
	<b>DEHDASHT PETROCHEMICAL INDUSTRY COMPANY</b>  <b>DEHDASHT HIGH DENSITY POLYETHYLENE PROJECT</b>	 شرکت صنایع پتروشیمی خلیج فارس Persian Gulf Petrochemical Industries Co <b>PGPIC</b> شرکت صنایع پتروشیمی دشت (سهامی عام)																		
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# Packing and Marking Procedure

D0	23-Apr-2020	A.Khosravian	A.Kaviyan	Sh.Mojahed	H.Farhadi	IFA
REV	DATE ISSUE	PREPARED	CHECKED	PPI	NARGAN	PURPOSE OF ISSUE
				APPROVED		





DEHDASHT PETROCHEMICAL INDUSTRY COMPANY

DEHDASHT HIGH DENSITY POLYETHYLENE PROJECT



شرکت صنایع پتروشیمی خلیج فارس  
Persian Gulf Petrochemical Industries Co  
PGPIC  
شرکت صنایع پتروشیمی دهشت (سهامی عام)

Contract No.:

DOCUMENT TITLE: Packing and Marking Procedure

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Rev. D0

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## 1. OBJECTIVE



The PACKING AND MARKING PROCEDURE specifies the preparation, packing, and marking of all Goods or Materials or Equipment and miscellaneous items under supply in accordance with the Purchase Order, within High-Density Polyethylene (HDPE) plant for 300,000 KTPA High Density Poly Ethylene (HDPE) including required utilities production and distribution offsite facilities (herein after referred to as PLANT) at Dehdasht City, Kohgiluyeh and Boyer-Ahmad Province, Iran.

## 2. SCOPE

The following procedure is intended for minimum requirements, and adherence to this procedure in no way absolves or relieves VENDOR of any responsibility or obligation outlined in the Order. In all circumstances, the packing will be calculated in order to support any strain exerted on the GOODS during transportation. They must be carried out specifically, in order to permit the delivery of GOODS to the jobsite by sea, road or air in good condition.

## 3. DEFINITIONS

- **CONTRACTOR:** NARGAN and PETROPARS as Partnership
- **GOODS or MATERIAL(S) or EQUIPMENT:** Means all machinery, apparatus, appliances, fixtures, devices, materials and all physical objects to be permanently installed in the PLANT including special tools, test equipment, pre-commissioning, spare parts and also catalyst and/or CATALYST, adsorbents, chemicals and lubricants, commissioning and Two-Year operation and capital spare parts of the PLANT according to the CONTRACT.
- **OWNER:** DEHDASHT PETROCHEMICAL INDUSTRIES COMPANY
- **VENDOR(S)/SUPPLIER(S):** Means any firm, company or organization whose name is Approved by OWNER for issue of enquiry for supply of materials, Equipment etc. and on whom purchase order(s) will be placed by CONTRACTOR and SUBCONTRACTORS.
- **PACKER:** company to whom VENDOR/SUPPLIER has subcontracted the package.
- **FREIGHT FORWARDER:** the firm responsible for performing freight forwarding activities.

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#### 4. VENDOR'S RESPONSIBILITY

The package will have to be suitable to support numerous handlings and shall guarantee the protection of the contents from the action of external agents (atmospheric and nonatmospheric) not only during the planned transport period, but also - if there aren't different specifications - for the possible outdoor storage, in the site of destination, for at least 12 months.

The VENDOR will be considered responsible for all the possible losses or damages that result from unsuitable packing.

The measures written in the paragraphs that describe the constructive modes of different types of package are an approximate guide for the sizing of the structural and protective parts: they are normally minimum measures that have to be checked on every occasion. For this reason they don't remove the VENDOR's responsibility to prepare a suitable and safe package.

#### 5. DESCRIPTION



##### 5.1 General

##### 5.1.1 Validity

This documentation defines a series of requirements of general validity which represent the minimum requests that the VENDOR will have to follow to make the packages of CONTRACTOR products, unless it is otherwise indicated in the Material Requisition or in the Order.

