

Analysis

Design

Sampling

 Division of
Packaging Solutions

Service

Delivery

Production

1. INTRODUCTION

TART, s.r.o. has rich experience in the field of packaging.

Due to our wide range of materials, well-coordinated and highly qualified specialists, and a strong technological background, we have the ideal environment for a complete solution to a customer's packaging requirements.

Art of
packaging...

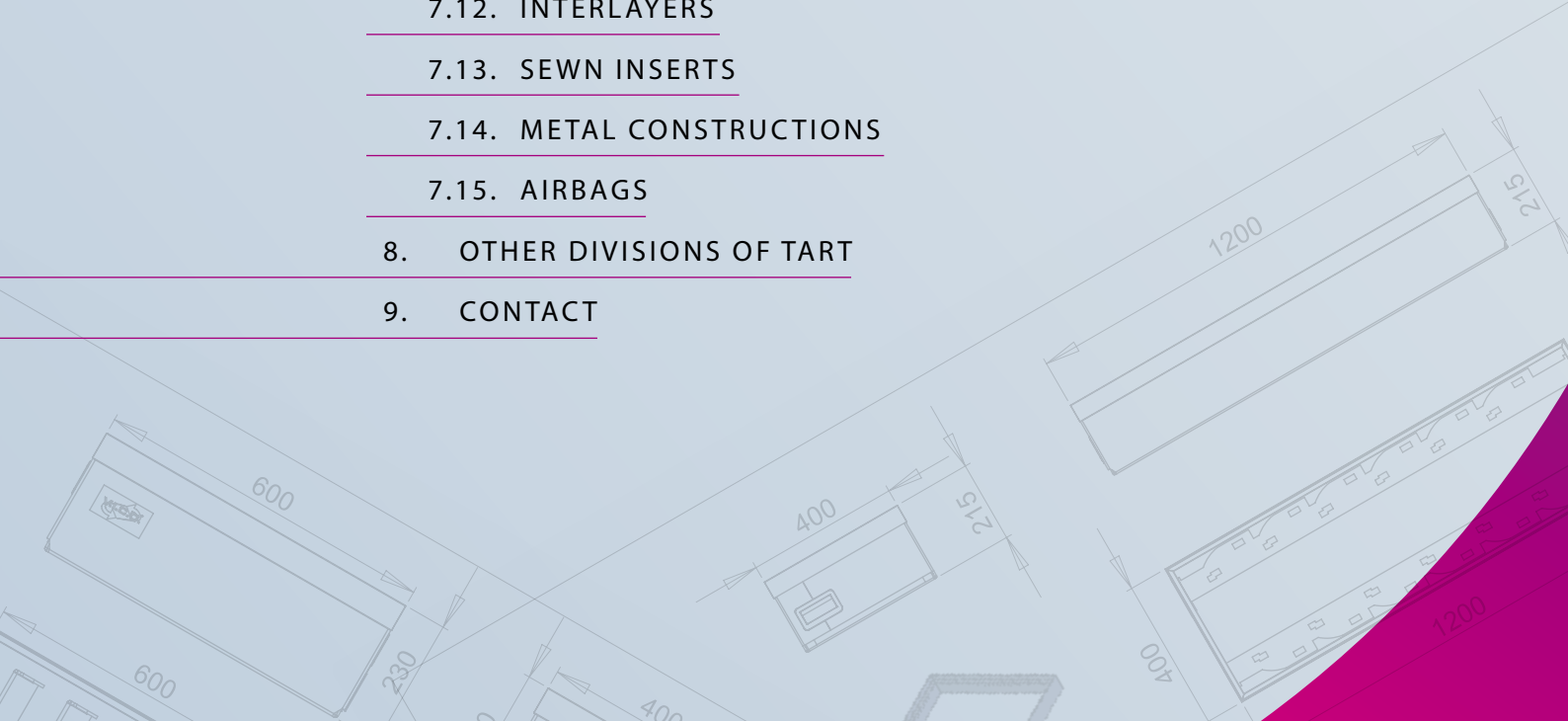


The objective of the Division of Packaging Solutions is to analyze, design and realize an optimal solution in the field of packaging for a customer's specific product.

