

Special terms and conditions of contract for tool manufacture (WZB)

(Version 05/2010)



Clause 1: Collaboration by the customer

1.1 Machine data and installation drawings

- The customer is responsible for timely provision of the special machine data required for the production of the tool. MARBACH has available to it such data for commonly-used machine types; MARBACH uses the version of the data sheets most recently issued by the machine manufacturer if the customer provides no other data.
 - Clause 14 (7) of the MARBACH general terms and conditions of business shall apply to defects or damages caused by non-performance of the customer's obligation to collaborate.
 - Clauses 6 (2) and (4) of the MARBACH general terms and conditions of business shall apply to delays.
 - The customer shall pay any extra expenses in accordance with Clause 4 (7) of the MARBACH general terms and conditions of business.
- If no publications by the machine manufacturer on the stipulated machine type are available or if the customer's machine does not correspond to the standard dimensions, the customer must provide the machine data needed for performance of the contract and the installation drawings for the construction of the tool for the machine. The delivery period shall be extended by the duration of any such clarification.
- By way of an alternative or supplemental to clause (2), MARBACH may, if requested to do so, communicate to the customer the installation data used for the construction of the tool to verify his machine. This offer relates to all specifications and manufacturing stages for the tool, the stacking station of the manufactured products after their die cutting or forming, supply of the tool or the machine with media such as compressed air and water and all other peripherals of the tool such as heating modules etc. MARBACH shall have no responsibility for the results of the customer's own verifications.

1.2 Connections

The tool connections used by MARBACH for compressed air and water are the appropriate standard connections of the machine manufacturer. MARBACH shall be notified in writing of any deviations from such standard connections before commencement of construction.

- Clause 14 (7) of the MARBACH general terms and conditions of business shall apply to defects or damages caused by non-performance of the customer's obligation of collaboration.
- Clauses 6 (2) and (4) of the MARBACH general terms and conditions of business shall apply to delays.
- The customer shall pay any extra expenses in accordance with Clause 4 (7) of the MARBACH general terms and conditions of business.

We therefore recommend the customer, as a safeguard, to designate the current connections of his machine or to make them clear otherwise.

1.3 Test material, provision by the customer, film qualities

- The material for an agreed test run, running in of the tool and any process-optimisation work (tool mould sampling, e.g. to define the pre-stretch contour) must be provided by the customer free of charge for MARBACH. Film quality and characteristics of the film ultimately used in the production process must meet the requirements of modern thermofforming. The film must be properly and evenly formable in order to obtain good end results. The properties of the film to be processed using the tool must correspond to normal market specifications where the order confirmation gives no particular specifications. Otherwise the standard machine manufacturer's specifications (e.g. for die cutting forces) used by MARBACH in the construction of the tool cannot be taken as a reference. The same applies to toughness, brittleness or other mechanical and chemical characteristics of the film affecting the production process. In the case of new materials or material combinations (layer films), more extensive tests may be required at the customer's expense in order to be able to develop and construct a properly functioning tool.
 - Clause 14 (7) of the MARBACH general terms and conditions of business shall apply to defects or damages caused by:
 - Non-performance of the customer's obligation to collaborate or
 - Deviations from the agreed film quality or
 - Deviations from agreed film characteristics qualities or
 - Problems that were not perceivable on formation of the contract.
 - Clauses 6 (2) and (4) of the MARBACH general terms and conditions of business apply to delays.
 - The customer shall pay any extra expenses in accordance with Clause 4 (7) of the MARBACH general terms and conditions of business.
- If the quality or characteristics of the film seem problematic either in general or for the machining process or for the product to be manufactured or subsequent processing stages, MARBACH will give notice of the problems which became apparent after the order date. If the customer insists on the specification despite notification by MARBACH, the guarantee and liability of MARBACH is restricted to defects and consequences of defects which would have occurred even if the customer had acted on the notification.
- If the film is supplied in special packaging or on a rack on rollers etc., MARBACH shall return this after use at the customer's expense and risk, provided the customer does not wish to or has not announced that it will collect it himself.
- If the residual material cannot be disposed of locally and cost neutral, the customer shall bear the costs of disposal.

1.4 Shrinkage specifications

- Shrinkage of the products to be processed using the tool is, among other things, but not exclusively, dependant on the material used, the material additives, extrusion, the extruder process settings and preheating/heating and the machine. Item geometry and material distribution in the item also have a not insignificant influence. The shrinkage specifications shall be provided by the customer.
 - Clause 14 (7) of the MARBACH general terms and conditions of business shall apply to defects or damages attributable to defective shrinkage specifications from the customer.
 - Clauses 6 (2) and (4) of the MARBACH general terms and conditions of business shall apply to delays.
 - The customer shall pay any extra expenses in accordance with Clause 4 (7) of the MARBACH general terms and conditions of business.If requested, MARBACH may use its own empirical specifications; however, no responsibility can be accepted for the final form.
- Approximate values may also be found by trials with a test tool.

