

Q

| Geometry | Applications | Feed rate | | |
|-------------------------------------|---|-----------|-------------|--------------|
| | | mm/rev | in/rev | |
| .00 | grooving, finishing of grooves, for long chipping materials, low feed rates | ↓ | 0.02 - 0.12 | .0008 - .005 |
| Chipbreaker for special inserts | grooving, finishing of grooves, geometry for inserts with profile, for short chipping materials and high tensile strength | ↓ | 0.02 - 0.12 | .0008 - .005 |

↓ Grooving ↔ Side turning

Cutting data Grooving and parting off



Q

| Material | | Hardness Brinell (HB) | Cutting speed v_c (m/min) | | | | | | | | | | | |
|----------|-------------------------------|-----------------------|-----------------------------|----------|---------|-----------|-----------|----------------|-----------|---------|-----------|---------|---------|---------|
| | | | K10 | MG12 | P20 | TI22 TN32 | TI25 TN35 | TF45 TA45 TH35 | TF46 TA46 | AS62 | AL96 AS66 | H20 | H54 | |
| P | Carbon steel | 0,2% C | 140 | | | 180-120 | 200-160 | 180-130 | 200-160 | 280-180 | 250-180 | 300-180 | 230-170 | 200-140 |
| | | 0,4% C | 180 | | | 160-110 | 180-150 | 170-120 | 180-150 | 250-140 | 230-170 | 270-150 | 220-160 | 180-120 |
| | | 0,6% C | 200 | | | 140-90 | 180-140 | 150-100 | | 230-120 | 220-160 | 250-120 | 210-150 | 160-100 |
| | Alloyed steel (<5%) | annealed | 180 | | | 140-100 | 180-140 | 160-110 | 180-140 | 230-100 | 200-150 | 250-100 | 210-150 | 180-120 |
| | | quenched | 280 | | | 110-90 | 160-110 | 130-90 | | 190-90 | 160-110 | 220-90 | 170-120 | 160-100 |
| | | quenched | 350 | | | 80 | 140-90 | 100-70 | | 170-80 | 130-100 | 200-80 | 140-80 | 120-80 |
| | high alloyed steel (>5%) | annealed | 200 | | | 120-80 | 120-90 | | | 200-140 | 180-120 | 220-140 | 120-100 | 100-90 |
| | | hardened | - | | | | | | | | | | | |
| | Cast steel | unalloyed | 180 | | | | 130-100 | | | | 200-150 | 200-150 | 180-120 | |
| | | alloyed | 220 | | | | 110-80 | | | | 160-100 | 150-90 | 140-90 | |
| M | Stainless steel | martensitic, ferritic | 200 | | 90-70 | | 130-100 | 120-60 | | 180-120 | 170-120 | 190-140 | 190-120 | |
| | | austenitic | 180 | | 90-60 | | | 100-70 | | 140-110 | | 140-110 | 170-120 | |
| K | Cast iron | low tensile strength | 180 | 90-60 | 80-60 | | | | 130-90 | 180-120 | 180-120 | 200-120 | | |
| | | high tensile strength | 250 | 90-60 | 80-60 | | | | 90-70 | 140-100 | 140-100 | 160-120 | | |
| | Spheroidal graphite cast iron | ferritic | 160 | | | | 90-70 | 90-70 | 120-80 | 170-90 | 170-90 | 180-130 | | |
| | | perlitic | 250 | | | | 70-60 | 70-60 | 110-80 | 180-80 | 150-80 | 160-120 | | |
| | Malleable cast iron | ferritic | 125 | | 100-80 | | 140-120 | 100-70 | | 120-100 | 190-140 | 220-120 | | |
| | | perlitic | 225 | | 70-50 | | 100-80 | 80-60 | | 90-80 | 140-100 | 190-100 | | |
| N | Al-alloy | not heat treatable | 30-80 | 1000-600 | 800-400 | | | 1000-600 | | | | | | |
| | | heat treatable | 80-120 | 400-220 | 300-200 | | | 400-220 | | | | | | |
| | Al-cast-alloy | not heat treatable | 80 | 1000-600 | 800-400 | | | 1000-600 | | | | | | |
| | | heat treatable | 100 | 600-300 | 400-250 | | | 600-300 | | | | | | |
| | Copper-alloy | not heat treatable | 90 | 200-120 | | | 200-150 | 210-130 | | 200-150 | | | | |
| | | heat treatable | 100 | 150-90 | | | 150-60 | 160-90 | | 150-110 | | | | |
| S | Heat resistant alloy (FE) | annealed | 200 | | 50-30 | | | 50-30 | | | | | | |
| | | hardened | 275 | | 40-20 | | | 40-20 | | | | | | |
| | Heat resistant alloy (Ni, Co) | annealed | 250 | | 30-20 | | | 30-20 | | | | | | |
| | | hardened | 350 | | 20-10 | | | 20-10 | | | | | | |