In the period of its existence, our team has managed to satisfy hundreds of demanding requirements from business partners, mainly in the automotive branch and the electrotechnical industry. The high-quality of our products is evident by the continually growing number of satisfied customers.

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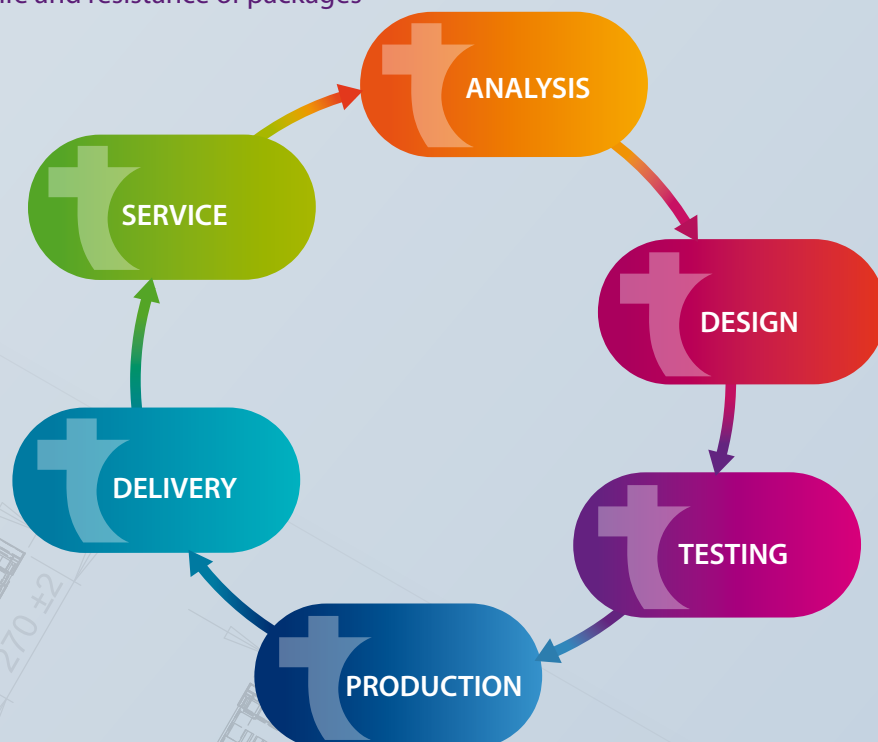
2. Packaging Production Process

The packaging production process consists of several successive steps:

- 1 Each individual project begins with a detailed analysis of an actual or planned product, its production, logistic process (handling, transport, storage etc.) and other customer specific requirements.
- 2 Together with our design center, an optimal solution is proposed upon information gained, and package prototypes are produced on the basis of this solution.
- 3 Upon the customer's agreement, the prototypes are then subjected to practical testing.
- 4 Suitable prototypes, agreed on by the customer, are put into production.
- 5 Finished packages are delivered on the date and in the amount specified by the customer.
- 6 The use of packages is continually monitored, analyzed and improved within the service.

Proposed and realized solutions must conform to a number of assumptions:

- absolute protection against damage during handling and transport
- optimal protection of sensitive, visible, and varnished parts
- long life and resistance of packages
- simple package handling
- reduction in costs arising from handling and transport
- easy recycling



3. Services

Besides the creation of packaging we offer a range of related services that enable our customers to reduce product protection costs and facilitate their production process.

Our services include:

Just In Time

We offer our customers a Just In Time service (JIT), a system of supplying packaging according to current needs, at a desired time and quantity. JIT service primarily reduces the customer costs of storage and handling with packaging and increases the efficiency of their production. Our company can for example serve customers in 24/7 mode or provide packaging distribution throughout the branch network of the customer.



Kitting

Kitting constitutes a service within the supply of complex packaging, which must be assembled. Within kitting we supply complex assembled packaging that is ready for immediate use.



