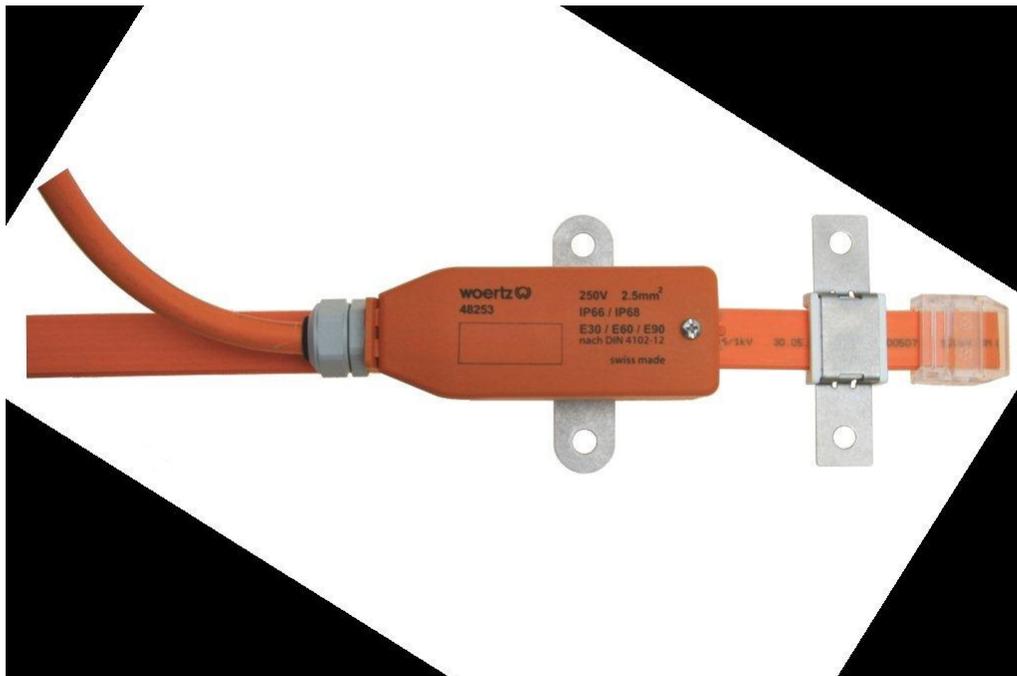# Woertz FE180 3 hour Fire Safety Cables and junction boxes

Selection Criteria:

It is important to select the proper cable for the application. A fire protection design is critical in the case where the cabling system has to meet stringent safety standards.

The Woertz Safety cables only burn close to the ignition source and prevents the spread of fire. Features include:

- Low fire load
- Low heat conductivity **(IEC60332-1/EN 60332-1)**, self-extinguishing: no flames are spread **(IEC 60332-1/EN 60332-1)**
- Halogen-free: no corrosive gases emitted. No corrosive elements will form in combination with extinguishing water **(IEC 60754-2/EN50267)**
- Low smoke emission, visibility not reduced **(IEC61034/EN 50268)**
- Cable structure: **DIN VDE 250-214 and DIN VDE 0281**
- The modular system is waterproof and meets **IP66/68 standards**

Fire and its effects are very unpredictable and 100% safety cannot be guaranteed. Testing only covers about 95% of the cases which may occur and enable comparative values to be obtained in order to determine different levels of safety.

Insulation integrity FE

The basic test (according to IEC 60331) is designed to stress the insulation of a cable by submitting it to flame temperature of at least 750°C (1,382 °F) – test length 50cm (~ 20 inches).

If electrical current flows for 180 minutes and no short-circuit occurs, the circuit integrity of the cable is classified as FE 180 (FE = effect of fire or flame)

Function integrity E

Testing the function integrity requires measuring the duration which current continues feeding life safety equipment such as emergency lighting, smoke extraction systems, alarms and exit signs.

The function integrity indicates the duration which the installation should continue to function in the event of a fire. This applies to the entire installation, cables, boxes, wire duct and fasteners.   Function integrity is designated by the letter E together with a number.   E 90 means that the installation will continue to function for 90 minutes without short-circuits and no voltage failure.

