

# fTool<sup>®</sup> INTERNATIONAL



Electrode material



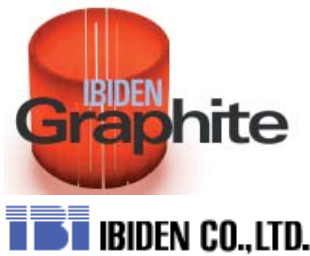
New forms with  
F-Tool blocks and  
blanks



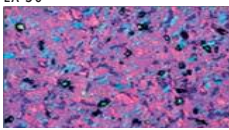
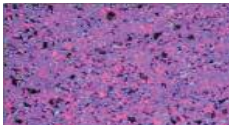
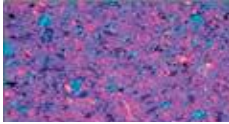
Ready to run

**New forms with blocks and blanks**

IBIDEN, specialised in electronics and ceramics, produces since 1976 high-class, isostatic manufactured EDM graphite. In the sinking EDM business, the graphite is a more and more deciding factor for quality and performance. F-Tool delivers you prepared blocks and blanks ready to run.



**Selected isotropic graphite for EDM**

	Max. block size L x W x H mm	Bulk density g/cm <sup>3</sup>	Flexural / strength Mpa	Hardness Shore	Average grain µm	Electrical resistivity µΩ cm	Surface roughness VDI
EX 50 	Colour code EX 50 1'000 x 600 x 300	1.75	63.7	55	13	1'250	28
EX 60 	Colour code EX 60 1'020 x 610 x 305	1.80	80.0	62	10	1'300	24
EX 70 	Colour code EX 70 1'000 x 440 x 235	1.85	68.6	70	6	1'500	18

→ Values are typical values

**Handling advices**

Graphite is suited excellent for the modern high speed milling process. With the new IBIDEN graphite, filigree geometry and high surface finish can be achieved. The handling times shorten articulately compared to copper, and the edges don't have to be deburred in laborious handwork no more.

The following recommendations demonstrate rough directives for the cutting performance and have to be adapted for the respective conditions.

Milling	Cutting speed (m/min)	Feed (mm/tooth)	Cutting material
Roughing	800 ~ 1'000	0.1 ~ 0.8	Carbide, PKD, coated HM
Finishing	1'000	< 0.08	

Turning	Cutting speed (m/min)	Feed (mm/rotation)	Rate of cut (mm)	Cutting material
Roughing	800 ~ 1'000	0.1 ~ 0.8		Carbide, PKD, coated HM
Finishing	1'000	< 0.08	0.1 ~ 0.5	

Grinding	Cutting speed (m/min)	Feed (mm/min)	Rate of cut (mm)	Cutting material
	1'000 ~ 2'300	150 ~ 800	< 3	SiC, corundum, diamond

Bandsaw	Cutting speed (m/min)	Feed (mm/min)	Cutting material
	400 ~ 1'000	200 ~ 400	HSS, HM, diamond

**Job safety**

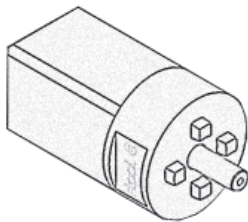
Isostatic manufactured graphite consists of 99.96 % chemically purely carbon, is not toxic and is physiological harmless. However, while handling, the allowable MAK values are to be noticed and a vacuum cleaning while handling is to be recommended.



**F-Tool graphite square blank**

Form	Dimension (mm)			Quantity	Weight	Code	Quality		
	x	y	z				EX 60	EX 70	
	15	15	60	Set of 36 pieces	0.89 kg	G	Article no.	FT 01241	FT 01277
	15	15	250	Set of 2 pieces	0.21 kg	G	Article no.	FT 01242	FT 01278
	25	25	60	Set of 36 pieces	2.46 kg	G	Article no.	FT 01243	FT 01279
	25	25	250	Set of 2 pieces	0.57 kg	G	Article no.	FT 01244	FT 01280
	30	30	60	Set of 36 pieces	3.54 kg	G	Article no.	FT 01245	FT 01281
	30	30	250	Set of 2 pieces	0.82 kg	G	Article no.	FT 01246	FT 01282

