

HOUSING DETAIL STANDARD-SIZED MODEL DEVELOPMENT

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Body parts processed in the production of JSC "Izmeritel" have been considered. A standard-sized model of the housing detail for this production was compiled. It is based on the analysis of the structural elements of the details and their sizes.

One of the most important factors that should be considered while designing and creating machine-building production is the size of a product.

The standard size of a product is a product of this type of design with certain values of parameters [1]. The number of production parameters depending on it is large: from the required area for equipment placement to necessary tool. Therefore, when developing a standard model of a product, designers and technologists need to pay considerable attention to the production cost. Knowing in advance what equipment and tools are needed, you can optimize costs and use the savings for other purposes.

Housing parts is one of the types of products for which the creation of a standard-sized model is often required. The nomenclature of this type of parts is very diverse: the housing itself, covers, boxes, slats, panels, etc. In addition, the overall dimensions of body parts can vary from tens to several thousand millimeters. These two features often require a large number of diverse equipment belonging to the same type, for example, several milling machines, with different magnitude of spindle movement.

Creating a standard model is carried out in several stages:

- 1) analysis of the parts that will be manufactured in production (during its development), or upgrading already manufactured parts;
- 2) identification of common structural elements (SE) and determining their boundary dimensions;
- 3) creation of the model with all common SE where the dimensions are determined by the smallest and largest size for each specific element.

The use of the obtained standard-size model, as well as its change when new products appears, allows us to simplify the procedure of tools and equipment selection, as well as to reduce the time of organizing new manufacturing process for producing items included in this model.

As an example, a standardized product was developed on the basis of a body parts processed in the production of JSC «Izmeritel» analysis. The resulting model is presented in Fig. 1.

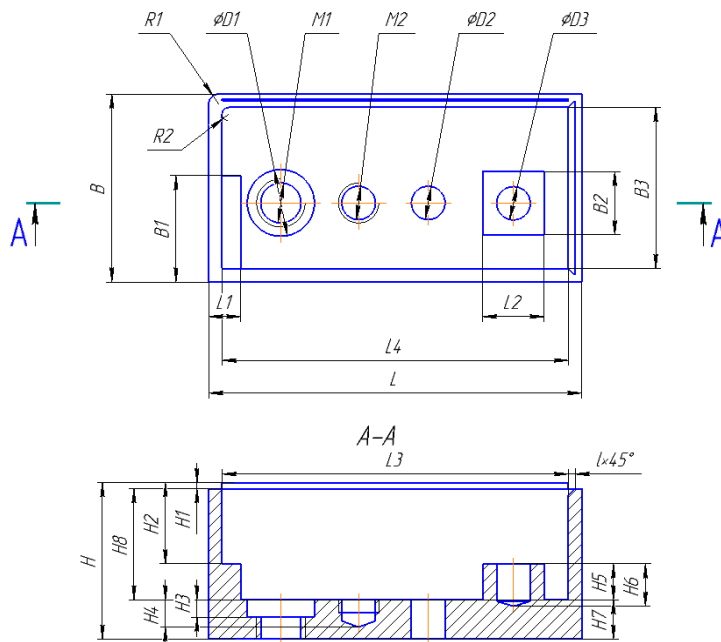


Figure 1. – Standard model of a housing detail

As it can be seen, a standard-sized product is a housing detail, with the design including many structural elements belonging to this type of product: chamfers, pockets, roundings, holes of various types, lugs, shoulder, etc.

The boundary values of dimensions indicated in the drawing are presented in Table 1.

Table 1. – The limits of the dimensions of the CE model size

CE	Designation on the drawing	Size, mm
Main dimensions	L; B; H	100...585; 52...395; 5,5...89
External and internal rounds	R ₁ ; R ₂	0...10; 2...6
Pocket	B ₃ ; L ₄ ; H ₈	36...560; 42...370; 3...74
Ledge	B ₁ ; L ₁ ; H ₂	0...120; 0...60; 0...34
Boss	B ₂ ; L ₂ ; H ₅	0...65; 0...65; 0...28
Shoulder	L ₃ ; H ₁	0...540; 0...3
Chamfer	l×45°	0...5×45°
Step hole	D ₁ ; H ₇ ; H ₃	0...66; 0...15; 0...8
Through hole	D ₂ ; H ₇	0...28; 0...30
Blind hole	D ₃ ; H ₆	0...16; 0...45
Threaded hole	M ₂ ; H ₄	0...M8; 0...36
Threaded through hole	M ₁ ; H ₇	0...M8; 0...40

Using and analyzing this model we can decide what equipment and tools are needed for processing, mainly:

- three- and four-coordinate milling machines of horizontal or vertical type;
- face mills with a diameter of 40 ... 50 mm;
- end mills with a diameter of 1 ... 20 mm;
- spiral and centering drills;
- threaded mills and machine taps;
- in some cases cone and radius cutters.

REFERENCES

1. ГОСТ 23945.0-80 [Электронный ресурс]. – Режим доступа: <http://www.vashdom.ru/gost/23945.0-80/> - Дата доступа: 03.02.2019.