**Woertz Fire Safety also conforms to the following standards:**

Features of the cable system	Standards
Insulation integrity FE 180	IEC 60331-11/-21 (180 minutes)
Function integrity E30 to E90	DIN 4102 part 12

The Modular Solution

Woertz® flat cable systems comprise of the following modules:

- **Woertz® FE 180 Safety cable**
  - Ceramically insulated and have an insulation integrity of 180 minutes
  - The distance from core to core has been accurately calculated so **NO ADVERTENT CONTACT and NO SHORT-CIRCUIT** will occur between individual wires, even if the sheath is completely damaged by burning.
  - As wires in the flat cable run parallel, they will not cross or superimpose.
 - A **rodent repellent** has been incorporated into the cable sheath.
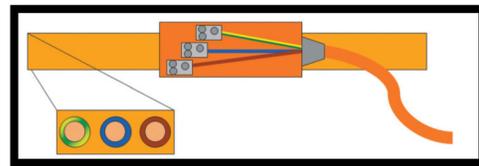
- **Woertz® branching and feeing box**
  - External casing meets IP66/68 protection rating standards (protected against powerful jets of water and continuous submersion in water.
  - The metal parts inside the box are separated by **ceramic insulation** and a metal frame maintains structural stability
  - The wires in the flat cable run parallel and facilitate easy access to the individual wires via junction boxes that can be placed anywhere using the Woertz piercing® method that does not require stripping.
  - The asymmetric profile of the cable ensures that the boxes can only be mounted in a specific position, so that all wires and connections are automatically placed correctly.
  - Woertz utilizes DOUBLE INSULATION PIERCING CLAMPING units. Two pointed screws and a metal bar firmly clamp and maintain each core.
  - **The contact will be maintained even if the insulation and other layers are damaged in a fire.**
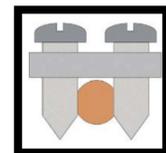
- **For addition protection, Wire duct and fasteners are available**
  - Cable duct s are made of glass fiber-reinforced polyester resin (halogen-free) and provided with fire-proof fabric tape. They are protected by a dust-proof cover.
  - Ducts should be installed with the fasteners provided by Woertz.
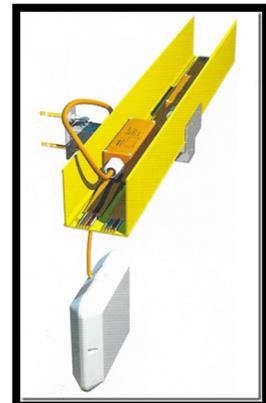
Woertz FE180 3G4 mm²

flat cable for E30 to E90 application

	halogen-free
	No.
	■ 48450OR

1L+N+PE

Technical data

Dimension	mm	24×7
Weight	g/m	330
Fire load	kWh/m	1.75
No. of leads x cross-section	mm²	3×4

High current part

Copper conductors		CU bare
Insulation of the leads		ceramic insulated live parts
Colour of the leads		brown, blue, yellow/green
Cross-section	mm²	4
Test voltage	kV / Hz	4 / 50
Rated voltage	kV	0.6/1
Properties of material		FRNC/LS0H
Additives in sheath		to keep away rodents
Insulation integrity		FE180
Function integrity		E90
DC-resistance	Ω/km	4.61
max. operating temperature (at conductor)		-15 °C to +90 °C
min. Installation temperature		+5 °C
Cu weight	kg/km	116

Connecting box	Technical data		
No.			
48453/01	with cable gland D 6.0-8.0	M20x1.5	
48453/02	with cable gland D 8.0-11.0		Contacts of copper allo
48453/03	with cable gland D 11.0-15.0		
			Plastic parts: halogen-free
			Metal parts: V4A
	LxWxH mm	137×50×49	
		(without cable gland)	
	Weight g	330	
	Test current A	24	
	Test voltage kV/Hz	4/50	
	Rated voltage V/Hz	690/50	
	Degree of protection	IP66/IP68	
		(2 m, 30 min.)	
	Function integrity	E90	
	Thread of cable gland	M20×1.5	
	Contacts	Woertz Piercing	
	Packing unit pce.	1	
	Protection on request		

Accessories

Flat cable box for E30 to E90 applications

Heat-shrinkable end cap	Technical data		
No. 48511/42	L×Ø mm	105×42	End cap with adhesive and sealant.
	Weight g	33.8	
	Packing unit pce.	5	Note: Cut cable ends cleanly and smoothly. Then mount the end pieces. No need to strip insulation.
			Cable end pieces can only be mounted once.
			Halogen-free

Clamp	Technical data		
No. 49370	Material	high quality steel V4A and ceramic	
	LxWxH mm	103.5x32x12.5	
	Mounting shaft mm	80	
	for E30 to E90 application		
	Packing unit pce.	10	

Shears		Technical data		
No. 49930	Eldas-Nr. 983 045 007	Weight g	223	For cutting neatly and easily every type of flat cables of max. width 32mm.
		Packing unit pce.	1	With sliding anvil. Teflon coated blades.