Packaging Process Analysis

Our experts are able to analyze and optimize the existing packaging processes and reduce the customer's packaging costs. We also can design the most suitable packaging process for the client's future projects, including optimal packaging.



4. V.I.C.O.® System

The V.I.C.O.® (Value Inside Checkpoint Outside) system is an integrated system of tailor-made returnable packages. Implementing the V.I.C.O. System brings a lot of benefits:

- saving packaging materials
- time saving in production
- quick identification
- damage risk reduction
- effective transport
- rational handling
- elimination of waste
- certified quality management system ISO 9001-2009
- implementation of a system of ecological approach ISO 14 000:2005

The V.I.C.O.® system helps strengthen the logic of your logistics.

Two of our V.I.C.O.® system packaging solutions received the "Package of the Year" award.



5. References

The best indication of our product and service quality within the Division of Packaging Solutions is our long-term cooperation with our many satisfied business partners:

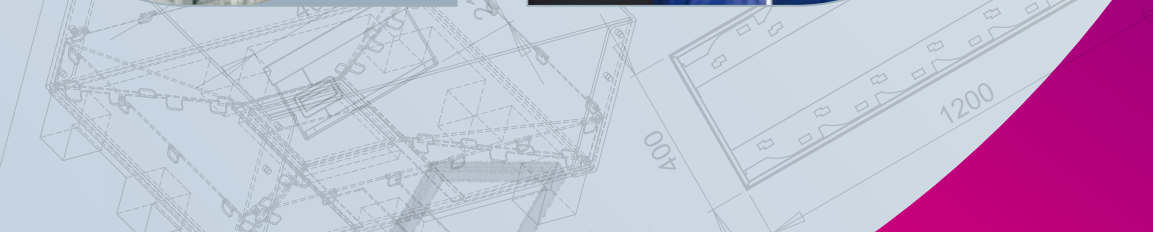
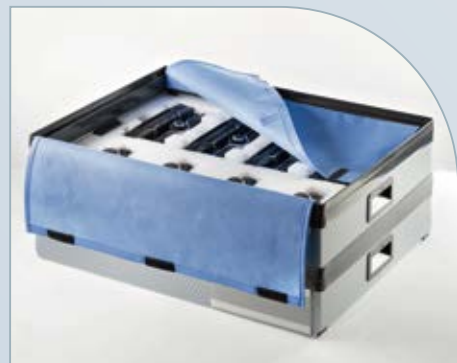
- | | |
|-----------------------|---------------------------|
| • AUTOMOTIVE LIGHTING | • MEOPTA |
| • BOSCH DIESEL | • PANASONIC |
| • CONTINENTAL | • PIERBURG |
| • FAURECIA | • SIEMENS |
| • FOXCONN | • ŠKODA AUTO |
| • HONEYWELL | • TPCA |
| • HVCC | • VALEO |
| • INVENTEC | • VARROC LIGHTING SYSTEMS |
| • MAGNA | • WISTRON |
| • MANN+HUMMEL | And plenty of others... |

6. Main materials used

Modern materials, which conform to the highest demands on product protection, are used for the development of transport and storage packages. The materials may be mutually combined, and they have numerous specific advantages.

- hollow polypropylene (plastic board)
- corrugated board (two/three/five-layer board, event. seven-layer board)
- expanded materials – polystyrene, polypropylene
- PVC films
- reticulated and non-reticulated foams
- woven and nonwoven fabrics (PES, PAD, PVC, Tyvek, Spunbond etc.)
- vacuum-formed materials (ABS, PE, PP)
- PE films (bubble, with lamination etc.)
- wood and plywood
- polyurethane foam (plastic foam)

These suitably combined materials create packages that fully comply with customers' requirements and bring them a lot of benefits.



7. Packaging Solutions

7.1. Stackable boxes

Material

PP

Plastic boxes are produced in a wide range of varieties according to customer specific requirements. When combined with other materials, they provide full protection of packaged items. In addition, plastic boxes enable simple handling and storing (stacking). The great advantage of these packages (contrary to KLT boxes) is that their dimensions may be adjusted.

