

Die intelligente
Welding device generation
by SCHWEIßKRAFT

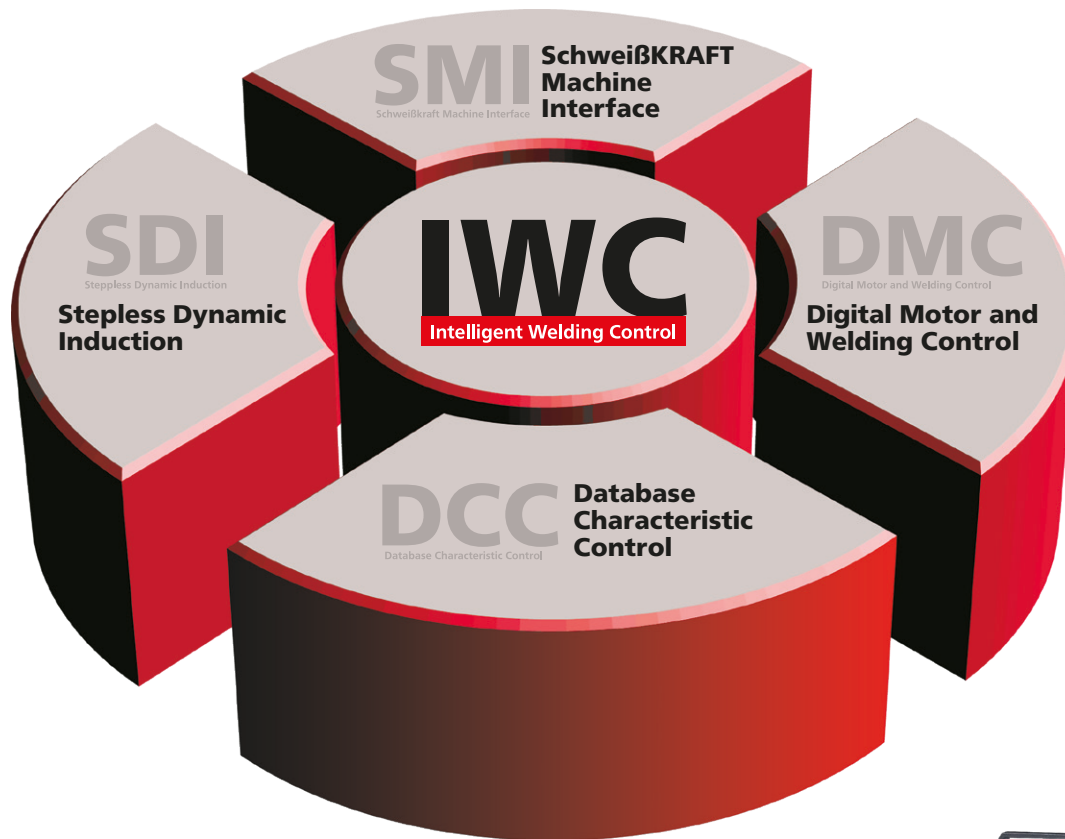


Qualität Made
in Germany



Professional MIG/MAG welding equipment

PRO-MIG synergie – step controlled inert gas welding equipment
Best in class welding results and easy control thanks to automated settings and IWC smart processor control



“IWC is a superordinate controller for the entire system”

IWC Intelligent Welding Control

The arc length is not just controlled by measuring the arc voltage and welding current, but additionally by digitally acquiring the wire feed speed.

- ▶ During the entire ignition and arc process, the droplet transition point is continuously monitored and digitally controlled – like with the latest pulse power sources
- ▶ Setting the correct welding parameters is easy and safe thanks to the integrated DCC welding parameter database and the convenient SMI control solution
- ▶ The integrated microprocessor uses this to quickly and efficiently compensate for changes, thus keeping the arc significantly constant.

SDI Stepless Dynamic Induction

SDI technology - Automatic choke compensation

SDI boost economic efficiency: because the heat transfer can be controlled in an improved way compared with legacy step controlled MIG/MAG systems, and spatter in the mixed arc is greatly reduced, visibly less rework is required.

This means that the weld properties can be adapted to the welding conditions in an even better way, e.g., in **out of position welding, such as vertically rising welds, overhead welds, or welding with a long stick out** in positions that are difficult to access.

