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**Tools for moulding — Tool specification  
sheet for injection moulds**

*Outillage de moulage — Formulaire de spécifications d'outils pour  
moules d'injection*

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## Foreword

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The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 16916 was prepared by Technical Committee ISO/TC 29, *Small tools*, Subcommittee SC 8, *Tools for pressing and moulding*.

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# Tools for moulding — Tool specification sheet for injection moulds

## 1 Scope

This International Standard defines the description and specification of injection moulds to be used when requesting tools (stage of tender) and ordering tools. This International Standard gives data for material acquisition, equipment, structural design of injection moulds including the surfaces of the tool. Information relating to machine-specific data, types of operation and warranty is also contained in this specification sheet.

This International Standard does not apply to compression moulds and die casting dies.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 12165:2000, *Tools for moulding — Components of compression and injection moulds and diecasting dies — Terms and symbols*

## 3 Terms and definitions

For the purposes of this document the terms and definitions given in ISO 12165 apply.

## 4 Use of the specification sheet

By using this specification sheet, the offers of various suppliers can be compared with each other. In consideration of these specification misunderstandings, misinterpretations or claims to damages shall already be eliminated or minimized at the time when the tools are ordered.

The user of this specification sheet is permitted to make copies.

## 5 Tool specification sheet

|                                                                                                                                                         |                                                     |                                 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|---------------------------------|
| <b>1 General information</b>                                                                                                                            |                                                     |                                 |
| Buyer:                                                                                                                                                  |                                                     | Date:                           |
| Person to contact for all technical questions:                                                                                                          |                                                     | Request No.:                    |
|                                                                                                                                                         |                                                     | Telephone:                      |
|                                                                                                                                                         |                                                     | Telefax:                        |
|                                                                                                                                                         |                                                     | E-mail:                         |
| Offer No.:                                                                                                                                              | Drawing No.:                                        | State of modification:          |
| Moulding designation:                                                                                                                                   |                                                     | Total amount of pieces planned: |
| Part drawing No.:                                                                                                                                       | Prototype tool                                      | <input type="checkbox"/>        |
|                                                                                                                                                         | Production tool                                     | <input type="checkbox"/>        |
| Drawing for request: <input type="checkbox"/>                                                                                                           | Approved moulding drawing: <input type="checkbox"/> |                                 |
| Type of resin, compound:                                                                                                                                | Shrinkage:                                          |                                 |
| NOTE Important                                                                                                                                          |                                                     |                                 |
| Number of cavities:                                                                                                                                     |                                                     |                                 |
| Subsequent specification for mould offer:                                                                                                               |                                                     | <input type="checkbox"/>        |
| Subsequent specification for mould ordering:                                                                                                            |                                                     | <input type="checkbox"/>        |
| Supplier of standards:                                                                                                                                  |                                                     |                                 |
| External supplier:<br>(external work bench)                                                                                                             |                                                     |                                 |
| <b>2 Guidelines</b>                                                                                                                                     |                                                     |                                 |
| 2.1 The mould design concept shall be presented to the customer for approval prior to purchasing the material and starting the production of the mould. |                                                     |                                 |
| 2.2 The manufacture of the cores and cavities shall be carried out in accordance with the actual mould design.                                          |                                                     |                                 |
| 2.3 If there are any uncertainties with respect to the drawing data, agreement with the customer is necessary in each case.                             |                                                     |                                 |
| 2.4 Sampling of the mould should preferably be done in the hardened state.                                                                              |                                                     |                                 |
| 2.5 Sampling of the mould shall be carried out with the moulding compound given in the moulding drawing.                                                |                                                     |                                 |
| 2.6 The performance of the mould in full automatic cycle shall be verified.                                                                             |                                                     |                                 |
| 2.7 The rights of ownership of electrodes, software (CNC programmes) and original construction documents are handed over to:                            |                                                     |                                 |
| <input type="checkbox"/> customer<br><input type="checkbox"/> supplier                                                                                  |                                                     |                                 |
| 2.8 The buyer shall specify the data relating to the contents of the mould type plate.                                                                  |                                                     |                                 |
| <b>3 Description of mould order</b>                                                                                                                     |                                                     |                                 |
| 3.1 To be provided for offer <input type="checkbox"/> and order <input type="checkbox"/>                                                                |                                                     |                                 |
|                                                                                                                                                         | provided by the customer                            | provided by the orderer         |
| Moulding drawing                                                                                                                                        | <input type="checkbox"/>                            | <input type="checkbox"/>        |
| CAD data                                                                                                                                                | <input type="checkbox"/>                            | <input type="checkbox"/>        |
| Sample                                                                                                                                                  | <input type="checkbox"/>                            | <input type="checkbox"/>        |