Used materials:

- hollow polypropylene

Types:

- all sides closed
- open top box, one or two sides opened
- with a lid
- with a film/fabric top cover

Options:

- inner fixation with grids, sewn inserts, EPE, EPS and other materials used for fixation of items in the box
- handles, grips
- stackable frames, edges
- document case
- box identification - printing or labels



The In-process transport box received the "Package of the Year 2005" award.



DÍLU	POPIS	rozloženy pohled/Množ.
oxu	Cp 5mm, 1000g/m2, transparent PVC L-lišta, 30x30mm, 257mm PVC H-profil No	1

7. Packaging Solutions

7.2. Megaboxes

Material

PE, PP

Large-volume collapsible boxes replace usual steel containers and gitterboxes. There are three parts: the lid, the pallet, and the collapsible protective enclosure. These light-weight megaboxes have a high load capacity and solidity. Other benefits of the returnable packaging system are its long durability, easy assembly and handling, and great reduction in volume during storage and transport of empty containers.

Used materials:

- polyethylene (palett and lid)
- polypropylene (sleeve)

Types:

- with a steel pallet for maximum load
- with a double protective enclosure for maximum resistance

Options:

- inner fixation: grids, sewn inserts, EPE, EPS and other materials used for fixing items in the box
- lockable lid
- opening front side or sides
- box identification - printing or labels
- integrated document case

The Large-volume collapsible box F-GIBOX received the "Package of the Year 2006" award.



DESCRIPTION	QTY.
- součást sady Megabox Beta 1200x1000x990	1
- součást konstrukce pro uchycení vozíky (rozložený)	1
- síťová konstrukce (vyšek - pro 9 ks dveřních výplní)	1
- součást sady Megabox Beta 1200x1000x990	1
- součást sady Megabox Beta 1200x1000x990	1
- Přední plachta PVC - se suchými zipy Pro uchycení k rámu. STC S 895x45x35 mm	2

Šrouby M8 25mm se šestihrannou hlavou - pro sešroubování rámu: 22ks na 1 komplet + 22 ks podložek

7. Packaging Solutions

7.3. Expanded material packages

Material

EPS , EPP

Expanded materials are materials injected into customer-specific forms. These are light materials with excellent protective characteristics; they are washable and fully recyclable. They are used as inserts into outer plastic or board packages or as self-supporting frames and boxes. They perfectly fix and protect the product and they also fill voids.

This package type is designed for a larger series of products.

Used materials:

- expanded polystyrene
- expanded polypropylene

Filling and fixation

Types:

- shaped pieces of different shape and size

Options:

- identification - labels or stamping
- ESD version

Stacking boxes

Types:

- box (with a lid)
- self-supporting frame with fixation
- box with integrated fixation

Options:

- ESD version
- washable
- identification - labels or stamping
- document case



7. Packaging Solutions

7.4. Shaped pieces and fixations

Material

PE, PAP

Used mainly for fixation in the automotive and electrotechnical industries, these are fixing inserts, fillings or grids and they make the bottom or sides of the box softer. Foam PE may be heat-welded, which enables the production of complex designs. Such packaging is suitable for a smaller and middle series of products.

Used materials:

- foam polyethylene (PE)
- corrugated board

Types:

- simple shape cut-outs
- complex cut-outs for fixation of single parts
- collapsible fixation structures
- shaped pieces of both materials

Options:

- printing (handling symbols, recycling symbols etc.)
- ESD version



7. Packaging Solutions

7.5. KLAPPY boxes

Material

Wood

The KLAPPY box is a highly resistant transport and storage container, which consists of an underlying palette, plywood casing and lid. It is possible to equip the container with linings or fixations of different materials (polyethylene foam, wood, plastic, cardboard, etc.) depending on the transported/ stored product.

Used materials:

- wood / plywood

Types:

- extensive size variability
- with top or side filling
- with interior panels to meet customer needs
- two-way or four-way pallets

Options:

- boxes can be provided with print
- slots for easier handling
- notches for binding straps



7. Packaging Solutions

7.6. Cardboard boxes

Material

PAP

Cardboard containers are currently the most widely used type of packaging. They facilitate logistics and protect the product during handling and storage. The advantages of cardboard containers is that they include a very wide range of sizes and types of packaging, including light weight and good storage of empty containers and the possibility of combining with other materials.

