

Recommended Speeds & Feeds For Turning & Grooving With Horizon Carbide Inserts							
Material Group	Material Specs.	Surface Speeds (SFM) & Feed Rates (FPR)					
		Uncoated	PVD TIN Coated		PVD TiAlN Coated		
		C23 & C23J	123	156	310	323 & 323F	356
Aluminum	2024, 6061, 7075 etc.	Maximum SFM .001-.010+ FPR	Maximum SFM .001-.010+ FPR	Maximum SFM .001-.010+ FPR	---	---	---
Aluminum - Cast	A356 ( A380, A390 Use Diamond )	600-1000 .001-.010+ FPR	800-1000 .001-.010+ FPR	---	---	---	---
Copper	Most Alloys	600-1000 .001-.007 FPR	800-1000 .001-.007 FPR	---	---	---	---
Brass - Bronze	Most Free Machining Alloys	600-1000 .001-.010 FPR	800-1000 .001-.010 FPR	---	---	---	---
Carbon Steels - Soft	1010, 1018, 1025 1117, 12L14	---	300-500 .001-.005 FPR	400-600 .001-.008 FPR	200-300 .001-.008 FPR	300-600 .001-.005 FPR	450-850 .001-.008 FPR
Carbon Steels 25 Rc+	1045, 1070, 1144, A36	---	300-450 .001-.005 FPR	350-550 .001-.006 FPR	200-300 .001-.007 FPR	300-500 .001-.005 FPR	450-750 .001-.007 FPR
Alloy Steels	4130, 4140, 4330 4340, 8620	---	250-450 .001-.004 FPR	350-500 .001-.005 FPR	200-300 .001-.006 FPR	300-500 .001-.004 FPR	400-700 .001-.006 FPR
Alloy Steels 30 Rc+	4130, 4140, 4150 4330, 4340, 52100	---	250-450 .001-.004 FPR	300-500 .001-.005 FPR	200-300 .001-.005 FPR	300-450 .001-.004 FPR	350-600 .001-.005 FPR
Tool Steels - Annealed	O1, W1, S6, P20 A6, D2, H13, etc.	---	200-400 .001-.004 FPR	250-450 .001-.004 FPR	150-300 .001-.004 FPR	200-400 .001-.004 FPR	350-600 .001-.005 FPR
Stainless Steels	201, 202, 301, 302 303, 304, 410, 416	---	250-450 .001-.003 FPR	250-500 .001-.004 FPR	200-300 .001-.005 FPR	300-600 .001-.004 FPR	350-500 .001-.005 FPR
Stainless Steels	304L, 316, 316L, 420 422, 430, 455, 17-4PH	---	200-400 .001-.003 FPR	225-450 .001-.004 FPR	150-275 .001-.004 FPR	250-550 .001-.003 FPR	250-450 .001-.005 FPR
Stainless Steels	316VAR, 13-8MO PH 15-5 PH 36 Rc+, 440C	---	150-300 .001-.003 FPR	---	150-250 .001-.003 FPR	150-350 .001-.003 FPR	150-300 .001-.004 FPR
Titanium - CP	Commercially Pure	150-400 .001-.006 FPR	250-400 .001-.003 FPR	---	200-300 .001-.003 FPR	250-600 .001-.003 FPR	---
Titanium - Alloys	6AL-4V, 5AL-2.5SN	100-200 .001-.003 FPR	100-200 .001-.003 FPR	---	100-250 .001-.003 FPR	150-350 .001-.003 FPR	---
Titanium - Hardened	Alloys 36 Rc+	75-100 .001-.003 FPR	75-125 .001-.003 FPR	---	75-150 .001-.003 FPR	100-200 .001-.003 FPR	---
High Temp Alloys	Ni 200, Monel, Invar Kovar, Inconel 600	100-150 .001-.003 FPR	100-200 .001-.003 FPR	---	100-250 .001-.003 FPR	100-300 .001-.003 FPR	---
High Temp Alloys	A286, Inconel 625 718, X750, Hastelloy	75-150 .001-.003 FPR	100-150 .001-.003 FPR	---	75-200 .001-.003 FPR	100-200 .001-.003 FPR	---
High Temp Alloys	Hardened Alloys 35 Rc+, Stellite etc.	50-100 .001-.002 FPR	50-125 .001-.002 FPR	---	50-100 .001-.002 FPR	75-150 .001-.003 FPR	---
Core Iron	Low Carbon Iron & Soft Iron Alloys	---	300-500 .001-.004 FPR	300-600 .001-.005 FPR	200-300 .001-.005 FPR	300-600 .001-.005 FPR	450-800 .001-.006 FPR
Gray Cast Iron	150-325 BHN Class 20, 30, 35, 40	200-300 .001-.010+ FPR	200-600 .001-.010+ FPR	---	100-300 .001-.010+ FPR	250-600 .001-.010+ FPR	---
Gray Cast Iron	275-450 BHN Class 50, 55, 60	150-250 .001-.008+ FPR	150-450 .001-.008+ FPR	---	100-250 .001-.008+ FPR	200-500 .001-.008+ FPR	---
Alloy / Ductile Iron	60-40-18, 80-55-06 100-70-03, A536	100-250 .001-.008+ FPR	150-500 .001-.008+ FPR	300-500 .001-.008+ FPR	100-300 .001-.008+ FPR	250-500 .001-.008+ FPR	300-600 .001-.008+ FPR

**Horizon Carbide Grades are Designed to provide Long Tool Life at Higher Speeds and Light Feed Rates.**

- 1. Start near the top of the SFM Range using a Light Feed Rate to Reduce Built-up Edge & Insert Chipping.**
- 2. Adjust RPM & Feeds after Setup to achieve Optimum Tool Life. Use Higher Feed Rates in Soft Materials.**
- 3. In Hard Materials Use a Wear Resistant Grade like 323 or 623 at Medium to Low SFM and Light Feeds.**

**Formula to Calculate Surface Feet Per Minute (SFM):  $SFM = 3.1416 \times \text{Part Diameter, Divided by } 12 \times \text{RPM}$**