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## Power spinning dies

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# Table of Contents

Foreword
1 Scope
2 Normative References
3 Terms and Definitions 4 Structure
4.1 Classification
4.2 Composition
4.3 Typical Structures
5 Technical Requirements
5.1 Working Surfaces
5.2 Structural Requirements
5.3 Dimensions
5.4 Accuracy
5.5 Materials and Heat Treatment
6 Test Methods
6.1 Appearance
6.2 Geometric Dimensions
6.3 Taper and Datum Face Distance
6.4 Geometric Tolerances
6.5 Surface Roughness
6.6 Hardness
6.7 Depth of Hardened Layer
7 Inspection Rules
7.1 Inspection Items
7.2 Factory Inspection
8 Marking, Packaging, Transportation and Storage
8.1 Marking
8.2 Packaging
8.3 Transportation
8.4 Storage

# Foreword

This document was drafted in accordance with the provisions of GB/T 1.1-2020 Directives for Standardization - Part 1: Rules for the Structure and Drafting of Standardization Documents.

Certain contents of this document may involve patents. The issuing body of this document shall not be liable for identifying any such patents.

This document was proposed and is under the jurisdiction of the National Technical Committee on Mould Standardization (SAC/TC33).

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# Power spinning dies

## 1 Scope

This document specifies the structure and technical requirements for power spinning dies, describes the corresponding test methods, and also specifies the inspection rules, marking, packaging, transportation and storage requirements for such dies.

This document is applicable to the manufacture of shear spinning dies and flow spinning dies.

Note: Spinning referred to in this document means external spinning in cold spinning forming.

## 2 Normative References

The contents of the following documents constitute indispensable provisions of this document through normative reference in the text. For dated referenced documents, only the version corresponding to the specified date applies to this document; for undated referenced documents, the latest version (including all amendments) applies to this document.

GB/T 230.1 Metallic materials - Brinell hardness test - Part 1: Test method

GB/T 8541 Forging and stamping terms

GB/T 8845 Moulds - Terms

GB/T 9450 Determination and verification of depth of carburized and quenched hardened layers for steel parts

GB/T 10610 Geometrical product specifications (GPS) - Surface texture: Profile method - Rules and methods for the assessment of surface texture

## 3 Terms and Definitions

The terms and definitions defined in GB/T 8541 and GB/T 8845 apply to this document.

## 4 Structure

### 4.1 Classification

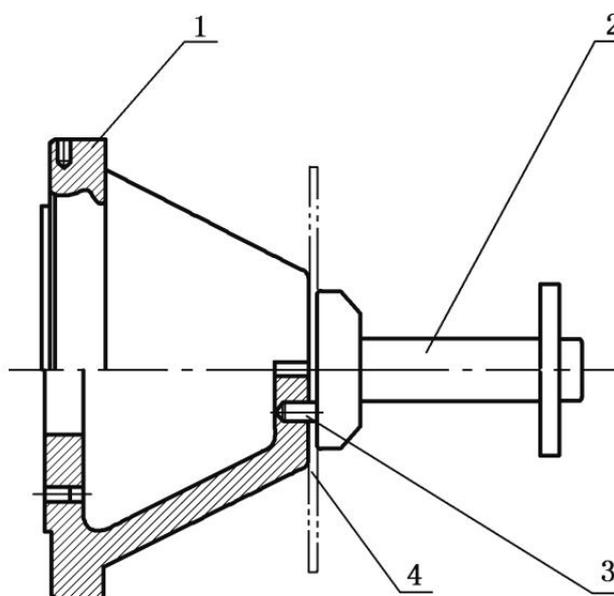
Power spinning dies are classified into shear spinning dies and flow spinning dies according to their deformation characteristics.

### 4.2 Composition

Power spinning dies are mainly composed of mandrel, stripping device, tail top device and other components.