Used materials:

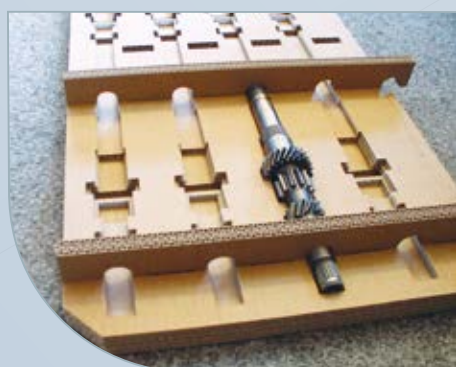
- three/five/seven-layer cardboard with various wave combinations

Types:

- flap boxes
- boxes with separate lids
- stillage boxes
- shape cutouts
- trays, grids, fixations
- pallet boxes, octabins

Options:

- marking of boxes with stickers, printing or document pouch
- possibility of colour designs
- cutout options (handles, eyeholes etc.)
- PP lamination (polypropylene)
- anticorrosion coating
- polyurethane foam (plastic foam)



7. Packaging Solutions

7.7. Laminated bags and sacks

Material

HDPE/LDPE, PE, PAP

Laminated bags and sacks are used mainly for the protection of products against scratching (monitors, screens, PC components...). Laminated materials combine the advantages of several package types.

Used materials:

- HDPE/LDPE film
- bubble film
- foam polyethylene
- paper

Options:

- different sizes
- ESD version
- printing (one-sided, two-sided, single colour, multi-colour, customer-specific)
- vent holes, perforation



7. Packaging Solutions

7.8. Pallets

Material

WOOD, HDPE, PAP

Pallets distinctively help in product completion and handling. Apart from wooden pallets of standard or custom size, there are plastic pallets available. Plastic pallets have a lot of advantages such as longer durability and being light weight; they are stackable and washable etc.

Used materials:

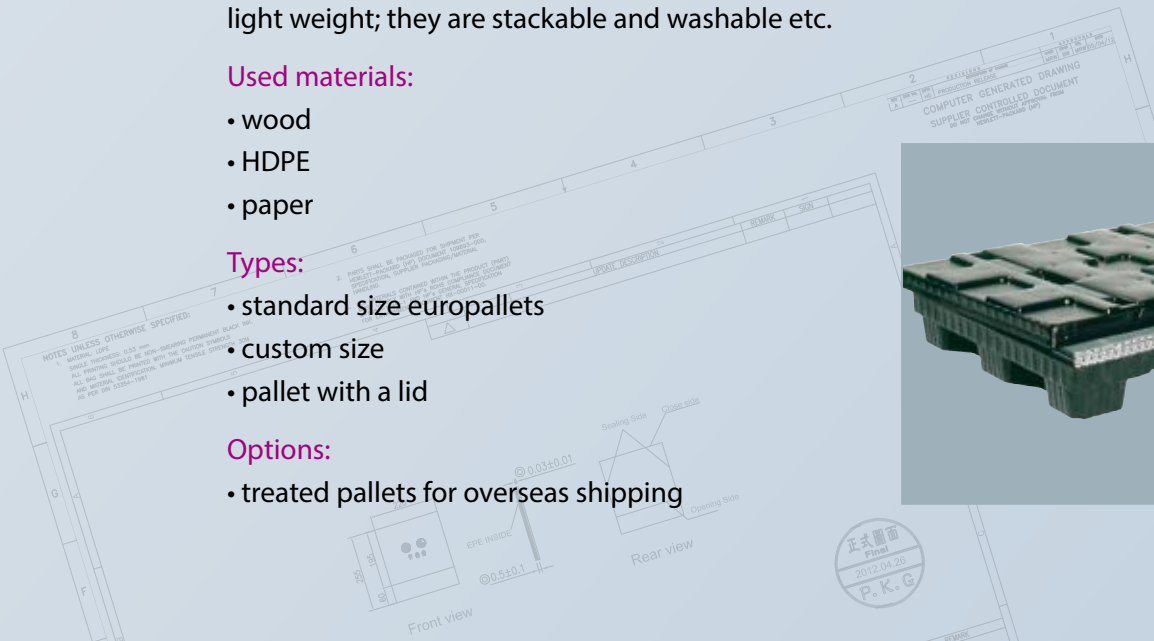
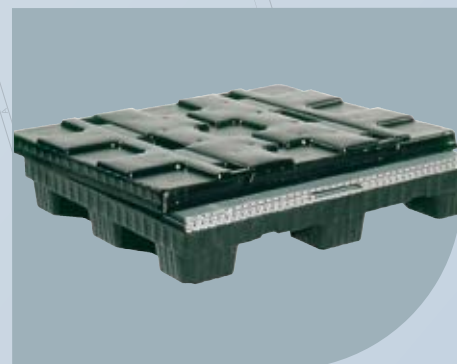
- wood
- HDPE
- paper

