TRISTONE

Annex 1:

Supplier Packaging Manual

Revision 1.0

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1. INTRODUCTION

The Tristone Flowtech Supplier Packaging Manual specifies the packaging, storage and shipping standards for material being shipped to TFT. The requirements in this manual must be applied to all current and future parts shipped to all TFT locations worldwide.

The intent of these standards is to ensure safe movement, part quality, freight cube optimization, lean implementation and control of total costs. The responsibility for ensuring quality of material shipped remains with the supplier throughout the material movement process. Compliance to all local regulations is required.

The following are basic requirements that a supplier must follow during the development and application of their packaging/shipping plan. The use of these standards or approvals of the TFT Supplier Packaging Information (SPI) form does not relieve the supplier of responsibility for part quality. These requirements should be applied to all production parts prior to quote submission.

Tristone Flowtech Packaging Engineer must approve all exceptions. Upgraded standards may be required for your specific applications.

Additionally, these requirements may be modified by supplemental requirements of the receiving TFT facility.

It is expected each supplier will ensure all affected employees are knowledgeable and capable of compliance. It is the supplier's responsibility to ensure part quality from their manufacturing location to the point of use within TFT. If part quality is compromised, the supplier may be held liable for repacking, inspection and incremental freight costs.

2. GENERAL PACKAGING REQUIREMENTS

2.1 GENERAL

TFT standard containers should be used for packaging by default. Special design and sizes should only be defined as exception in case of specific/ extraordinary requirements of the material to be delivered. If special containers are essential, suppliers must work with TFT on the design.

Where returnable packaging is equal in economic and qualitative terms compared to expendable packaging, returnable packaging shall be preferred as serial packaging.

The following requirements apply regardless of the type of packaging selected:

- Damage-free delivery of parts (no quality impairment of parts)
- Set up rational Shipping Units (SU)
- Only one part number per Packaging Unit (PU) allowed
- Mixed part numbers in the same pallet are only allowed for the same product, e.g. left hand and right hand version. – For materials with high amount of parts per PU

(e.g. screws, seals) exceptions might be possible by approval of TFT Packaging Engineer

- Optimum capacity utilization of PU's and SU's. Packaging must not be larger or more elaborate than essential to protect the goods.
- Secured transport (e.g. strapping of pallets, corner protectors etc.)
- Trouble-free unloading of transport vehicles by forklift and/or jack lift
- Stackability (e.g. lids and pallets must be compatible)
- Ergonomic and easy-to-handle structure
- Total height of a single SU should not exceed 1000 mm [millimeters]
- Easy and efficient access to the parts (ergonomic, economic, quality and time)
- Returnable packaging must be designed to be cleaned, drained easily
- Where possible returnable packaging shall be collapsible when empty.
- Recyclable Materials
- Minimal use of disposable packaging (dunnage) materials (e.g. separators, trays, etc.)
- Compliance with standard practice and applicable safety laws and ergonomics of receiving TFT plant. Under no circumstance gross weight shall exceed 12 kg per PU. Details need to be agreed with TFT Packaging Engineer.
- Overseas packaging must be compliant with VDA 4525 (details see Chapter 2.6).
- All packaging must be in accordance with national and international regulations on dangerous goods.
- Optimization of Shipping Unit dimensions with inside dimensions of the type of transport used. Standard outside and inside dimensions of type of transport are generally as follows:

ROAD FREIGHT:

REGION	TYPE	DIMENSIONS (mm)						VOLUME (cbm)	MAX. PAYLOAD (kg)
		OUTSIDE			INNSIDE				
		L	W	H	L	W	H		
EU	EURO-Trailer	13.750	2.550	2.800	13.620	2.480	2.700	91	25.000
	MEGA-Trailer	13.750	2.550	3.100	13.620	2.480	3.000	101	24.000
US	53' Standard	16.155	2.540	2.795	16.000	2.435	2.640	103	19.090

OCEAN FREIGHT:

		20' Container		40' Container		45' High-Cube Container	
		imperial	metric	imperial	metric	imperial	metric
Outside	Length	20' 0"	6,058 m	40' 0"	12,192 m	45' 0"	13,716 m
	Width	8' 0"	2,438 m	8' 0"	2,438 m	8' 0"	2,438 m
	Height	8' 6"	2,591 m	8' 6"	2,591 m	9' 6"	2,896 m
Inside	Length	19' 4 13/16"	5,898 m	39' 5 45/64"	12,032 m	44' 4"	13,556 m
	Width	7' 8 19/32"	2,352 m	7' 8 19/32"	2,352 m	7' 8 19/32"	2,352 m
	Height	7' 9 57/64"	2,385 m	7' 9 57/64"	2,385 m	8' 9 15/16"	2,698 m
Door	Width	7' 8 1/8"	2,343 m	7' 8 1/8"	2,343 m	7' 8 1/8"	2,343 m
	Height	7' 5 3/4"	2,280 m	7' 5 3/4"	2,280 m	8' 5 49/64"	2,585 m
Volume		1.169 ft³	33,1 m³	2.385 ft³	67,5 m³	3.040 ft³	86,1 m³
Max. Total weight		52.910 lb	24.000 kg	67.200 lb	30.480 kg	67.200 lb	30.480 kg
Tareweight		5.140 lb	2.330 kg	8.820 lb	4.000 kg	10.580 lb	4.800 kg
Payload		47.770 lb	21.670 kg	58.380 lb	26.480 kg	56.620 lb	25.680 kg