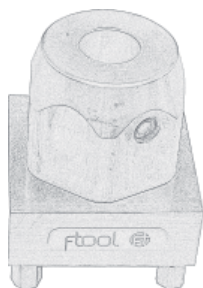
→ Other sizes or other qualities on request



**F-Tool graphite square block CIF (cross interface)**

Form	Dimension (mm)			Quantity	Weight	Code	Quality		
	x	y	z				EX 60	EX 70	
	35	35	35	Set of 10 pieces	0.78 kg	G	Article no.	FT 01247	FT 01283
	35	35	50	Set of 10 pieces	1.11 kg	G	Article no.	FT 01248	FT 01284
	35	80	35	Set of 10 pieces	1.78 kg	G	Article no.	FT 01249	FT 01285
	50	50	35	Set of 10 pieces	1.59 kg	G	Article no.	FT 01250	FT 01286
	50	50	50	Set of 10 pieces	2.28 kg	G	Article no.	FT 01251	FT 01287

→ Other sizes or other qualities on request

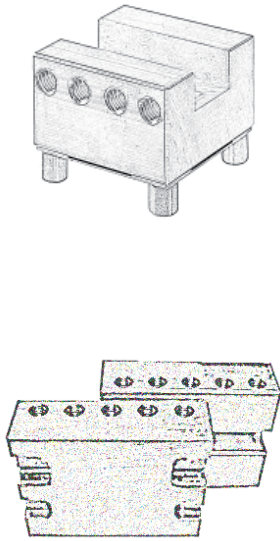


**F-Tool graphite cylindrical bar**

Form	Dimension (mm)			Quantity	Weight	Code	Quality		
	x		z				EX 60	EX 70	
	20		60	Set of 10 pieces	0.34 kg	G	Article no.	FT 01252	FT 01288
	20		315	1 piece	0.18 kg	G	Article no.	FT 01253	FT 01289
	30		60	Set of 10 pieces	0.77 kg	G	Article no.	FT 01254	FT 01290
	30		315	1 piece	0.40 kg	G	Article no.	FT 01255	FT 01291

→ Other sizes or other qualities on request

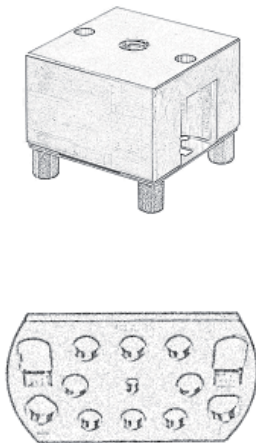
**F-Tool graphite rip**



Form	Dimension (mm)			Quantity	Weight	Code	Quality		
	x	y	z				EX 60	EX 70	
	12	100	60	Set of 10 pieces	1.31 kg	G	Article no.	FT 01256	FT 01292
	12	300	60	1 piece	0.39 kg	G	Article no.	FT 01257	FT 01293
	20	100	60	Set of 10 pieces	2.19 kg	G	Article no.	FT 01258	FT 01294
	20	300	60	1 piece	0.65 kg	G	Article no.	FT 01259	FT 01295
	25	100	60	Set of 10 pieces	2.73 kg	G	Article no.	FT 01260	FT 01296
	25	300	60	1 piece	0.82 kg	G	Article no.	FT 01261	FT 01297
	32	100	60	Set of 10 pieces	3.50 kg	G	Article no.	FT 01262	FT 01298
	32	300	60	1 piece	1.05 kg	G	Article no.	FT 01263	FT 01299

→ Other sizes or other qualities on request

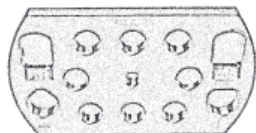
**F-Tool graphite block 2 x M6 a = 40 mm**



Form	Dimension (mm)			Quantity	Weight	Code	Quality		
	x	y	z				EX 60	EX 70	
	60	60	60	Set of 10 pieces	3.94 kg	G	Article no.	FT 01264	FT 01300
	80	80	60	Set of 10 pieces	7.00 kg	G	Article no.	FT 01265	FT 01301
	80	120	60	1 piece	1.05 kg	G	Article no.	FT 01266	FT 01302
	100	100	60	1 piece	1.09 kg	G	Article no.	FT 01267	FT 01303
	100	100	100	1 piece	1.82 kg	G	Article no.	FT 01268	FT 01304