Types:

- standard size europallets
- custom size
- pallet with a lid

Options:

- treated pallets for overseas shipping



7. Packaging Solutions

7.9. Vacuum-formed packages and fillings

Material

PSH, PP, ABS

These are transport and automated containers, pads and interlayers. They are characterized by their high strength and accuracy even in products with complex shapes. These containers and interlayers have smooth or textured bottoms and they are designed to be easily stackable. Vacuum-formed packages and fillings are suitable for a larger series of products.

Used materials:

- polystyrene
- polypropylene
- ABS

Types:

- separate shaped interlayers
- self-supporting boxes with integrated fixation

Options:

- ESD version
- washable
- identification - labels or stamping



7. Packaging Solutions

7.10. Protective self-adhesive LDPE films

Material

LDPE

Protective films are attached directly to the protected part of a product and they protect against scratching, soiling or ESD. They are applied mainly on visible parts of the product (glass, plastic, metal, porcelain, fine wood, etc.).

Used materials:

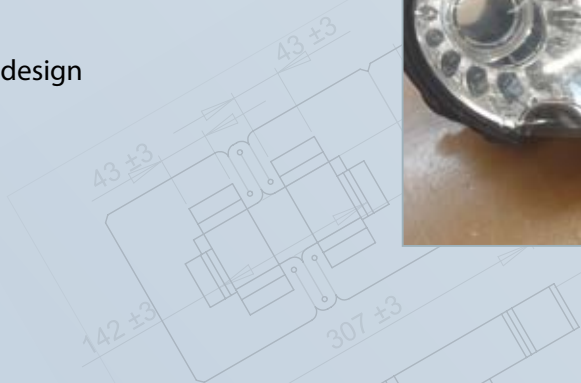
- LDPE films

Types:

- shaped cut-outs
- rolls

Options:

- different colour design
- UV protection
- printing



7. Packaging Solutions

7.11. Grids and Dividers

Material

PP, PAP, PE

Grids are used for the fixation and separation of single product units. In the majority of cases, they are collapsible, so they save space and reduce the costs of travel and storage.

Used materials:

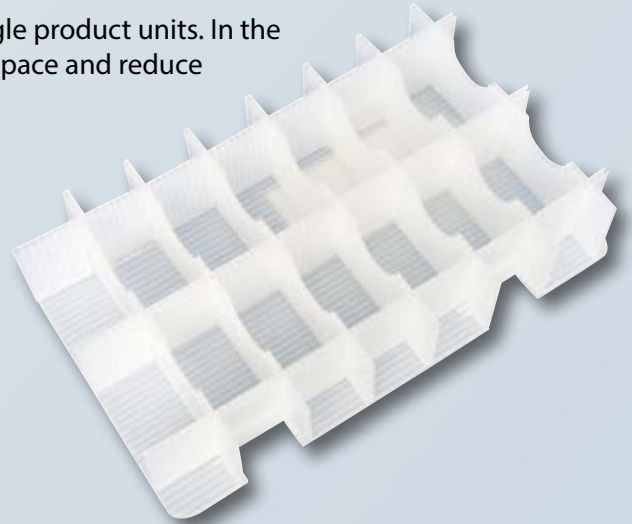
- hollow polypropylene
- corrugated board
- polyethylene