2.2 SPECIAL REQUIREMENTS FOR COMPONENTS PACKAGING

The components supplier knows the special packaging requirements of their product. In this respect, the following issues may need to be considered:

- Required measures against corrosion
- Components may have to be transported and stored in a certain position
- Certain components parts may be easily damaged
- Certain components parts should not be subject to load
- Protection against exposure to environmental effects that may cause deterioration
- Hazardous goods

The components supplier must explicitly inform the pertinent TFT location about these requirements.

2.3 LABELLING OF PACAKGING

All Shipping Units [SU] and/or Packaging Units [PU] must be labelled in accordance TFT Labelling Manual. (Annex 2 of TFT Global Logistics Supplier Manual) and the following international acknowledged standards:

- VDA 4994
- ODETTE Global Transport Label (LL08)

The label must be placed in the way to be well visible from outside. The transport labels should be inserted in the label holders intended for this purpose. If no label holder is available, the transport label must be attached using adhesive points. Care must be taken to ensure that the information on the transport label is completely legible at any time.

Old labels and inspection notes must be removed completely (without any residue) by the supplier.

2.4 QUALITY IMPAIRMENT OF GOODS DUE TO PACKAGING

The supplier must ensure that no goods are packed in wet, soiled or damaged containers. The supplier is liable for any quality impairment caused by such packaging.

If the packaging concept of the supplier impairs the quality of the goods, the supplier must take immediate corrective action and define a new packaging concept in cooperation with TFT.

2.5 GENERAL REQUIREMENTS ON THE AVOIDANCE OF PACKAGING WASTE

In all cases, packaging planning should take environmental aspects into consideration. Waste management goals within environmental legislation list the following waste priorities:

- Avoidance ➔ keep waste to a minimum
- Reduction ➔ recycle by using reusable packaging – Preferred use of reusable packaging based on aforementioned principle. Disposable materials should be reduced
- Recycling ➔it must be possible to salvage and reuse reusable and disposable packaging in an environmentally compatible manner. To comply with the requirements of the packaging directive and to avoid unnecessary pollution of the environment, only environmental friendly materials shall be used. Multiple material compositions (e.g. plastic, wood and card board) shall be easy to be separated from eacht other for better recycling at any time.

2.6 SUPPLIER PACAKGING REQUIREMENTS FOR OVERSEAS TRANSPORT

Tristone Flowtech minimum requirement for overseas packaging is, that it must be in accordance with VDA 4525 standard for international business and must protect supplied parts against corrosion.

Please follow the links below to download VDA 4525 from VDA website in German or English language.

https://www.vda.de/de/aktuelles/publikationen/publication/standardisierte-einwegverpackung-f-r-seecontainer-anwendungen

https://www.vda.de/en/news/publications/publication/vda-4525-standardized-expendable-packaging-for-sea-container-applications

The following aspects must be considered when developing packaging concepts for the supply of overseas locations (maritime or air transport):

- Increased mechanical load
- Temperature variances from -30°C [-22°F] to +80°C [176°F]
- Humidity up to 100%
- Transport/Storage period up to 6 months

- In the case of wood packing materials (e.g. pallets), import regulations for the country of destination must always be met and confirmed on the delivery note accompanying each delivery
- Shipping Units shall be secured against physical strains during transport, e.g. rolling, pitching and yawing.
- In the event additional container stuffing material is required in order to ensure a material safety loading such stuffing material must be supplied and paid by the component supplier.

2.7 AUTHORIZED AND NON-AUTHORIZED PACKAGING MATERIALS

Packaging material should always be universally recyclable and clearly and visibly identified on the packaging to aid identification.

