



Never Stop Learning On The Job



Apprenticeship: Skilled metal worker in Metal Construction and Installation Technology (EQF level3)

Presentation for
Meeting June 25th / 26th 2015



Employment
Innovation
Entrepreneurship
Training
EVIA Ecosystem



CJD Rhein-Pfalz/Nordbaden
WOERTH-Maximiliansau

This first draft of the Curriculum is based on the occupation, recognized in Germany:

*Skilled Metal Worker specialised in
Construction and Installation Technology
(See Certificate supplement -revised April 2013)*

It describes in this state the learning outcomes, to be assessed in a final exam and the framework of the assessment

This occupation contains four sub-profiles:

- Construction technology
- Installation technology
- Chipping technology
- Wire and transformation technology

They have some common learning outcomes,
others are specialisations for the profile

Full-time apprenticeship takes 2 years, alternate in
enterprise (~2/3) and in vocational school (~1/3)

Chapter A: Learning outcomes for occupational profile in general

- Construction of components
- Maintenance of operating resource
- Control technology
- Put, Secure and transport
- Mounting and removal of component and modules

Chapter B: Learning outcomes for occupational profile Installation technology

- Planning and preparation of mounting and removal processes
- Create bonds
- Supervision and optimising mounting and removal processes

Chapter C: Learning outcomes for occupational profile Construction technology

- Mounting and removal of metal constructions
- Separating and transforming
- Joining modules
- Treatment and protection of surfaces

Chapter D: Transversal learning outcomes for the occupational profile skilled metal worker

- Apprenticeship, Labour law, collective bargaining law
- Organisation and hierarchy of the company
- Safety and health in the workplace
- Environment protection
- Conduct quality assurance
- In-company and technical communication
- Planning and executing tasks

Assessment of achieved learning outcomes:

➤ Execute an assembly order
by producing a specimen:

- ✓ The examinee has to show that he/she is able to
 - ✓ ..understand the kind and the mode of an order, to research for information to execute and to realize the order
 - ✓ ... choose the way of treatment, to produce modules in manual or mechanical way, considering safety and health in the workplace and environmental aspects
 - ✓ ... mount assemblies appropriately, considering the sequence of elements, to adjust, to fix and to secure
 - ✓ ... adjust the performance of the assembly
 - ✓ ... choose and to use testing procedures and equipment, check utilisability of equipment, to assess and to record the result

Assessment of achieved learning outcomes:

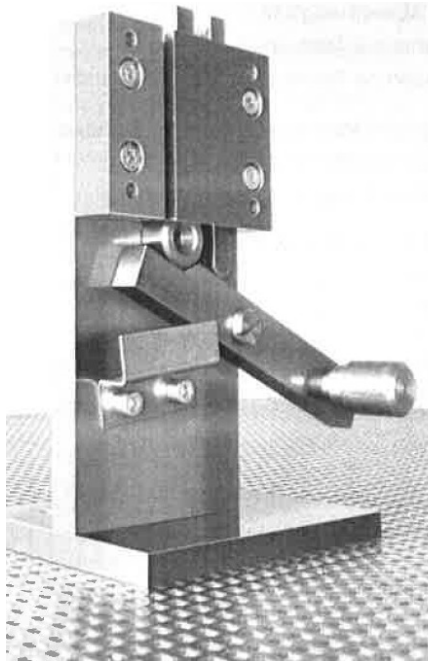
➤ Analysis of the order and the function : (5)

- ✓ The examinee has to show that he/she is able to
 - ✓ ...analyse an order for manufacturing and mounting
 - ✓ ...to check and to complete the correctness and completeness the technical documents
 - ✓ ... to plan the steps of manufacturing and mounting, taking into account safety and health in the workplace and environmental aspects
 - ✓ ... to operate following the technical regulations, plans and the rules and inspection requirements
 - ✓ ... to explain the correct mounting of the assembly concerning situation, function and sequence of the particles
 - ✓ ... deliver an assembly and to explain the function
 - ✓ ... determine process and parameter, measures of inspection and inspection equipment

Assessment of achieved learning outcomes:

- Production and mounting methods: (6)
 - ✓ The examinee has to show that he/she is able to
 - ✓ ...assess and to choose methods for manufacturing, mounting and joining when producing components and assemblies, taking into account technical, economical and ecological aspects
 - ✓ ... identify and calculate the specific values for manufacturing and mounting
 - ✓ ... choose raw material and supplies appropriate to the order
 - ✓ ... plan the workflow and to allocate tools and machines

Examination will be done like described in the example



Montageauftrag
Bereitstellungsunterlagen für
den Ausbildungsbetrieb

(p 23 ff)

Musterprüfung

M 0716 B

Environment protection in metalworking companies

Basics of general “green skills” in all metalworking sectors, examples from a handbook for vocational training:

Jörg Bartenschlager et.al.,

Fachkunde Metall, ISBN 987-3-8085-1157-2

© Verlag Europa Lehrmittel, 2013

Disposal in chipping production

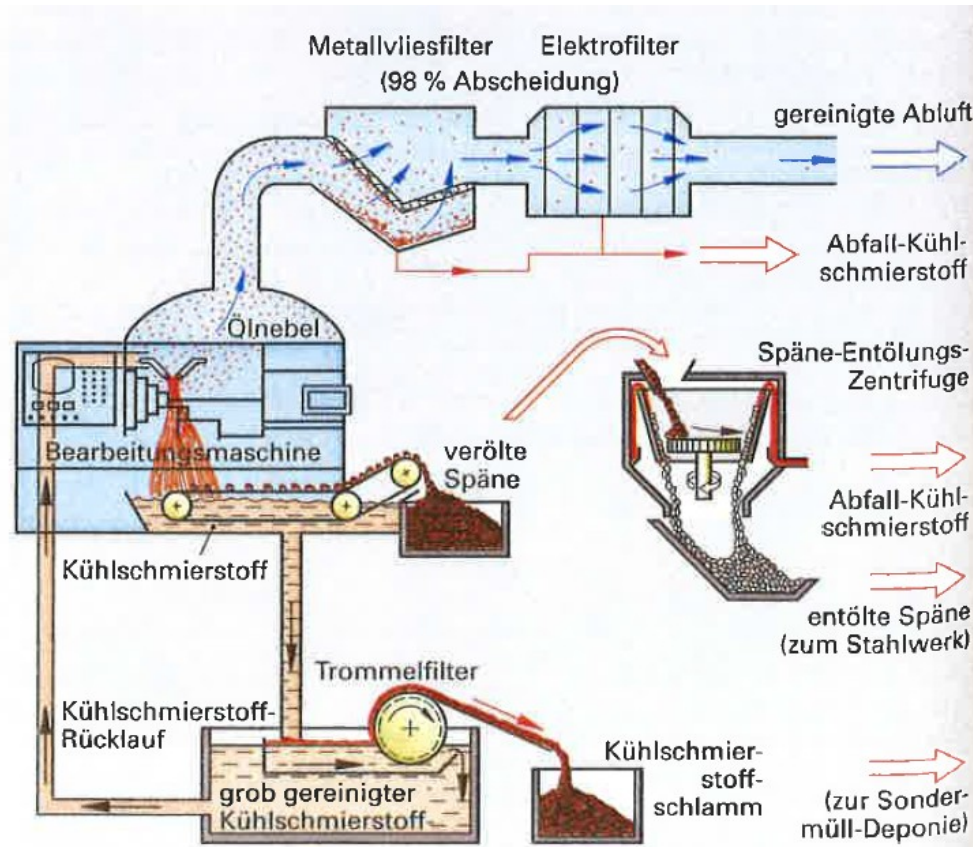


Bild 1: Entsorgung bei der spanenden Fertigung

Extraction by suction; separation; de-oiling; reprocessing; depolluting

Cleaning of polluted components

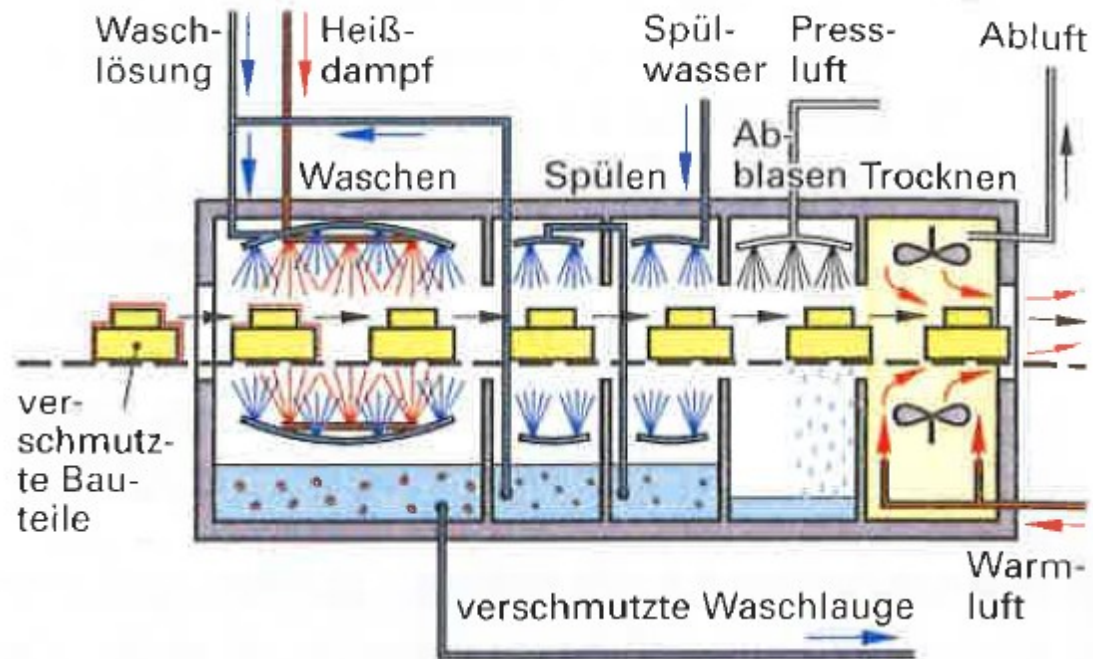


Bild 1: Reinigungsanlage für verschmutzte Werkstücke

Cleaning with hot steam and tensides, cleaning suds in a purification plant

Powder coating in a tunnel machine

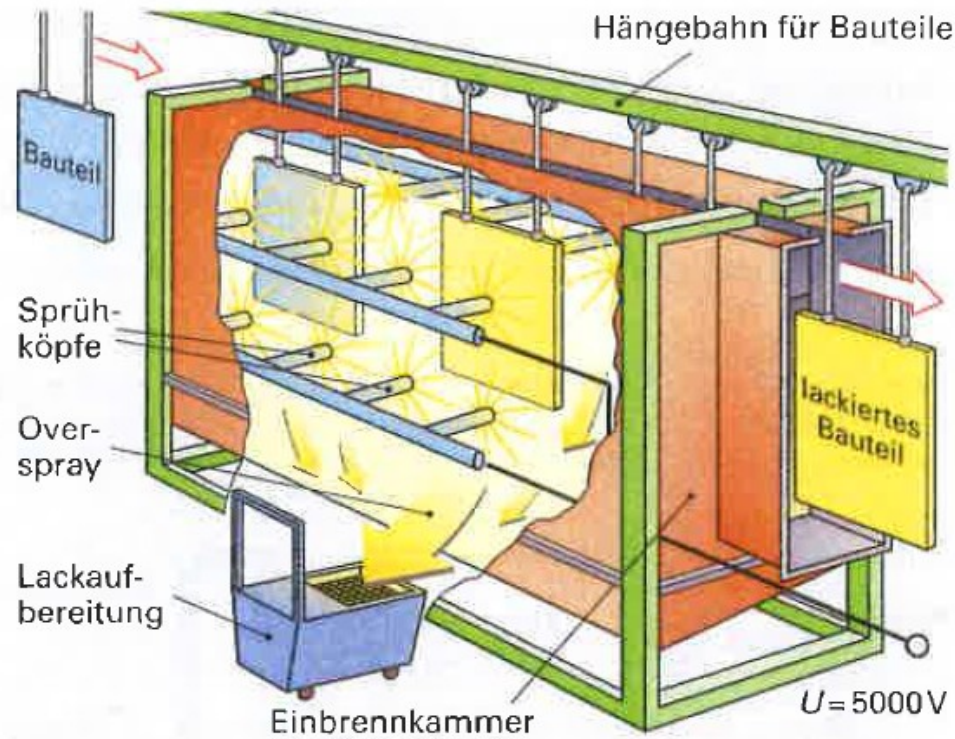


Bild 2: Pulverlackier-Durchlaufanlage

Avoiding solvents by varnishing with powder – recycling of remains

Clean-up of con- taminated Air

