

General Manufacturing and Action Guidelines for Suppliers

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1. Scope

These Manufacturing and Action Guidelines are part of the purchase order and apply to all deliveries and services provided by suppliers for orders of TRIOPTICS GmbH.

2. Offers and Offer Documents

Offers are always free of charge for TRIOPTICS, unless otherwise agreed in writing. Your binding offers shall include clear and detailed specifications and/or description of the scope of services and further comprehensive commercial information as proof of product compliance. Moreover, compliance with the applicable export control regulations must be ensured

2.1. Offer Documents - Product Compliance

As a supplier of technical components and systems, you confirm in your offer that the products are manufactured according to the state of the art and in compliance with all applicable laws and regulations as well as relevant directives and restrictions.

In particular, proof of conformity and the handling of hazardous substances must be provided (e.g. RoHS, REACH, safety data sheets).

2.2. Offer Documents - Export Control Law

In your offer, please provide us with the statistical goods tariff (HS code) and the country of origin for customs classification.

For export control classification, please inform us in detail of all relevant data (e.g. export or control list no., EAR99, ECCN no.) in all cases in which the products fall under export control regulations of DE / the EU and the USA.

We are happy to provide you with our forms for this purpose. You can request these via the following e-mail address ek-import@trioptics.com

3. Specifications

Our purchase orders include the latest drawings, specifications and any other order documents that may apply. Please follow the instructions on required measurement reports, certificates and other confirmations and documentation.

In order to provide comprehensive specifications for structural components, TRIOPTICS provides PDF-format, 2D drawings in compliance with applicable standards, as well as, upon request, files in STEP and DXF format and assembly overviews as an EDRAWING or 3D PDF.

The PDF-format 2D drawings are the reference document and defining basis for all structural components.

They may include requirements that go beyond mere geometry.

The drawings describe the required delivery condition and do not replace work schedules or intermediate stages in the manufacturing process that must be described.

Devices or assembly groups are defined by a bill of material. When an order is placed the currently valid bill of material will be attached to it and will replace previous versions if necessary. **Where manufacturer data are prescribed, these are binding.** Alternative solutions can be used in coordination with TRIOPTICS when they comply with the technical specification. A written notification of change is mandatory and must be sent to the purchaser, who is responsible for internal clarification and will inform the contractor about the approval.

4. Design Services

Designs for TRIOPTICS shall be created exclusively with the following programs

- SOLIDWORKS
- Creo Elements/Direct Modeling
- EPLAN Electric P8 2.9

The design shall be carried out in accordance with TRIOPTICS' "Design Guidelines for External Service Providers". These can be requested through the Supplier Portal or your contact person in Purchasing.

Documentation and data exchange are carried out via an FTP server. This is set up by TRIOPTICS and the access data is provided to the contractor.

5. Product Modifications / Product Discontinuation

5.1. Product Modifications

TRIOPTICS must be notified immediately in writing of product modifications on the part of the supplier via the internet Supplier Portal or by e-mail to purchasing@trioptics.com if this has been agreed or if these modifications affect product-related factors, e.g. performance data, function, service life, compatibility, device design.

All necessary technical and commercial information affected by the modification must be communicated.

5.2. Product Discontinuations

Product discontinuations for items which have been procured by TRIOPTICS at least once must be notified to TRIOPTICS via the internet Supplier Portal or by e-mail to purchasing@trioptics.com in writing without delay.

6. Materials

6.1. Applications without specific material requirements

General designations such as "Ms", "St", or "AlMg" are used.

6.2. Aluminium Cast Plates – EN AW-5083 (O3)

On our drawings these materials are designated with EN AW-5083 (O3) or a brand name such as C250[®], Dogal[®] etc.

6.3. Aluminium Cast Plates – Anodization, black

In order to achieve an even black surface when anodizing cast aluminum, the use of an anodizing quality material is recommended.

Alloy	>	EN AW 5083 (O3) Eloxal (EQ)
Surface	>	E0 / Anodized - BLACK, layer thickness 20µm

7. Surfaces

7.1. General requirements

- Tolerances of the finished dimensions as per drawing (PDF document) must be met
- Special requirements of the drawings must be observed
- Fits and smooth internal threads must be ensured;
- if necessary, they must be covered before surface treatment
- Optically flawless surfaces

7.2. Blasting = glass bead blasting

Ultra-fine finish for matt surfaces (grit size $\leq 200 \mu$).

(NO sandblasting)

7.3. Chemical coatings and electroplating

7.3.1. Passivation

> Chromium(VI)-free

7.3.2. Anodization / black

A uniformly black surface is required. A dark brown surface obtained due to the use of some electrolytical processes should be avoided.

