

Leseprobe

Christiani

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Operational training · Metal working

Manual material processing

Thread production



Text book

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1. General information

This booklet is part of the METINA (method-enintegrierte Ausbildung (English: method-integrated training)) training concept for IMBE developed by RUHRKOHLE AG. The concept includes the following written documentation for each stage of the occupational training plan at RUHRKOHLE AG:

1. Theoretical information

2. Trainer manual

3. Documentation for practical exercises

4. Documentation for trainees

The training concept is based on the premise that the qualifications required in the Training Ordinance are taught from systematically organised documents and/or in the form of learning processes that are similar to training courses in their nature.

"Thread production" belongs to the "Manual material processing" part of the training programme. It is offered as a training course.

Other training courses included in this part of the training programme:

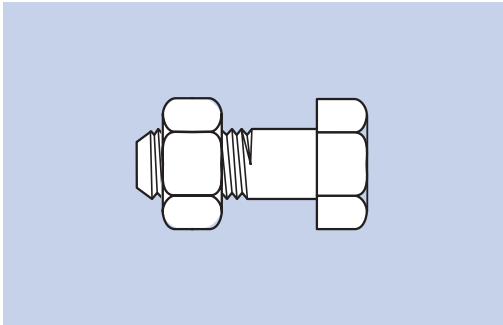
- ▶ **Sawing**
- ▶ **Filing**
- ▶ **Drilling, countersinking, reaming**
- ▶ **Scribing, punching, marking**
- ▶ **Chiselling**
- ▶ **Checking: Measuring, gauging**

The training course is self-contained. It teaches skills and shares knowledge in a practical setting as part of an occupational training framework designed to meet the needs of industrial mechanics. In completing the exercises, trainees will learn basic skills and recognise and consolidate fundamental work techniques.

The theoretical information contained in this booklet is part of a comprehensive multimedia resource library and is readily available to both trainers and trainees in the training location.

2. Classification of thread production

Screw with nut



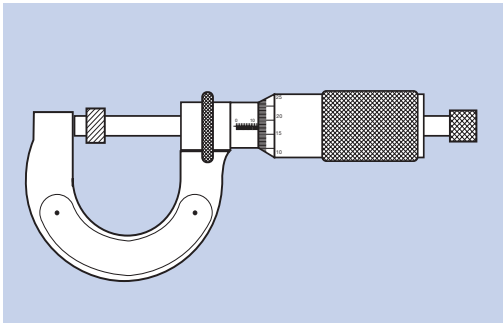
2.1 General information about threads

In technology, a thread is the most commonly used system for connecting and moving components.

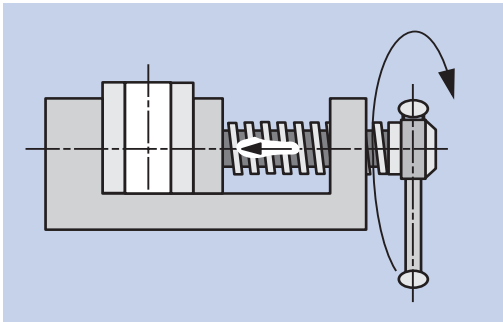
Screws are one of the most frequently used detachable joining elements. Screw joints are created by screwing together internal and external threads.

Other applications for the mode of action of the screw can be found in the context of measuring, tensioning, setting and moving.