Cutting data Grooving and parting off



Q

| Material | Hardness Brinell (HB) | Cutting speed v_c (ft/min) | | | | | | | | | | | |
|----------|-------------------------------|------------------------------|-----------|-----------|-----------|-----------|----------------|-----------|---------|-----------|---------|---------|---------|
| | | K10 | MG12 | P20 | TI22 TN32 | TI25 TN35 | TF45 TA45 TH35 | TF46 TA46 | AS62 | AL96 AS66 | H20 | H54 | |
| P | Carbon steel | 0.2% C | | | 590-395 | 650-525 | 590-430 | 650-525 | 920-590 | 820-590 | 985-590 | 755-560 | 650-460 |
| | | 0.4% C | | | 525-360 | 590-495 | 560-395 | 590-495 | 820-460 | 755-560 | 885-495 | 720-525 | 590-395 |
| | | 0.6% C | | | 460-295 | 590-460 | 495-330 | | 755-395 | 720-525 | 820-395 | 690-495 | 525-330 |
| | Alloyed steel (<5%) | annealed | | | 460-330 | 590-460 | 525-360 | 590-460 | 755-330 | 650-495 | 820-330 | 690-495 | 590-395 |
| | | quenched | | | 360-295 | 525-360 | 430-295 | | 625-295 | 525-360 | 720-295 | 560-395 | 525-330 |
| | | quenched | | | 265 | 460-295 | 330-230 | | 560-265 | 430-330 | 650-265 | 460-265 | 395-265 |
| | high alloyed steel (>5%) | annealed | | | 395-265 | 395-295 | | | 650-460 | 590-395 | 720-460 | 395-330 | 330-295 |
| | | hardened | | | | | | | | | | | |
| | Cast steel | unalloyed | | | | 430-330 | | | | 650-495 | 650-495 | 590-395 | |
| | | alloyed | | | | 360-265 | | | | 525-330 | 495-295 | 460-295 | |
| M | Stainless steel | martensitic, ferritic | | 295-230 | | 430-330 | 395-200 | | 590-395 | 560-395 | 625-460 | 625-395 | |
| | | austenitic | | 295-200 | | | 330-230 | | 460-360 | | 460-360 | 560-395 | |
| K | Cast iron | low tensile strength | 295-200 | 265-200 | | | | 430-295 | 590-395 | 590-395 | 650-395 | | |
| | | high tensile strength | 295-200 | 265-200 | | | | 295-230 | 460-330 | 460-330 | 525-395 | | |
| | Spheroidal graphite cast iron | ferritic | | | | 295-230 | 295-230 | 395-265 | 560-295 | 560-295 | 590-430 | | |
| | | perlitic | | | | 230-200 | 230-200 | 360-265 | 590-265 | 495-265 | 525-395 | | |
| | Malleable cast iron | ferritic | | 330-265 | | 460-395 | 330-230 | | 395-330 | 625-460 | 720-395 | | |
| | | perlitic | | 230-165 | | 330-265 | 265-200 | | 295-265 | 460-330 | 625-330 | | |
| N | Al-alloy | not heat treatable | 3280-1970 | 2625-1315 | | | 3280-1970 | | | | | | |
| | | heat treatable | 1315-720 | 985-650 | | | 1315-720 | | | | | | |
| | Al-cast-alloy | not heat treatable | 3280-1970 | 2625-1315 | | | 3280-1970 | | | | | | |
| | | heat treatable | 1970-985 | 1315-820 | | | 1970-985 | | | | | | |
| | Copper-alloy | not heat treatable | 650-395 | | | 650-495 | 690-430 | | 650-495 | | | | |
| | | heat treatable | 495-295 | | | 650-495 | 690-430 | | 650-495 | | | | |
| S | Heat resistant alloy (FE) | annealed | | 165-100 | | | 165-100 | | | | | | |
| | | hardened | | 130-65 | | | 130-65 | | | | | | |
| | Heat resistant alloy (Ni, Co) | annealed | | 100-65 | | | 100-65 | | | | | | |
| | | hardened | | 65-35 | | | 65-35 | | | | | | |

