

1. Which ministry is responsible for education in your country?

Address / persons responsible

Ministry of Education, Culture and Science, Rijnstraat 50, 2515 XP
The Hague. Minister Jet Bussemaker and State Secretary Sander Dekker.

2. Which trade/professional association is responsible in your country for blacksmiths and metalwork designers?

Address / persons responsible

Koninklijke Metaalunie, Einsteinbaan 1, 3439 NJ Nieuwegein.
Chairman Fried Kaanen, director Bert Jaarsma.

3.a) Who is legally responsible for the training of blacksmiths and metal-work designers in your country?

(Please find out the addresses, websites, and contacts . Try to obtain the training targets in writing and attach these to your research data and write a short resume for our joint Erasmus Report).

Samenwerkingorganisatie Beroepsonderwijs Bedrijfsleven,
Louis Braillelaan 24, 2719 EJ Zoetermeer, Ms Mirjan van Ormondt.

3.b) Which grants or aid/help (governmental or private) is offered in your country and on which conditions?

(Training grants, loans, accommodation whilst away from home)

Stichting Opleidings- en Ontwikkelingsfonds voor het
Metaalbewerkingsbedrijf, Frankrijklaan 10, 2391 PX Hazerswoude-Dorp. On
condition that the student is working at a metalworking company.

4. Which schools (including schools financed by the government or private schools) in your country provide training/education for young blacksmiths and metalwork designers?

Address / persons responsible

List of Regional Training Centres (ROCs) with metal training
crebo number 25291 BOL / BBL

Name school	Location	Address	Postcode	BOL / BBL	Level	Telephone	Contact person
Deltion College	Zwolle	Mozartlaan 15	8031 AA	BOL / BBL	2	038 850300	
MBO College Hilversum	Hilversum	Arena 301	1213 NW	BOL / BBL	2	035 6892000	
MBO College Westerpoort	Amsterdam	Tempelhofstraat 80	1043 ER	BOL / BBL	2	020 5791466	
Noorderpoort	Groningen	Muntinglaan 3	9727 JT	BOL / BBL	2	088 2307602	M. Harms / E. Holland
Noorderpoort	Stadskanaal	Sportparklaan 5	9502 CW	BOL / BBL	2	088 2307719	J. Wever
Nova College	Haarlem	Nassaulaan 37	2011 PB	BOL / BBL	2	023 5302450	
ROC A12	Ede	Reehosterweg 80	6717 LG	BOL / BBL	2	0318 455500	
ROC A12	Huissen	Julianastraat 17	6851 KJ	BOL / BBL	2	026 3263210	
ROC A12	Veenendaal	Sportlaan 11-13	3905 AD	BOL / BBL	2	0318 495060	
ROC Da Vinci	Dordrecht	Leerparkpromenade 100	3312 KW	BOL / BBL	2	088 6572657	
ROC Drenthe College	Assen	Aziëweg2	9407 TG	BOL / BBL	2	088 1884444	
ROC Drenthe College	Emmen	Anna Paulounalaan 1	7822 JJ	BOL / BBL	2	088 1884444	
ROC Flevoland	Almere	Straat van Florida 1	1334 PA	BOL / BBL	2	036 5495900	
ROC Friese Poort	Drachten	de Wetterville 68	9201 BK	BOL / BBL	2	0512 767700	
ROC Friese Poort	Emmeloord	Espelerlaan 74	8302 DC	BOL / BBL	2	0527 634800	
ROC Friese Poort	Leeuwarden	Wilaarderburen 1	8924 JK	BOL / BBL	2	058 2655200	
ROC Friese Poort	Sneek	Harste 4 - 6	8602 JX	BOL / BBL	2	0515 481600	
ROC Gilde Opleidingen	Venlo	Hagerhofweg 15	5912 PN	BOL / BBL	2	088 4682015	
ROC het Graafschap College	Doetinchem	JF Kennedylaan 49	7001 EA	BOL / BBL	2	0314 353500	
ROC Horizon College	Hoorn	Maelsonstraat 24	1624 NP	BOL	2	0299 287100	
ROC ID College	Leiden	Bétaplein 18	2321 KS	BOL / BBL	2	088 2221777	
ROC Koning Willem I College	s-Hertogenbosch	Onderwijsboulevard 3	5223 DE	BOL / BBL	2	073 6249624	
ROC Midden Nederland	Nieuwegein	Harmonielaan 2	3438 EB	BOL / BBL	2	030 7541200	
ROC Midden Nederland	Amersfoort	Disketteweg 10	3821 AR	BOL / BBL	2	030 7541300	
ROC Mondriaan	Den Haag	Tinwerf 24	2544 ED	BOL / BBL	2	088 6663600	
ROC Nijmegen	Nijmegen	Campusbaan 6	6512 BT	BOL / BBL	2	024 8904500	
ROC Rijn IJssel	Arnhem	Thorbeckestraat 6	6828 TV	BOL	2	026 3129400	
ROC van Twente	Hengelo	Sportlaan Driene 2	7553 VZ	BOL / BBL	2	074 8525000	
Techniekkollege Rotterdam	Rotterdam	RDM-kade 59	3089 JR	BOL / BBL	2	010 4287160	C. Snel / A. Kruithof

Which conditions have to be fulfilled to be accepted for training?