7.3.3. Nickel-, zinc coating, chromed or chromated / black

The use of alternative methods might be admissible. A written approval by TRIOPTICS must be obtained in advance. The use of alternative methods might be admissible. A written approval by TRIOPTICS must be obtained in advance.

7.4. Powder Coating

Powder coating materials from the manufacturers listed below must be used for the following functional areas to ensure a uniform appearance.

The layer thickness is freely variable in consideration of the general requirements (4.1). Surfaces that should not be coated are indicated in the drawings.

Color samples can be provided. The article numbers are listed below:

7.4.1. Housing inside, smooth / dull matt

RAL 9005	Jet black
Type	REPO EP Protect S/DM
Manufacturer	AkzoNobel
Item no.	8239418
Formerly	(RELEST Powder Hybrid RAL9005 S/DM 5%)
Color sample	on request

7.4.2. Housing outside, fine structure:

RAL 5005	Signal blue
Type	ML-MA315, RAL5005 FS/matt
Manufacturer	Ganzlin Beschichtungspulver GmbH
Item no.	ML-5005-MA315
Color sample	0-500-332

RAL 5007	Brilliant blue
Type	ML-MA315, RAL5007 FS/matt
Manufacturer	Ganzlin Beschichtungspulver GmbH
Item no.	ML-5007-MA315
Color sample	0-500-314

**Obsolete! Do not
use for new
productions!**

RAL 7035	Light grey
Type	MEGAMIX® FS/M Serie 120-24
Manufacturer	Cenaris
Item no.	120-24-7035-225
Color sample	0-500-315

RAL 9005	Jet black
Type	MEGAMIX® FS/M Serie 120-24
Manufacturer	Cenaris
Item no.	120-24-9005-225
Color sample	0-500-316

RAL 9006	White Aluminum
Type	Drylac / matt
Manufacturer	Tiger Coatings
Item no.	29/90146

7.4.3. Special applications/Functional coatings

Electrically conductive coating powder (**ESD powder coating**):

The function is influenced by the layer thickness. To ensure the function, the manufacturer's specifications must be carefully observed.

RAL 5005	Signal blue	
Type	DURA®mix 331M IGP 50050 R fs/matt / ESD-conductive	
Manufacturer	IGP Pulvertechnik	
Color sample	0-500-333	
RAL 5007	Brilliant blue	
Type	DURA®mix 331M IGP 50070 R fs/matt ESD-conductive	Obsolete! Do not use for new productions!
Manufacturer	IGP Pulvertechnik	
Item no.	331MA50072C00	
Color sample	0-500-319	
RAL 7035	Light grey	
Type	DURA®mix 331M IGP 70350 R fs/matt / ESD-conductive	
Manufacturer	IGP Pulvertechnik	
Item no.	331MA70350C00	
Color sample	0-500-320	
RAL 9005	Jet black	
Type	DURA®mix 331M IGP 90050 R fs/matt / ESD-conductive	
Manufacturer	IGP Pulvertechnik	
Item no.	331MA90050C00	
Color sample	0-500-321	

For other colors you may choose any manufacturer.

7.5. Paint

7.5.1. Fine textured paint, matt

RAL 5005	Signal blue	
Type	BUCOPUR 2K-PU textured paint silk-matt RAL 5005	
Manufacturer	Lackfabrik Ernst Bub GmbH	
Distributor	Exler Lackiertechnik Vertriebsgesellschaft m.b.H.	
Item no.	838-567-95	
Color sample	0-500-334	
RAL 5007	Brilliant blue	
Type	ML-MA315, RAL5007 FS/matt	Obsolete! Do not use for new productions!
Manufacturer	Ganzlin Beschichtungspulver GmbH	
Item no.	ML-5007-MA315	
Color sample	0-500-314	
RAL 7035	Light grey	
Type	BUCOPUR 2K-PU textured paint silk-matt RAL 7035	
Manufacturer	Lackfabrik Ernst Bub GmbH	
Distributor	Exler Lackiertechnik Vertriebsgesellschaft m.b.H.	
Item no.	838-735-9	
Color sample	0-500-325	
RAL 9005	Jet black	
Type	BUCOPUR 2K-PU textured paint silk-matt RAL 9005	
Manufacturer	Lackfabrik Ernst Bub GmbH	
Distributor	Exler Lackiertechnik Vertriebsgesellschaft m.b.H.	
Item no.	838-905-95	
Color sample	0-500-326	
Hardener		
Type	BUCOPUR hardener type 116-000	
Application	Mixing ratio = 8 : 1	
Manufacturer	Lackfabrik Ernst Bub GmbH	
Distributor	Exler Lackiertechnik Vertriebsgesellschaft m.b.H.	
Item no.	116-000	

We recommend the use of the thinner listed below. If the desired result can also be achieved with another product, another thinner may also be used.

