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Foreword

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This document was prepared by Technical Committee ISO/TC 29, *Small tools*, Subcommittee SC 8, *Tools for pressing and moulding*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document was developed on basis of ISO 8695 and Chinese National Standard GB/T 8845-2017.

Tools for pressing — Vocabulary

1 Scope

This document establishes the terms and definitions of the main types of tools for pressing, their features and dimensional characteristics. Some of these terms refer to components whose functions are shown in Figure 1, Figure 2 and Annex A.

This document is intended to serve as a reference for users and manufacturers of tools for pressing.

This document is used for understanding of technical terms and applicable for communication and trade of tools for pressing.

NOTE The figures are given only as examples to illustrate the terms and definitions.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1 Classification

3.1.1
stamping die
stamping tool
tool to get product under pressure through separating, shaping or joining metallic, non-metallic flat sheet or section by deforming it with a die, including *blanking die* (3.1.2), *drawing die* (3.1.5), *bending die* (3.1.3), *forming die* (3.1.6), *progressive die* (3.1.8) and *compound die* (3.1.7), etc.

3.1.2
blanking die
die to separate sheet material along a closed or open profile line

3.1.2.1
punching die
blanking die (3.1.2) to separate material and get product with closed outer profile, consisting of blanking *punch* (3.2.6.1) and punching *die plate* (3.2.5)

Note 1 to entry: See Figure A.1.

3.1.2.2
perforating die
blanking die (3.1.2) to separate material and get product with closed inner profile

3.1.2.3
fine blanking die
blanking die (3.1.2) with the sheet deformation zone punched under three-dimensional pressure stress to form high smoothness surface and high precision dimension product

3.1.2.4
cutting-off die
blanking die (3.1.2) to separate sheet material along non-closed profile

3.1.2.5
trimming die
blanking die (3.1.2) to cut off excess material at the edge of processed part

3.1.2.6
shaving die
blanking die (3.1.2) to trim off a small amount of material along the blanked edges or holes to improve the product dimension precision and reduce the blanked section roughness value

3.1.3
bending die
stamping die (3.1.1) to bend blank or workpiece to certain angle and shape

Note 1 to entry: See Figure A.2.

3.1.4
curling die
stamping die (3.1.1) to curl workpiece edge to certain shape, or to create a hollow ring

3.1.5
drawing die
stamping die (3.1.1) to draw blank to hollow body product or workpiece or to further change the hollow body workpiece shape and dimension

Note 1 to entry: See Figure A.3.

3.1.5.1
obverse drawing die
drawing die (3.1.5) to redraw workpiece in the same direction of former drawing process

3.1.5.2
reverse drawing die
drawing die (3.1.5) to flange hollow body workpiece inwall

3.1.5.3
hydrodrawing die
drawing die (3.1.5) using fluid to draw a part

3.1.6
forming die
stamping die (3.1.1) to produce plastic deformation without a bank holder in sheet or blank material to form a product

3.1.6.1
bulging die
forming die (3.1.6) to produce tensile plastic deformation inside hollow blank to get product with convex drum shape

3.1.6.2
flanging die
forming die (3.1.6) to erect workpiece edge or to form certain angle of straight flange

3.1.6.3
burring die
forming die (3.1.6) to erect workpiece hole edge or to form certain angle of straight flange

3.1.6.4
necking die
forming die (3.1.6) to reduce the radial dimension of hollow or tubular workpiece end

3.1.6.5
flaring die
forming die (3.1.6) to enlarge the radial dimension of hollow or tubular workpiece end

3.1.6.6
hydroforming die
forming die (3.1.6) using fluid as a force transmission medium to work with a *punch* (3.2.6.1) or *die plate* (3.2.5) to form product

3.1.6.7
micro forming die
forming die (3.1.6) with which at least two-dimensional submillimeter level dimensions in the plastic forming part of product are achieved

3.1.6.8
calibration die
forming die (3.1.6) used to rework a product to achieve the required shape, dimension and precision

3.1.6.9
embossing die
forming die (3.1.6) used to press a convex-concave imprint on the product surface, while changing the material thickness between the two surfaces

3.1.7
compound die
single-station *stamping die* (3.1.1) which can simultaneously complete two or more stamping processes in one-stroke of press machine

Note 1 to entry: See Figure A.4.

3.1.7.1
obverse compound die
compound die (3.1.7) with the *cutting punch in combination punching* (3.2.6.3) in the *upper die* (3.2.3) and with the punching *die button* (3.2.6.4) and perforating *punch* (3.2.6.1) mounted in the *lower die* (3.2.4)

3.1.7.2
inverse compound die
compound die (3.1.7) with the *cutting punch in combination punching* (3.2.6.3) in the *lower die* (3.2.4) and with the punching *die button* (3.2.6.4) and perforating *punch* (3.2.6.1) mounted in the *upper die* (3.2.3)

3.1.8
progressive die
stamping die (3.1.1) which in one-stroke of press machine can the strip material be fed in successively at fixed pitch and simultaneously complete multi-process stamping in multi-station arranged in the direction of material-feeding

Note 1 to entry: See Figure A.5.

3.1.9
single-operation die
stamping die (3.1.1) which completes one stamping process in one-stroke of press machine

3.1.10
combined die
stamping die (3.1.1) which completes different stamping processes or produces various products through disassembling and assembling combination of die components

3.1.11
transfer die
stamping die (3.1.1) to simultaneously complete multi-process stamping at two or more stations arranged in the feeding direction in one stroke of press machine, in which the delivery of workpiece is realized by means of automatic transmission device

3.1.12
flexible die
stamping die (3.1.1) which respectively produces various specification of products through controlling states of different working stations

3.1.13
hot stamping die
stamping die (3.1.1) to shape heated metal sheet and then harden it by cooling

3.1.14
multi-function stamping die
stamping die (3.1.1) with multiple functions such as automatic punching, stacking, counting, grouping, skewing and safety protection, etc.

