

[Organization logo]

[Organization name]

Commented [9100A1]: All fields in this document marked by square brackets [] must be filled in.

PROCEDURE FOR PRODUCTION OF METALS

Commented [9100A2]: If you want to find out more about production and service provision, see this 9001Academy article: Understanding Product & Service Provision in ISO 9001 <http://advisera.com/9001academy/blog/2014/10/07/understanding-product-service-provision-iso-9001/>

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Commented [9100A3]: Adapt to the existing practice in organization.

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1. Purpose, scope and users

The purpose of this procedure is to describe the process of production of metals according to demanded quantity and deadlines, in line with the request for product quality, according to customer request.

The procedure is applied in realization of the production process.

Users of this document are persons responsible for the process of production in [organization name].

2. Reference documents

- AS9100 Rev D standard clauses 8.5; 8.6
- Procedure for Document and Record Control
- Procedure for Competence, Training and Awareness
- Procedure for Purchasing and Evaluation of Suppliers
- Procedure for Design and Development
- Warehousing Procedure
- Procedure for Management of Nonconformities and Corrective Actions
- Procedure for Equipment Maintenance and Measuring Equipment
- [Work instruction manuals]

Commented [9100A5]: List the names of instruction manuals used in this process.

3. Product realization

3.1. Product realization planning

3.1.1. Making production plan

According to demand of products and volume of production in previous period, [CEO] together with [job title] creates [Production Plan].

Commented [9100A6]: E.g. Production Manager

Production Plan defines the following:

- Availability of information that defines product characteristics

[Redacted text]

For project-based production and individual production according to customer request, information about product characteristics is defined in [document name].

Commented [9100A7]: E.g. Product Specification, law and regulatory requirements, instructions, catalogues, etc.

Commented [9100A8]: Delete if there is no cyclic production.

Commented [9100A9]: E.g. Customer Request, Project Task, etc.

- Defining resources for production

[Redacted text]

for defining need for training.

Commented [9100A10]: Delete if organization doesn't perform this type of production.

[Job title] creates the Quality Plan, which defines necessary activities of verification, monitoring, measuring, controlling and testing the product.

Commented [9100A11]: E.g. Production Manager

- *Availability of work instructions*

[Job title] is responsible for creation of work instructions for the following process activities: [list the names of work instruction for each activity].

Commented [9100A12]: Work instructions are needed for more complex activities that have precisely defined order of execution operations and/or appropriate measuring is needed. They can be in form of Quality Plans, Flowcharts, drawings, etc.

- *Usage of adequate equipment*

[Job title] is responsible to ensure that all equipment is in operational condition and, on [job title] of the Plan for Preventive Equipment Maintenance and records of calibration and repairs of measuring equipment.

Commented [9100A13]: E.g. Maintenance Operator

Commented [9100A14]: E.g. Production Manager

[Job title] is responsible for equipment maintenance and working environment as specified by the company or legal and regulatory requirements. [Job title] is responsible for ensuring all such requirements.

Commented [9100A15]: E.g. Head of maintenance department

- *Conducting measuring and monitoring*

[Job title] must ensure availability of monitoring and measuring resources and define the method of the monitoring process and product and methods of sampling and measuring and enter them into the Quality Plan.

Commented [9100A16]: E.g. Production Manager, Technology Engineer, etc.

[Job title] ensures that any documented information for monitoring and measurement

Commented [9100A17]: Other records can be defined as addition to Quality Plan, e.g. records for monitoring temperature, pressure, humidity, etc.

are to be retained, and any specific equipment required and instructions for use.

Commented [AS910018]: E.g. Production Manager, Technology Engineer, etc.

Commented [AS910019]: E.g. pass/fail, etc.

[Job title] must ensure that when sampling is used the sampling plan is justified on the basis of a recognized statistical principles and appropriate for use.

Commented [AS910020]: E.g. Production Manager, Technology Engineer, etc.

3.1.2. *Creating work order*

For each individual batch, [job title] creates [Work Order] which defines all activities to be executed

According to [document name], [job title] makes an internal purchasing order that specifies quantities of raw material and other resources needed for realization of product or phase, defined in the Project Plan, and delivers it to [job title]. [Job title] defines which work instructions will be applied are stated in the Product Specification made by [job title].

Commented [9100A21]: E.g. Production Plan, Customer Request, Project, etc.

Commented [9100A22]: E.g. Production Manager

Commented [9100A23]: Delete if clause 8.3 of AS9100 Rev D is excluded.

Commented [9100A24]: E.g. Warehouse Manager

Commented [9100A25]: E.g. Production Manager

3.2. *Production provision realization*

Production is executed in controlled working conditions, which implies compliance with all technical

Commented [9100A26]: E.g. Production Manager

Commented [9100A27]: All the steps and sub-sections can be edited or deleted in order to be aligned with the production process in the company.