Cutting data Face grooving



Q

| Material | | Hardness Brinell (HB) | Cutting speed v_c (m/min) | | | | | | | | | | | |
|----------|-------------------------------|-----------------------|-----------------------------|----------|---------|-----------|-----------|----------------|-----------|---------|---------|---------|---------|---------|
| | | | K10 | MG12 | P20 | TI22 TN32 | TI25 TN35 | TF45 TA45 TH35 | TF46 TA45 | AS62 | AS66 | H20 | H54 | |
| P | Carbon steel | 0.2% C | 140 | | | 140-100 | 160-130 | 140-110 | 160-130 | 220-140 | 200-140 | 240-140 | 190-140 | 200-140 |
| | | 0.4% C | 180 | | | 130-90 | 140-120 | 130-100 | 140-120 | 200-120 | 190-130 | 220-120 | 180-130 | 180-120 |
| | | 0.6% C | 200 | | | 120-80 | 140-120 | 120-180 | | 190-100 | 180-130 | 200-100 | 170-120 | 160-100 |
| | Alloyed steel (<5%) | annealed | 180 | | | 120-80 | 140-120 | 140-100 | 140-120 | 190-80 | 160-120 | 200-80 | 170-120 | 180-120 |
| | | quenched | 280 | | | 90-70 | 140-90 | 110-80 | | 170-80 | 140-90 | 180-80 | 140-100 | 160-100 |
| | | quenched | 350 | | | 60 | 120-70 | 80-60 | | 140-60 | 110-80 | 160-70 | 120-60 | 120-80 |
| | high alloyed steel (>5%) | annealed | 200 | | | 100-60 | 100-70 | | | 160-120 | 150-100 | 180-120 | 110-80 | 100-90 |
| | | hardened | - | | | | | | | | | | | |
| | Cast steel | unalloyed | 180 | | | | 110-80 | | | | 160-120 | 160-120 | 140-100 | |
| | | alloyed | 220 | | | | 90-60 | | | | 140-80 | 120-80 | 120-80 | |
| M | Stainless steel | martensitic, ferritic | 200 | | 80-60 | | 110-80 | 110-50 | | 160-100 | 130-110 | 150-120 | 150-100 | |
| | | austenitic | 180 | | 60-40 | | | 80-60 | | 120-100 | | 110-80 | 140-100 | |
| K | Cast iron | low tensile strength | 180 | 70-50 | 70-50 | | | | 110-70 | 140-100 | 140-100 | 160-100 | | |
| | | high tensile strength | 250 | 70-50 | 70-50 | | | | 80-60 | 120-80 | 120-80 | 140-100 | | |
| | Spheroidal graphite cast iron | ferritic | 160 | | | | 90-60 | 80-60 | 100-60 | 140-80 | 150-70 | 150-110 | | |
| | | perlitic | 250 | | | | 80-60 | 60-50 | 90-60 | 130-70 | 120-60 | 140-100 | | |
| | Malleable cast iron | ferritic | 125 | | 80-60 | | 120-100 | 80-60 | | 100-80 | 160-110 | 180-100 | | |
| | | perlitic | 225 | | 60-40 | | 80-60 | 60-50 | | 80-60 | 120-80 | 150-120 | | |
| N | Al-alloy | not heat treatable | 30-80 | 1000-600 | 800-400 | | | | 1000-600 | | | | | |
| | | heat treatable | 80-120 | 400-220 | 300-200 | | | | 400-220 | | | | | |
| | Al-cast-alloy | not heat treatable | 80 | 1000-600 | 800-400 | | | | 1000-600 | | | | | |
| | | heat treatable | 100 | 600-300 | 400-250 | | | | 600-300 | | | | | |
| | Copper-alloy | not heat treatable | 90 | 160-100 | | | 160-130 | 190-110 | | | | | | |
| | | heat treatable | 100 | 130-80 | | | 130-60 | 140-80 | | | | | | |
| S | Heat resistant alloy (FE) | annealed | 200 | | 40-30 | | | 40-30 | | | | | | |
| | | hardened | 275 | | 35-20 | | | 35-20 | | | | | | |
| | Heat resistant alloy (Ni, Co) | annealed | 250 | | 25-20 | | | 20-10 | | | | | | |
| | | hardened | 350 | | 20-10 | | | 20-10 | | | | | | |