With its SDI technology, the PRO-MIG has excellent ignition properties and a very stable arc. The choke effect is optimised by the integrated processor control. This reduces spatter to a minimum.



PRO-MIG 450-4 WS synergie

DCC automatic adjustment: Three easy steps – off we go...

You simply select the material and wire thickness.

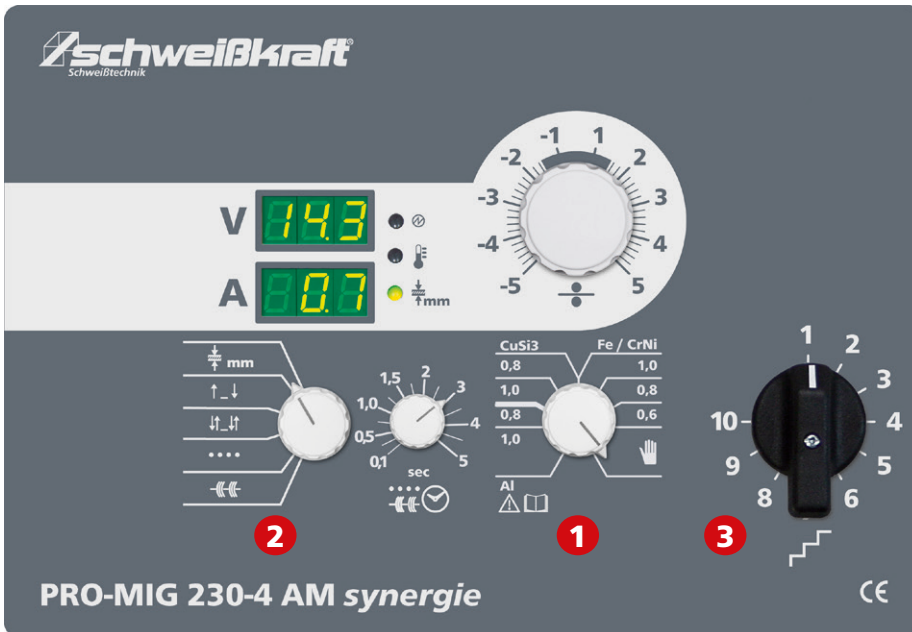
The machine tells you the weldable material thickness – and off you go.

Our PRO-MIG synergie takes care of modifying the other welding parameters on the basis of the stored synergie characteristic curves and DCC itself.

The wire feed speed and all other critical parameters are automatically optimised, depending on the voltage level, for the programmed materials: steel, stainless steel and aluminium and for various wire electrode diameters and gas types.

Standard equipment for all
PRO-MIG types

DCC
Database Characteristic Control



Step 2
Selection display
Material thickness

Step 1
Material and
wire diameter selection

Step 3
Press the torch button and use the stage
switches to select the material thickness to
be welded. The digital display (A) shows
the material thickness in mm.

DMC

Digital Motor and Welding Control

DMC technology - Digital motor control

Arc length changes, e.g., caused by voltage fluctuations in resistances in the hose pack are compensated for more quickly and efficiently thanks to DMC.

In addition to measuring the arc voltage, the feed speed is also captured using incremental sensors on the feed motor. DMC detects and corrects arc length changes at an early stage.

DMC guarantees constant wire feed speeds – independently of the feed motor temperature or hose pack soiling.

DCC

Database Characteristic Control

DCC technology - Automatic setting of welding parameters to reflect the material thickness.

All related welding parameters are automatically selected with optimum parameter defaults. The comprehensive, integrated welding parameter database (DCC) is jam packed with practical expert knowledge. The combination of material, wire diameter and voltage level is used to preset the synergie parameters required for a successful welding process from the database.

During welding, the actual values are continually compared with these process defaults and corrected in next to no time, as needed. All parameters required for perfect welding (more than 900) are selected by DCC to match the individual machine requirements.

SMI

Schweißkraft Machine Interface

SMI technology - Easy as pie – rules out incorrect operation:

SMI ensures fast and safe setting of the correct welding parameters while guaranteeing easiest possible handling at the same time – choose the material, set the material thickness – weld.