Cable glands		Technical data		
No.	Eldas-Nr.	Diameter of cables mm		of polyamide, grey
48560/02/M20		6.0-8.0		M20×1.5
48560/03/M20	121 682 607	8.0-11.0		
48560/05/M20	121 682 617	11.0-15.0		delivered with O-ring seal of NBR
		Packing unit pce	1	halogen-free

Retaining plate	Technical data		
No. 48254	Material	high quality steel V4A	
	LxW mm	80x105	
	mounting shaft mm	80	
	fastening hole mm	ø9.5	
	Packing unit pce.	10	

Woertz FE180 5G16 mm^2

flat cable for E30 to E90 applications

halogen-free

No.

■ 48950OR

3L+N+PE

Technical data

Dimension	mm	52×11
Weight	g/m	1436
Fire load	kWh/m	4.96
No. of leads x cross-section	mm^2	5×16

High current part

Copper conductors		CU bare
Insulation of the leads		ceramic insulated live parts
Colour of the leads		grey, black, brown, blue, yellow/green
Cross-section	mm^2	16
Test voltage	kV / Hz	4 / 50
Rated voltage	kV	0.6/1
Properties of material		FRNC/LS0H
Additives in sheath		to keep away rodents
Insulation integrity		FE180
Function integrity		E90
DC-resistance	Ω/km	1.15
max. operating temperature (at conductor)		-15 °C to +90 °C
min. Installation temperature		+5 °C
Cu weight	kg/km	768

Caution

The cable has to be cut with a belt saw.

Branching boxes	Technical data		
No.			
48353/01	with cable gland D 6.0-8.0	M20x1.5	
48353/02	with cable gland D 8.0-11.0		
48353/03	with cable gland D 11.0-15.0		Contacts of copper allo
48355/01	with cable gland D 12.5-16.0	M25x1.5	Plastic parts: halogen-free
48355/02	with cable gland D 16.0-20.5		Metal parts: V4A
	L×W×H mm	146×85×77	
		(without cable gland)	
	Weight g	820	
	Test current A	24	
	Test voltage kV/Hz	4/50	
	Rated voltage V/Hz	690/50	
	Degree of protection	IP66/IP68	
		(2 m, 30 min.)	
	Function integrity	E90	
	Contacts	Woertz Piercing	
	Packing unit pce.	1	
	Safety clip on request		

Accessories

Flat cable box for E30 to E90 applications

Heat-shrinkable cap	Technical data		
No. 48511/55	L×Ø mm	165×55	End cap with adhesive and sealant
	Weight g	76.6	
	Packing unit pce.	5	Note: Cut cable ends cleanly and smoothly. Then mount the end pieces. No need to strip insulation.
			Cable end pieces can only be mounted once.
			Halogen-free

Clamp	Technical data		
No. 49379	Material	high quality steel V4A and ceramic	
	LxWxH mm	139.5x32x18	
	Mounting shaft mm	116	
	for E30 to E90 application		
	Packing unit pce.	10	

Cable glands	Technical data		
No. 48560/02/M20 48560/03/M20 48560/05/M20	Diameter of cables mm 6.0-8.0 8.0-11.0 11.0-15.0		of polyamide, grey M20×1.5
	12.5-16.0 16.0-20.5		delivered with O-ring seal of NBR
48560/03/M25 48560/05/M25			halogen-free
	Packing unit pce.	1	

| Retaining plate	Technical data		
No. 48954	Material	high quality steel V4A	
	LxB mm	110x141	
	mounting shaft	116	
	Fastening hole mm	ø9.5	
	Packing unit pce	10	