Commented [9100A28]: This refers to law and legal requirements

[organization name]

materials are entered in Production Registry by [job title]. [Job title] ensures that products are never

3.2.1. Metal casting

3.2.1.1. Internal purchase and receipt of raw materials

According to the Production Plan and Production Registry, [job title] makes internal purchase. After

Commented [9100A29]: Adapt to organization practice.

3.2.1.2. Melting

[Job title] transports raw materials (virgin material, external scrap, internal scrap, and alloying elements) to furnace where the material is being melted on [degrees]°C. The process includes

Commented [9100A30]: Adapt to organization practice.

from the molten metal to avoid casting defects. [Job title] adds the material during the melting process to bring the final compound within a specific range specified by industry and/or internal standards.

3.2.1.3. Molding

[Job title] is responsible for making a pattern to shape of the desired part.

Commented [9100A31]: Adapt to organization practice.

[Job title] makes the pattern out of wax, wood, plastic or metal. The molds are constructed by [job

Commented [9100A32]: Adapt to organization practice.

processes include:

- Sand casting — Green or resin bonded sand mold.
- [REDACTED]
- [REDACTED]
- [REDACTED]
- V-process casting — Vacuum is used in conjunction with thermoformed plastic to form sand molds. No moisture, clay or resin is needed for sand to retain shape.
- [REDACTED]
- [REDACTED]

Commented [9100A33]: Adapt to organization practice.

[Job title] pours molten metal into the mold; the mold holds this material in shape as it solidifies. A metal casting is created.

according to the Procedure for Managing Nonconformities and Corrective Actions. In a manufacturing process causes for incomplete metal castings could be; insufficient amount of

[organization name]

material poured, loss of metal from mold, insufficient fluidity in molten material, cross section within

3.2.1.4. Surface cleaning

After degating and heat treating, [job title] cleans the surface by blasting.

Numerous materials may be used as media, including steel, iron, other metal alloys, aluminum

further work-harden and finish the surface.

3.2.1.5. Finishing

The final step in the process of casting usually involves grinding, sanding, or machining the

Removing the remaining gate material, called a gate stub, is done by [job title] using a grinder or

3.2.1.6. Quality control

After production, [job title] samples the products and conducts inspection to determine whether the

products and are handled according to the Procedure for Managing Nonconformities and Corrective Actions.

3.2.1.7. Packaging

[Job title] receives final products and sends them to packaging which is done by [describe the process].

3.2.2. Identification and traceability

Configuration Management practices defined in the Procedure for Production and Service Provision enter identification data in the Record of Traceability, identifying differences between the actual configuration and the required configuration on the Record of Product-Service Configuration.

3.2.3. Validation of production and service provision

[Job title] must conduct validation of all processes of production and service provision where:

- [redacted]
- it is not possible to conduct measurement, since product or service is being destroyed in the process.

Commented [9100A34]: Adapt to organization practice.

Commented [9100A35]: Adapt to organization practice.

Commented [9100A36]: Adapt to organization practice.

Commented [9100A37]: Adapt to organization practice.

Commented [9100A38]: For example by hand or by using some machine.

Commented [9100A39]: Or Production Registry.

Commented [9100A40]: Delete if there are no processes that require validation; see Quality Manual.

Commented [9100A41]: For example lacquer thickness of lacquered wire.

Commented [9100A42]: E.g. welding – techniques for testing

[organization name]

Processes that fall under at least one of above conditions are defined as Special Processes and the results of their validation are recorded on the Record of Validation of Product Process and Special Process.

Where appropriate, as part of validation, [job title] must determine:

- [redacted]
- [redacted]
- [redacted]
- Special work instructions
- Use of special methods and procedures necessary for implementing and monitoring the process
- [redacted]
- [redacted]

Commented [AS910043]: E.g. necessary training and re-training of employees who perform the process, monitoring requirements for the process, scheduled re-validation of the process, etc.

Commented [9100A44]: This is entered in Quality Plan.

Commented [AS910045]: E.g. Statistical measurement controls, detailed implementation procedures, etc.

Commented [9100A46]: This is entered in Quality Plan.

Commented [9100A47]: This is done when previous validation didn't give expected results, or when validation needs to be done on a routine basis.

Commented [9100A48]: Adapt to organization.

[Job title] creates records needed to provide evidence that realization processes and resulting products meet predefined requests.

[Job title] enters data about validation in the Production Plan, which demonstrates the capability of Processes on the Record of Validation of Production Process and Special Process, which

[Job title] obtains data from a representative item from the first production run of a new batch to original results.