PRO-MIG 280-4 synergie

PRO-MIG synergie – longest duty cycle, easiest operation, best welding results and maximum reliability

- ▶ Smart, superordinate IWC control
- ▶ **Electronic choke sync SDI** for an even better ignition process
- ▶ **Synergie operation DCC** via integrated database with stored characteristic curves
- ▶ Special MIG soldering characteristic curves for 230 AM models
- ▶ Special aluminium characteristic curves in addition with 230-4 AM, 300-4 to 450-4 WS models
- ▶ Automatic wire threading, current and gas free in rapid motion
- ▶ Automatic feed
- ▶ Automatic inching for reliable ignition
- ▶ Hold function
- ▶ Permanent mains voltage monitoring for a stable arc
- ▶ Automatic wire burn-back for constant wire end lengths and an individually configurable burn-back time
- ▶ Customisable gas post-flow time
- ▶ Safety forced shutdown in 4-cycle operation to prevent undesirable wire uncoiling
- ▶ **Temperature controlled fan and water pump with standby circuit** for low noise emission
- ▶ Thermal protection switch
- ▶ Gas-cooled and liquid-cooled models available
- ▶ Two large steering and fixed rollers

Features:

- ▶ Powerful wire feed; digitally controlled with real-time monitoring
- ▶ Clear-cut control panel
- ▶ Two easy-to-read digital displays with Hold function for **welding voltage, welding current and weldable material thickness**
- ▶ Excess temperature display
- ▶ Wire spool easy to change
- ▶ Wire feed roll change without tools
- ▶ Ergonomic design
- ▶ Ergonomic design, industrial standard housing as per IP 23 for outdoor welding
- ▶ Easily manoeuvrable thanks to robust chassis with large wheels

Operational modes

- ▶ 2-cycle operation
- ▶ 4-cycle operation
- ▶ Spot welding
- ▶ Synergie operation
- ▶ Manual operation

Configurable parameters

- ▶ Spot/interval time
- ▶ Welding output

Process
▶ MIG/MAG
▶ MIG soldering (PRO-MIG 230 AM synergie)
Sheet thicknesses
▶ from 0.5 mm (MAG)
▶ Aluminium from 0.8 mm (MIG)
▶ MIG soldering as of 0.5 mm
Base materials
▶ Construction steels, non alloy and low alloy materials
▶ CrNi steels ferritic/austenitic
▶ Duplex steels
▶ Aluminium (MIG)
▶ galvanised, pre-treated steels (MIG soldering)
Typical applications
▶ Plant, container, machine, steel construction
▶ Maintenance/repairs
▶ Automobile industry and automotive supplies
▶ Vehicle maintenance and repairs
▶ Vehicle manufacturing/construction machinery
▶ Rail vehicle manufacturing
▶ Shipbuilding

Program/characteristic curves	Fe/CrNi				Aluminium			CuSi	
	0.6	0.8	1.0	1.2	0.8	1.0	1.2	0.8	1.0
Synergie operation DCC									
PRO-MIG 230-2 AM	●	●	●					●	●
PRO-MIG 230-4 AM	●	●	●		●	●		●	●
PRO-MIG 280-4		●	●	●					
PRO-MIG 310-4		●	●	●					
PRO-MIG 300-4		●	●	●		●	●		
PRO-MIG 350-4 W		●	●	●		●	●		
PRO-MIG 450-4 WS		●	●	●		●	●		

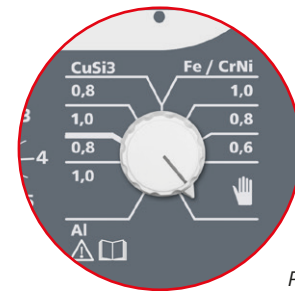


Fig. left
Synergie program selection
PRO-MIG 230-4 AM

MIG soldering with the PRO-MIG

Welding as of a sensational 15 A

The PRO-MIG 230-4 AM and 230-2 AM are specially designed for use in thin sheet processing with a sensational welding current of 15 A or more. The special Synergie programs for MIG/MAG welding and MIG soldering of galvanised and aluminised body sheet metal make them the ideal machines for vehicle workshops.

With its powerful 4-roll drive and additional Synergie characteristic curves for welding aluminium materials, the PRO-MIG 230-4 AM is a genuine all-rounder for welding aluminium materials. Anyone who needs to weld with thin wires, but does not want to do without this 4-roll drive. It helps you to perform fine welding work on thin sheets with even better process assurance.