→ Other sizes or other qualities on request

**F-Tool graphite block 4 x M8 a = 31 mm**



Form	Dimension (mm)			Quantity	Weight	Code	Quality		
	x	y	z				EX 60	EX 70	
	100	100	50	1 piece	0.91 kg	G	Article no.	FT 01269	FT 01305
	100	150	80	1 piece	2.19 kg	G	Article no.	FT 01270	FT 01306
	100	200	80	1 piece	2.92 kg	G	Article no.	FT 01271	FT 01307

→ Other sizes or other qualities on request

**F-Tool graphite free block**

Form	Dimension (mm)			Quantity	Weight	Code	Quality			
	x	y	z				EX 60	EX 70		
	300	100	80	1 piece	4.38 kg	G	Article no.	FT 01272	FT 01308	
	300	120	80	1 piece	5.25 kg	G	Article no.	FT 01273	FT 01309	
	300	150	100	1 piece	8.21 kg	G	Article no.	FT 01274	FT 01310	
	300	200	100	1 piece	10.95 kg	G	Article no.	FT 01275	FT 01311	
	Other sizes on request			Price per dm <sup>3</sup>	1.82 kg	G	Article no.	FT 01276	FT 01312	

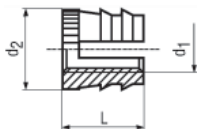
**F-Tool graphite full block**

Form	Dimension (mm)			Quality	Weight	Article no.	Code	
	x	y	z					
	1'000	600	300	EX 50	315.00 kg	FT 01238	G	
	1'020	610	305	EX 60	341.58 kg	FT 01239	G	
	1'000	440	235	EX 70	191.29 kg	FT 01240	G	



**Full customised graphite shapes**

We are also welcome to make for you system-oriented electrodes in the conformable electrode holder according to your drawing. The costs will be charged on effort. Or demand us for an offer.

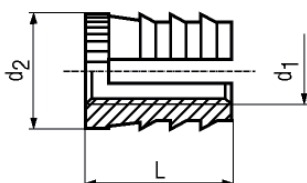


**Press-on threaded inserts brass BN1050 M6 Ø 8.4**

For the use on graphite blanks.

Article no.	Article	Quantity	Weight	Code	
FT 01442	Press-on threaded inserts Messing BN1050 M6 Ø 8.4	Set of 20 pieces	0.04 kg	B	

d1	M6
d2~	8.66
L	9.5
Hole size	8.4



**Press-on threaded inserts brass BN1051 M6 Ø 10.4**

For the use on graphite blanks.

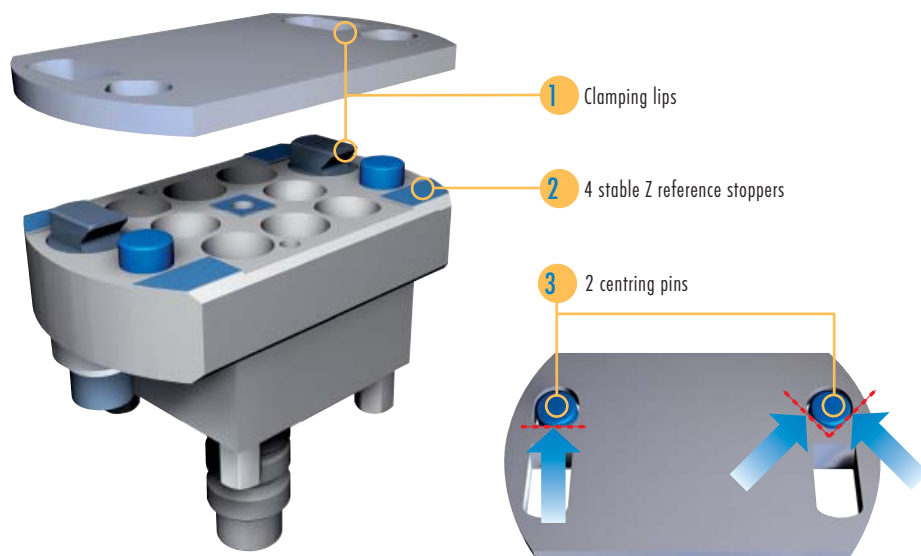
Article no.	Article	Quantity	Weight	Code	
FT 01443	Press-on threaded inserts brass BN1051 M6 Ø 10.4	Set of 20 pieces	0.11 kg	B	