2.7.1 PLASTICS PACKAGING MATERIALS

The following regulations apply:

- Protective and insulating caps ➔ Only PE (natural-colored)
- Loose fill ➔ NOT PERMITTED
- Foamed plastics (disposable or reusable) ➔ Only PE, PP
- Shrink wrapping film and stretch film: only PE with material labelling according to DIN 6120
- Bags and sacks of plastic sheet/film ➔ Only PE with material labelling according to DIN 6120
- Only identical-material labels and adhesive strips
- Printing should not exceed 3% of film area.
- Expanded Polystyrene (EPS) ➔ Only by approval of TFT
- Expanded Polypropylene (EPP) ➔ Only by approval of TFT

2.7.2 PAPER AND PAPERBOARD

The following regulations apply:

- Corrosion-resistant paper: Must be free of substances harmful to paper production and marked with the RESY symbol. Seals with plastic or textile tapes. VCI paper certified recyclable with paper/paperboard must show the RESY-Symbol.
- Papers with water-insoluble coatings or adhesives, i.e. wax, paraffin, bitumen coated or oiled paper and self-adhesive paper tapes, are NOT PERMITTED.

2.7.3 WOOD

The EU Directive 2001/219/EG as well as the regulation (EU) 2023/1115 apply to the approval of wood.

For more details please visit:

https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32001D0219

https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32023R1115&qid=1687867231461

All kind of wooden packaging (e.g. pallets, crates) must comply with ISPM15 standard.

To prevent the spread of pests, the following should be taken into consideration (IPPC):

With Ruling 2001/218/EG and 2001/219/EG passed by the EU Commission and which refers to packaging wood manufactured entirely or partly from untreated softwood (with the exception of Tulia L.) originating from Canada, China, Japan, USA or Portugal and used or intended for use for packing boxes, cases, crates, barrels, bins, drums and similar means of packaging, pallets, box pallets and other load carriers as well as attachment frame for pallets, the following shall apply:

- The wood must be heat treated for at least 30 minutes at a minimum temperature of 56°C in a closed chamber or artificially dried in a drying oven; the chamber or oven used must be officially certified, rated and authorized for this purpose

OR:

- Fumigate with an approved chemical agent according to an officially authorized
- technical process.
- The wood must be marked with an approved label for the respective treatment; this label must indicate where and by whom this treatment was carried out.
- Packaging material from hardwood originating from China and in addition to the above mentioned measures must carry a plant health certificate in accordance with actual laws or directions given by official authorities of the country or region (e.g. European Union) of final destination.
- The wood must be stripped of bark and not show any holes bored by insects of more than 3 mm in diameter

OR:

- It must be subject to an artificial drying process at an appropriate temperature/time ratio until the moisture content is less than 20% dry substance.

2.7.4 SECURING STRAPS

Securing straps must be made of PP. Steel straps shall only be used by prior approval of the particular TFT location.

Polyamide and polyester straps are NOT PERMITTED.

3. RETURNABLE PACKAGING

3.1 DESIGN & DEVELOPMENT

In any case supplier is responsible for design and development of returnable packaging. He must submit the designed proposal with drawings or pictures together with Tristone Flowtech SPI [see Annex 1.1 "TFO_F09_SPI_Supplier Packaging Information] to the relevant TFT Packing Engineer for approval.

3.2 PROCUREMENT

The commercial agreements and quantity of returnable packaging to be purchased will be mutually agreed and confirmed in the TFT Purchase Contract. [see 4. Packaging costs]

If, as per TFT Purchase Contract, supplier or a third investor, acting on behalf of the material supplier, is obliged to purchase returnable packaging, but fails to request or procure packaging at the appropriate time, it shall bear the additional costs that may be incurred (such as shipping or repacking costs).

3.3 MANAGEMENT OF BALANCES

TFT and SUPPLIER shall keep accounts for returnable packaging and cross-check and agree the balances at least on a monthly basis. Objections must be received within SEVEN [7] calendar days by the other party empties management responsible.

Quantity discrepancies shall be eliminated by reaching a mutual consensus of all involved parties.

In this context and in the case of complaints (for example caused by quantity differences, waste, damage) the supplier has to provide photos, a short description with reference to the delivery note number to the responsible TFT plant.

If the complaint is already visible at the moment of returning the empties to supplier the driver of the forwarder has to sign off on that complaint at any shipping document, such as Waybill, Bill of Lading or CMR. This document must be forwarded to the TFT location as well. Otherwise the complaint will not be accepted. The following procedure has to be agreed on a case by case basis.

3.4 RETURN OF EMPTIES

Return of empties is considered as part of the material delivery. The party which is responsible for the transport of material from supplier to TFT manufacturing location shall also be responsible for the return of the empties as its own costs and within the time of the agreed loop time.

In case it is suppliers responsibility returning the empties to his production location TFT is responsible to provide all available empty packaging at the moment of delivery.

If supplier fails to pick up empty packaging it may have a negative impact on his delivery performance.