Mounting procedure of connecting box No. 48253/L/68/E90

(may be used for both feeding and branching)
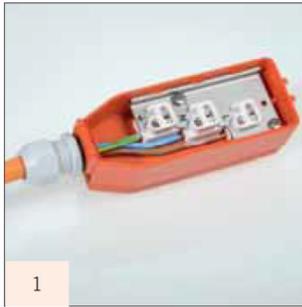
1 Remove the cover plate of the box. The cable gland has to be prepared and mounted on the branching cable (round cable). Cut the latter to the desired length and dismantle it. Introduce the stripped leads.
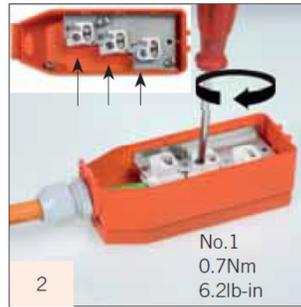
2   No.1 0.7Nm 6.2lb-in

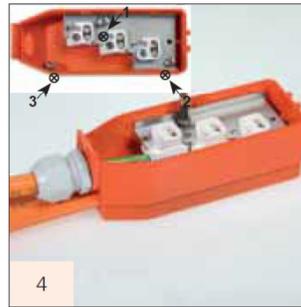Tighten up the 3 screws. Once the O-ring positions correctly in the cable gland, tighten up the latter.

3 Position the flat cable in the right position. The lug in the base acts as a reference point. It has to match the lug of the flat cable. In case of incorrect mounting the box cannot be fitted with normal force. The cable must be cleaned, gel and oil must be removed.

4 Snap together the upper part and the base. Tighten up the 3 fastening screws of the base.
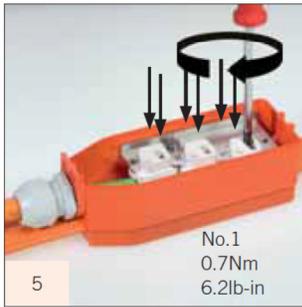
5   No.1 0.7Nm 6.2lb-in

Tighten up the 6 piercing screws (Twin-Piercing) in order to establish contact with the flat cable cores.
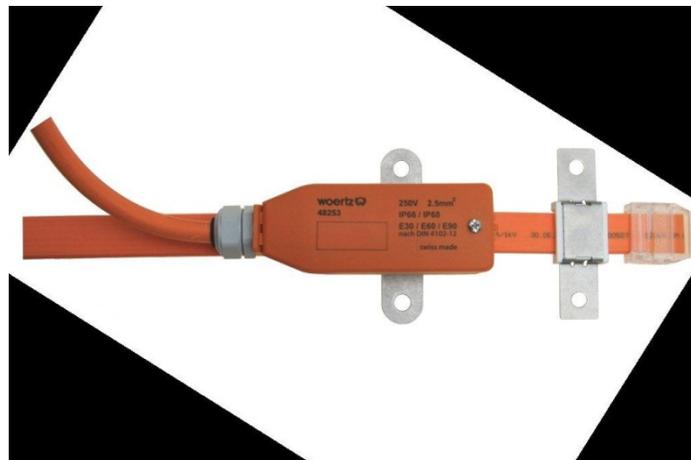