d1	M6
d2~	10.67
L	14.3
Hole size	10.4

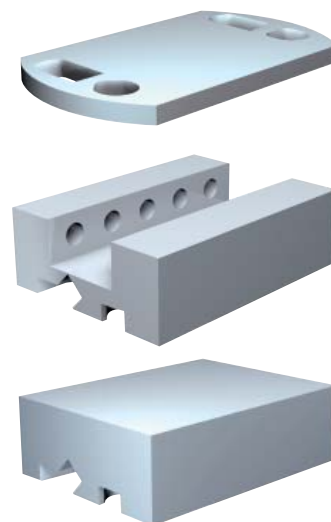
## RefTool holder

The RefTool holder brings completely new possibilities to clamp electrodes fast and economic.

### 1. The function



### 2. Economic electrode holders



### 3. The application

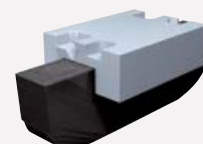
#### 3.1. RefTool graphite adapter

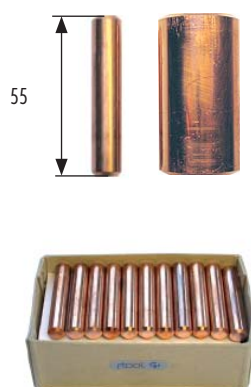
- Screw the RefTool graphite adapter on the graphite blank
- Cut and use the electrode in the system
- Store the electrodes together with the economic graphite adapter



#### 3.2. RefTool graphite clamp

- Clamp the graphite blank into the clamp
- Cut and use the electrode in the system
- Store the electrodes with the economic graphite clamp

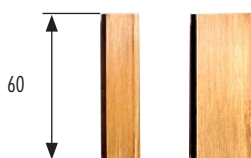




### Electrode copper for the F-Tool holders

In no time at all ready for application.

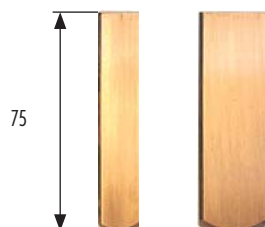
Article no.	Article	Quantity	Weight	Code
FT 01149	El.-copper Ø 10 x 55 mm	Set of 10 pieces	0.44 kg	E
FT 01150	El.-copper Ø 10 x 55 mm	Set of 48 pieces	1.90 kg	E
FT 01151	El.-copper Ø 12 x 55 mm	Set of 10 pieces	0.60 kg	E
FT 01152	El.-copper Ø 12 x 55 mm	Set of 48 pieces	2.70 kg	E
FT 01153	El.-copper Ø 16 x 55 mm	Set of 10 pieces	1.05 kg	E
FT 01154	El.-copper Ø 16 x 55 mm	Set of 48 pieces	4.80 kg	E
FT 01155	El.-copper Ø 20 x 55 mm	Set of 10 pieces	1.60 kg	E
FT 01156	El.-copper Ø 20 x 55 mm	Set of 24 pieces	3.80 kg	E
FT 01157	El.-copper Ø 26 x 55 mm	Set of 10 pieces	2.70 kg	E
FT 01158	El.-copper Ø 26 x 55 mm	Set of 24 pieces	6.35 kg	E
FT 01159	El.-copper Ø 30 x 55 mm	Set of 10 pieces	3.60 kg	E
FT 01160	El.-copper Ø 30 x 55 mm	Set of 24 pieces	8.45 kg	E



### Electrode copper for square clamp

Incl. milled phase 45° for the safe, direction-oriented application.

Article no.	Article	Quantity	Weight	Code
FT 01331	El.-copper 10 x 10 x 50 mm	Set of 10 pieces	0.45 kg	E
FT 01332	El.-copper 10 x 10 x 50 mm	Set of 48 pieces	2.14 kg	E
FT 01161	El.-copper 15 x 15 x 60 mm	Set of 10 pieces	1.22 kg	E
FT 01162	El.-copper 15 x 15 x 60 mm	Set of 48 pieces	5.73 kg	E
FT 01163	El.-copper 25 x 25 x 60 mm	Set of 10 pieces	3.39 kg	E
FT 01164	El.-copper 25 x 25 x 60 mm	Set of 24 pieces	8.09 kg	E
FT 01165	El.-copper 30 x 30 x 60 mm	Set of 10 pieces	4.89 kg	E
FT 01166	El.-copper 30 x 30 x 60 mm	Set of 24 pieces	11.61 kg	E



### Electrode copper for square clamp

Incl. milled phase 45° for the safe, direction-oriented, and with lapped stop-surface for the accurate application.