Cutting data Face grooving



Q

| Material | | Hardness Brinell (HB) | Cutting speed v_c (ft/min) | | | | | | | | | | | |
|----------|-------------------------------|-----------------------|------------------------------|-----------|-----------|-----------|-----------|----------------|-----------|---------|---------|---------|---------|---------|
| | | | K10 | MG12 | P20 | TI22 TN32 | TI25 TN35 | TF45 TA45 TH35 | TF46 TA45 | AS62 | AS66 | H20 | H54 | |
| P | Carbon steel | 0.2% C | 140 | | | 460-330 | 525-430 | 460-360 | 525-430 | 720-460 | 650-460 | 790-460 | 625-460 | 650-460 |
| | | 0.4% C | 180 | | | 430-300 | 460-395 | 430-330 | 460-395 | 650-395 | 625-430 | 720-395 | 590-430 | 590-395 |
| | | 0.6% C | 200 | | | 395-265 | 460-395 | 395-590 | | 625-330 | 590-430 | 650-330 | 560-395 | 525-330 |
| | Alloyed steel (<5%) | annealed | 180 | | | 395-265 | 460-395 | 460-330 | 460-395 | 625-265 | 525-395 | 650-265 | 560-395 | 590-395 |
| | | quenched | 280 | | | 300-230 | 460-300 | 360-265 | | 560-265 | 460-300 | 590-265 | 460-330 | 525-330 |
| | | quenched | 350 | | | 200 | 395-230 | 265-200 | | 460-200 | 360-265 | 525-230 | 395-200 | 395-265 |
| | high alloyed steel (>5%) | annealed | 200 | | | 330-200 | 330-230 | | | 525-395 | 495-330 | 590-395 | 360-265 | 330-300 |
| | | hardened | - | | | | | | | | | | | |
| | Cast steel | unalloyed | 180 | | | | 360-265 | | | | 525-395 | 525-395 | 460-330 | |
| | | alloyed | 220 | | | | 300-200 | | | | 460-265 | 395-265 | 395-265 | |
| M | Stainless steel | martensitic, ferritic | 200 | | 265-200 | | 360-265 | 360-165 | | 525-330 | 430-360 | 495-395 | 495-330 | |
| | | austenitic | 180 | | 200-130 | | | 265-200 | | 395-330 | | 360-265 | 460-330 | |
| K | Cast iron | low tensile strength | 180 | 230-165 | 230-165 | | | | 360-230 | 460-330 | 460-330 | 525-330 | | |
| | | high tensile strength | 250 | 230-165 | 230-165 | | | | 265-200 | 395-265 | 395-265 | 460-330 | | |
| | Spheroidal graphite cast iron | ferritic | 160 | | | | 300-200 | 265-200 | 330-200 | 460-265 | 495-230 | 495-360 | | |
| | | perlitic | 250 | | | | 265-200 | 200-165 | 300-200 | 430-230 | 395-200 | 460-330 | | |
| | Malleable cast iron | ferritic | 125 | | 265-200 | | 395-330 | 265-200 | | 330-265 | 525-360 | 590-330 | | |
| | | perlitic | 225 | | 200-130 | | 265-200 | 200-165 | | 265-200 | 395-265 | 495-395 | | |
| N | Al-alloy | not heat treatable | 30-80 | 3280-1970 | 2625-1315 | | | | 3280-1970 | | | | | |
| | | heat treatable | 80-120 | 1315-720 | 985-650 | | | | 1315-720 | | | | | |
| | Al-cast-alloy | not heat treatable | 80 | 3280-1970 | 2625-1315 | | | | 3280-1970 | | | | | |
| | | heat treatable | 100 | 1970-985 | 1315-820 | | | | 1970-985 | | | | | |
| | Copper-alloy | not heat treatable | 90 | 525-330 | | | 525-430 | 625-360 | | | | | | |
| | | heat treatable | 100 | 430-265 | | | 430-200 | 460-265 | | | | | | |
| S | Heat resistant alloy (FE) | annealed | 200 | | 130-100 | | | 130-100 | | | | | | |
| | | hardened | 275 | | 115-65 | | | 115-65 | | | | | | |
| | Heat resistant alloy (Ni, Co) | annealed | 250 | | 85-65 | | | 65-35 | | | | | | |
| | | hardened | 350 | | 65-35 | | | 65-35 | | | | | | |