Clause 2: Warranty, liability

2.1 Environmental conditions

- In order to achieve optimum quality, maximum tool life and durability, our tools are made from precision components. In order to maintain their function and useful life, the environmental conditions must be optimal.

2.1.1 Environmental conditions/transport

- After transport, during which the constant base temperature of 20°C cannot be guaranteed, all tools shall be stress-relieved in particular by loosening the bolts and properly readjusted at a temperature of 20°C in accordance with specifications. Tools operated under stress become damaged.
- In transport (in particular in the case of transport by sea) the tool may be subject to vibration. Therefore, before commissioning, all screws and attachments must be checked by a specialist to ensure that they are tight.

2.1.2 Environmental conditions/operating temperatures

- The tools are designed for an environmental temperature of 20°C. If this temperature is exceeded or fallen below, condensation and dimensional changes may arise. The tool must be conditioned using a sufficiently high-performance system at a sufficient operating pressure. Technical specifications regarding this can be found in the operating instructions. We expressly recommend that temperature-stabilization devices should be used. Simply cooling with cold water, possibly in cyclic operation, is often insufficient.
- Temperature monitoring: In the case of combined-working thermofforming tools, temperature monitoring is necessary in the tool which shuts down the machine in the event of excessive temperature differences between upper and lower tool. The maximum possible temperature variations are set out in the operating instructions. Where this is not the case, the following applies: Max. 2 Kelvin Delta for male/female tools; max. 4 Kelvin for strip steel tools.

2.1.3 Environmental conditions/quality of external media

- The external media (e.g. coolant, environmental air, compressed air etc.) must at least comply with the requirements of modern mechanical engineering and the machine specifications and be provided in sufficient quality and quantity.
- Relevant special conditions shall be complied with for the manufacture of food packaging.
- Regular maintenance of the components in the tool in contact with media shall be observed. If the media do not correspond to the optimum values, maintenance intervals shall be shortened correspondingly or, if available, a version of the tool or its components should be ordered that is in line with the characteristics of the media used.
- In particular water quality must be suitable for the operation of tools and machinery. Precise values for this are set out in the operating instructions. In order to reduce corrosion due to electrical voltage differences, all units in the water circuits must be made of voltage-neutral materials where possible.

2.1.4 Environmental conditions/storage

- The tool is partially coated to protect it against corrosion. Please note that coatings in principle can only retard corrosion.
- In order to preserve the life of the components for as long as possible, it is important that the tool is properly stored and water is at no point lying on or in the tool.
- In the case of lengthy periods, the components must be protected by oils as permitted. The storage temperature shall not fall below 10°C, as otherwise the seals could become prematurely brittle, among other things.
- In principle, before commissioning after a lengthy period of storage, a complete function test shall be carried out.

2.1.5 Environmental conditions/new and recommissioning

Production process, transport and storage may result in residues collecting in the tool which only become detached during commissioning and despite the greatest care cannot initially be identified. Startup products must therefore be separated out. Before release for production, the production parts must be subjected to a quality check to ensure that they are clean and dimensionally stable.

2.2 Cycle time specifications

- The target cycle times specified by MARBACH are based on the one hand on empirical values with average-performance machines and production systems, or, where the machines and systems of the customer are known, their expected capability. On the other hand the specification is based on the requirements for the finished product issued to MARBACH and its expected material characteristics.
- In addition to forming and cooling times, the cycle time is determined by some other factors (such as stacking, system drying cycle time, control unit and valve reaction times, kinematics and smooth running of the system, inline control for the extruder, heating and automation etc.). Therefore the specifications cannot be binding and relate to a system in optimum condition and average requirements for product quality and dimensional stability. In order to obtain more precise cycle time estimates, a forming time analysis may be made using a test tool. If the forming time alone is added to the ancillary times of the system concerned, the customer will obtain a relatively accurate estimate of cycle time.

2.3 Maintenance, in-process quality control, corrosion protection, operating instructions

- In order to ensure reliable operation of the tools, regular maintenance is mandatory. In addition to the normal resharpening work, we recommend regular inspection and the careful changing of wear parts (e.g. seals, brushes etc.). Depending on the scope of maintenance work, such operations must be carried out by a tool expert in order to ensure that the tool is restored to an operational condition.
- All maintenance instructions in the operating instructions must be complied with.
- It should also be noted that wear parts such as seals may in some cases have defects without any advance signs of wear being apparent. In order to be able to immediately recognise any effects on production, it is therefore necessary to carry out, during production, permanent quality control of the products manufactured using the tool.
- MARBACH accepts no responsibility for consequential costs or damages attributable to late, insufficient or unprofessional maintenance or neglected or inadequate quality control in production.