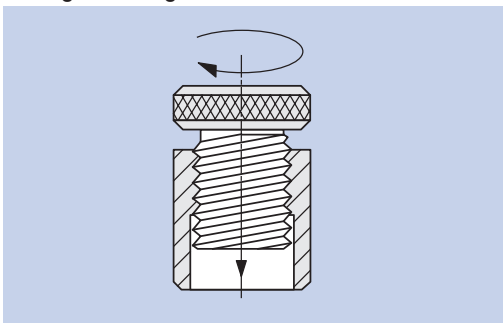
Measuring



Tensioning

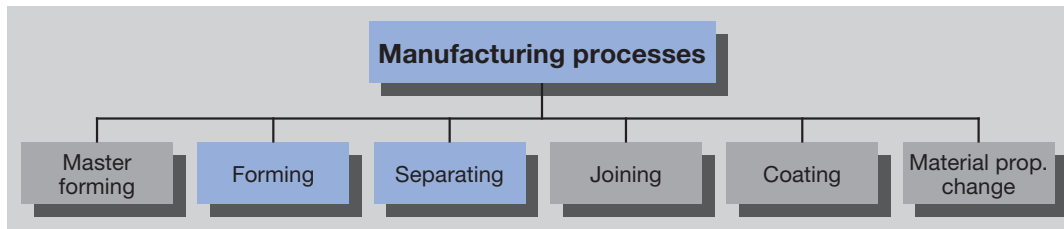


Setting or moving



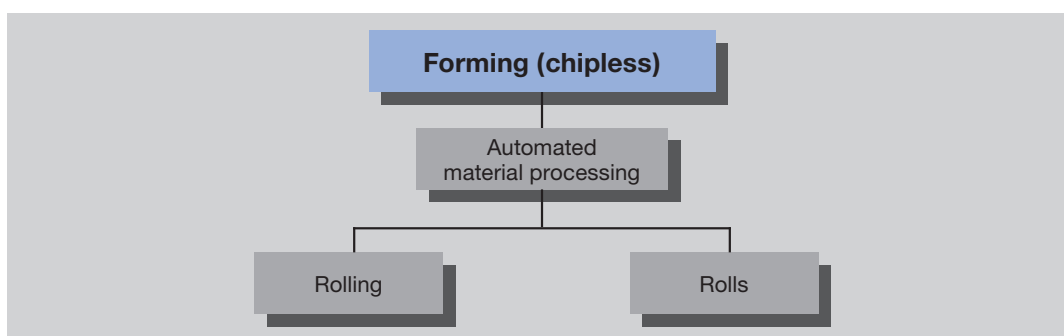
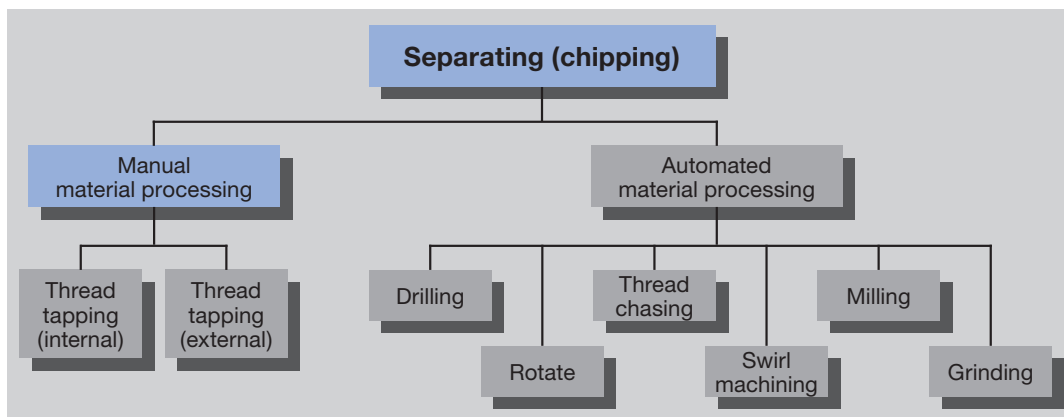
2.2 Manufacturing processes

The manufacturing processes have been divided into 6 main groups according to DIN 8580.



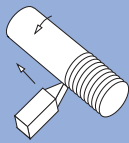
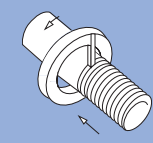
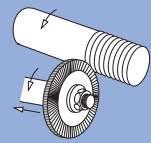
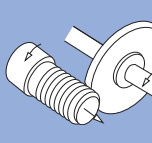
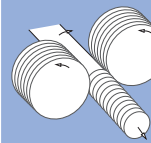
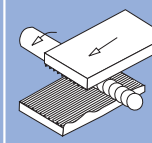
2.3 Thread production processes

Threads can be created using chipping or chipless procedures, manually or with machines.



2.4 Automated production processes

Overview of some procedures for producing threads on machine tools

Thread production by means of cutting				Thread production by means of forming	
Rotate	Swirl machining	Traverse thread-milling	Grinding	Rolling	Rolls
					
Tool: Thread lathe tool with the profile of the thread to be cut	Ring-shaped cutter head	Disc-shaped single-profile milling cutter	Single-profile or multiple-profile grinding wheel	Circulating rollers with thread profile	Plates with thread profile
Workpiece or tool movement: Chisel feed must follow the pitch of the thread	Cutter head circles the workpiece, which is moving slowly, eccentrically at high speed	Revolutions of the workpiece correspond to the number of thread turns	Grinding wheel rotates around the workpiece, which is rotating slowly, at high speed	Rollers push the thread chiplessly into the bolt, which is also rotating	Plates push the thread chiplessly into the bolt, which is also rotating
Machine: Precision lathe	Thread whirling machine Precision lathe with whirling unit	Traverse thread-milling machine and universal milling machine	Thread grinding machine	Thread rolling machine	Thread rolling machine
Application: <ul style="list-style-type: none"> • Short and long external threads • Short internal threads • Primarily single-item production and small batches 	<ul style="list-style-type: none"> • Primarily for long external threads, e.g. lead screws 	<ul style="list-style-type: none"> • Any length of thread, e.g. spindles with trapezoidal thread and worms 	<ul style="list-style-type: none"> • Dimensionally accurate thread with high surface quality, even in hardened workpieces, e.g. thread plug gauges, taps 	<ul style="list-style-type: none"> • Only for external threads in mass production with cold-formable materials, e.g. screws 	