Schooling

They should attend or have attended training in metal, such as Construction fitter, Metalworker or equivalent.

which certificates are necessary?

VCA (safety certificate Contractors-Basic)

Which EQF levels (from 1 to 8) are reached during training?

EQF levels 2 up to and including 5

Who issues the training certificates?

The Regional Training Centre (ROC).

Who conducts the practical and theoretical examinations?

The training institute in cooperation with the ROC and SBB.

5. How does one become a blacksmith trainee, journeyman or a master craftsman?

Occupational training in internet (investigate curriculum)?

Mondra Opleidingen bv. Mondra Opleidingen bv was included in the Central Register Short Vocational Training (CRKBO) by the Centre for Post Initial Education Netherlands.

Who issues the certificates?

Address / persons responsible

Ambachtsweg 38, 6673 DK Andelst. J. Pronk-Huisman and C.J. Pronk.

6. Are there free schools, academies for blacksmiths and metalworkers?

(investigate curriculums)

Address / persons responsible

Unknown.

7. Are there leading metalworker designers/companies (Stakeholders) in your country who take care of training and advanced education?

(for example, who offer traineeships or support journeymen.)

Address / persons responsible

List of smithies that are acknowledged by the SBB as training companies.

Name	Address	Postcode	City	Telephone
Vaags Molentechniek VOF	Dinxperlosestraat 58	7122 AH	Aalten	0543 478041
Siersmederij Beentjes	Fluorietweg 25-b	1812 RR	Alkmaar	072 5051202
Smederij De Balk bv	Condensatorweg 42	1014 AX	Amsterdam	020 6823736
Smederij Goedhart	Polijsterweg 15	1032 KP	Amsterdam	020 6366298
Smederij Cornelis Pronk	Ambachtsweg 38	6673 DK	Andelst	0488 454368
Kunst- en Siersmederij van Baars	Ommelsveld 15	5721 VT	Asten	0493 691799
Dick Norg	Tinallingerweg 3a	9953 TA	Baflo	0595 422402
L.A. van der Meijden Constructiebedrijf-Smederij bv	Molenweg 16	5056 JC	Berkel-Enschot	013 5331279
Vegt van der Smeed- en Constructiebedrijf	Manmakerweg 2	2971 VP	Bleskensgraaf	088 1652000
Smederij Rombout Buurmalsen	Rijksstraatweg 9	4197 BA	Buurmalsen	0345 572284
Rombout Geldermalsen	De Aaldor 15b	4191 PC	Geldermalsen	0345 581008
Wilpstra Siersmeedwerk	Hoofdstraat 160	9861 AM	Grootegast	0594 612112
Smederij Reinier Hoving	Havendijk 1	3846 AC	Harderwijk	06 5440245
Siem's Las & Siersmederij	Pasteurstraat 5	1704 RV	Heerhugowaard	072 5346990
Smederij van de Geijn	Oude Varkensmarkt 4	2311 VP	Leiden	071 5427116
Smederij Dirksen	Hoef 2-A	4051 CC	Ochten	0344 643439
BTM (Bas Timmermans Metaal)	Hoogdijk 14	5091 CH	Oost West en Middelbeers	013 5141498
t' Oude Ambacht Siersmederij Spaapen	Putseweg 31	4641 SL	Ossendrecht	0164 612716
Kunst- en Siersmederij Tim Vos	Zuid Rekkenseweg 32	7157 BL	Rekken	0545 431986
IJzerij Paulûs	Kandelaarweg 85	3047 EV	Rotterdam	06 14242057
Smederij van den Helm	Venkant 15	5271 SP	Sint Michelsgestel	073 5512137
Kunst- en Siersmederij Rijn Tupker	Zuidergracht 50	3763 LW	Soest	035 6021552
Smederij Oldenhave bv	Bedrijvenweg 6	7251 KX	Vorden	0575 551428
Nico Kaaijk Metaalbewerking	Krimp 13	1506 AA	Zaandam	075 6163415

8. Are there any institutes, academies or schools in your country which take care of advanced education (special knowledge)?

