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Cemented carbide drills for printed boards

印制板用硬质合金钻头

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1 Scope

The standard lays down the terms and definitions, the dimensions, the technical requirements, the inspection, the packaging, the storage and the transport of cemented carbide drills of diameter 0.05 mm to 6.5 mm used for machining printed boards, called drills below.

2 Normative references

The application of the following documents to this document is indispensable. For a dated reference only the edition bearing that date applies; for an undated reference the latest edition, including all amendments, applies.

GB/T 4340.4-2009, Metallic materials - Vickers hardness test - Part 4: Tables of hardness values.

YB/T 5349-2006, Metallic materials - Test method for mechanical properties in bending.

3 Classification

3.1 Classification by the shape of the front end. Drills are divided into the ST type, that is the straight type, and the UC type, that is the undercut type. The ST type is the ordinary drill whose drill body generatrix is a straight line, its point shape being shown in Figure 1. The UC type is the drill whose rear body outside diameter is machined to a smaller diameter, its point shape being shown in Figure 2.

3.2 Classification by external dimensions. Drills are divided into the conventional type and the ID type, that is the inverse drill type. The conventional type is the drill whose drill diameter is smaller than its shank diameter, as in Figure 3; the ID type is the drill whose drill

diameter is larger than its shank diameter, as in Figure 4.

3.3 Classification by shank diameter. Drills are divided into two kinds, with a shank diameter of 3.175 mm and with a shank diameter of 2 mm.

3.4 Classification by use. Drills are divided into two kinds, drills for ordinary hole drilling and slot drills for machining narrow slots.

4 Terms and definitions

The following terms and definitions apply to this document.

4.1 chisel edge: the cutting edge formed by the intersection of the two flanks, marked X in Figure 5. 4.2 web taper: the ratio of the increase of the web, measured from the point of the drill towards the end of the flute of the drill body, to the length over which it is measured; also called web gradient, marked H in Figure 6.

4.3 chamfer angle: the angle or the arc at the end of the shank, the chamfering or rounding at the shank end being made so that the drill can be fitted and removed conveniently, marked C in Figure 7. 4.4 drill diameter: the actual dimension of the drill body, measured close to the drill point, marked d in Figure 7.

4.5 land: the helical part of the drill body, comprising two parts, the margin marked E in Figure 7 and the back of the land marked F in Figure 7. 4.6 width of fluted land: the width of the peripheral part of the drill body between adjacent flutes, that is the distance between the leading edge of the margin and the trailing edge, measured perpendicularly to the leading edge of the margin, marked with the subscripted S in Figure 7.

4.7 flute land ratio: the ratio between the width of the flute and the width of the land at a given position of the drill body. 4.8 width of margin: the width of the margin, measured in the direction perpendicular to the edge of the margin, that is to the secondary cutting edge, marked b in Figure 7. 4.9 body clearance diameter: the diameter of the back of the land behind the margin, marked with the subscripted d in Figure 7.

4.10 overall length: the distance between the two planes perpendicular to the drill axis that pass through the chisel edge and through the end of the shank, marked with the subscripted L in Figure 7. 4.11 flank: the surface formed on the drill point by the main cutting edge, the boundary line of the land, the boundary line of the other flute and the chisel edge; it comprises the primary flank marked A in Figure 7 and the secondary flank marked B in Figure 7.

4.12 point angle: the angle between the projections of the two main cutting edges; in the plane passing through the axis and parallel to the main cutting edge, it is twice the value of the angle between the main cutting edge and the axis, marked with the Greek letter sigma in Figure 7. 4.13 primary face angle: the clearance angle measured at the outer corner of the cutting edge of the drill point, marked with the subscripted alpha in Figure 7. 4.14

secondary face angle: the clearance angle of the primary flank, marked with the second subscripted alpha in Figure 7.

4.15 shank: the part used for clamping the drill in the drilling machine and for transmitting the drive. 4.16 shank diameter: the diameter of the shank of the drill, marked D in Figure 7.

4.17 web thickness: the smallest dimension between the bottoms of the two flutes, measured in the plane perpendicular to the axis, marked K in Figure 7.

4.18 flute length: the distance between the two planes perpendicular to the drill axis that pass through the tip of the drill point and through the furthest point of the end of the flute of the drill body, marked with the second subscripted L in Figure 7. 4.19 step: the part connecting the drill body and the drill shank, marked P in Figure 7. 4.20 helix angle: the angle between the tangent at a point on the leading edge of the margin and the axis of the drill body, marked with the Greek letter gamma in Figure 7.

4.21 chips: nicks, cracks, pores and the like on the cutting edge of the drill point, arrowed in Figure 8. The English term printed against this Chinese entry is the one used by the issuing body and is reported unchanged. 4.22 flare, also called oversized head: the width of the primary flank at the periphery of the drill is greater than its width at the centre of the drill point, arrowed in Figure 9. 4.23 negative, also called undersized head: the width of the primary flank at the periphery of the drill is smaller than its width at the centre of the drill point, arrowed in Figure 10.