Article no.	Article	Quantity	Weight	Code
FT 01094	Square blank 15 L = 75 mm	Set of 40 pieces	6.00 kg	E
FT 01095	Square blank 25 L = 75 mm	Set of 24 pieces	10.59 kg	E

EDM tubes for hole drilling.

Most single hole tubes (SH) and multiple hole tubes (MH) can be delivered ex stock.



### Single hole (SH)

Article no.	Article	Quantity	Weight	Code
FT 01313	Copper tubes SH Ø 0.1 x L200	Set of 20 pieces	0.01 kg	T
FT 01314	Copper tubes SH Ø 0.13 x L200	Set of 25 pieces	0.01 kg	T
FT 01315	Copper tubes SH Ø 0.15 x L200	Set of 25 pieces	0.02 kg	T
FT 01214	Copper tubes SH Ø 0.2 x L200	Set of 20 pieces	0.01 kg	T
FT 01215	Copper tubes SH Ø 0.3 x L300	Set of 20 pieces	0.01 kg	T
FT 01216	Copper tubes SH Ø 0.4 x L300	Set of 20 pieces	0.01 kg	T
FT 01217	Copper tubes SH Ø 0.5 x L300	Set of 20 pieces	0.01 kg	T
FT 01218	Copper tubes SH Ø 0.6 x L300	Set of 20 pieces	0.02 kg	T
FT 01219	Copper tubes SH Ø 0.7 x L300	Set of 20 pieces	0.02 kg	T
FT 01220	Copper tubes SH Ø 0.8 x L300	Set of 20 pieces	0.03 kg	T

→ Other diameters or lengths on request.



### Multi hole (MH)

Article no.	Article	Quantity	Weight	Code
FT 01188	Copper tubes MH Ø 0.5 x L300	Set of 20 pieces	0.01 kg	T
FT 01189	Copper tubes MH Ø 0.6 x L300	Set of 20 pieces	0.02 kg	T
FT 01190	Copper tubes MH Ø 0.7 x L300	Set of 20 pieces	0.02 kg	T
FT 01191	Copper tubes MH Ø 0.8 x L300	Set of 20 pieces	0.03 kg	T
FT 01192	Copper tubes MH Ø 0.9 x L300	Set of 20 pieces	0.04 kg	T
FT 01193	Copper tubes MH Ø 1.0 x L300	Set of 20 pieces	0.04 kg	T
FT 01194	Copper tubes MH Ø 1.1 x L300	Set of 20 pieces	0.05 kg	T
FT 01195	Copper tubes MH Ø 1.2 x L300	Set of 20 pieces	0.06 kg	T
FT 01196	Copper tubes MH Ø 1.3 x L300	Set of 20 pieces	0.07 kg	T
FT 01197	Copper tubes MH Ø 1.4 x L300	Set of 20 pieces	0.08 kg	T
FT 01198	Copper tubes MH Ø 1.5 x L300	Set of 20 pieces	0.09 kg	T
FT 01199	Copper tubes MH Ø 1.6 x L300	Set of 20 pieces	0.09 kg	T
FT 01200	Copper tubes MH Ø 1.7 x L300	Set of 20 pieces	0.12 kg	T
FT 01201	Copper tubes MH Ø 1.8 x L300	Set of 20 pieces	0.15 kg	T
FT 01202	Copper tubes MH Ø 1.9 x L300	Set of 20 pieces	0.15 kg	T
FT 01203	Copper tubes MH Ø 2.0 x L300	Set of 20 pieces	0.15 kg	T
FT 01204	Copper tubes MH Ø 2.1 x L300	Set of 20 pieces	0.17 kg	T
FT 01205	Copper tubes MH Ø 2.2 x L300	Set of 20 pieces	0.19 kg	T
FT 01206	Copper tubes MH Ø 2.3 x L300	Set of 20 pieces	0.21 kg	T
FT 01207	Copper tubes MH Ø 2.4 x L300	Set of 20 pieces	0.22 kg	T
FT 01208	Copper tubes MH Ø 2.5 x L300	Set of 20 pieces	0.23 kg	T
FT 01209	Copper tubes MH Ø 2.6 x L300	Set of 20 pieces	0.26 kg	T
FT 01210	Copper tubes MH Ø 2.7 x L300	Set of 20 pieces	0.27 kg	T
FT 01211	Copper tubes MH Ø 2.8 x L300	Set of 20 pieces	0.29 kg	T
FT 01212	Copper tubes MH Ø 2.9 x L300	Set of 20 pieces	0.31 kg	T
FT 01213	Copper tubes MH Ø 3.0 x L300	Set of 20 pieces	0.33 kg	T