(e.g. working with metal in the preservation of ancient buildings / architecture / tools/ construction/ historic techniques or methods / blacksmiths / carriage makers

Mondra Opleidingen bv. Knowledge centre for forging and casting techniques.

Address / persons responsible

Ambachtsweg 38, 6673 DK Andelst. www.mondraopleidingen.nl

J. Pronk-Huisman and C.J. Pronk

9. Which networks are available nationally and internationally for blacksmiths and metalworkers?

(e.g. Internet information platforms, discussion groups, free organisations etc.)

Smedentotaal, Mondra databank, Schmiede das Eisen, NGK, Metaal en Techniek, MetaalNieuws, Vraag en Aanbod, Hephaistos, Metaalbouw etc.

10. Media: which printed text books and internet media are available in your country?

Address / persons responsible

The following textbooks are published by Mondra Opleidingen bv, Ambachtsweg 38, 6673 DK Andelst.

Tekenen voor Smeden	Meino Durand
Handhamersmeden	Uri Hofi
Vrij-vorm smeden met lucht- of veerhamer	Uri Hofi
Stijl- en Bouwherkenning	Janny Huisman
Stijlherkenning voor Smeden	Janny Huisman
Leerboek Smeden	C.J. Pronk
Leerboek voor de smid	C.J. Pronk
Leerboek Smeden	C.J. Pronk
Smeden 1	C.J. Pronk
Smeden 2	C.J. Pronk
Smeden 3	C.J. Pronk
Beroepstaak 1 Metaalbewerken Smeden	C.J. Pronk
Gereedschapsmeden	C.J. Pronk
Vuurlassen	C.J. Pronk
Leerboek Restauratiesmeden	C.J. Pronk
Restauratiesmeden	C.J. Pronk
Werken met Koper	C.J. Pronk
Bronssmeden	C.J. Pronk

11. Which technical literature is offered in your language?
Publishers / Addresses / persons responsible

Title book

100 Wereldwonderen
50 Onvergetelijke Bouwwerken
501 Steden
Alles van metaal
Alles wat je altijd al wilde weten over monumenten en bouwstijlen
Arbeid met vuur en verve. Leven en werk van Herman Heijenbrock
Automatische Legergeweren Encyclopedie
Barock und Rokoko
Barok Architectuur, Beeldhouwkunst, Schilderkunst
Barok Architectuur, Beeldhouwkunst, Schilderkunst
Beelden aan de Oude IJssel
Beknopt leerboek der staalconstructies
Bouw Siersmederij 1e deel 700 schetsen Deurpanelen-Vensters-etc.
Bouw Siersmederij 2e deel 672 schetsen Tuiningamgen en Poortjes
Bouwen in Nederland 600 - 2000
Bouwgeschiedenis van Monumenten
Bouwkunden 4,
Bouwkunden I, 2e druk 1944
Bouwkunden I, 8e druk 1960
Bouwkundige termen
Bouwkunst huis der provincie Gelderland
Bouwstijlen Herkennen
Bouwstijlen in beeld
Bouwstijlen van de Wereld
Bronzen in den Tijd
Bruggen in Nederland
Constructie leer voor metaalbewerkers
Constructie leer voor metaalbewerkers deel 2
Constructie leer voor metaalbewerkers deel 3
Constructie leer voor metaalbewerkers deel 4
Cursusboek basisvaardigheden smeden 2003/2004 NGK
De Amsterdamse School
De bouw van een kathedraal
De Bouwkunst van ons Land derde druk
De Bouwkunst van ons Land Tweede druk
De Gulden Snede
De Kunst van de Italiaanse Renaissance
De Kunst van de Italiaanse Renaissance
De Nieuwe Mathematica van de hedendaags Architectuur
De oertijd van de DRU

Author book

Manfred Leiter
Isalel Kuhl

Willi Rommel
Meindert Stokroos
S. Honing
A.E. Hartink
Wilfried Hansmann
Könemann
Ullmann & Konemann
Joop Boersma
J.E. de Vries
P. Winand
P. Winand dit is verdeel in 2 delen 3A en 3 B
K. Bosma, A Mekking, K. Ottenheym, A, vd Woud
Drs. Koos
R. Jellema, M.C.A. Meischke, J.A. Muller
R. Jellema, M.C.A. Meischke, J.A. Muller
R. Jellema, M.C.A. Meischke, J.A. Muller
dr. E.J. Haslinghuis - dr. Ing. H. Janse
Provinciaal Bestuur provincie Gelderland
Jan Nederlof
Owen Hopkins
Clemens Jöckle
A.J.G. Verster
Henk de Jong & Nico Muyen
B. Hoek, J.C. Heemskerk, J.J. Sohier
H. van der Waal en G. van Marion
H. van der Waal en G. van Marion
H. van der Waal en G. van Marion