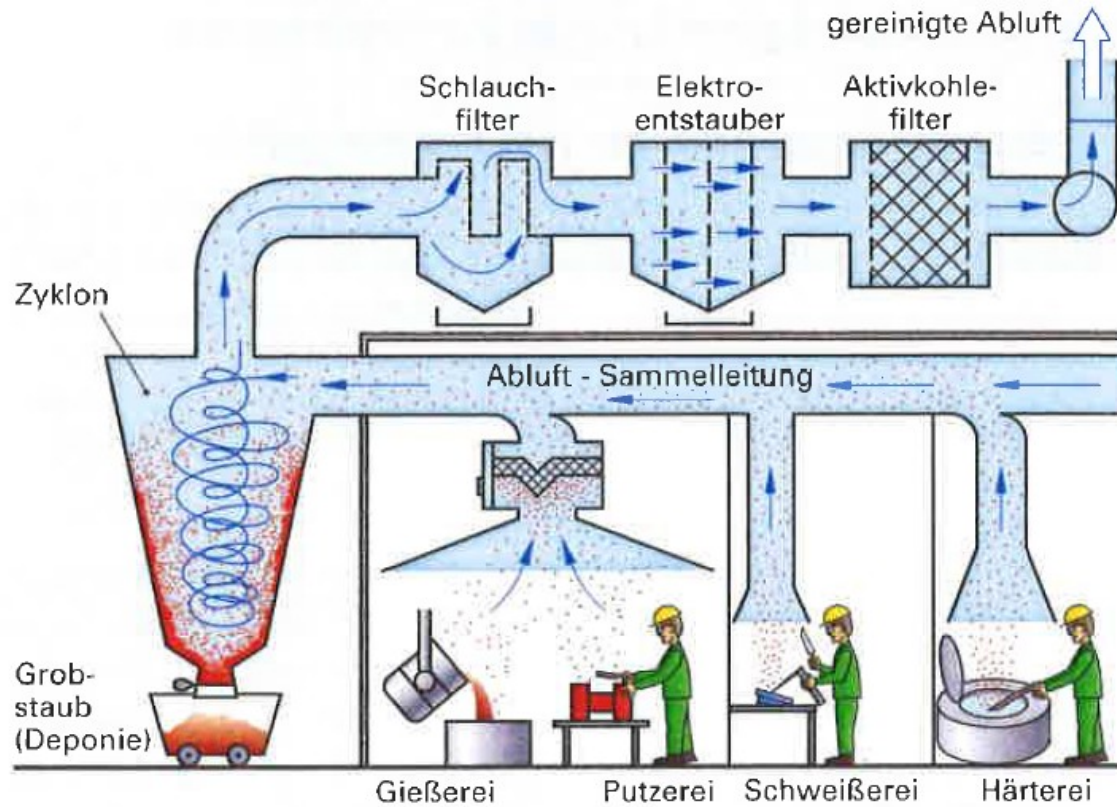


Bild 3: Abluft-Reinigungsanlage eines Fertigungsbetriebes

Cleaning outgoing air with filter systems; deposit coarse particles

Purification plant for wastewater

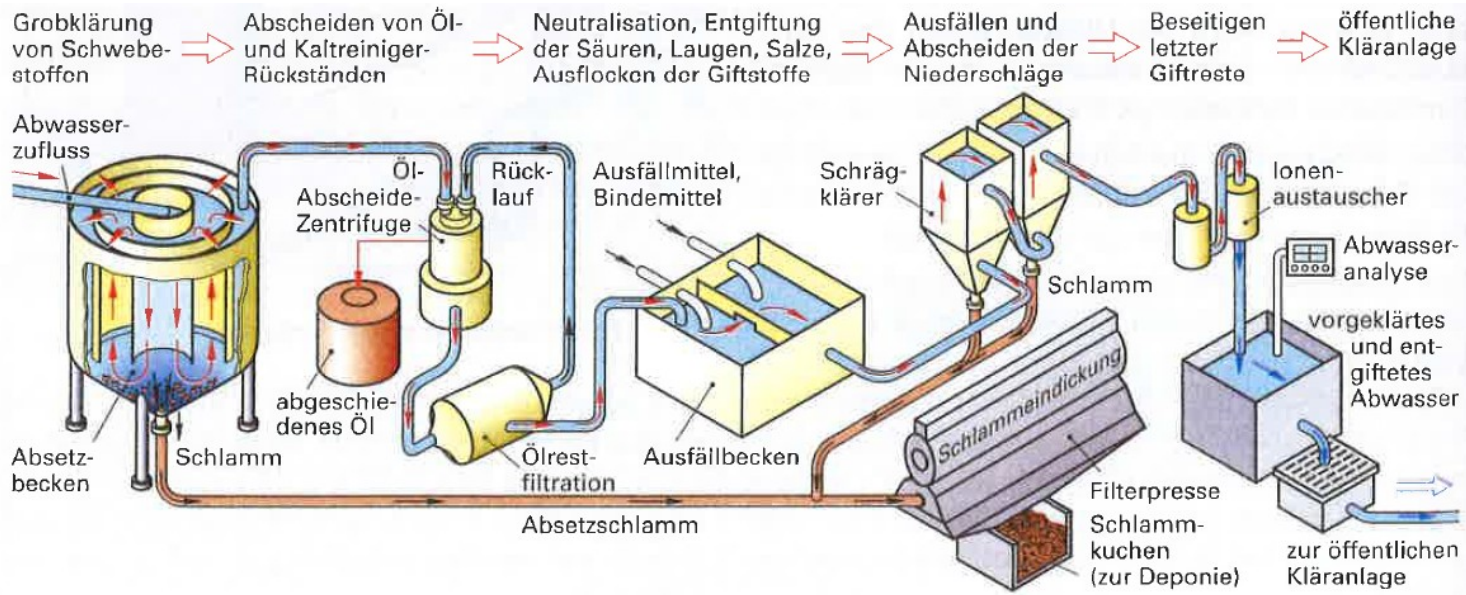


Bild 1: Reinigungsanlage für Abwasser aus Metallbetrieben

Purification in a multistage process; minimize toxic waste

Use of Energy
and
environmental
burden when
producing
raw material

Energy consumption to produce 1 t

Tabelle 1: Energieverbrauch in kWh zur Erzeugung von 1 t Werkstoff

Werkstoffe	Primär- erzeugung	Recycling- gewinnung
Eisen/Stahl	4300	1670
Aluminium	16000	2000
Kupfer	13500	1730
Polyethylen (PE)	3500	–
Polyvinylchlorid (PVC)	4000	–

Production Recycling

Training-Methods

Methods will be chosen appropriate to the apprentices competences, the trainers methodological aptitude and the situation

- “Teaching in four steps” – follows the idea of the traditional “masters teaching”
 - Learning by performing real customers orders
 - “Guided instruction by text” – a method following the paradigm of “complete action (6 Steps)” and gives more and ore autonomy to the apprentice
- ... and others

Next draft version can be done, if some more questions are clarified:

- ✓ Which will be the learning outcomes we agree on to aim at?
- ✓ How will the apprentice's competences be assessed before they start the course?
- ✓ How far can we support the participating companies in their pedagogical activity
- ✓ ... more



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