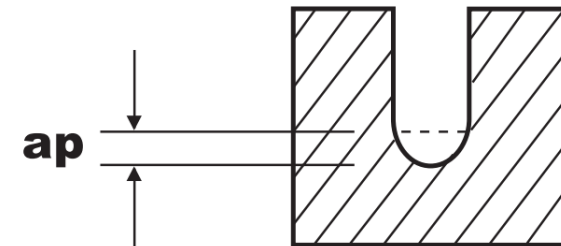
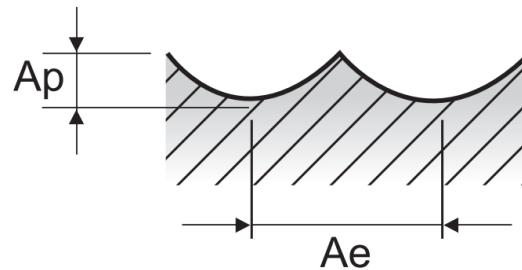
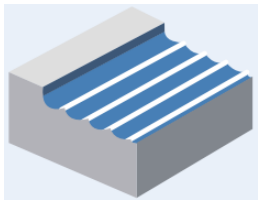


Speeds and Feeds



End Mill Series - **HSAM1**

Material		Recommended Cutting Values - 2 Flutes / Ball / Plane Cutting													
Group		Material Description	Width of Cut, ae	Depth of Cut, ap	Parameter	Tool Diameter (mm)									
ISO	VDI 3323					3	4	5	6	8	10	12	16	20	25
N	21	Aluminum-wrought alloy	0.2D	0.5D	Vc, m/min.	210	210	210	211	216	270	324	342	270	270
					RPM, rev./min.	22282	16711	13369	11200	8600	8600	8600	6800	4300	3438
					Fz, mm/tooth	0.030	0.040	0.050	0.062	0.093	0.109	0.140	0.159	0.205	0.250
					FEED, mm/min	1337	1337	1337	1400	1600	1880	2400	2159	1760	1719
					Vc, m/min.	210	210	210	211	216	270	324	342	270	270
					RPM, rev./min.	22282	16711	13369	11200	8600	8600	8600	6800	4300	3438
	22	Aluminum-wrought alloy	0.2D	0.5D	Fz, mm/tooth	0.030	0.040	0.050	0.062	0.093	0.109	0.140	0.159	0.205	0.250
					FEED, mm/min	1337	1337	1337	1400	1600	1880	2400	2159	1760	1719
					Vc, m/min.	120	120	120	137	140	176	211	222	176	175
					RPM, rev./min.	12732	9549	7639	7280	5590	5590	5590	4420	2795	2228
					Fz, mm/tooth	0.030	0.040	0.050	0.062	0.093	0.109	0.140	0.159	0.205	0.250
					FEED, mm/min	764	764	764	910	1040	1222	1560	1403	1144	1114
	23	Aluminum-cast, alloyed	0.2D	0.5D	Vc, m/min.	120	120	120	137	140	176	211	222	176	175
					RPM, rev./min.	12732	9549	7639	7280	5590	5590	5590	4420	2795	2228
					Fz, mm/tooth	0.030	0.040	0.050	0.062	0.093	0.109	0.140	0.159	0.205	0.250
					FEED, mm/min	764	764	764	910	1040	1222	1560	1403	1144	1114
Vc, m/min.					120	120	120	137	140	176	211	222	176	175	
RPM, rev./min.					12732	9549	7639	7280	5590	5590	5590	4420	2795	2228	
24	Aluminum-cast, alloyed	0.2D	0.5D	Fz, mm/tooth	0.030	0.040	0.050	0.062	0.093	0.109	0.140	0.159	0.205	0.250	
				FEED, mm/min	764	764	764	910	1040	1222	1560	1403	1144	1114	



Speeds and Feeds



Feed Rate, Per Revolution (mm/min)

$$v_f = f_n \cdot n$$

Feed Rate, Per Tooth (mm/min)

$$v_f = f_z \cdot n \cdot Z$$

Feed Per Revolution (mm/rev)

$$f_n = \frac{v_f}{n}$$

Feed Per Tooth (mm)

$$f_z = \frac{v_f}{n \cdot Z}$$

Cutting Speed (m/min)

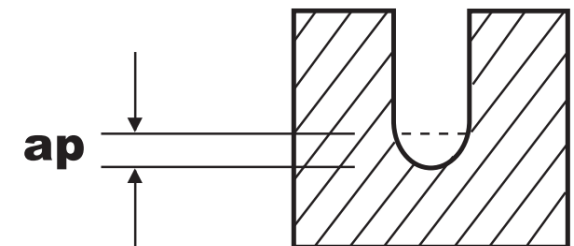
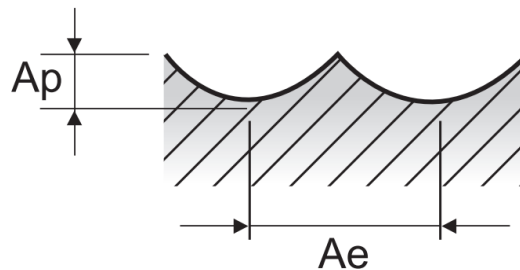
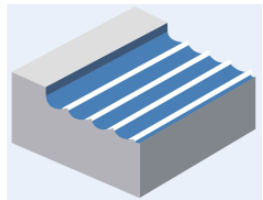
$$v_c = \frac{\pi \cdot D_{tool} \cdot n}{1000}$$

Spindle Speed (rev/min)

$$n = \frac{v_c \cdot 1000}{\pi \cdot D_{tool}}$$

Material Removal Rate (mm³/min)

$$MMR = \frac{a_p \cdot a_e \cdot v_f}{1000}$$



Metric

Symbol	Definition	Unit
v_f	Feed rate	mm/min
f_n	Feed per revolution	mm/rev
f_z	Feed per tooth	mm
v_c	Cutting speed	m/min (SMM)
n	Spindle speed	rev/min (RPM)
D_{tool}	Tool cutting diameter	mm
MMR	Material removal rate	(mm ³ /min)
a_e	Radial depth of cut	mm
a_p	Axial depth of cut	mm
Z	Number of teeth/flutes	