A. Pronkhorst en S. van Ginneken
Malcolm Hislop
J.J. Vriend
J.J. Vriend
Wim Kleijne/Ton Konings
Konemann
Ullmann & Konemann
Jane Burry + Mark Burry
J.Schreure en J.W.de Kort

De siersmid		Otto Schmirler
De Smid	Eerste Deel	F. Fink
De Smid	Tweede Deel	F. Fink
De taal van de Architectuur		Emily Cole
De toegepaste kunst in Nederland		W.H. Gipsen
De wereld van Art Nouveau		William Hardy
Decoratief Vergulden		Annie Sloan
Decoratieve kunsten in Venetië		Mark E. Smith
Een smid tot een smid.		Fr. Deijs
Eenvoudig Anatomietekeningen		Christopher Hart
Egypte in de oudheid		R. Hamilton
Gebouwen schetsen en tekenen		Jim Woods
Geïllimineerde Letters		Margaret Morgan
Gelderland monumenteel, Gelre's verleden in foto's van nu		Karel Janssen en Cees Ippel
Gereedschapsmeden		C.J. Pronk
Geschiedenis van de bouwkunst		John Julius Norwich
Geweren en Karbabijnen Encyclopedie		A.E. Hartink
Gotiek Architectuur, Beeldhouwkunst, schilderkunst		Könemann
Gotiek architectuur beeldhouwkunst, Schilderkunst		Ullmann & Konemann
Gouden Handen		Uitgave van Nederlands Centrum voor Volkscultuur
Handboek der Metaalbewerking		A. de Jong
Handboek voor aankomende metaalbewerkers		J. Vader
Handboek voor alle metaalbewerkers		B. de Jager
Handboek voor den smid orgineel uitgave van 1899 1e druk		F.Lz Berghuis
Handboek voor den smid Herdruk 2006		F. Lz. Berghuis
Handboek voor Smeden		P.G. van Dongen
Handboek voor Smeden		R. van der Wal
Handleiding voor den Metaalbewerker		F.C. van der Togt
Handleiding voor den Metaalbewerker en Smid		J.A. van der Kloes en J.Z. Risch Jr.
Harden en Temperen		Luc. P.M. Michiels
Harderij Raadgever 1		A. Heil Sr.
Harderij Raadgever 2		A. Heil Sr.
Hekken in Nederland		Peter Meijer
Het bekende onbekende ambacht Koperslaan		Theo Alofs
Het geheim van de Nieuwkoopse smid		Leendert Jansen en Cornelis Verlooi
Het Handboek van den Wagenmakers en de Wagen-smid		Prof. J.A. van den Kloes en G. van Helden
Het levensverhaal van Antoon Tijdink. 'n schakel in de keten		Hans de Beukelaer
Het verhaal van de Tijd		Kristen Lippincott
Het vervaardigen van sierlijke voorwerpen uit koper en messing		
Het Wiskunde Boek		Clifford A. Pickover
Hightech machines 19e eeuw		G. Santi- Mazzini
Historische bouwmaterialen		Dr. Ing. Herman Janse
Historische verdedigingswerken		Mr. S.H. Poppema
Hoefproblemen		Rob van Nassau
Hoeven & hoefbeslag		Pascal Ebell