PRO-MIG 300-4 synergie

Unique in this class

For all PRO-MIG types:

Revolutionary IWC control solution

- ▶ In contrast to some other suppliers, you benefit from the benefits of a smart control solution from the smallest to the largest system.

Digital volt and amperage display with Hold function for the parameters used

- ▶ Ideal for certification welding work for welding data transfer. The parameters used here remain in place until next used and are displayed.

Automatic setting of welding parameters to reflect the material thickness.

- ▶ Fast, easy and safe thanks to database support

Extremely long duty cycle

Best in class price/performance ratio

- ▶ State-of-the-art engineering and maximum equipment level



PRO-MIG synergie 230-2 AM to 310-4
Compact design with steering rollers and generously dimensioned fixed rollers

PRO-MIG synergie 300-4 to 350-4 W
Industrial design for up to 50 l gas cylinders, chassis width extension, steering rollers and generously dimensioned fixed rollers.

PRO-MIG synergie 450-4 WS
WS design with liquid cooling and a separate, removable wire feed case

Complies with DIN EN 1090: With a Schweißkraft WPQR/WPS package for DIN EN 1090 compliance

Thanks to the Schweißkraft WPQR/WPS package for the PRO-PULS SPEED, PRO-ARC SPEED and PRO-MIG models, manufacturers of load-bearing steel structures can now benefit from an inexpensive option for implementing welding procedure specifications (WPS) for the most common welding applications. For the companies involved, this

removes the need for time-consuming and expensive work for creating their own specifications, while at the same time meeting an important requirement in terms of certification and compliance with CE marks. The folder with 12 procedure tests and 169 welding specifications is available as **Art. no. WPQR-SK** (For further information see page 36)

Welding specifications (WPS) valid for:

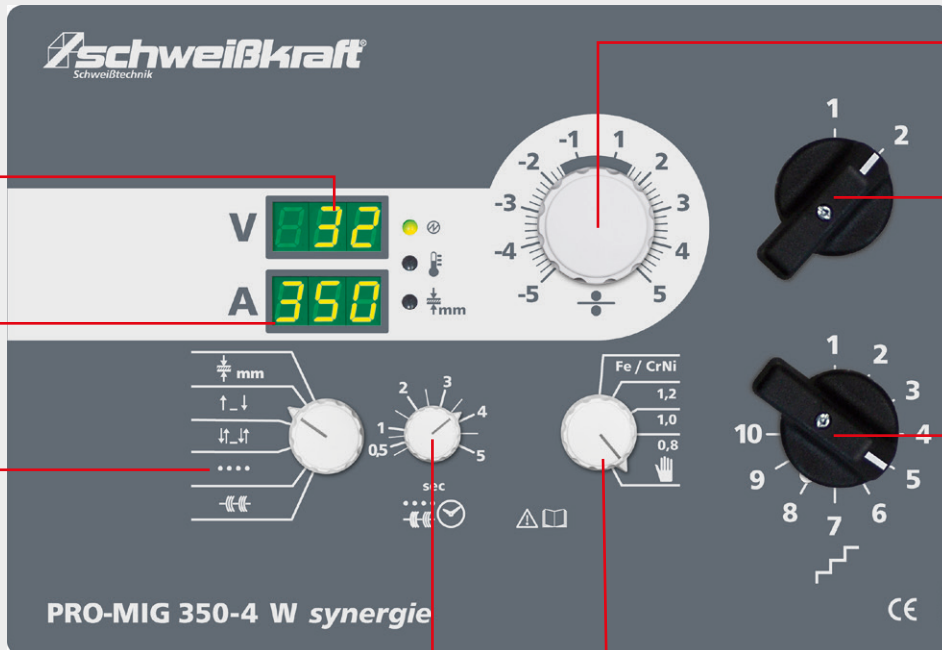
- PRO-MIG 280-4
- PRO-MIG 310-4
- PRO-MIG 350-4W
- PRO-MIG 450-4 WS



WPQR package
Art. no. WPQR-SK

Control elements

SMI
Schweißkraft Machine Interface



Digital display for welding voltage with Hold function

Digital display for welding current and material thickness

Operational modes
Material thickness display, 2-cycle, 4-cycle, spot, interval

Setting the spot and interval time

Synergie program selection: Material/wire diameter program or manual operation e.g., for welding aluminium

