-45°
- ●Flute length 1D




Helix angle: 42°- 45°

| Cat. No. | Stock | Grade | No. of inserts | Dimensions (mm) r | φDc | ℓ | Lf | φDb | MD | C | W |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SMSR-4160R05-M8 | ● | DH115 | 4 | 0.5 | 16 | 16 | 24 | 15 | M8 | 5.5 | 14 |
| SMSR-4160R10-M8 | ● | | | 1 | | | | | | | |
| SMSR-4160R20-M8 | ● | | | 2 | | | | | | | |
| SMSR-4160R30-M8 | ● | | | 3 | | | | | | | |
| SMSR-4200R05-M10 | ● | | | 0.5 | 20 | 20 | 29 | 19 | M10 | 5.5 | 17 |
| SMSR-4200R10-M10 | ● | | | 1 | | | | | | | |
| SMSR-4200R20-M10 | ● | | | 2 | | | | | | | |
| SMSR-4200R30-M10 | ● | | | 3 | | | | | | | |
| SMSR-4250R10-M12 | ● | | | 1 | 25 | 25 | 35 | 24 | M12 | 5.5 | 22 |
| SMSR-4250R20-M12 | ● | | | 2 | | | | | | | |
| SMSR-4250R30-M12 | ● | | | 3 | | | | | | | |
| SMSR-4300R10-M16 | □ | | | 1 | 30 | 30 | 44 | 29 | M16 | 5.5 | 27 |
| SMSR-4300R20-M16 | □ | | | 2 | | | | | | | |
| SMSR-4300R30-M16 | □ | | | 3 | | | | | | | |
| SMSR-4320R10-M16 | ● | | | 1 | 32 | 32 | 46 | 30 | M16 | 5.5 | 27 |
| SMSR-4320R20-M16 | ● | | | 2 | | | | | | | |
| SMSR-4320R30-M16 | ● | | | 3 | | | | | | | |

● : Standard stock items , □ : Stock in Japan

Note) 1. When mounting head to shank, tighten with recommended tightening torque value not to be over-tightening. (See the right table "Attention to mounting S-Head.)
2. Only use torque control spanner wrench or DIJET DS type spanner wrench.

Please see the catalogue PRODUCT NEWS or DIJET general catalogue for applicable MSN carbide shank holders.

## Attention to mounting S-Head

Recommended tightening torque for S-Head

Please tighten the tightening torque by the power of about usual 1/5 to become uniting carbide head & shank.

| Tool dia. φDC(mm) | Spanner size W(mm) | Spanner wrench | Tightening torque |
|---|---|---|---|
| φ16 | 14 | DS-14 | 10～11N·m |
| φ20 | 17 | DS-17 | 10～16N·m |
| φ25 | 22 | DS-22 | 15～20N·m |
| φ30 | 27 | DS-27 | 20～25N·m |
| φ32 | 27 | DS-27 | 20～25N·m |

※S-Head are supplied without spanner wrench.

## SMSR TYPE — Recommended cutting conditions for SMSR

●Shoulder cutting

| Work materials | Carbon steel (C50, C55), below 250HB | | | | Mold steel (1.2311,P20), 30-43HRC | | | |
|---|---|---|---|---|---|---|---|---|
| Tool dia. φDc (mm) | n (min-1) | Vf (mm/min) | ap (mm) | ae (mm) | n (min-1) | Vf (mm/min) | ap (mm) | ae (mm) |
| **16** | 2,980 | 1,430 | ～0.8Dc | ～0.1Dc | 2,390 | 1,150 | ～0.8Dc | ～0.1Dc |
| **20** | 2,390 | 1,150 | ～0.8Dc | ～0.1Dc | 1,910 | 920 | ～0.8Dc | ～0.1Dc |
| **25** | 1,910 | 920 | ～0.8Dc | ～0.1Dc | 1,530 | 730 | ～0.8Dc | ～0.1Dc |
| **30** | 1,590 | 760 | ～0.8Dc | ～0.1Dc | 1,270 | 610 | ～0.8Dc | ～0.1Dc |
| **32** | 1,490 | 720 | ～0.8Dc | ～0.1Dc | 1,190 | 570 | ～0.8Dc | ～0.1Dc |

| Work materials | Hardened die steel (1.2344, 1.2379), 42-52HRC | | | | Stainless steel, Below 250HB | | | |
|---|---|---|---|---|---|---|---|---|
| Tool dia. φDc (mm) | n (min-1) | Vf (mm/min) | ap (mm) | ae (mm) | n (min-1) | Vf (mm/min) | ap (mm) | ae (mm) |
| **16** | 1,390 | 670 | ～0.8Dc | ～0.05Dc | 1,990 | 960 | ～0.8Dc | ～0.1Dc |
| **20** | 1,110 | 540 | ～0.8Dc | ～0.05Dc | 1,590 | 760 | ～0.8Dc | ～0.1Dc |
| **25** | 890 | 430 | ～0.8Dc | ～0.05Dc | 1,270 | 610 | ～0.8Dc | ～0.1Dc |
| **30** | 740 | 360 | ～0.8Dc | ～0.05Dc | 1,060 | 510 | ～0.8Dc | ～0.1Dc |
| **32** | 700 | 330 | ～0.8Dc | ～0.05Dc | 1,000 | 480 | ～0.8Dc | ～0.1Dc |

| Work materials | Titanium alloy (Ti-6Al-4V) | | | | Inconel (Inco718) | | | |
|---|---|---|---|---|---|---|---|---|
| Tool dia. φDc (mm) | n (min-1) | Vf (mm/min) | ap (mm) | ae (mm) | n (min-1) | Vf (mm/min) | ap (mm) | ae (mm) |
| **16** | 1,590 | 640 | ～0.8Dc | ～0.1Dc | 1,000 | 200 | ～0.8Dc | ～0.1Dc |
| **20** | 1,270 | 510 | ～0.8Dc | ～0.1Dc | 800 | 160 | ～0.8Dc | ～0.1Dc |
| **25** | 1,020 | 410 | ～0.8Dc | ～0.1Dc | 640 | 130 | ～0.8Dc | ～0.1Dc |
| **30** | 850 | 340 | ～0.8Dc | ～0.1Dc | 530 | 110 | ～0.8Dc | ～0.1Dc |
| **32** | 800 | 320 | ～0.8Dc | ～0.1Dc | 500 | 100 | ～0.8Dc | ～0.1Dc |

Vc : Cutting speed, Vf : Feed speed, ap : Depth of cut, ae : Pick feed, n : Spindle speed

■The reduction rate for SMSR type

※In case of lengthening overhung length, the figures above need to be reduced according to the reduction rate.

| L／D | n (min-1) | Vf(mm/min) | ap(mm) | ae(mm) |
|---|---|---|---|---|
| L≦4D | 0% | 0% | 0% | 0% |
| 4D＜L≦6D | 20% Reduction | 30% Reduction | 0% | ～0.05Dc |
| 6D＜L | 30% Reduction | 50% Reduction | ～0.5Dc | ～0.025Dc |

Note) Slotting is not recommended.