6 Replace the cover plate carefully and tighten up the screws. The box may be marked if necessary.
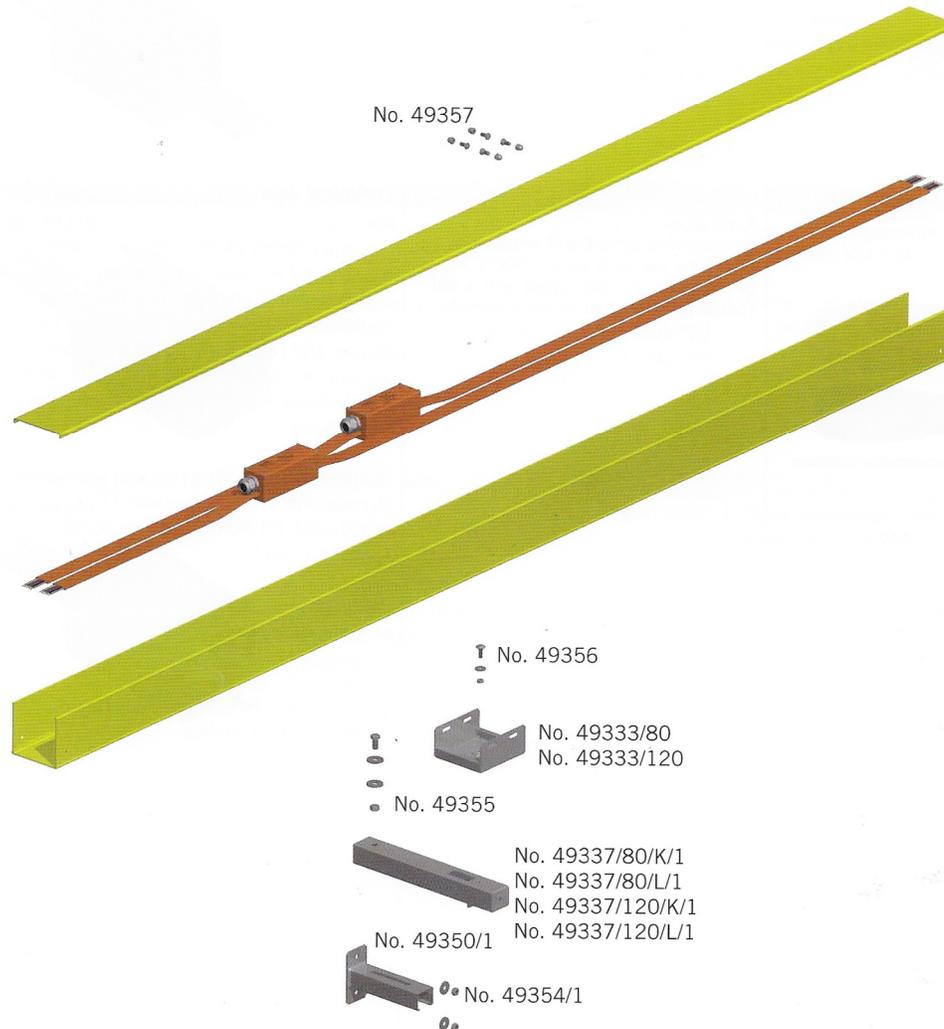
Cable duct system Woertz E30 to E90

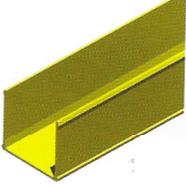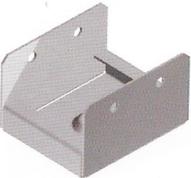Duct system 80×80 for E30 to E90 applications

Assembling with one duct

No. 49357

No. 49356

No. 49333/80
No. 49333/120

No. 49355

No. 49337/80/K/1
No. 49337/80/L/1
No. 49337/120/K/1
No. 49337/120/L/1

No. 49350/1

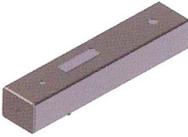No. 49354/1

Technical data

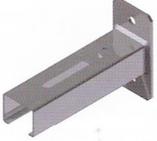|		
Marking		Woertz duct E30 - E90, date of manufacture, series number, meter marks
Function integrity (system)		E90 according to DIN 4102 part 12
NC = no corrosive fire effluent		similar to IEC 60754-2
LS = low smoke generation		similar to IEC 61034-2
OH = halogen-free		similar to IEC 60754-1
Low fire propagation		similar to IEC 60332-3-24
Function integrity		according to DIN 4102 part 12
Laying of cables		cable trays (mounted on brackets V4A) of glass fibre-reinforced plastics
Distance between brackets	mm	1000
Sales unit		running meter
Delivery unit		L=3000 mm

Cable duct system Woertz E30 to E90

Accessories to duct system 80×80 and 120×120

Profile	80×80	120×120	Technical data
No.	**49331/80**	**49331/120**	Material: glasfaserverstärktes Polyesterharz
	W×H int. dim. mm 80×80	W×H int. dim. mm 120×120	Further dimensions on request
	W×H ext. dim mm 90×83	W×H ext. dim mm 130×123	
	Length of profile mm 3000	Length of profile mm 3000	
	Poids on request	Poids on request	

Duct cover	80×80	120×120	Technical data
No.	**49332/80**	**49332/120**	Material: glasfaserverstärktes Polyesterharz
	W×H ext. dim mm 96×13	W×H ext. dim mm 126×13	
	Length of profile mm 3000	Length of profile mm 3000	
	Poids on request	Poids on request	