- Honderdvijfentwintig jaar Grofsmederij
Ijzer aan de Oude IJssel
Ijzer van vroeger
Ijzerbouw Handleiding tot het construeeren van eenvoudige ijzerkon.
IJzergieterijen langs de Oude IJssel
In vuur en vlam
Industrieel Erfgoed
Industrieel Erfgoed Nederlandse monumenten van industrie en techniek
Instandhouding van smeedijzer in het exterieur
Internationale Stijl Modernistische Architectuur van 1925 tot 1965
Jachtgeweren Encyclopedie
Kastelen en buitenplaatsen
Kerken en Kathedralen 1700 jaar Sacrale Bouwkunst
Kostprijsberekening voor Smeden
Kunstabgesproken inzichten krijgen in de belangrijkste kunststromingen
Kunsten A SMI
Kunstsmeedwerk gebruiksvoorwerpen
Leerderswoordenboek
Leren Tekenen
Leren Tekenen
Leve het oude ambacht
Leven en werk van M.C. Escher
Lood om oud ijzer
Materialen en Gereedschappen deel 3
Materialen en Gereedschappen deel 4
Materialenkennis voor Metaalbewerkers
Maya's opkomst, bloei en verval van een eeuwenoude beschaving
Mechanische Techniek handboek tekenen
Metaalbewerking
Mister Achterhoek
Mokume Gane
Monument in Beeld
Monumentale Kerkgebouwen
Monumentale Schoolgebouwen
Naslagwerk Smeden niveau 2 & 3
Nederlandsche Burgelijke Bouwkunst
Nederlandsche Kerkelijke Bouwkunst
Nostalgie keukenemaille deel III
Oer-Kracht Tentoonstelling IFGS 2008
Ons eigen land
Onze Bouwmaterialen
Oog voor Architectuur in Europa
Opleiding tot smid
Over de ontwikkelingsgeschiedenis van de Toegangshekken
Palladio alle gebouwen
R.van Wezel
A.J.G. Verster
P. Bakker
Jan Smit
Cornelis Pronk
Marcel Overbeek
Erik Nijhof
Rijksdienst voor de monumentenzorg
Hasan-Uddin Khan
A.E. Hartink
drs.J.M.M. Kylstra-Wielinga
Rolf Toman
F.J.C. van Essen
Stephen Little
Harvard Bergland
J. Boerman, P.G. van Dongen
S.J. Verhallen, L.F. de Vries
Peter Gray
Walter Foster & Ernest Norling
Hans Bouma
F.H. Bool, J.R. Kist, J.L. Locher en F. Wierda
Tim Graas
I. Vooren, H. vd Waal, W. Goettsche en A. Brunia
I. Vooren, H. vd Waal, W. Goettsche en A. Brunia
T. Polderman
Aart Aarsbergen
A. van Goor
Jacob Schreuder
Steve Midgett
drs. Frits Scholten
drs. Ada van Deijk
dr. Ineke Pey
Jos de Graaf
A. v L.
Hannie van der Vegt-de Groot
Peter Elgaß
Dr. M.D. Ozinga
J.A. van der Kloes
Prof. Dr. Nico Nelissen
PBNA
Peter Meijer
Paolo Marton, Manfred Wundram, Thomas Pape

Roccoco in Nederland
 Romaanse bouwkunst
 Romaanse Stijl
 Romaanse kunst architectuur beeldhouwkunst, Schilderkunst
 Schetstechnieken
 Schilderkunst van A tot Z
 Siersmeden
 Siersmeedkunst voor huis en tuin
 Siersmeedwerk
 Smederijmuseum Mathijssen
 Smeedijzerkunst
 Smeedwerk
 Smeedwerk / ijzerwaren
 Spijkers & draadnagels
 Tabellenboek Mechanische Techniek
 Technische gegevens voor het Nijverheidsonderwijs
 Tekeningen constructie- en apparatenbouw
 Tweehonderd jaar DRU
 Uit ijzer gegoten
 Uitslaan van plaatwerk deel 1
 van der Linden
 van Leerling tot Smidsgezel
 Variatie in Monumenten
 Verzamelband van Heinz Neumann
 Verzamelde Antwoorden uit de Bondsbladen
 Voorbereiding tot de Constructieleer en het vaktekenen
 Vuurvast en energiek 250 jaar DRU
 Wat kunnen wij van metaal maken
 Wereld Geschiedenis van de Kunst
 Werk en werktuigen van de kunstsmid
 Werkplaatsoefeningen verzamelde examenopgaven o.a. smeden
 Windwijzers op Groninger torens en kerken
 Wonen in Nederland

o.a. Reiner Baarsen, Dirk Jan Biemond etc.
 Raymond Oursel
 Benedetta Chiesi
 Ullmann & Konemann
 Lucy Watson
 K. Bijlsma en P. Kok
 Otto Schmirler
 Frans Deijns
 Jan Mathijssen
 Rebo Products
 Hans Mellendijk, Bert Scheuter en Wil van Til
 Lilian Fopma, Ries van Hemert en Theo
 Rouwhorst
 Herman Janse
 A. C. Bruinshoofd
 R.C. van Ree
 G.H. Wormgoor
 W. Gilles
 Barbara S. Kaspenberg
 M.Dekker/N.de Rooy
 Frank van Helften
 H. Stam
 Albert van der Meer
 Krantenknippels en tekeningen
 B.W. Naber
 H. van der Waal en G. van Marion
 Jacco Rodermond
 J.Komrij
 H.W. Jason
 Otto Schmirler
 J.B.L. Baijens en J. Vis Cz.
 K.T. Meindersma
 Nederlands Architectuurinstituut

These books are in the library of Mondra Opleidingen at the Ambachtsweg 38, 6673 DK in Andelst and are part of the private collection of C.J. Pronk, who is in possession of more than 1.700 books in various languages on forging, art history and culture. Also, C.J. Pronk is in possession of a collection of over 750 films and videos on forging. In addition, Mr C.J. Pronk is in possession of a drawing archive of the First Rotterdam Steam Factory for Art forging works, of which most of the drawings are watercolour.