### 4.3 Typical Structures

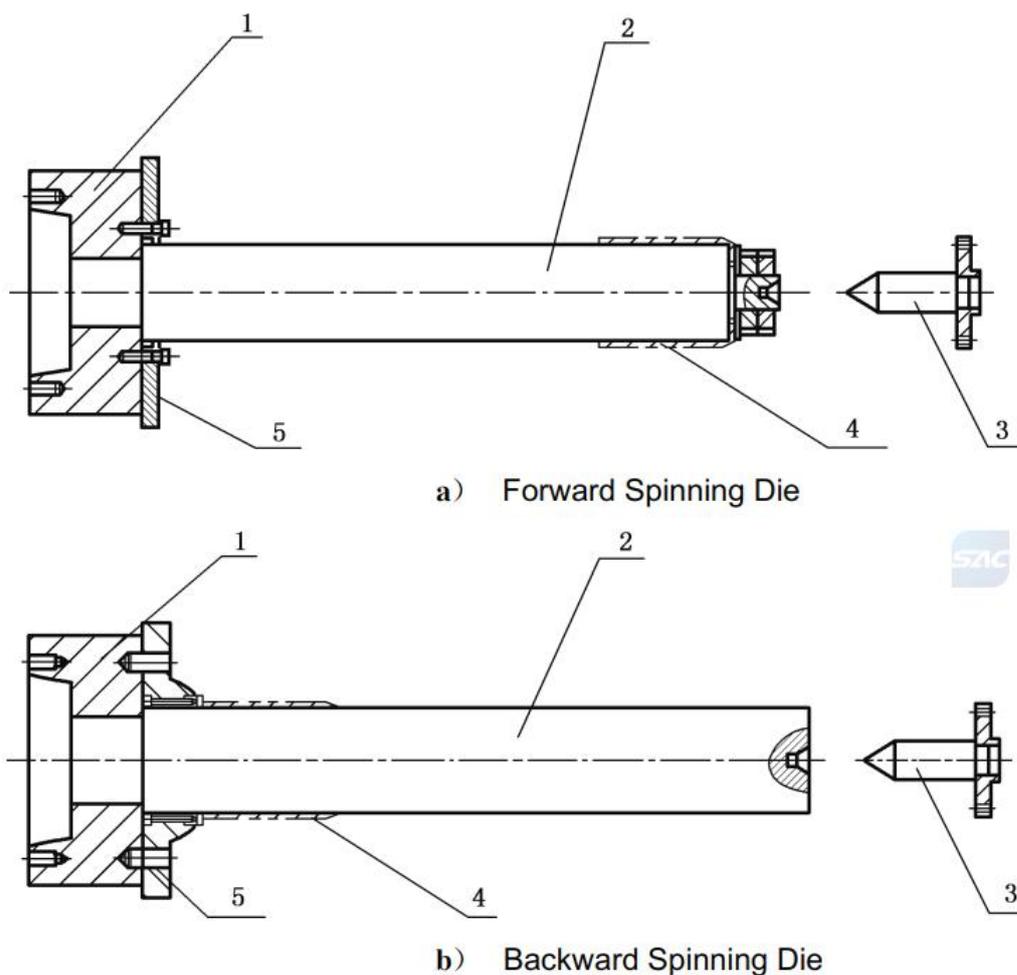
The typical structure of shear spinning dies is shown in Figure 1, and the typical structure of flow spinning dies is shown in Figure 2.



Explanation of Index Numbers:

- 1——Mandrel;
- 2——Tail top device;
- 3——Pin;
- 4——Blank。

Figure 1 Shear Spinning Die



Explanation of Index Numbers:

- 1——Connecting flange;
- 2——Mandrel body;
- 3——Tail top device;
- 4——Blank;
- 5——Stripping device。