Rotary button for wire speed and arc length correction

Rough step switch

Granular step switch

MIG/MAG shield gas welding equipment

Compact series, gas-cooled, for 20l gas cylinder

Model	MIG soldering	MIG soldering	PRO-MIG synergie 280-4	PRO-MIG synergie 310-4
	PRO-MIG synergie 230-2 AM	PRO-MIG synergie 230-4 AM		
Art. no.	1081025	1081024	1081028	1081031
Recommended Torch kit	15/25	15/25	25/35	25/35
Art. no.	1091510	1091510	1092510	1092510
Technical specifications				
Wire Ø steel/special steel*	0.6 - 1.0 mm	0.6 - 1.0 mm	0.8 - 1.2 mm	0.8 - 1.2 mm
Wire Ø aluminium*	-	0.8 - 1.0 mm	-	-
Wire Ø CuSi*	0.8 - 1.0 mm	0.8 - 1.0 mm	-	-
Wire feed	0.3 - 20 m/min	0.3 - 20 m/min	0.3 - 20 m/min	0.3 - 20 m/min
Adjusting range	15 - 230 A	15 - 230 A	35 - 280 A	35 - 300 A
Duty cycle at I _{max.} 40 °C	40 %	40 %	40 %	40 %
Welding current at 100% DC 40 °C	150 A	150 A	180 A	210 A
Open circuit voltage	15 - 37 V	15 - 37 V	17 - 37 V	17 - 40 V
Switching stages	10	10	10	12
Wire feeders	2-roll	4-roll	4-roll	4-roll
Power connector	3 x 400 V	3 x 400 V	3 x 400 V	3 x 400 V
Permanent output at 100% DC	4.9 kVA	4.9 kVA	6.3 kVA	6.6 kVA
Fuse	16 A	16 A	16 A	32 A
Cos phi power factor	0.96	0.96	0.96	0.96
Insulation class	H	H	H	H
Cooling type	AF	AF	AF	AF
Torch cooling	Gas	Gas	Gas	Gas
Degree of protection	IP 21	IP 21	IP 21	IP 21
Weight	68 kg	68 kg	72 kg	78 kg
Dimensions (L x W x H)	800 x 320 x 620 mm			
Standards	EN 60 974-1;-3;-10 / S mark / EMC - class A			

*weldable materials, program-supported

Industrial series, gas and liquid cooled, for 50l gas cylinder

Model	PRO-MIG synergie 300-4	PRO-MIG synergie 350-4 W	PRO-MIG synergie 450-4 WS
Art. no.	1081030	1081036	1081045
Recommended Torch kit	25/35	400/50	400/70
Art. no.	1092510	1094010	1094011
Technical specifications			
Wire Ø steel/special steel*	0.8 - 1.2 mm	0.8 - 1.6 mm	0.8 - 1.6 mm
Wire Ø aluminium*	1.0 - 1.2 mm	1.0 - 1.2 mm	1.0 - 1.2 mm
Wire feed	0.3 - 20 m/min	0.3 - 20 m/min	0.3 - 20 m/min
Adjusting range	40 - 300 A	40 - 350 A	45 - 450 A
Duty cycle at I _{max.} 40 °C	50 %	50 %	50 %
Welding current at 100% DC 40 °C	210 A	260 A	320 A
Open circuit voltage	17 - 42 V	18-43 V	18-51 V
Switching stages	12	20	30
Wire feeders	4-roll	4-roll	4-roll
Power connector	3x 400 V	3x 400 V	3x 400 V
Permanent output at 100% DC	6.9 kVA	9.6 kVA	12.7 kVA
Fuse	32 A	32 A	32 A
Cos phi power factor	0.96	0.97	0.96
Insulation class	H	H	H
Cooling type	AF	AF	AF
Torch cooling	Gas	Gas/liquid	Gas/liquid
Degree of protection	IP 23	IP 23	IP 23
Weight	110 kg	120 kg	137 kg
Dimensions (L x W x H)	1 040 x 560 x 850 mm		1 040 x 560 x 1 400 mm
Standards	EN 60 974-1;-3;-10 / S mark / EMC - class A		