12. Are certain elements of the metalworkers' and blacksmiths' training lacking in your country?

Which parts? Please use the list of detailed knowledge attached hereto.

Main areas of techniques (methods) and fields of training

Please check if and in what quality the training centres, schools, academies and institutes in your country have included the following skills in their training programmes. Please add missing skills to the list.

As of 1 August 2016, the training Metalworker provides free space to attend the forging training. This is done at central locations that have extensive and fully equipped training facilities. This means that there is more space in the training for a specialist training like forging.

Steel / stainless steel

Material science

Correct firing guides / correct handling of wrought fire

Forge welding

Welding: process: 111 Metal-arc welding with covered electrode

Process: 131 Metal-arc inert gas welding MIG-welding

Process: 135 Metal-arc active gas welding MAG-welding

Process: 141 Tungsten inert gas arc welding TIG -welding

Process: 311 Oxy-acetylene welding

Tool-making: forceps (tongs), hammer, punch

Basic techniques of forging: forging by hand, with a mechanical hammer

Techniques/Methods: punching holes, gorging (elbowing), splitting

Twisting

Pipe bending without machines: free bending according to size

Manufacture of tools for the above-mentioned techniques/methods

Methods of Joining

Surface engineering: black annealing (oil blacking)

Splitting techniques: metal fittings, ornaments

Inlay work

Historic ornaments: identification of such, implementation

There is no training for restoration smith in the Netherlands yet. But attention is devoted to it in the Style and Construction Recognition course of the forging training by Mondra Opleidingen bv. Also, the training Restoration smith is currently being developed and is expected to start in 2019.

Sacred and mundane ornaments

Planning – Draft – Drawing of Object

Design training: search for possible shapes/designs, shaping of form/design

Restoration – Reconstruction

Corrosion protection for historic works

Non-ferrous metals (Copper and Bronze)

We chose to leave out the non-ferrous in this questionnaire. However, various trainings on non-ferrous are provided by Mondra Opleidingen, in which the following techniques are discussed.

Material science

Basic methods: annealing, handling (treatment)

Soldering: soft and hard soldering

Welding:

Process: 131 Metal-arc inert gas welding MIG-welding

Process: 141 Tungsten inert gas arc welding TIG -welding

Process: 311 Oxy-acetylene welding

The welding processes are included in the training programme by default in the training Metalworker and Construction fitter.

Handling: calculating

Handling: metal plates, hollow parts

Handling: ornaments

Deformation: construction of tools from sheet metal or tube blanks

Coating: construction of tools

Deformation of ornaments: relief

Colouring of copper and copper alloys

Joining: riveting, crimping

Tin coating of copper and copper alloys

Forging of copper and copper alloys

Corrosion protection, surface protection

Restoration, reconstruction

Cast bronze: methods

Historic works: identification

Interconnection with other materials: glass, stone ...

4.1 Partial Qualification Basic Skills Metal

Final attainment levels

The student:

module metalworking

1. can saw metal manually
2. can perform filing operations
3. can drill
4. can galvanise conically and flat
5. can thread-cut and tap manually
6. can maintain tools
7. can set work pieces
8. can clamp work pieces

module marking out and drawing reading

9. can interpret a working drawing
10. can mark out
11. can place marks

module material knowledge

12. can distinguish metals and non-metals
13. can distinguish different metal types
14. can list the applications of different metal types

module quality

15. can measure components
16. can check components
17. can examine components
18. can maintain measurement tools
19. can maintain checking tools

module safety

20. can apply fundamental safety requirements

4.2 Partial Qualification Basic Skills Construction

Final attainment levels

The student:

module metalworking

1. can saw mechanically
2. can cut along straight lines and corners
3. can flame and/or plasma cut metal

module grinding, deburring and finishing off

4. can grind
5. can debur
6. can finish off

module transport

7. can work with simple transport and hoisting devices

module quality

8. can work in accordance with set quality requirements

module safety

9. can apply safety requirements

module assembling

10. can apply trade operations in an integrated manner
11. can assemble components using arc welding
12. can mount components

4.3 Partial Qualification Arc Welding MBE 1 - MIG/MAG 1 - TIG 1

Final attainment levels

The student:

module process and equipment

1. can set a welding machine
2. can operate the welding equipment

module material behaviour during welding

3. can perform appropriate measures regarding material behaviour

module constructions

4. can read working drawings and work instructions
5. can perform welding work using working drawings and work instructions

module execution

6. can perform underhand arc welding MBE1 - MIG/MAG1 - TIG 1
7. can perform welding work on sheet and profile material in unalloyed steel
8. can work safely