→ Other diameters or lengths on request.



### Terms and conditions of delivery

Conditions

- net, ex-works Schöffland according to Incoterms 2000
- exclusive customs duty, VAT or miscellaneous taxes
- exclusive forwarding, freight and insurance charges

Prices

recommended retail price in CHF (Swiss Francs)  
The price list can change anytime.  
The valid prices can be enquired or will be confirmed in writing after receipt of the order.

Minimum charge for goods is CHF 50.00

Payment

30 days net  
or by arrangement

Technical modifications

Subject to technical modifications.  
The published pictures or constructions can differ from the technical documentation.

Code

meant for resale only

Otherwise according to the general terms and conditions of delivery

See for yourself. To meet your practical circumstances you are only one «click» away from us. Visit our homepage at [www.f-tool.com](http://www.f-tool.com)

## 1. General

1.1 The purchase contract will be concluded by a written order and the written order confirmation from the supplier. Offers which do not include a deadline for acceptance will not be binding.

## 2. Scope of the goods and services

2.1 The supplier's goods and services will be listed in the order confirmation. The supplier will anytime be entitled to modify products in order to improve them.

## 3. Plans, photographs and technical documents

3.1 In the absence of any agreement to the contrary, brochures and catalogues will not be binding. Details in technical documents will only be binding if they are expressly guaranteed. Some products are procured from selected first-class sub-suppliers. Published pictures or versions may differ from the sales documents.

## 4. Regulations in the destination country and safeguards

4.1 The purchaser must inform the supplier of the regulations and standards of the country of destination relating to the provision of goods and services, the business and health and safety at work, at the latest when placing the order.

4.2 In the absence of any agreement to the contrary, the goods and services will comply with regulations and standards at the registered office of the purchaser, of which the purchaser has informed the supplier in accordance with no. 4.1. Additional or other safeguards will also be provided insofar as this has been agreed.

## 5. Prices

5.1 The price list valid on the date of the order will determine the prices. In the absence of any agreement to the contrary, all prices will be net, ex works, and exclusive of carriage, customs clearance, packaging and VAT and in Swiss Francs or euros, net of any deduction (EXW).  
The purchaser will be responsible for all incidental costs, e.g. for freight, insurance, export, transit, import and other licenses and certification. The purchaser will also be responsible for all taxes, charges, fees, duty, etc. of any nature whatsoever which may be raised in connection with the contract or refund them to the supplier on production of corresponding evidence, if the latter has become liable for payment thereof.

5.2 The supplier reserves the right to amend the prices, should there be a change in rates of pay, prices of materials or suppliers' prices between the date of the order and performance in accordance with the contract.

## 6. Payment terms

6.1 In the absence of any express agreement, prepayment will be due upon readiness to delivery.

6.2 Otherwise, the payment deadline for contracting partners will be 30 days net from the date of the invoice, in the absence of any agreement to the contrary. In the event of arrears of payment, the purchaser must anticipate 8% interest on arrears from the date on which payment is due. The right to claim further compensation remains reserved.

## 7. Reservation of title

7.1 The supplier will retain title to all its goods until it has received full payments in accordance with the contract. The purchaser authorises with the signing of the order and so the acceptance of these General Terms and Conditions of Delivery the supplier, if necessary with the regulations of the country of destination, to register such a retention of title in the appropriate register.

## 8. Delivery date / delivery conditions

8.1 The supplier will endeavour to deliver the standard products from stock on a specific date. The purchaser must refer to the order confirmation for deliveries with delivery dates.