Commented [AS910049]: This is often called first article inspection.

3.2.4. Customer property

[Job title] is responsible for identification, verification, and protection of customer or sub-contractor using Notification to Customer about Changes on His Property.

Commented [9100A50]: This can be deleted if organization doesn't use Customer Property. See Quality Manual.

3.2.5. Control of changes

[Job title] reviews and controls changes for production and service provision in order to ensure continuing conformity with the requirements and enters changes in the Production/Service Change Review Record.

3.2.6. Product release, delivery and activities after delivery

requirements are met regarding Product Specification and customer requirements. If requirements are met, [job title] confirms fulfillment of requirements by signing Record of Product Service Conformance and approving shipment.

[organization name]

[Job title] ensures that the release of products and services to the customer will not proceed until [redacted]

[Job title] ensures that all documented information required to accompany the products and services are present at delivery.

[redacted]

- Statutory and regulatory requirements
- The potential undesired consequences associated with the products and services
- [redacted]
- [redacted]
- [redacted]
- Collection and analysis of in-service data
- Control, updating and provision of technical documentation relating to product use, maintenance, repair and overhaul
- [redacted]
- [redacted]
- [redacted]
- [redacted]
- Planning servicing activities
- Need for competence of employees and training needs
- [redacted]
- [redacted]

Commented [AS910051]: E.g. off-site work

Commented [9100A52]: Adapt to organization's needs.

During post-delivery activities, [job title] is obligated to initiate correction of non-conformance using the Procedure for Management of Nonconformities and Corrective Actions for every non-conformity [redacted]

3.3. Product preservation

[Job title] is responsible for preservation of product during production and internal transport of product and/or assembly parts.

Commented [9100A53]: E.g. Production Manager

[redacted] is responsible for preservation and handling of [redacted] and/or assembly parts before delivery to a customer according to Warehousing Procedure.

Commented [9100A54]: E.g. Warehousing Manager

[Job title] is responsible for preservation of product during transport.

Commented [9100A55]: E.g. Driver

3.4. Resolving non-conformities

If a non-conformity [redacted] notifies [job title], who acts according to the Procedure for Management of Nonconformities and Corrective Actions.

[organization name]

production process and acts according to the Procedure for Management of Nonconformities and Corrective Actions, but can't change technological parameters.

Commented [9100A56]: E.g. Shift Leader

4. Managing records kept on the basis of this document

Record name	Code	Storage			Responsibility
		Retention time	Location	Protection	
Product Specification	PR.10.1	2 years	[office of Production Manager]	Records are stored in file cabinet [describe name/location]	[job title]
Record of Product/Service Conformance	PR.10.2	2 years	[office of Production Manager]	Records are stored in file cabinet [describe name/location]	[job title]
Quality Plan	PR.10.3	2 years	[office of Production Manager]	Records are stored in file cabinet [describe name/location]	[job title]
Notification to a Customer about Changes on his Property	PR.10.4	2 years	[office of Production Manager]	Records are stored in file cabinet [describe name/location]	[job title]
Record of Traceability	PR.10.5	2 years	[office of Production Manager]	Records are stored in file cabinet [describe name/location]	[job title]
Production/Service Change Review Record	PR.10.6	2 years	[office of Production Manager]	Records are stored in file cabinet [describe name/location]	[job title]
Record of Validation of Product Process and Special Process	PR.10.9	2 years	[office of Production Manager]	Records are stored in file cabinet [describe name/location]	[job title]

Commented [9100A58]: If the records in this column are in electronic form, write the name of the folder on Production Manager computer.

Commented [9100A59]: Adapt the information in this column to the normal practice in your company.

Commented [9100A57]: Adapt the information in this column to the normal practice in your company.

Commented [9100A60]: This document is unnecessary if organization doesn't store and work with customer property.

[organization name]

Record of Product-Service Configuration	PR.10.10	2 years	[office of Production Manager]	Records are stored in file cabinet [describe name/location	[job title]
Production Plan	PR.10.17	2 years	[office of Production Manager]	Records are stored in file cabinet [describe name/location	[job title]
Production Registry	PR.10.18	2 years	[office of Production Manager]	Records are stored in file cabinet [describe name/location	[job title]

5. Appendices

- Appendix 1 – Product Specification
- Appendix 2 – Record of Product/Service Conformance
- Appendix 3 – Quality Plan
- Appendix 4 – Notification to a Customer about Changes on his Property
- Appendix 5 – Record of Traceability
- Appendix 6 – Production/Service Change Review Record
- Appendix 9 – Record of Validation of Product Process and Special Process
- Appendix 10 – Record of Product-Service Configuration
- Appendix 17 – Production Plan
- Appendix 18 – Production Registry