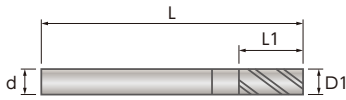


ファルコン エメラルドエンドミル

Falcon Emerald End Mill

外周・溝加工エンドミル

Side・Slot milling end mill



特徴

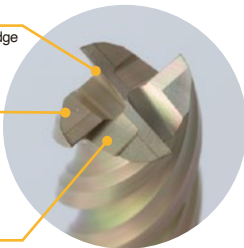
- 40° 42° 不等リード
- 潤滑性の高いフルート形状

- 40° 42° unequal lead
- High lubricity flute

刃先の剛性が非常に強い

The stiffness of the cutting edge is extremely strong.

芯厚設計
Thick Core Design



独特のギャッシュ形状

Original gash shape

ポイント

Point

- ◎ 難削材溝加工で、切込み量 1D~2D の状態でも高速加工ができる
- ◎ 抜群の切粉排出性能
- ◎ 時間短縮で生産効率がアップし、コスト削減に繋がる
- ◎ Able to mill at high speeds even at 1D-2D cutting depth conditions slot milling difficult-to-cut material.
- ◎ Outstanding chip evacuation efficiency.
- ◎ Reduction of time and increase in production efficiency which leads to cost reduction.



詳細動画
Detailed video

備考 Notes

- 本エンドミルは主軸の剛性が高いことを前提に設計しております。BT30の機械で加工する場合、まずはSPHFシリーズをおススメします。もしSPEFをご使用の場合切削条件を上記の50%以下でご使用ください。
- 1刃当たりの送り量はできるだけお守りください。周速と送り速度は1刃当たりの送り量をベースにしてください。
- 本エンドミルは、外周、溝、どちらにも対応できるエンドミルです。またトロコイド加工で抜群の寿命を発揮します。
- 乾式の場合、切削条件は上記の60~80%でご使用ください。
- 送り速度は、ap Dが条件より大きい場合は60~80%でご使用ください。
- MC加工によるBT50番相当の機械剛性をベースに条件出してあります。
- ※ BT40番相当の場合切削条件を70~80%程度で、BT30番相当の場合切削条件を40~50%程度で加工してください。(1刃当たり送り量は次ページ数値より下げてください。)

超硬不等リード不等分割エンドミル 4枚刃(ねじれ角40°/42°)

Carbide Unequal Lead, Unequal Flute Spacing End Mill 4 Flutes (40°/42° helix angle)

(mm)

P/N	D1	L1	L	d	F	定価(円) Original Price (yen)
型番 Part Number	刃径 Mill Dia.	刃長 Flute Length	全長 Overall Length	軸径 Shank Dia.	刃数 No. of Flute	
SPEF4-2	2	6	50	6	4	4,000
SPEF4-3	3	9	50	6	4	4,000
SPEF4-4	4	12	50	6	4	4,000
SPEF4-5	5	15	50	6	4	4,000
SPEF4-6	6	18	50	6	4	4,000
SPEF4-8	8	24	60	8	4	6,300
SPEF4-10	10	30	75	10	4	9,300
SPEF4-12	12	36	75	12	4	12,400
SPEF4-20	20	50	100	20	4	36,700

被削材質 Work Material

炭素鋼 Carbon steel	合金鋼 Alloy steel	焼入れ鋼 Hardened steel	鋳物 Cast iron	ステンレス鋼 Stainless steel	チタン合金 Titanium	超耐熱合金 Super heat resistant alloy
≤HRC40	≤HRC45	≤HRC50				
○	○	○	○	◎	◎	◎

ステンレスの溝加工の考え方 Perspective on slot milling stainless steel

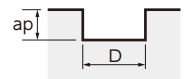
オーステナイト系のステンレスは加工硬化の影響が大きいため、できるだけ送りを推奨条件前後まで上げます。また析出硬化系やマルテンサイト系ステンレスは強度(切削抵抗)が高いため送りが高すぎるとピビリが発生して刃先の欠損リスクが高まり、欠損すると一気に刃先に熱が集中して切り粉が熱で固まり、エンドミルの溝を埋めることにより切り粉が排出できず折損の原因となるため、如何にエンドミルをピビラせないように条件を高くできるかがポイントです。ピビラせないことについては、お客様それぞれの使用環境や治具が工具の性能の最大化に大きく影響するため、従来の治具の固定方法や突き出しの量やチャック把握力を見直して、できるだけ高い剛性環境で加工ができるようにしていただきますと、弊社工具だけでなく他の工具の寿命の向上にも貢献します。

