

## Expanded lineup of “Aqua REVO series”

### 1. Our efforts

In 2018, we launched the “Aqua REVO Drill”, a carbide drill series with completely new material, geometry, and coating. It has been highly evaluated by customers and has expanded its market share. In 2019, the “Aqua REVO Mill” was added to the series, a carbide endmill series with long tool life, high efficiency, and multi-purpose features. It has been highly evaluated by customers and has expanded its market share for carbide milling tools.

In recent years, in the machining of stainless steel, for which demand is increasing for various applications, we have added the “Aqua REVO Mill for Stainless Steel”, which achieves higher efficiency and longer tool life through improved chip evacuation and heat reduction. We will contribute to quality improvement and cost reduction for our users in milling difficult-to-cut materials.

### 2. Overview of “Aqua REVO Mill for Stainless Steel”

Stainless steel has excellent corrosion resistance, heat resistance, and durability and its demand is expanding worldwide. It is used for home appliances such as washing machines and dishwashers, industrial equipment such as power generation, chemical plants, and even hydrogen stations.

On the other hand, there are machining issues such as “recutting and clogging of chips”, “high work hardening and cutting resistance increase”, and “low thermal conductivity, heat tends to accumulate in the cutting edge of the tool”. Therefore, it is known to be a difficult-to-machine material.

#### (1) Features

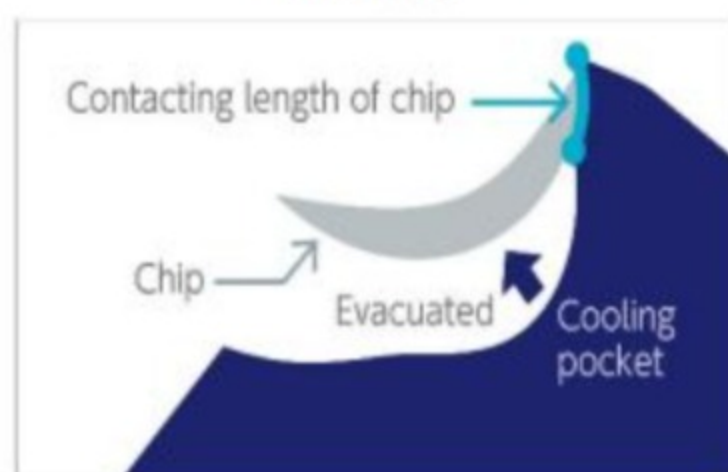
The Aqua REVO Mill for stainless steel adopts a newly developed flute shape called the (\*)“Air Flute”. By limiting the length of contact between the chips and the rake face, chip evacuation is improved, which reduces chip jamming and clogging.

In addition, cutting resistance is reduced by 20% compared with conventional products by reducing the heat generated in the machining process and reducing work hardening. Furthermore, by creating a space between the cooling flute and the chips, the coolant can easily flow to the vicinity of the tool's cutting edge, suppressing heat generation. Outstanding performance is demonstrated not only in side milling but also in slotting where chip evacuation is difficult.

(\*) Patent pending

**Air Flutes**

Air flute



#### ① Improved surface quality, high efficiency

Due to the Air flute geometry, efficient chip evacuation can be achieved even when slotting where the chip width is wide, and cutting resistance is reduced. Stable machining can be achieved without scratches due to the recutting of chips, even in high-efficiency machining.

#### ② Long life

Due to improved chip evacuation, reduced cutting resistance, and machining heat, tool life can be increased by approximately 3 times compared with competitors' conventional products with less chipping and wear.

#### ③ Versatile

Applicable to a wide range of work materials, from austenitic to precipitation-hardened stainless steel, as well as general structural steel to difficult-to-cut materials such as titanium alloys and heat-resistant alloys.

#### (2) Series and Size Range

4-flutes 2.5D G (Gashland Type)

Size range: from  $\Phi 3$  to  $\Phi 20$ , 9 sizes

Reference size: Typical size  $\Phi 6.0$ , O.A.L 50mm,  
7,500 Japanese yen/piece (without tax)



### 3. Launch Date and Sales Target

Release date: November 1, 2022 global release Sales

target: ¥100 million per year in the first year and ¥300 million per year in three years