## 5 Technical Requirements

### 5.1 Working Surfaces

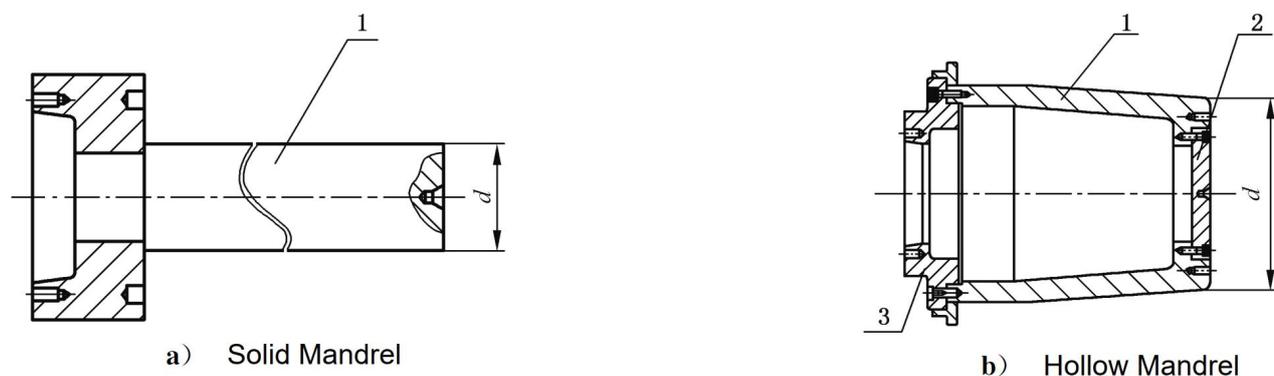
**5.1.1** The working surfaces of spinning dies shall be free from blowholes, cracks, scratches, dents, unevenness and other defects.

**5.1.2** The working surface of the mandrel body shall be processed by grinding, with a surface roughness  $R_a$  of not more than  $0.8 \mu\text{m}$ .

## 5.2 Structural Requirements

### 5.2.1 Mandrel

5.2.1.1 The mandrel body shall adopt a solid structure when its minimum diameter  $d$  is less than 150 mm; and a hollow structure when its minimum diameter  $d$  is not less than 150 mm. If a tail top device is used in spinning, a plug shall be added to the hollow spinning die, see Figure 3.



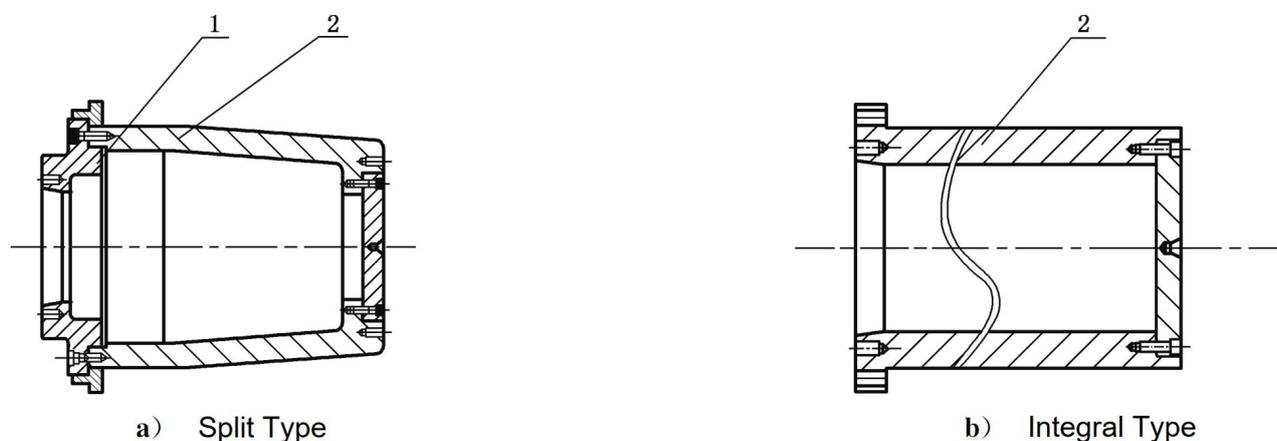
Explanation of Index Numbers

- 1 - Mandrel body;
- 2 - Plug;
- 3 - Connecting flange.

**Figure 3 Mandrel Structures**

5.2.1.2 The wall thickness of the hollow mandrel body shall be more than three times the thickness of the spinning blank, and should not be less than 50 mm.

5.2.1.3 The connection modes of the mandrel body with the machine tool are divided into split type and integral type, see Figure 4. The integral type should be adopted when the dimensions of the mandrel body are close to the interface dimensions of the machine tool.



a) Split type

b) Integral type