##### 5.1.2 Variants

In case of presentation of his offer after CONTRACTOR approval, the VENDOR can propose packing solutions that are alternative to the ones written in this procedure and that he considers cheaper and more functional on the basis of his experiences. As a rule, possible alternative proposals won't be taken into consideration after the Order assignment.

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### 5.1.3 General instructions

#### Limit of dimensions and weight

In course of packing planning all the necessary steps must be taken to limit the dimensions and the weight as defined in the "Purchase Conditions".

#### Materials

For the wooden parts silver fir or another kind of timber that has an admissible stress to flections of at least 100 kg/cm<sup>2</sup> must be used; for the sheathing's phenolic plywood or OSB type 3 panels can be used. The humidity rate mustn't be over 20%.

Beams and boards must have neither passing or connected burls nor must big fissures; possible burls or partial fissures be closed with suitable products.

The nominal dimensions that are written in the paragraphs concerning the single packages have to be considered subject to the following tolerances: wooden parts:  $\pm 3$  mm for thickness up to 50 mm;  $\pm 5$  mm for higher thickness; phenolic plywood or OSB type 3 panels:  $\pm 1$  mm.

#### Joints




In the construction of cases, crates or pallets, if it isn't possible to get the longitudinal bottom beams from a single wooden part, one joint only of two pieces of equal section is allowed in the point of the beam where the lowest stress is expected. The joints can be made with the systems as described in the UNI 9151 norm.

#### Superimposition load

If there aren't different instructions, the cases and the crates have to be able to support a load placed on the cover as written in the following table (values in kg/m<sup>2</sup> of cover surface).

If it is not possible to observe these values, the maximum superimposition load that is guaranteed will have to be written indelibly on the four case and crate walls - in the upper right corner. If the package contents make it possible, a superimposition load increase can be achieved by placing some wooden support baseboards on the packed material. In any case, the cover must always be walkable.

PACKAGE	TRANSPORT	DISTRIBUTED LOAD	POINT LOAD
Case / Crate	Road / Direct railway	500	250
Case	Sea	1.000	500
Crate	Sea	500	250

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### Documentation

A copy of the packing list will have to be fixed on the internal surface of the cover. Also a copy of the technical documentation required in the "Purchase Conditions", in a suitable waterproof envelope, will have to be put in the package - out of the material covering. Another copy of the packing list will have to be put in a waterproof envelope which is then placed under a metallic plate marked PACKING-LIST and applied externally to the package.

### Packer's Assistance

If a packer is charged by the CONTRACTOR with the package construction, the VENDOR will have to place at the packer's disposal the lifting devices that are necessary for the positioning of the materials in the respective packages and he will have to give his own technical supervision during the stowage and protection operations.

### General Notes

Inspection of packing and marking must be carried out either by the CONTRACTOR/OWNER's representative directly or by authorized Third Party. At the time of inspection, the lids of the cases will remain open and a copy of packing list will be available in order to allow the content to be checked.




Vendor should submit his packing and marking procedure for approval prior to commencing the packing work and notifying the packing inspection application.

Vendors shall give recommendations in advance for a further 2(two) years storage under site conditions, including required storage facilities.

Highly sensitivity parts (manometers, electric boxes and others), that might interfere with the packing, shall be protected by cushioning material in order to prevent damage by the packing components. Accessories mounted in areas where there is risk of damage will be disassembled and packed separately.

**Hazardous equipment** shall be identified on a separate packing list to those for nonhazardous material. All hazardous material must be prepared in adherence to the detailed requirement relating to packing, marking and labeling set out in the most recent report of the Board's Standard Advisory Committee on the Carriage of Dangerous Goods in Ships (The Blue Book) for sea freight, and the Restricted Articles Regulations, laid down by the International Air Transport Association for airfreight.

All hazardous material shall be identified by the appropriate hazard class and technical or proper shipping name. All packing lists for hazardous material shall contain the following statement: "This is to certify that the above named material is properly classified, described,

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packaged, marked and labeled, and is in proper condition for transportation according to the appropriate IMDG / ADR / RID / IATA regulations".