8.2 The EXW delivery terms must be interpreted in accordance with the current applicable Incoterms (currently Incoterms 2000).

8.3 The purchaser will have no rights or claims to remuneration as a result of goods or services being late. However, it reserves the right to cancel the contract.

8.4 The minimum charge for goods or services is CHF 50.00.

## 9. Packaging

9.1 The supplier will issue a separate invoice for packaging.

## 10. Inspection and acceptance of goods and services

10.1 Insofar as is standard practice, the supplier will inspect the goods and services prior to despatch and guarantees that they are complete and of good quality.

10.2 The purchaser must inspect the goods and services within a reasonable period and notify the supplier of any detected defects in writing without delay. Should it fail to do so, the goods and services will be deemed to have been accepted.

10.3 The purchaser has a 30-day return, exchange or money-back guarantee for standard list products. This concerns all standard list products which are purchased regularly, not customized, not used or modified and in their complete, original packaging.  
The purchaser will be responsible for the return freight costs.

## 11. Guarantee, liability for defects

11.1 The *guarantee period* is 30 days, as stated in no. 10.3, in the absence of any stipulation to the contrary in the delivery documents or in legislation. The period starts at the date of delivery, respective with the writing of the delivery note.

11.2 *Liability for material defects, design flaws or shortcomings in implementation*  
The supplier undertakes to repair or replace any parts of its goods which verifiably become defective or unusable as a result of material defects, design flaws or shortcomings in completion up to the end of the guarantee period, as soon as possible on written demand by the purchaser. Characteristics are only warranted, if they are mentioned expressly in the order confirmation or in the specifications. The confirmation counts until the expiration of the guarantee period. Are the warranted characteristics not, or only partially fulfilled, the purchaser has the right of immediate amendment of the supplier. For this, the purchaser has to afford the supplier the needed time and opportunity.

11.3 *Exclusions of liability for defects*  
Damage will be excluded from the supplier's guarantee if it is not verifiably a consequence of poor material, design flaws or shortcomings in completion, e.g. a result of wear and tear, poor maintenance, failure to observe operating instructions, overloading, inappropriate operating resources, chemical or electrolytic effects, structural or installation work not carried out by the supplier, and other reasons for which the supplier is not responsible.

11.4 *Sub-suppliers' goods and services*  
The supplier will only guarantee goods and services of sub-suppliers within the scope of the guarantee obligations of the sub-suppliers in question.

## 12. Exchange procedure

12.1 Should the goods supplied not comply with the guarantee undertaking of the supplier / manufacturer / sub-supplier, or should the delivery be incomplete, the following steps must be taken:  
- The supplier must be contacted and claims asserted in writing under guarantee for defects or missing or wrongly delivered parts.  
- Should a consignment be returned for any reason whatsoever, an **RMA number (Returned Merchandise Authorization)** with the requisite fault reports and shipping instructions must be requested from the supplier.  
Packages without a RMA number will not be accepted.  
- All returns will undergo a strict incoming goods inspection. Returned goods must be complete, in the original packaging and be accompanied by the appropriate documents, fault reports, guarantee cards and accessories.

12.2 The purchaser will be responsible for the return freight costs.

12.3 15% of the list price plus repair costs will be charged for outlay for returns which are incomplete or are not defective.

12.4 Replacement parts will be charged as standard and the returns credited with a 'Credit Note' after inspection.

## 13. Preclusion of further liability by the supplier

13.1 All cases of breach of contract and their legal consequences, and all claims by the customer, irrespective of the legal basis on which they are asserted, are covered conclusively by these terms and conditions. In particular, all claims for compensation, a reduction and cancellation of the contract which are not expressly stipulated are excluded. Under no circumstances will claims for compensation by the customer be valid for damage which does not occur to the delivered item itself, such as loss of production, use, orders, profit or other direct or indirect losses. Preclusion of liability will not apply to unlawful intent or gross negligence of the supplier, but will also apply to unlawful intent or gross negligence of ancillary persons. In other respects, this preclusion of liability will not apply if it is contrary to legislation.

## 14. Court of jurisdiction and applicable law

14.1 **The court of jurisdiction for the customer and the supplier will be the registered office of the supplier.**  
However, the supplier will be entitled to take legal action against the customer at its registered office.

14.2 The legal relationship will be governed by substantive Swiss law.