3.1.15
low-cost die
stamping die (3.1.1) with simple structure, short manufacturing cycle and low cost, suitable for small-lot or pilot production

3.1.15.1
rubber die
low-cost die (3.1.15) in which the *working components* (3.2.6) are made of rubber

3.1.15.2
resin die
low-cost die (3.1.15) in which the *working components* (3.2.6) are made of high polymer material

3.1.15.3
low-melting-point alloy die
low-cost die (3.1.15) in which the *working components* (3.2.6) are made of low melting-point alloy

3.1.16
planishing die
stamping die (3.1.1) to flatten product to achieve the required plane precision

3.2 Parts and components

3.2.1
die set
sub-assembly of a die usually consisting of a bottom plate (*matrix* (3.2.6.2) *retainer* (3.2.23.4)) and an top plate (*punch* (3.2.6.1) *retainer* (3.2.23.4)), with *guide pillars* (3.2.23.1) built into one of the plates and the corresponding *guide bushes* (3.2.23.2) built into the other plate

3.2.1.1
standardized die set
die set (3.2.1) combined by assembly of components which have standardized, serialized structural types and dimensions, and certain interchangeability

3.2.1.2
quick change die set
die set (3.2.1) into which several different die *inserts* (3.2.8) can be fitted

3.2.1.3
die set, rear pillars
die set (3.2.1) with *guide pillars* (3.2.23.1) mounted on the rear side of the top and bottom plates

Note 1 to entry: *Die set* (3.2.1) with rear pillars, which is particularly suited to single-process dies and is used for inserting large work pieces.

3.2.1.4
die set, diagonal pillars
die set (3.2.1) with *guide pillars* (3.2.23.1) mounted diagonal to each other at the corners of the top and bottom plates

Note 1 to entry: *Die set* (3.2.1) with diagonally positioned pillars, which is particularly suited to *progressive dies* (3.1.8) with multiple working steps, but only for suitably narrow work pieces.

3.2.1.5
die set, center pillars
die set (3.2.1) with *guide pillars* (3.2.23.1) mounted in bilateral symmetry at the centre of the edges of the top and bottom plates

Note 1 to entry: *Die set* (3.2.1) with center pillars, which is primarily used for single-process dies, e.g. *blanking dies* (3.1.2).

3.2.1.6
die set, four pillars
die set (3.2.1) with *guide pillars* (3.2.23.1) mounted at all four corners of the top and bottom plates

3.2.1.7
fine blanking die set
die set (3.2.1) with high rigidity and guide precision and suitable for fine blanking

3.2.1.8
sliding guide die set
die set (3.2.1) in which sliding guides are used to guide the *upper* and *lower dies* (3.2.3 and 3.2.4)

3.2.1.9
die set with roller bearing
die set (3.2.1) in which roller bearings are used to guide the *upper* and *lower dies* (3.2.3 and 3.2.4), preferably using ball or roller guides

3.2.1.10
die set with spring-loaded plate
die set (3.2.1) in which a third plate, the spring-loaded *guide plate* (3.2.23.5), is placed between the *upper* and *lower dies* (3.2.3 and 3.2.4)

3.2.2
die shoe
part of *die set* (3.2.1) that is fixed to the press ram or bed, on which the *working components* (3.2.6), *guide elements* (3.2.23) and locating parts are positioned

3.2.3
upper die
upper half of die
die part mounted on the press ram

3.2.4
lower die
lower half of die
die part mounted on the press bed (anvil)

3.2.5
die plate
plate part that forms *stamping die* (3.1.1)

Note 1 to entry: *Die plates* (3.2.5) include the openings for the *punches* (3.2.6.1) used in the various work stages.

3.2.6
working component
component which directly forms the shapes and dimensions of the product

3.2.6.1
punch
working component (3.2.6) which is counterpart to the *matrix* (3.2.6.2) and used for cutting or punching in shear cutting processes

3.2.6.1.1
round punch
punch (3.2.6.1) with cylindrical section body

Note 1 to entry: See Figure 1.

3.2.6.1.2
punch with ejector
punch (3.2.6.1) with mounting holes for *ejector pins* (3.2.25.6)

3.2.6.1.3
quick change punch
punch (3.2.6.1) which can be rapidly demounted and replaced

3.2.6.1.3.1
ball-lock punch
quick change punch (3.2.6.1.3) which is mounted and held by a ball-lock

3.2.6.2
matrix
working component (3.2.6) which is used for cutting or punching in shear cutting processes

3.2.6.2.1
round matrix
cylindrical *matrix* (3.2.6.2)

Note 1 to entry: See Figure 2.

3.2.6.2.2
quick change matrix
matrix (3.2.6.2) which can be rapidly demounted and replaced

3.2.6.3
cutting punch in combination punching
working component (3.2.6) which serves both as the cutting *punch* (3.2.6.1) and cutting *die button* (3.2.6.4)

3.2.6.4
die button
plate part that works as the *matrix* (3.2.6.2)

3.2.7
shrinking ring
circular bushing component embracing *die button* (3.2.6.4), which has interference fit with the *matrix* (3.2.6.2) to increase its strength