Clause 3: Special terms and conditions for steel strip tools

(Tools in which material is cut by a steel strip – also known as blades – against a counter punching plate)

- Seal clamping frames:**
Steel strip tools are equipped with an elastomer seal on the clamping frame. The clamping frame secures the film to be processed in place. For this technique to be reliable it is necessary not to supply the forming air until after closure of the clamping frame. The operating instructions shall be complied with in this context.
- Steel strip:**
In order to achieve optimum life and operation of the steel strip, it is expressly recommended that the tool must be secured with all the securing bolts present.
- Changing the blade:**
As the blades are very sharp and fragile, assembly onto the existing receiver plates must only be carried out by a specialist in order to protect the customer and the tool.
- Stop point:**
The stop points (interruptions of the cutting lines) are to be defined by the customer (position, form, size).
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 - Clauses 6 (2) and (4) of the MARBACH general terms and conditions of business shall apply to delays.
 - The customer shall pay any and all extra expenses in accordance with Clause 4 (7) of the MARBACH general terms and conditions of business. If no precise empirical values are available, MARBACH may provide assistance in selecting the position. The properties of the stop points may be varied by using the "MARBACH Tab-Flex System", which permits, within the realms of system's capabilities, subsequent modification of the stop points without affecting the blades themselves.
- Counter-stamping plates:**
MARBACH uses as the counter-stamping plate a hardened, ground precision steel. MARBACH recommends that the steel should not be reground to prevent the tool dimensions from being altered. In the event of regrounding, a regrounding component to compensate for the distance to the counter-stamping plate created by regrounding, where appropriate, is necessary in the tool.

Clause 4: Replacement parts

- We recommend that a complete set of replacement parts should be ordered at the time of ordering tools. Subsequent and individual production of replacement and wear parts is time consuming and cost-intensive.
- In the case of match-metal tools for cutting and stamping technology, we recommend that a die plate pre-manufactured by MARBACH should be kept in storage. In particular, double die cutting in the production process may result in cracking of the plate. Production of the pre-manufactured plate by MARBACH requires approximately 15 working days.
- If complete die plates or stamping plates are produced as replacement parts, there is a risk that the replacement plate will expand in time, resulting in the tools no longer matching one another perfectly when the original plate is replaced by the spare. Despite the utmost care and intensive heat treatment, such material and storage-time-related phenomena cannot be ruled out entirely. MARBACH can therefore issue no guarantee for such occurrences.
- In case of steel strip tools, we recommend that two sets of blades should always be ordered, including holder. In the event of a blade being reordered it is then possible to send the worn blade set in the holder to MARBACH

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which can then be fitted by MARBACH with new blades according to instructions and continue to be used on the machine with a set of replacement blades. Blades may also be reordered from MARBACH without the holder.

(6) To facilitate optimised planning, the service engineer must be requested from MARBACH at least 3 weeks before the planned appointment.

Clause 5: Tool development, construction

- (1) Development services shall be subject to separate express agreement. The success of the development is not an obligation unless expressly agreed otherwise.
- (2) In relation to payment, subject to an agreement to the contrary, the provisions of Clause 5 of the MARBACH terms and conditions of assembly and repair shall apply accordingly.
- (3) Subject to an agreement to the contrary, jigs, tools, processes, procedures etc. developed by MARBACH shall remain in the ownership and intellectual property of MARBACH. A non-exclusive licence to use the developed tool, restricted to the use specified in the contract, shall be granted to the customer. The same applies to usable partial results after premature termination of services according to Clause 6 (4).
- (4) If in the course of development work, new findings yield that substantially change the result of the development, the planned costs, the planned timeframe or other framework conditions, MARBACH shall inform the customer in the normal course of business. Both parties have the right to terminate (cancel) the development order with future effect if within two weeks after receipt of the information no agreement can be reached regarding the continuation of the development work.

Clause 6: Optional services, commissioning

6.1 Optional: functional test, running-in, setting parameters

- (1) On request (and where the tools match the available test systems), MARBACH may offer, before delivery, the running-in and/or a function test of the tools. Setting parameters, process data and pre-stretch unit contours may be determined in this context (pre-stretch units are devices that form the film into a temporary product form). The functional test itself does not include any optimisation measures.
- (2) During running-in of the tool, optimisations are stipulated for the process. The setting parameters found are however dependent on machine and material. The specifications determined by MARBACH may therefore only be guide values; subsequent deviations are possible and probable, despite due care. Fine-tuning may only be optimised over a long production period by the customer himself.
- (3) In relation to payment, subject to an agreement to the contrary, the provisions in Clause 5 of the MARBACH terms and conditions of assembly and repair shall apply accordingly.