Please raise the feed to around the recommended conditions as austenitic stainless steel is significantly effected by work hardening. In addition, if the feed is excessively high chatter occurs causing a higher risk of the cutting edge to become damaged, as precipitation hardening and martensitic stainless steels have high levels in strength (cut resistance). If damage occurs then heat concentrates at the cutting edge causing chips to harden from the heat, clogging the flutes of the end mill leading to the inability for chips to evacuate, possibly becoming a cause for breakage. Therefore, a key factor is how to raise the conditions without causing chatter to occur in the end mill. In respect to avoiding chatter, due to the significant effect the jig has on maximizing the tools capabilities and each clients usage environment, reviewing the grasping force of the chuck, stick out amount and conventional methods of mounting the jig, as well as milling in a highly rigid setting as much as possible will contribute to the improvement of tool life not only with our tools but with others as well.

耐熱合金の溝加工の考え方 Perspective on slot milling heat resistant alloys

加工硬化の影響があり、高温強度が大きく、さらに熱伝導率が非常に悪い、難削要素が見事に揃った材料です。耐熱合金については弊社のノウハウで、種類ごとに都度ご説明が可能です。代表的なものでは、Ni当量のパーセンテージが高い材料または、硬度が高くなるレアメタルが使われている材料ほど、切削抵抗が大きくなる傾向が高いため、周速と送り速度を上げにくいです。しかし周速が低すぎると刃物本来の切れ味を発揮できず刃先が欠損したり、送りが低すぎると熱がこもるため、工具寿命に大きく悪影響を与えます。よって切削抵抗が低い設計の工具を選定し、切り粉の排出性がよくなる滑り性のよいコーティングで、刃先の欠損が起きにくい超硬が使われている、さらに剛性が強くピビリが発生しにくい設計の工具を選定する必要があります。ピビラせないことについては、お客様それぞれの使用環境や治具が工具の性能の最大化に大きく影響するため、従来の治具の固定方法や突き出しの量やチャック把握力を見直して、できるだけ高い剛性環境で加工ができるようにしていただきますと、弊社工具だけでなく他の工具の寿命の向上にも貢献します。

Heat resistant alloys are a material perfectly completed with the effects of work hardening and excellent high temperature strength, in addition to extremely poor thermal conductivity and difficult-to cut elements. In respect to heat resistant alloys, it is possible to give a case by case explanation of each type based on our track records. The more a material with a high percentage of nickel equivalent or rare metals that increases in hardness, there is a higher tendency that cutting resistance increases so it is harder to increase the peripheral speed and feed rate. On the other hand, if the peripheral speed is too low, the blade is unable to display its original sharpness damaging the cutting edge. Furthermore, if the feed is too low, heat accumulates and has a large negative effect on the tools lifespan. Therefore, it is important to select a tool that is designed for low cutting resistance, has a coating that has excellent lubricity and improves chip evacuation, and is made with carbide that is less prone to cutting edge damage. Moreover, it is important to select a tool that is strongly rigid and designed to avoid chatter. In respect to avoiding chatter, due to the significant effect the jig has on maximizing the tools capabilities and each customers usage environment, reviewing the grasping force of the chuck, stick out amount and conventional methods of mounting the jig, as well as milling in a highly rigid setting as much as possible will contribute to the improvement of tool life not only with our tools but with others as well.



- This end mill is designed on the premise that the stiffness of the spindle is high. It is recommended to first use the SPHF series if milling with a BT30 machine. Please apply with under 50% of the milling parameters mentioned above if using SPEF.
- Please observe closely to the feed rate per tooth if possible. Please base the the peripheral speed and feed rate on the feed rate per tooth.
- This end mill can be used for side and slot milling. It also demonstrates excellent tool life with trochoidal milling.
- Please apply at 60-80% of the milling parameters mentioned above for dry processing.
- For the feed rate, please apply at 60-80% if ap D is greater than the conditions.
- The conditions are based on the rigidity of BT50 machine by means of MC processing.
- ※ Please mill at around 40-50% of the milling parameters for BT30 and around 70-80% of the milling parameters for BT40.
- (Please lower the feed rate per tooth lower than the values on the following page.)