|                                                    | provided by the customer | provided by the orderer  |
|----------------------------------------------------|--------------------------|--------------------------|
| Mould design                                       | <input type="checkbox"/> | <input type="checkbox"/> |
| Master pattern                                     | <input type="checkbox"/> | <input type="checkbox"/> |
| Shrinkage pattern                                  | <input type="checkbox"/> | <input type="checkbox"/> |
| Raw material                                       | <input type="checkbox"/> | <input type="checkbox"/> |
| Mould assembly                                     | <input type="checkbox"/> | <input type="checkbox"/> |
| Hot runner                                         | <input type="checkbox"/> | <input type="checkbox"/> |
| Standard parts                                     | <input type="checkbox"/> | <input type="checkbox"/> |
| Electrodes                                         | <input type="checkbox"/> | <input type="checkbox"/> |
| Machine data sheet                                 | <input type="checkbox"/> | <input type="checkbox"/> |
| Other                                              | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>3.2 Scope of delivery relative to the mould</b> |                          |                          |
|                                                    | by the customer          | by the orderer           |
| Design with parts list                             | <input type="checkbox"/> | <input type="checkbox"/> |
| Drawings of components, cores and cavities         | <input type="checkbox"/> | <input type="checkbox"/> |
| Drawing of plates                                  | <input type="checkbox"/> | <input type="checkbox"/> |
| Drawing of electrodes                              | <input type="checkbox"/> | <input type="checkbox"/> |
| Drawing of wire pattern                            | <input type="checkbox"/> | <input type="checkbox"/> |
| CAD data                                           | <input type="checkbox"/> | <input type="checkbox"/> |
| List of coordinates                                | <input type="checkbox"/> | <input type="checkbox"/> |
| Mould type plate (visible on the tool)             | <input type="checkbox"/> | <input type="checkbox"/> |
| Set of electrodes                                  | <input type="checkbox"/> | <input type="checkbox"/> |
| NC programmes                                      | <input type="checkbox"/> | <input type="checkbox"/> |
| Connection cables                                  | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>3.3 Sampling</b>                                |                          |                          |
|                                                    | by the customer          | by the orderer           |
| Samples                                            | <input type="checkbox"/> | <input type="checkbox"/> |
| Test report                                        | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>4 Mould design</b>                              |                          |                          |
| <b>4.1 Type of mould</b>                           |                          |                          |
| Square mould assembly                              | <input type="checkbox"/> |                          |
| Round mould assembly                               | <input type="checkbox"/> |                          |
| Standard mould                                     | <input type="checkbox"/> |                          |
| Split mould                                        | <input type="checkbox"/> |                          |
| Stripper plate mould                               | <input type="checkbox"/> |                          |
| Three-plate mould                                  | <input type="checkbox"/> |                          |
| Stack mould                                        | <input type="checkbox"/> |                          |
| Hot-runner mould                                   | <input type="checkbox"/> |                          |

| 4.2 Setting up/Transport                |                                |                                |
|-----------------------------------------|--------------------------------|--------------------------------|
| 4.2.1 Setting up                        |                                |                                |
|                                         | Supplier                       | National standard or ISO       |
| Lifting device                          | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| Transport securing unit                 | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| Resting feet                            | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| Lifting eye bolt                        | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| Stop screw                              | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| Tool centering                          | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| Locating ring                           |                                |                                |
| — movable half (MH)                     | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| — fixed half (FH)                       | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| 4.2.2 Clamping on machine               |                                |                                |
|                                         | Supplier                       | National standard or ISO       |
| Mould clamping by means of              |                                |                                |
| — screws                                | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| — clamping units                        | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| — quick-action clamping                 | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| — magnetic clamping plate               | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| Clamping plates                         |                                |                                |
| — flush on all sides                    | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| — overhanging in lateral direction      | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| — overhanging in longitudinal direction | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| — overhanging on all sides              | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| Special clamping plates                 | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| Adapter plates                          | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| Clamping grooves                        | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| 4.3 Type of gating                      |                                |                                |
|                                         | Supplier                       | National standard or ISO       |
| Sprue gate                              | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| Sprue on subrunner                      | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| Tunnel gate                             | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| Film gate                               | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| Pin-point gate                          | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| Ring gate                               | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| Umbrella gate                           | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| Three-plate system                      | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| Side-gate in mould parting area         | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |



|                                                                                               | Supplier                       | National standard or ISO       |
|-----------------------------------------------------------------------------------------------|--------------------------------|--------------------------------|
| Hot-runner — Manifold block with distributor bushing                                          |                                |                                |
| — heated internally                                                                           | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| — heated externally                                                                           | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| Heated nozzle with pin-point gate                                                             | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| Heated nozzle with open gate                                                                  | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| Heated nozzle with needle valve                                                               | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| <b>4.4 Cooling/heating</b>                                                                    |                                |                                |
| <b>4.4.1 Expected mould temperature in degree Celsius</b>                                     |                                |                                |
| Fixed half (FH): _____ Movable half (MH): _____                                               |                                |                                |
| Number of cooling/heating circuits (FH): _____ Number of cooling/heating circuits (MH): _____ |                                |                                |
| <b>4.4.2 Cooled/heated mould components</b>                                                   |                                |                                |
| Inserts                                                                                       | <input type="checkbox"/> ..... |                                |
| Cores                                                                                         | <input type="checkbox"/> ..... |                                |
| Threaded cores                                                                                | <input type="checkbox"/> ..... |                                |
| Slides                                                                                        | <input type="checkbox"/> ..... |                                |
| Cavity plates                                                                                 | <input type="checkbox"/> ..... |                                |
| Backing plates                                                                                | <input type="checkbox"/> ..... |                                |
| Clamping plates                                                                               | <input type="checkbox"/> ..... |                                |
| <b>4.4.3 Thermal insulating sheets</b>                                                        |                                |                                |
|                                                                                               | Supplier                       | National standard or ISO       |
| Fixed half (FH)                                                                               | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| Movable half (MH)                                                                             | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| <b>4.4.4 Cooling nipple</b>                                                                   |                                |                                |
|                                                                                               | Supplier                       | National standard or ISO       |
| Design                                                                                        |                                |                                |
| — with open passage                                                                           | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| — with valve                                                                                  | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| Mounting position                                                                             |                                |                                |
| — countersunk                                                                                 | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| — projecting                                                                                  | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| Size of connecting thread                                                                     | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| <b>4.4.5 Electric mould heating</b>                                                           |                                |                                |
|                                                                                               | Supplier                       | National standard or ISO       |
| Cartridge heaters                                                                             |                                |                                |
| — cylindrical                                                                                 | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| — tapered                                                                                     | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| Heating coil                                                                                  | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |
| Band heater                                                                                   | <input type="checkbox"/> ..... | <input type="checkbox"/> ..... |