4.4 Partial Qualification Arc Welding - MBE 2 - MIG/MAG 2 - TIG 2

Final attainment levels

The student:

module process and equipment

1. can independently set the welding machine
2. can independently operate the welding equipment

module material behaviour during welding

3. can perform appropriate measures regarding material behaviour

module execution

7. can perform arc welding-MBE - MIG/MAG in different positions, where the welding spot is easily accessible
8. can perform welding work on sheet and profile material of unalloyed steel
9. can work safely

module execution

10. can perform arc welding-TIG in different positions, where the welding spot is easily accessible

Outflow Direction Stainless steel

11. can perform arc welding-TIG on work pieces made of stainless steel, where sheet-sheet connections and sheet-pipe connections occur

Outflow Direction Aluminium

12. can perform arc welding-TIG on work pieces made of aluminium, where sheet-sheet connections and sheet-pipe connections occur

4.5 Partial Qualification Construction Working

Final attainment levels

The student:

1. can bend strip, sheet and profile material using hand tools and can mark out bending lines
2. can bend sheet, strip and profile material using angle bending equipment
3. can manufacture components from sheet and profile material
4. can assemble components using arc welding
5. can apply trade operations in an integrated manner on bended sheet and profile constructions

6. can perform the work:
 - according to the right working method
 - according to the quality requirements
7. can apply safety and environmental requirements during the work

1. can read drawings
2. can read and make deflections
3. can determine developed lengths and/or stretched lengths
4. can mark out and cut deflections of sheet components
5. can bend flat or profile using a hoop bender
6. can bend using a folding machine (at least 4 bends)
7. can bench work and can:
 - clear cylindrical and conical holes
 - grind hand tools
 - perform cold pipe bending manually
8. can manufacture components from light and medium heavy sheet and profile material
9. can assemble components using arc welding, dowel pins, markers and screw and thread connections
10. can integrate and apply operations in light and medium heavy constructions
11. can execute the work in:
 - steel
 - stainless steel
 - aluminium

4.6 Partial Qualification Construction Working/Welding

Final attainment levels

The student:

1. can set thermal cutting equipment
2. can employ auxiliary tools for thermal cutting and gouging
3. can thermally cut and gouge different shapes in sheet and profile material manually
4. can saw and cut pipe material into various shapes
5. can cut off grind pipe
6. can apply bevels
7. can manufacture components from heavy sheet and profile material
8. can assemble components using arc welding and threaded connections

9. can apply operations in an integrated manner in heavy constructions
10. can execute the work in:
 - steel
 - stainless steel
 - aluminium

4.7 Partial Qualification Basic Skills Forging

Final attainment levels

The student can:

1. read drawings, interpret assignments and sketches
2. distinguish (art and work) styles based on external characteristics
3. maintain the forge fire and forging tools
4. work with heat sources
5. perform basic forging operations such as:
 - forging of wedges
 - forging from round to square
 - stretching
 - cutting
 - swaging
 - fullering
 - twisting
 - drawing
 - hot bending
 - forging of bends and square bends
 - punching holes
 - cleaving/splitting
6. make rivet joints
7. apply forging operations in limited integration
8. draw and sketch execution constructions of (specific) forging constructions such as:
 - thumbs
 - shackles
 - wall brackets
 - iron binding
 - twists and spirals
 - etc.
9. recognize working mistakes and take measures to prevent them, such as:
 - appearance of doublings through inclusions
 - overheating of the material
10. assemble work pieces using riveting and arc welding
11. preserving work pieces

4.8 Partial Qualification Forging 2

Final attainment levels

The student can:

1. read drawings, interpret the feasibility of assignments and sketches
2. make working drawings and working sketches
3. make design sketches
4. choose a heat source in hot working of metals
5. choose fuels for the heating of metals
6. perform forging operations such as:
 - branching
 - fire welding
 - making a joint, etc.
7. apply forging operations in an integrated manner
8. forge using mechanically driven forging hammers
9. responsibly integrate modern techniques with the smithcraft such as:
 - thermal cutting
 - machining techniques
 - roll bending and angle bending
 - welding
10. make auxiliary tools/molds and simple forging stamps
11. draw execution constructions of (specific) forging constructions such as:
 - fences
 - trelliswork
 - handgrips
 - shackles
 - wall brackets
 - anchor rods
 - hinges
 - hanging and closing structures
 - utensils
 - art objects/single copies
 - twists and spirals
12. manage clients
13. perform work related to other (trade) disciplines

4.9 Partial Qualification Extra-Functional Level 2B

Final attainment levels

The student:

module social and personal skills

1. can function in a company
2. can work independently and meticulously
3. can work together with co-workers