*weldable materials, program-supported

Standard equipment

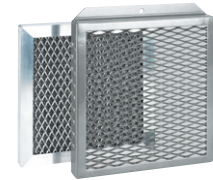
PRO-MIG

- With 2- or 4-roller drive
- optionally gas or liquid-cooled and available as a compact or case system
- With 2-cycle/4-cycle/interval control
- Mains cable with connector 5 m
- Central connection
- Digital display for welding voltage, current and material thickness
- Operating and temperature display
- **Without torch in each case**
- **Without earth cable**
- **Without pressure regulator and without intermediate hose pack (see accessories)**



Optional equipment PRO-MIG synergie

Designation	Art. no.
Air filter attachment PRO-MIG 350-4 W AM and 450-4 WS complete	1034004
Trolley for feed case	1033667



Air filter attachment

Accessories - torch kits

consisting of: torch 4 m, earth cable, 315 bar Argon/CO₂ pressure regulator

Designation	Art. no.
Torch kit 15/25: SMB 15/4 m gas-cooled, earth cable 25 mm ² 4 m, pressure reg.	1091510
Torch kit 25/35: SMB 25/4 m gas-cooled, earth cable 35 mm ² 4 m, pressure reg.	1092510
Torch kit 36/50: SMB 36/4 m gas-cooled, earth cable 50 mm ² 4 m, pressure reg.	1093611
Torch kit 400/50: SMB 400/4 m liquid-cooled, earth cable 50 mm ² 4 m, pressure reg.	1094010
Torch kit 400/70: SMB 400/4 m liquid-cooled, earth cable 70 mm ² 4 m, pressure reg.	1094011
Universal torch holder	1090011

*Prices for torch kits only apply in combination with purchasing a welding device



Torch kit



Universal torch holder

Wear part set

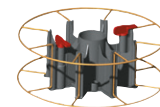
Designation	Art. no.
Wear part set SMB 15 consisting of: 1 x gas tip holder, 3 x retaining spring, 3 x each contact tip 0.6/0.8 mm, 3 x gas tip conical, 1 x gas tip cylindrical size 12, large sorting box	1091500
Wear part set SMB 25 consisting of: 3 x retaining spring, 2 x tip assembly, 5 x each contact tip 0.6/0.8 mm 2 x gas tip conical, 1 x gas tip cylindrical size 12, large sorting box	1092500
Wear part set SMB 36 consisting of: 2 x tip assembly M6, 3 x gas distributor brown, 5 x each contact tip 0.8/1.0/1.2 mm, 4 x gas tip conical, 1 x gas tip cylindrical, large sorting box	1093600
Wear part set SMB 400 consisting of: 2 x ring, 2 x tip assembly M8, 3 x gas distributor brown highly heat resistant, 5 x contact tip 1.0 mm, 10 x contact tip 1.2 mm, 4 x gas tip conical, 1 x gas tip cylindrical, large sorting box	1094000



Wear part set



Basket spool adapter KA 1



Basket spool adapter KA 2

Basket spool adapter

Designation	Art. no.
Basket spool adapter KA 1, single-part, pluggable	1110001
Basket spool adapter KA 2, with quick release coupling	1110005

Intermediate hose pack for PRO-MIG 450-4 WS

Designation	Art. no.
Intermediate hose pack pluggable 1.4 m length	1010235
Intermediate hose pack pluggable 5.0 m length	1010236
Intermediate hose pack pluggable 10.0 m length	1010237



Intermediate hose pack

Wire feed rolls for 2-roll wire feed

Designation	Art. no.
Wire feed roll 0.6/0.8 mm for 2-roll drive	1013706
Wire feed roll 0.8/1.0 mm for 2-roll drive	1013708
Wire feed roll 1.0/1.2 mm for 2-roll drive	1013710



Wire feeder rolls

Wire feed rolls for 4-roll wire feed

Designation	Art. no.
Feed roll pair solid wire with 0.6 mm gear	1033600
Feed roll pair solid wire with 0.8 mm gear	1033601
Feed roll pair solid wire with 1.0 mm gear	1033602
Feed roll pair solid wire with 1.2 mm gear	1033603
Feed roll pair solid wire with 1.6 mm gear	1033604
Feed roll pair aluminium with 4 x 1.0 mm gear	1033619
Feed roll pair aluminium with 4 x 1.2 mm gear	1033620
Feed roll pair aluminium with 4 x 1.6 mm gear	1033621
Feed roll pair flux-core wire with 1.2 mm gear	1033612
Feed roll pair flux-core wire with 1.6 mm gear	1033616
Feed roll pair flux-core wire with 1.8 to 2.4 mm gear	1033618