|                                                              |                             |                                                     |                              |
|--------------------------------------------------------------|-----------------------------|-----------------------------------------------------|------------------------------|
| <b>4.5 Demoulding</b>                                        |                             |                                                     |                              |
| Slide                                                        | <input type="checkbox"/>    | In horizontal position                              | <input type="checkbox"/>     |
| Slide drive system:                                          |                             | Position of rotating wedge <input type="checkbox"/> |                              |
| Angle pin                                                    | <input type="checkbox"/>    | Hydraulic system                                    | <input type="checkbox"/>     |
| Other                                                        |                             | Locking piece <input type="checkbox"/>              |                              |
| Ejector system:                                              | <input type="checkbox"/>    | Fixed half                                          | <input type="checkbox"/>     |
| Ejector plates, guided:                                      |                             | Movable half <input type="checkbox"/>               |                              |
| Slide guide                                                  | <input type="checkbox"/>    | Ball guide                                          | <input type="checkbox"/>     |
| Other                                                        |                             | <input type="checkbox"/>                            |                              |
|                                                              |                             | Supplier                                            | National standard or ISO     |
| Two-stage ejector                                            | <input type="checkbox"/>    | .....                                               | <input type="checkbox"/>     |
| Latch locking unit                                           | <input type="checkbox"/>    | .....                                               | <input type="checkbox"/>     |
| Angle ejector                                                | <input type="checkbox"/>    | .....                                               | <input type="checkbox"/>     |
| Thread removal by:                                           |                             |                                                     |                              |
| — helical spindle                                            | <input type="checkbox"/>    | .....                                               | <input type="checkbox"/>     |
| — rack hydraulic system                                      | <input type="checkbox"/>    | .....                                               | <input type="checkbox"/>     |
| — collapsible core                                           | <input type="checkbox"/>    | .....                                               | <input type="checkbox"/>     |
| Drive                                                        |                             |                                                     |                              |
| — hydromotor                                                 | <input type="checkbox"/>    | .....                                               | <input type="checkbox"/>     |
| — hydraulic system                                           | <input type="checkbox"/>    | .....                                               | <input type="checkbox"/>     |
| <b>4.6 Process control</b>                                   |                             |                                                     |                              |
|                                                              |                             | Supplier                                            | National standard or ISO     |
| Internal mould pressure                                      |                             |                                                     |                              |
| — pressure transducer                                        | <input type="checkbox"/>    | .....                                               | <input type="checkbox"/>     |
| — measuring pin                                              | <input type="checkbox"/>    | .....                                               | <input type="checkbox"/>     |
| Temperature control device                                   | <input type="checkbox"/>    | .....                                               | <input type="checkbox"/>     |
| Thermocouple                                                 | <input type="checkbox"/>    | .....                                               |                              |
| Position monitoring by micro switch                          |                             |                                                     |                              |
| Slide                                                        | on <input type="checkbox"/> | .....                                               | off <input type="checkbox"/> |
| Ejector                                                      | on <input type="checkbox"/> | .....                                               | off <input type="checkbox"/> |
| Core puller                                                  | on <input type="checkbox"/> | .....                                               | off <input type="checkbox"/> |
| <b>4.7 Mould centering of fixed half and movable half by</b> |                             |                                                     |                              |
|                                                              |                             | Supplier                                            | National standard or ISO     |
| Tool centering of fixed half and movable half by             |                             |                                                     |                              |
| — tapered locating units                                     | <input type="checkbox"/>    | .....                                               | <input type="checkbox"/>     |
| — prismatic locating units                                   | <input type="checkbox"/>    | .....                                               | <input type="checkbox"/>     |
| — self-centering inserts                                     | <input type="checkbox"/>    | .....                                               | <input type="checkbox"/>     |
| — square locating units                                      | <input type="checkbox"/>    | .....                                               | <input type="checkbox"/>     |

| 5 Mould steel grades, heat treatment |            |              |          |               |          |          |                 |          |
|--------------------------------------|------------|--------------|----------|---------------|----------|----------|-----------------|----------|
| Designation                          | Fixed half | Movable half | Hardened | Case-hardened | Tempered | Nitrided | Other treatment | Hardness |
| Clamping plate                       |            |              |          |               |          |          |                 |          |
| Cavity plate                         |            |              |          |               |          |          |                 |          |
| Backing plate                        |            |              |          |               |          |          |                 |          |
| Ejector retainer plate               |            |              |          |               |          |          |                 |          |
| Ejector base plate                   |            |              |          |               |          |          |                 |          |
| Risers                               |            |              |          |               |          |          |                 |          |
| Inserts                              |            |              |          |               |          |          |                 |          |
| Slides                               |            |              |          |               |          |          |                 |          |
| Other                                |            |              |          |               |          |          |                 |          |

  

| 6 Surfaces                                                                                                   |                          |                          |
|--------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|
| Surfaces shall be manufactured in accordance with the specification of the moulding drawing.                 |                          |                          |
| Within the area of direction of removal from the mould: line-polished, parallel to the direction of removal. |                          |                          |
| Coating of cores and cavities                                                                                |                          |                          |
|                                                                                                              | Fixed half               | Movable half             |
| TIC                                                                                                          | <input type="checkbox"/> | <input type="checkbox"/> |
| Chromium-plated                                                                                              | <input type="checkbox"/> | <input type="checkbox"/> |
| Nickel-plated                                                                                                | <input type="checkbox"/> | <input type="checkbox"/> |
| Other coating                                                                                                | <input type="checkbox"/> | <input type="checkbox"/> |

  

| 7 Marking of components                                         |                          |
|-----------------------------------------------------------------|--------------------------|
| Numbering of mould cavities                                     | <input type="checkbox"/> |
| Stamp for recycling                                             | <input type="checkbox"/> |
| Date stamp                                                      | <input type="checkbox"/> |
| Identification number                                           | <input type="checkbox"/> |
| Manufacturer's trademark                                        | <input type="checkbox"/> |
| Engraving/Graphic characters                                    | <input type="checkbox"/> |
| Other                                                           | <input type="checkbox"/> |
| Type and size of characters according to work standard No. .... |                          |
| (To be supplied with the order)                                 |                          |

  

| 8 Machine data |
|----------------|
| Machine type   |
| Alternative 1  |
| Alternative 2  |