3.5 STORAGE OF EMPTIES

The supplier is responsible for a proper storage (weather protected) of the returnables after empties have been returned to supplier. The returnables have to be stored in that way that contamination before, during and after the production process can be avoided. If contamination occurs during this period the supplier has to clean the returnables at its own expense.

3.6 CLEANING

Empties must meet the necessary degree of cleanliness of the product. If required returnable empties have to be cleaned by the supplier.

Empties have to be cleared of non-valid labels (e.q. labels or shipping notes). Responsibility therefore belongs to the supplier.

Empty packaging shipped back to supplier by TFT. Categorically TFT does not wash the packaging containers.

3.7 REPAIR & SCRAPPING

Returnable packaging are to be repaired if:

- Functionality is impaired – i.e. in particular:
  - hinged lids, covers, compartments, etc. are rigid or deformed to such an extent that they can no longer be closed
  - components are missing or do not function
  - essential markings are missing or illegible
- They represent a risk of injury – i.e. in particular:
  - the floor frame or the skids/supports are bent to such an extent that the PACKAGING EQUIPMENT can no longer stand evenly on the four supports or can no longer be stacked without risk
  - the corner posts are deformed, wire mesh torn and the wire ends project outward or inward

Returnable packaging are to be scrapped if all aforementioned measures are not in a cost-value ratio.

If the other party than the party deemed responsible intents to scrap returnable packaging has to provide evidence to the other party, by corresponding photos, analysis, reports etc.

3.8 REPLACEMENT PROCUREMENT

The replacement of returnable packaging is part of the initial procurement agreement regulated in the TFT Nomination Letter. [see 3.2 Procurement & 4. Packaging costs]

Shrinkage regardless of the reason shall be compensated immediately at the current replacement value by the PARTY deemed responsible.

4. PACKAGING COSTS

4.1 RETURNABLE PACKAGING

The quotation of packaging must contain all costs (e.g. development, sample container, presentation of sample and serial container, transport tests) and all elements of the packaging (e.g. PU, pallet, lid, shrink foil etc.) and must be separately submitted together piece component quotation.

The quantity of returnable packaging to be quoted has to be calculated and agreed between supplier and TFT Packaging Engineer based on average loop time, expected part quantity and potential peak volume.

Returnable packaging initially purchased by supplier or a third investor acting on behalf of the material supplier will be amortized by TFT in the piece price over a period and/or part quantity which must be mutually agreed and confirmed with Tristone Flowtech Purchase Contract.

During project life time period TFT grants the original investor of the packaging an annual interest rate of the original investment amount, for repairs and replacement. The interest rate to be granted will be agreed with separate returnable packaging invest agreement.

After the end of production or after agreed amortization period or quantity is due whatsoever is earlier) the containers will become the property of TFT and must be handed over to TFT at an agreed time and place or to be disposed (only by prior written consent).

4.2 EXPENDABLE PACKAGING

The quotation of packaging must contain all costs (e.g. development, sample container, presentation of sample and serial container, transport tests) and all elements of the packaging (e.g. PU, pallet, lid, shrink foil etc.) and must be separately submitted together with cost breakdown during piece price quotation.

Finally agreed packaging costs must be part of the mutually agreed piece price and confirmed with Tristone Flowtech Purchase Contract.

In the event of price increases the Supplier shall be obliged to provide TFT with evidence of such increases by submitting official offers.

The Supplier undertakes to obtain alternative offers for packaging of the same type and quality.

4.3 ALTERNATIVE PACKAGING

See 4.2 Expendable Packaging

5. EXCEPTIONS

5.1 ALTERNATIVE OR EMERGENCY PACKAGING

In case the agreed serial packaging is returnable packaging, the supplier shall also develop in parallel an alternative or emergency packaging for situations when serial packaging is not available. These alternative packaging solutions must be separately submitted together with piece component quotation and in the standardized TFT SPI form for review and approval. The alternative packaging must be approved and available prior to SOP [Start of Production].

It is preferred that alternative packaging specifications meet the same specifications as the serial packaging.

5.2 NON PALLETED-GOODS

Deliveries in cardboard boxes, bags, etc. without pallets are to be avoided at all times, as these require manual handling.

5.3 PACKAGING FOR SAMPLE PARTS / PROTOTYPES

In all cases packaging for sample parts needs to be clarified with Quality Assurance. In general, the supplier carries the costs.

6. ANNEXES

The following appendices are part of this agreement:

- Annex 1-1: TFO_M_01-1.1_SPaC_Supplier Packaging Catalogue
- Annex 1-2: TFO_F_13_SPI_Supplier Packaging Info

7. CHANGE HISTORY

Release	Date	Change Description	Author
001	2024-11-01	First Edition	Christian Matzanke Gian Franco Buscemi