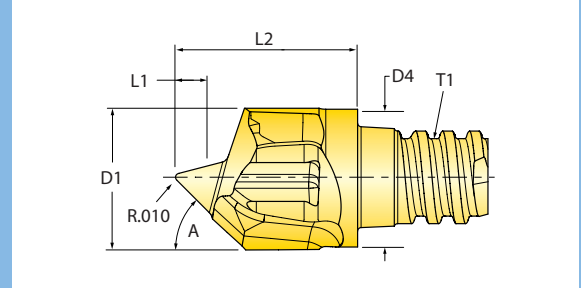


CHIP SURFER™ SERIES 45Q

SOLID CARBIDE ENGRAVING TIP



| GRADES | P | M | K | N _(Al) | S _(Al) | H _(TiN) |
|--------|---|---|---|-------------------|-------------------|--------------------|
| IN2005 | + | + | + | | + | |

+ Good 0 Bad



| Cutter Number | T1 Thread Size | A Nominal Chamfer Angle | D1 Nominal Diameter | Eff. Flutes | L1 Length of Cut | L2 Extension Length | D4 Neck Diameter |
|-----------------------|----------------|-------------------------|---------------------|-------------|------------------|---------------------|------------------|
| 45Q-3139TQRA45 IN2005 | T05 | 45 | 0.312 | 1 | 0.07 | 0.390 | 0.30 |

When assembling, be sure carbide tip is seated firmly on shank with no gap. Recommended axial depth of cut is .005" per step down.

| HARDWARE | Wrench | Optional Torque Wrench |
|-------------|---------|------------------------|
| Thread Size | WS-0043 | DT-60-04 |
| T05 | | |

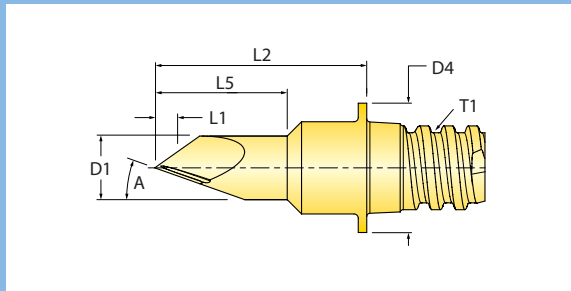
OPERATING GUIDELINES

CHIP SURFER™, - SOLID CARBIDE ENGRAVING TIP Series 45Q, 46Q

| | Workpiece Material | cutting speed Vc in/min | feed per tooth fz (in) |
|---|--------------------|----------------------------|---------------------------|
| P | Steel | 400-600 | .001-.002 |
| P | Tool steel | 300-500 | .001-.002 |
| M | Stainless steel | 250-400 | .001-.002 |
| K | Gray cast iron | 400-700 | .001-.002 |
| S | Super alloys | 100-200 | .001-.002 |
| N | Aluminum | 1000-2500 | .001-.002 |
| | Copper | 250-450 | .001-.002 |

Note: Feed and speed recommendations are starting operating parameters. They are only guidelines from which further optimization should take place. Operating parameters are influenced by many machining variables. These variables may cause for reductions in feeds and speed or dramatic increases. Additionally, DOC and WOC may need to be revised to optimize the tools performance.

SOLID CARBIDE FINE ENGRAVING TIP



GRADES

IN2005

| | | | | | |
|---|---|---|------------------|------------------|-------------------|
| P | M | K | N _(K) | S _(M) | H _(PK) |
| + | + | + | | + | |

+ Good 0 Bad



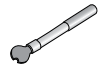
| Cutter Number | T1 Thread Size | A Nominal Chamfer Angle | D1 Nominal Diameter | Eff. Flutes | L1 Length of Cut | L2 Extension Length | D4 Neck Diameter | L5 Length |
|-----------------------|----------------|-------------------------|---------------------|-------------|------------------|---------------------|------------------|-----------|
| 46Q-1550TQRA60 IN2005 | T05 | 30 | 0.150 | 1 | 0.02 | 0.500 | 0.30 | 0.313 |

When assembling, be sure carbide tip is seated firmly on shank with no gap. Recommended axial depth of cut is .002" per step down.

HARDWARE



Wrench



Optional Torque Wrench

Thread Size

T05

WS-0043

DT-60-06

OPERATING GUIDELINES

CHIP SURFER™, - SOLID CARBIDE ENGRAVING TIP Series 45Q, 46Q

| | Workpiece Material | cutting speed Vc in/min | feed per tooth fz (in) |
|---|--------------------|----------------------------|---------------------------|
| P | Steel | 400-600 | .001-.002 |
| P | Tool steel | 300-500 | .001-.002 |
| M | Stainless steel | 250-400 | .001-.002 |
| K | Gray cast iron | 400-700 | .001-.002 |
| S | Super alloys | 100-200 | .001-.002 |
| N | Aluminum | 1000-2500 | .001-.002 |
| | Copper | 250-450 | .001-.002 |

Note: Feed and speed recommendations are starting operating parameters. They are only guidelines from which further optimization should take place. Operating parameters are influenced by many machining variables. These variables may cause for reductions in feeds and speed or dramatic increases. Additionally, DOC and WOC may need to be revised to optimize the tools performance.

JOB-048