Thinner

Type	BUCO 2K thinner
Manufacturer	Lackfabrik Ernst Bub GmbH
Distributor	Exler Lackiertechnik Vertriebsgesellschaft m.b.H.
Item no.	111-810

7.5.2. Paint, deep black ("optical paint")

For minimization of any stray light.

Type	NEXTEL® Velvet Coating 811-21 / 9218 black NEXTEL® Verdünner/Paint thinner 8061
Supplier	Mankiewicz Gebr. & Co., Hamburg

or comparable products

For small surfaces:

Type	Optical paint, deep black, matt
Manufacturer	may be chosen by contractor

Alternative: **Albrecht Schultafelfarbe deep black**

or comparable products.

7.5.3. Device Lettering / Screen Inks

RAL 5005	Signal blue
Type	Marabu Mara Star SR screen ink according to recipe
Manufacturer	Marabu GmbH & Co. KG
Item no.	RAL 5005 (mixed according to Marabu recipe – not standard)
Distributor	www.marabu-druckfarben.de/unternehmen/haendlersuche-weltweit.html

RAL 9006	White aluminum
Type	Marabu Mara Star SR screen ink 191 silver
Manufacturer	Marabu GmbH & Co. KG
Item no.	32270057191 – SR191
Distributor	www.marabu-druckfarben.de/unternehmen/haendlersuche-weltweit.html

7.5.4. Primer / Undercoat

The contractor may choose a suitable product according to the requirements of the finished product.

The contractor may choose the manufacturer/color.

8. Preservative Coating

Only silicone-free agents must be used.

9. Lettering

Since May 2019, both the font and the color tone of the TRIOPTICS logo have changed.

The color is RAL 5005 and the font is Lato semibold.

Please note that this font is designed WITHOUT ligatures (typographic letter connections).

Note: The "new" logo has 20 lines in the Siemens star and long T-dashes.

The file for the logo can be requested from marketing@TRIOPTICS.com.



10. Labeling of Parts

In order to ensure that the parts can be clearly allocated in receiving and internal transport, the parts are to be labeled using removable labels (alternatively, use tags or write on packaging). This does not pertain to parts whose surface might be damaged by labeling or parts for which a different type of labeling is specified in the drawing or specifications.

10.1. Marking of Assembled Cables

It is mandatory that our assembled cables/cable harnesses are visibly marked with our part number at all ends, e.g. printed or by sleeve.

11. Packaging

Packaging must be suitable for the part to be packaged and ensure the following functions:

- Protective function
- Loading and transport protection
- Storage function

Care must be taken to ensure that the packaging can withstand the strains of the functions.

Small parts must be packed separately – if necessary use a larger cardboard box. The packaging has to be marked with our part number.

(Small parts must not be packed between/within other items).

In order to ensure that assembly is as dust-free as possible, plastic material must be used for the direct packaging of components, as no components packaged in paper or cardboard may be stored due to the formation of dust. Packing material used to protect components during transport and not required for storage may be made of environmentally friendly material.

12. Delivery / Delivery Documents

Please note the acceptance times of our goods receiving department::

Monday - Thursday	7.00 – 15.30 Uhr
Friday	7.00 – 12.00 Uhr

Please follow the instructions below for deliveries and allocations in Receiving:

- No delivery without a delivery note.
- Indicate our purchase order number and type and quantity of goods delivered on the delivery note.
- Clearly allocate the goods/delivery note information to our purchase order items.
- Label the goods/packaging using our part number.
- The goods must be packaged and labeled in a way that ensures that we can enter, store and pick the goods according to our purchase order items without having to repackage.
- In the case of purchase orders/deliveries of sets or assemblies, these must always be packaged and delivered as a set (!) to enable direct order picking/shipping.
- If the scope of a purchase order item makes packaging as one (1) set in one (1) packaging unit impossible and requires several packaging units, every single package must be labeled.

This includes:

- TRIOPTICS part number
- Numbering including total number of packages (e.g. Part no. 123-..., box no. 1 of 5).

When delivering structural components as individual parts or assemblies, the following documents must be attached to the delivery note (2.1 and 2.2).

12.1.1. Delivery – structural components as per drawing

Attachment to the delivery note:

- Latest drawing including information on and confirmation of verified dimensions

12.1.2. Delivery – assemblies as per bills of materials

Attachment to the delivery note:

- Latest bill of materials including a confirmation of completeness and verified dimensions,
- for unconnected parts individual check and confirmation of the quantity supplied
- where applicable, documentation of inspection specifications/setting specifications

13. Applicable Instructions

We would like to point out the relevant quality assurance obligations as well as the required compliance with legal provisions.

In this context, the following sections in our General Purchasing Terms and Conditions must be followed in particular with regard to manufacturing, delivery and documentation:

- §3 / Included in delivery: technical design and documentation
- §9 / Quality assurance and product liability
- §10 / Hazardous substances