Guidance	80×80	120×120	Technical data
No.	**49333/80**	**49333/120**	to realize grades, brackets, angles etc. - on request
	Material V4A - 1.4571	Material V4A - 1.4571	
	Poids on request	Poids on request	

Extension	80×80	120×120	Technical data
No.	**49337/80/K/1**	**49337/120/K/1**	Range of adjustment
	Range adjust. mm 150-200	Range adjust. mm 150-200	Centre axis of duct front face/ mounting plate
	Material V4A - 1.4571	Material V4A - 1.4571	
	Poids on request	Poids on request	
No.	**49337/80/L/1**	**49337/120/L/1**	further versions on request
	Range adjust. mm 150-200	Range adjust. mm 150-200	
	Material V4A - 1.4571	Material V4A - 1.4571	
	Poids on request	Poids on request	

Extension	80×80	120×120	Technical data
No.	**49337/80/K/2**	**49337/120/K/2**	Range of adjustment
	Range adjust. mm 150-200	Range adjust. mm 150-200	Centre axis of duct front face/ mounting plate
	Material V4A - 1.4571	Material V4A - 1.4571	
	Poids on request	Poids on request	
No.	**49337/80/L/2**	**49337/120/L/2**	further versions on request
	Range adjust. mm 150-200	Range adjust. mm 150-200	
	Material V4A - 1.4571	Material V4A - 1.4571	
	Poids on request	Poids on request	

Cable duct system Woertz E30 to E90

Accessories to duct systems 80×80 and 120×120

Bracket	Technical data	
No. **49350/1**	Dimensions mm	200x125x65
	Material	V4A - 1.4571
	Range of adjustment mm	100
	further versions on request	

Fastening accessories	Technical data	
No. **49354/1** **fastening of bracket to wall anchor panel**	Material	V4A
	Fastening material for bracket No. 49350/1 further versions on request	

Fastening accessories	Technical data	
No. **49355** **fastening of extension to bracket**	Material	V4A

Fastening accessories	Technical data	
No. **49356** **fastening of guidance to extension**	Material	V4A

Fastening accessories	Technical data	
No. **49357** **fastening of profile to guidance**	Material	V4A
	Designed for all types of ducts	

Building Installation Picture:

For London underground the requirement for circuit integrity was EN50200 and BS8434-2 but not DIN4102.

For EN50200 we attained PH120 this test is a cable test.

An also BS8434-2 (930°C 60min (Fire +each 5min shock) + 60min (Fire +each 5min shock+ **water**) this test is a cable test

Junction box and the fuse module in the fire test BS8434-2

woertz ⓦ

Immobilien und Dienstleistungs AG
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4132 Muttenz 1   Fax +41 61 461 96 06

CE   **CE Declaration of Conformity**

We, Woertz AG, a company registered according to ISO 9001 and ISO 14001, declare under our sole responsibility that the products mentioned hereafter meet all of the following requirements:

Flat cable Woertz FE180 3G2.5mm² orange	48250OR
Flat cable Woertz FE180 5G2.5mm² orange	48350OR
Flat cable Woertz FE180 3G4mm² orange	48450OR
Flat cable Woertz FE180 5G4mm² orange	48650OR
Flat cable WOERTZ FE180 5G16mm² orange	48950OR

EU- Directives   **2014/35/EU**

Publications/
Standards

EN 50214 : Construction
IEC 60228 & EN 60228 : Conductor
VDE 0266 : Insulation
VDE 0266 : Sheath

IEC 60332-1/2 & EN 60332-1/2 : Flame retardant
IEC 60754-1 & EN 50 267-2-1 : Halogen free
IEC 60754-2 & EN 50 267-2-2 : No corrosives gases
IEC 61034-2 & EN 61 034-2 : Minimum smoke emission
IEC 60332-3-24 & EN 60 332-3-24 : Reduced fire propagation
IEC 60331-21 ,FE180 : Insulation integrity 180 min
DIN 4102 part12 ,E30/E90* : Function integrity of complete electric cable system 30 min
* Only if the complete certified Woertz System is used with the mounting materials and installation guidelines are met.

(Place and Date of issue)
Muttenz, 05.01.2016

(name and signature of authorized person)
Product Development   **Quality Management**

Dreier Andreas   Misslin Roland