Feed roll pair solid wire with 1.2 mm gear



Feed roll pair aluminium with 4 x 1.0 mm gear



Feed roll pair flux-core wire with gear ring 1.6 mm

DIN EN 1090

Schweißkraft for a fast and easy approach to DIN EN 1090 certification

DIN EN 1090 – The standard since July 2014

The new DIN EN 1090 standard means fundamental changes for manufacturers of steel and aluminium parts for building and civil engineering. Since 1 July 2014, contracts for metal construction work can only be awarded to

companies that have been tested and certified by a notified body. As of this point CE marking for all steel and aluminium load-bearing constructions is mandatory in Europe. The key issue in DIN EN 1090 is the introduction, documentation and maintenance

of a quality management system for in-house production checks that covers the entire manufacturing process in the enterprise from order intake to delivery.

Which EXC class applies to whom?

Classification into execution classes EXC1 to EXC4 to reflect the consequential damage, stress category and manufacturing category is new in DIN EN 1090.

Companies in the scope of class EXC 1 must have in-house production checks as per DIN

EN 1090-1; they must employ certified welders with a valid welder document as per DIN EN 287-1. Companies in the scope of classes EXC 2, 3 and 4 need to meet further requirements on top of this, such as a qualified welding inspector, and certified welders with valid welder documents as per DIN EN 287-1.

The following applies to all execution classes: the continuous quality of the welding results must be ensured by the processes and actions defined in the in-house production check manual.

Class	EXC 1	EXC 2	EXC 3	EXC 4
Quality requirements staff	Elementary	Standard	Expert	Expert
Welding supervision	None	SFM/ST	SFI	SFI
Inspection staff/certified welders	Required	Required	Required	Required
Quality documentation materials	No	Yes	Yes	Yes
Material certificates	Yes	Yes	Yes	Yes
Material traceability	No	In part	Yes	Yes
Weld evaluation group	D	C	B	B

5 steps to CE marking – how it is done



Welding procedure qualification – achieve your objective of creating welding instructions faster with Schweißkraft

■ For EXC1 and EXC2, Schweißkraft can provide welding instructions for the materials S235 to S355 as per EN ISO 15612.

■ For EXC1 and EXC2, Schweißkraft can provide templates for creating your own welding instructions as per EN ISO 15610 for the materials S235 to S275.



Schweißkraft special offers – Save time and money now with a package deal!

The Schweißkraft WPQR/WPS package for EXC1 und EXC2 – for the PRO-ARC SPEED, PRO-PULS SPEED and PRO-MIG model ranges, all in one book.

Welding procedure specifications (WPS) are required for all execution classes. REHM WPQR/WPS packages contain WPQR-certified welding instructions for standard welding procedures.

The welding instructions cover most steel welding applications for the materials S235 to S355 used to manufacture construction products in the construction industry.

Qualification methods DIN EN ISO 15609	EXC 1	EXC 2	EXC 3	EXC 4
Welding procedure approval testing DIN EN ISO 15614	No	X	X	X
Advance work sample testing DIN EN ISO 15613	No	X	X	X
Standard welding procedure DIN EN ISO 15612	No	X up to S275	∅	∅
Expertise in welding technology Experience DIN EN ISO 15611	X up to S275	X up to S275	∅	∅
Use of approved filler metals DIN EN ISO 15610			∅	∅

X Permissible ∅ Not permissible

Your benefits:

- You can purchase the Schweißkraft book with **169 WPS** Schweißkraft welding procedure specifications and 12 procedure
- Your compliant Schweißkraft welding equipment has the WPQR badge
- And you can extend the Schweißkraft WPQR/WPS packages to include your own welding instructions – without any additional procedure testing

**Schweißkraft
WPQR package**
Art. no. WPQR-SK

Creating your own welding instructions for use of approved filler metals (DIN EN 15610)

Users can create their own welding instructions without needing to audit the procedure by using approved and qualified filler metals for the execution class EXC1, EXC2 for steel grades up to 275 (not permissible for high strength materials) with sheet thicknesses from 3 to 40 mm and an a dimension ≥ 3 mm.

The WPS templates provided by Schweißkraft facilitate the process of creating your own welding instructions.