Types:

- simple grid
- grid with a bottom or with a frame
- grid integrated into the box

Options:

- foam or fabric layer to protect the transported parts from scratching
- special fixing units to prevent the parts from moving
- identification - labels or printing; eventually, a document case is included



7. Packaging Solutions

7.12. Interlayers

Material

PP, PAP, PE, HDPE, PU

Interlayers are used as a protective layer between grids; they are used for boxes, and metal and wood constructions. Interlayers may be cut-out or provided with a 3D fixation to keep the product in place.

Used materials:

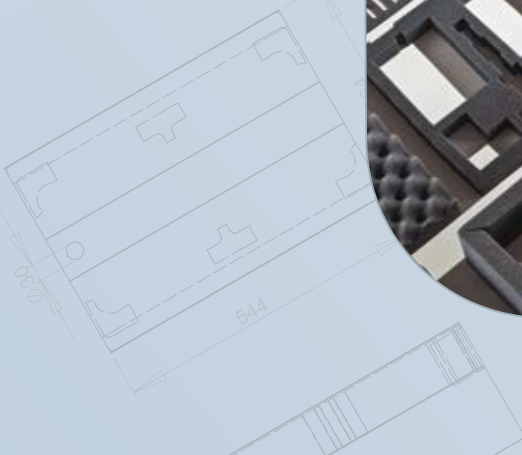
- hollow polypropylene
- corrugated board
- foam polyethylene
- bubble film
- laminated high-density polyethylene
- foam polyurethane (foam plastic)

Types:

- simple interlayers
- interlayers with cut-outs, holes etc.
- interlayers integrated into the box
- fabric covered interlayers
- edge sealed interlayers
- EPE fixation interlayers

Options:

- identification - labels or printing
- self-adhesive layer for firm attachment of the base



7. Packaging Solutions

7.13. Sewn inserts

Material
HDPE, PVC, PES, PAD

Sewn inserts protect visible parts from scratching.

Used materials:

- HDPE fibers
- PVC
- nonwoven fabric

Types:

- single inserts (sleeves)
- inserts for the boxes and KLT, for stackable CP boxes
- inserts suspended from a metal frame
- inserts with a transparent lid (visual control for operators)

Options:

- identification with patches, self-adhesive labels or a document case



Č. POLOŽKY
2
3
4

Č. DÍLU
šitá vložka
CP dlouhá
CP krátká

šitá vložka po stranách
celkový počet uložení
- Kratší příčky našité na
str.2

POPIS
3mm, 600g/m², modr
3mm, 600g/m²

547

50

547

347

7. Packaging Solutions

7.14. Metal constructions

Material

FE

Metal constructions are designed according to customer specific requirements – load capacity, handling characteristics and the type of packed product. Their purpose is to be a carrying frame for component storage during production or the logistic process.

Used materials:

- finished steel

Types:

- frames
- reinforcements
- constructions
- barrows

Options:

- combined with other packages – sewn inserts, grids, stackable boxes etc.



808

Vnitřní výška 770 mm

920

7. Packaging Solutions

7.15. Air Bags

Material

LDPE

The Air Bag is a new innovation in the way of packaging products, which is based on the principle of maximum protection of the transported product. The packaging forms separate air chambers that are arranged according to the protected product. Packaging is supplied unfilled with air and is inflated by one valve to all chambers.

Verwendete Materialien:

- LDPE Folien

Types:

- the packaging is manufactured according to the articles to be protected
- extensive size variability
- empty space fill
- pockets or bags

Options:

- UV stabilization
- ESD design
- custom printed
- film colouring



DÍLU	POPIS	rozloženy pohled/Množ.
oxu	Cp 5mm, 1000g/m2, transparent PVC L-lišta, 30x30mm, 257mm PVC H-profi No	1

8. Other Divisions of TART

Division of Packaging Materials

The Division of Packaging Materials produces and supplies a wide range of packaging from different materials and for different purposes. We permanently have more than a thousand items in stock.