6.2 Optional: optimisation measures before or after supply

- (1) If in the context of process optimisation, mechanical adjustments are appropriate to the tool or expressly requested by the customer (pre-stretch unit contours, changes to the forming/cutting components etc), these are modifications or additional services in terms of Clause 4. (6) of the MARBACH general terms and conditions of business. Please note that such adjustments take the necessary time and therefore the delivery period will be extended in accordance with Clause 6. (4) of the MARBACH general terms and conditions of business.
- (2) All adjustment measures are restricted to the capabilities of the agreed tool geometry and tool function and shall not affect the property rights of third parties.

6.3 Optional: test tools

- (1) On request, MARBACH may offer test tools for the creation of prototypes and to determine approximate shrinkage values. It should be noted that such tools are produced as one-off activities and the process parameters therefore may not necessarily meet exactly the requirements for the production tool, despite all due care. Deviations between prototype and end product are therefore possible in particular if the production machine is not identical to the test machine.
- (2) Test tools are designed for prototyping (manufacture of prototypes of the product to be produced using the tool) and are therefore not suitable for production (manufacture of large quantities of product). The test tools are normally inserts and may be cooling block units that have to be mounted onto the MARBACH test structure in order to be tested. The test structure is not part of the scope of supply for the test tool.
- (3) The individual parts of the test tool (form parts etc.) are kept, free of charge, for the customer by MARBACH for 6 months from release of tool production by the customer or, if no release is made, for 6 months from notification of the test result, after which they are scrapped without prior notification. On request, they may be delivered to the customer at his own expense and risk.

6.4 Optional: item-development services

- (1) On request, MARBACH may assist item development. Engineers can develop 3D models in accordance with the customer's specifications and concepts. We will carry out stacking studies and material distribution analyses with due diligence. Optimisation of the details for thermoforming can also be undertaken. Final release must however be carried out by an experienced packaging technician at the premises of the customer and/or end customer. All values and dimensions stated in the item drawing or other work results are subject to the usual tolerances for the injection moulding process.
- (2) In relation to payment, subject to an agreement to the contrary, the provisions of Clause 5 of the MARBACH terms and conditions of assembly and repair shall apply as appropriate.

6.5 Test run, prototyping, reworking of the pre-stretch unit contour special test and production conditions

- (1) Where not otherwise agreed, during the test run on the tool, the pre-stretch unit contour may be reworked up to max. 3x without price adjustment. Further reworking of the pre-stretch unit contour and adaptation of the other tool units will be calculated according to cost, in accordance with Clause 5 of the MARBACH terms and conditions of assembly and repair.
- (2) MARBACH recommends for critical elements that a replacement part should also be ordered with oversize. This can considerably reduce cost and time expenditure in the event of any adjustment work that may be necessary.
- (3) The MARBACH installations are part of a metalworking operation; therefore it is not possible to establish food-compatibility or clean-room conditions.

6.6 Commissioning at the customer's premises

- (1) If our assistance with the commissioning of the tool at the customer's premises has been agreed, our service engineer will provide support with the installation of the tool. He will also give instructions in maintenance and care to an employee of the customer on site. In order to be able to efficiently organise running-in, the machine must be in an operational condition when the engineer arrives and the necessary material must be available.
- (2) The MARBACH engineers cannot and must not operate thermoforming systems. Operation of the system must be by a trained employee of the customer. The customer must make available the required number of suitable staff for the task at the appointed time.
- (3) Waiting times or additional travel costs shall be paid for separately in accordance with Clause 5 of the MARBACH terms and conditions of assembly and repair.
- (4) Only experienced users can determine the optimum setting parameters; MARBACH engineers will provide support in this. Perfect operation of the entire thermoforming installation and all upstream and downstream units (e.g. extruders, heating, stacking units) is essential. Otherwise the manufacture of a perfect product cannot be guaranteed. The materials to be processed must be available or be produced in consistently the best quality.
- (5) The period of installation support defined in the offer is a guide value. If more time is required, MARBACH will, subject to an agreement to the contrary, charge for the engineer at a daily flat rate of 1,000 Euros plus VAT at the rate applying at the time of provision of the service. If an immediate extension of the agreed commissioning date is not possible for MARBACH due to internal reasons, we reserve the right to discuss and agree with the customer a replacement date and if appropriate a different engineer.