4. can carry responsibility for his own actions and execution of tasks
5. can take initiative
6. can work in a problem-solving way
7. can work methodically according to a fixed working method

module communicative skills

Dutch, listening and speaking skills

8. can apply different listening techniques and discussion techniques
9. can give verbal instruction

Dutch, reading and writing skills

10. can understand written information such as working instructions, requirements, reports, tables, graphs and forms
11. can apply different forms of reading
12. can make simple summaries
13. can make simple statements in writing

German and English, reading skills

14. can understand simple technical instructions in the English and German language

module material knowledge

15. can explain the goal of alloying
16. can define the concepts unalloyed, low-alloyed and alloyed steel and list application areas
17. can list the characteristics of cast iron and cast steel
18. can divide unalloyed steel types based on composition
19. can list material and mechanical characteristics and application areas of unalloyed steel types
20. can interpret commercial sizes and dimensions of steel
21. can explain symbols and numbers for the indication of unalloyed steel types
22. can describe the goal, the applications and the health risks of common refrigerants and lubricants
23. can list specific characteristics and applications of non-ferrous metals
24. can interpret material indications of common non-ferrous metals
25. can list the goal and applications of methods of material research
26. can list the goal and applications of heat treatments

module mechanical engineering components

27. can list goal, types and applications of bolts, nuts, screws, studs, locknuts, wedges, shanks and dowel pins
28. can look up names and dimensions of threaded connections
29. can describe the working method for applying and removing shanks, dowel pins and wedges
30. can describe applications and use of simple hoisting and transport devices
31. can describe the working method for the securing of loads

module business economics

32. can describe motives to work
33. can indicate the influence of automation in metal
34. can describe changes in the work process in metal
35. can list organisational forms of companies
36. can describe common organisational forms
37. can organise work
38. can interpret a simple organisation chart
39. can explain the goal of work preparation
40. can apply the concepts of planning and work study
41. can list factors that influence production costs
42. can describe important legal regulations with regard to:
 - the labour law
 - employee and employers organisations in metal
43. can globally describe the goal and function of collective labour agreements in metal

module health care systems

occupational safety and health

44. can describe the responsibilities, authorities, obligations and liabilities demanded by the Labour Conditions Act for one's own workplace situation
45. can prevent, limit, help solve and/or evaluate risks for safety, health and wellbeing in one's own workplace situation
46. can work safely
47. environmental care
48. can list aspects of environment
49. can list trade operations that have consequences for the environment
50. can apply business requirements with regard to the environment
51. can describe global environment laws

quality care

52. can contribute to quality care in relation with working methods and quality requirements

ergonomics

53. can apply ergonomical requirements in one's own workplace situation

module drawing reading

54. can describe concepts with regard to drawing reading
55. can apply standard sheets
56. can interpret working drawings
57. can interpret applied symbols for normalised indications

module polytechnic

- 58. can perform mathematical operations
- 59. can construct geometric figures
- 60. can describe concepts with regard to:
 - geometric figures
 - dynamics
 - movements
 - hydrostatics
 - friction
 - resistance theory
 - thermodynamics
- 61. can make calculations with regard to:
 - geometric figures
 - dynamics
 - movements
 - parts from hydrostatics
 - resistance theory
 - thermodynamics
- 62. can describe links with regard to labour, power and energy
- 63. can make calculations with regard to labour, power and energy

module computer science

- 64. can operate a computer
- 65. can work with application software
- 66. can describe applications of automation in production processes
- 67. can describe applications of automation in supporting business processes

4.10 Partial Qualification Socio-Cultural Level 2

Final attainment levels

The student:

module individual and society

- 1. is able to present his opinion on issues of human coexistence, which he encounters through different roles (partner, participant of social relationships in leisure time and work situation)
- 2. can explain that opinions and behaviour (of himself and others) are largely connected to societal and cultural positions
- 3. is able to present his vision on the interaction with others within a (partner)relationship
- 4. is able to interact with people from a different societal and cultural background on the basis of respect during his work and leisure time
- 5. can explain to what extent opinions and behaviours (of himself and others) align with the basic characteristics and principles of the parliamentary democracy

6. can explain to what extent opinions and behaviours (of himself and others) align with the basic characteristics and principles of the constitutional state

module human and work

7. is able to present his values, standards and opinions on the meaning of (paid and unpaid) labour for individual and society
8. is able to (independently) take steps that can lead to finding and accepting paid work
9. is able to articulate which rights, obligations and responsibilities result from an employment contract
10. can, in a given situation, recognize aspects connected to safety, health and wellbeing (working conditions). He is able to stand up for his interests.
11. can articulate which possibilities employees have in a given situation to have influence within their labour organisation. He can stand up for his interests.
is able to recognize ethical questions and dilemmas that can arise during professional practice. He can articulate how and why he would act ethically in