Division of Packaging Machinery

The objective of the Division of Packaging Machinery is to solve customer specific requirements, which are satisfied by offering customers a complete assortment of wrapping, strapping, carton sealing and shrink wrapping machines, heat sealers and complete packaging lines.



Division of Cortec Anticorrosion System

The Division of Anticorrosion System provides, within the license of the multinational company Cortec, an innovative solution for anti-corrosion protection for the engineering, power and petrochemical industries, metal working, telecommunication, electronic, and building industries, and the automotive and other branches.



Division of Industrial Export Packaging

TART offers a complete solution of the logistic process mainly to organizations and companies that realize foreign business and whose products require non-standard packaging and protection.



Division of Envira Biodegradable Packaging

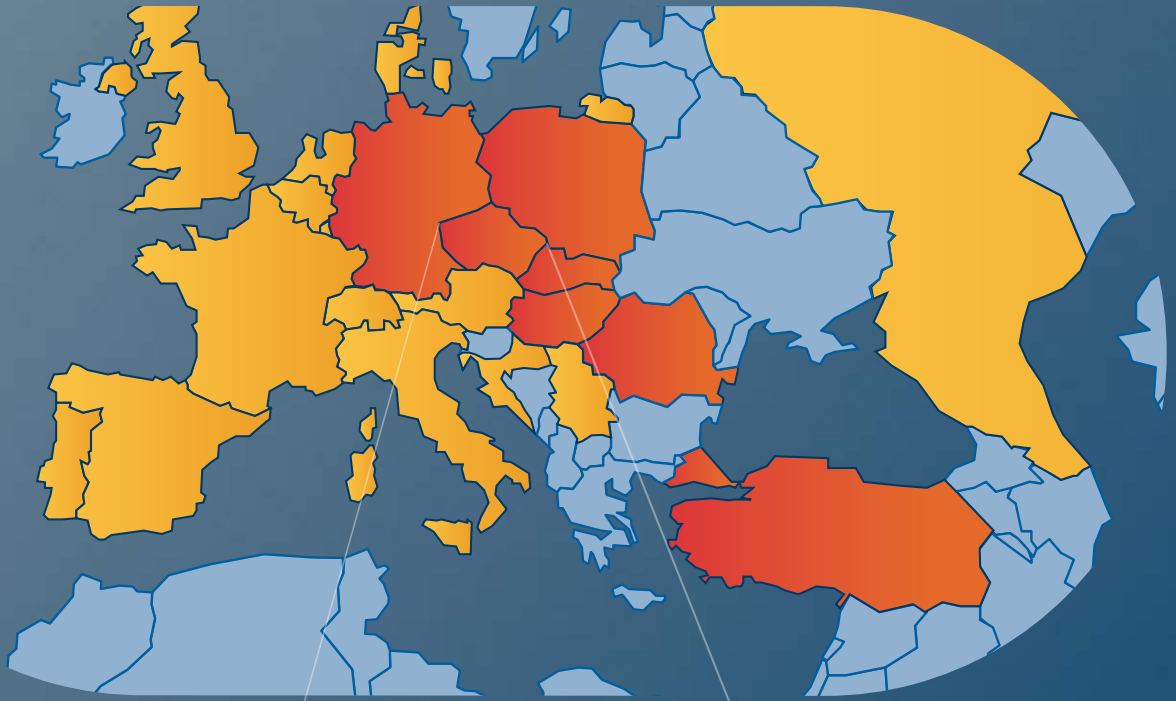
Envira® Biodegradable packaging helps protect the environment. They are made of raw materials (corn, soya) and they are fully compostable at the end of their life.



Division of Sunflex Thermoreflective Foils

SUNFLEX® Thermoreflective foils are an excellent supplement to common insulation systems for building structures. They distinctively contribute to the reduction of heat losses during the winter season and they increase comfort during summer months.





TART abroad:

- Subsidiaries of the Group TART
- Customers of the Group TART



- main office
- production plant
- distribution center
- sales agency

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