Nominal cutting speeds with HORN grades

| Material | | Hardness Brinell (HB) | * Cutting speed v_c (m/min) | | | | |
|--------------|-------------------------|---------------------------------|-------------------------------|--------|--------|--------------------|--------|
| | | | MG12 | TN35 | TI25 | TF45 / TA45 / TH35 | |
| P | Carbon steel, unalloyed | C < 0,4% | 125 | 14-110 | 14-180 | 14-180 | 14-180 |
| | | C > 0,4% < 0,6% | 150 | 14-110 | 14-180 | 14-180 | 14-180 |
| | | C > 0,6% < 0,8% | 200 | 14-110 | 14-180 | 14-180 | 14-180 |
| | low alloyed steel | annealed | 180 | 16-90 | 16-150 | 16-150 | |
| | | quenched | 275 | 16-90 | 16-150 | 16-150 | |
| | | quenched | 160 | 16-90 | 16-150 | 16-150 | |
| | high alloyed steel | annealed | 200 | | 19-90 | 19-90 | |
| | | quenched | 325 | | 19-90 | 19-90 | |
| | Cast steel | unalloyed | 180 | 19-110 | 19-180 | 19-180 | |
| | | low alloyed | 200 | 19-110 | 19-180 | 19-180 | |
| high alloyed | | 225 | 19-110 | 19-180 | 19-180 | | |
| M | Stainless steel | martensitic, ferritic, annealed | 200 | | 19-90 | 19-90 | |
| | | austenitic Ni>8%/Cr 18-20% | 180 | | 16-80 | | |
| N | Al-alloy | | 14-220 | 16-600 | 16-600 | | |
| | Copper and brass alloys | | 14-220 | 14-700 | 14-700 | | |
| S | Heat resistant alloy | NiFe | | | 18-75 | 18-75 | |
| | | NiCo | | | 18-40 | 18-40 | |

* v_c is depending on the bore diameter and therefore of the maximum numbers of revolutions of the machine.

Nominal cutting speeds with HORN grades

| Material | | Hardness Brinell (HB) | * Cutting speed v_c (ft/min) | | | | |
|--------------|-------------------------|---------------------------------|--------------------------------|---------|---------|--------------------|--------|
| | | | MG12 | TN35 | TI25 | TF45 / TA45 / TH35 | |
| P | Carbon steel, unalloyed | C < 0,4% | 125 | 45-360 | 45-590 | 45-590 | 45-590 |
| | | C > 0,4% < 0,6% | 150 | 45-360 | 45-590 | 45-590 | 45-590 |
| | | C > 0,6% < 0,8% | 200 | 45-360 | 45-590 | 45-590 | 45-590 |
| | low alloyed steel | annealed | 180 | 50-295 | 50-490 | 50-490 | |
| | | quenched | 275 | 50-295 | 50-490 | 50-490 | |
| | | quenched | 160 | 50-295 | 50-490 | 50-490 | |
| | high alloyed steel | annealed | 200 | | 60-295 | 60-295 | |
| | | quenched | 325 | | 60-295 | 60-295 | |
| | Cast steel | unalloyed | 180 | 60-360 | 60-590 | 60-590 | |
| | | low alloyed | 200 | 60-360 | 60-590 | 60-590 | |
| high alloyed | | 225 | 60-360 | 60-590 | 60-590 | | |
| M | Stainless steel | martensitic, ferritic, annealed | 200 | | 60-295 | 60-295 | |
| | | austenitic Ni>8%/Cr 18-20% | 180 | | 50-260 | | |
| N | Al-alloy | | 45-720 | 50-1970 | 50-1970 | | |
| | Copper and brass alloys | | 45-720 | 45-2295 | 45-2295 | | |
| S | Heat resistant alloy | NiFe | | | 60-245 | 60-245 | |
| | | NiCo | | | 60-130 | 60-130 | |

* v_c is depending on the bore diameter and therefore of the maximum numbers of revolutions of the machine.