NAME	VENDOR
TITLE	SIGNATURE
	TECHNICAL SHIPPING NAME

HAZARDOUS CLASS NR

UN Number	IMDG Page	Flash point (if any)
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The VENDOR shall produce any necessary hazardous cargo certificates, in accordance with the appropriate Government and International Transportation Regulations and the Material Safety Datasheets (MSDS) for all shipments.

Capital, Commissioning and Consumable spare parts and Special Tools (whenever required) shall be available at time of main equipment shipment. The Spare parts must be separate packed and clearly marked "COMMISSIONING SPARE PARTS", "CAPITAL SPARE PARTS", "CONSUMABLE SPARE PARTS", "SPECIAL TOOLS" and included in main equipment packages attached to baseboards. If it deems necessary to ship them separately due to size and dimensions, they shall be properly protected for storage and packing.




Spare parts for two years operation (if required), which shall be individually tagged, must be covered with a suitable preservative and wrapped with greaseproof paper and be packed in separate cases from the main equipment. The cases are to bear the markings as specified and in addition the words "SPARE PARTS FOR TWO YEARS OPERATION".

Fire bricks, special tiles and insulation refractories, shall be boxed after sealing in a polyethylene liner. These boxes shall be skid mounted. Instructions regarding storage prior to installation shall be stenciled on each box with particular reference to adverse weather/temperature/humidity conditions.

The packaging for electrical panels and instruments shall be provided with full protection against physical damage/vibration and atmospheric attack during transit and possible long period under adverse storage conditions. Packing of electrical panels shall be provided with humidity and shock sensors to ensure secure shipment and storage of the package.

Electronic PCBs shall be packed with anti-electrostatic envelopes.

Packing list for laboratory equipment and packages shall be prepared by details.

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## 5.2 CHOICE OF THE TYPE OF PACKAGE

### 5.2.1 Choice criteria

Generally the type of package that has to be prepared for the forwarding and the storage of any goods is chosen on the basis of the following information:

- 1 Product to be packed (such as machinery, apparatuses, measuring instruments, plants etc.)
- 2 Way of transport that has been chosen (road / railway / sea<sup>1</sup> / air)
- 3 Particular instructions that are relative to the specific case (for example particular requests of protection against humidity, availability of "one way"<sup>2</sup> containers etc.) as regards to point 1, CONTRACTOR classify products in 7 GROUPS OF GOODS:

- A APPARATUSES
- B MACHINERY
- C PACKAGES
- D INSTRUMENTAL LABORATORY AND ELECTRIC EQUIPMENT  
Sensitive to dust or humidity
- E INSTRUMENTAL LABORATORY AND ELECTRIC EQUIPMENT  
Insensitive to dust or humidity
- F PIPING, STEEL STRUCTURES, PLATES
- G CHEMICAL AND FOOD INDUSTRY PRODUCTS, VEGETABLE KINGDOM PRODUCTS AND INERT PRODUCTS




**The choice of the way of transport (point 2) is normally suggested by the destination of goods; in any case the packer will receive this information directly from CONTRACTOR or indirectly from the VENDOR.**

**Analogously, CONTRACTOR or its VENDOR will inform the packer of possible specific packing instructions.**




**On that account the TYPE of package of CONTRACTOR products can be defined on the basis of the following information:**

<sup>1</sup> In certain cases the sea transport will be distinguished between conventional sea transport (package in accordance with procedure sent just like that) and sea transport in container (package in accordance with procedure put in container).

<sup>2</sup> They are ordinary reusable containers that, when they arrive at their last forwarding, are used as not returnable containers and so they are always sent to destination. Generally the one way containers ask a lower number of handlings of the contents, which sometimes allows (when explicitly specified) to prepare cheaper packages.

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- 0** Belonging group of goods of the product to be packed
- 1** Specific product within the group of goods
- 2** Way of transport
- 3** Possible particular procedure




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### 5.2.2 Groups of goods




In the following table CONTRACTOR products are classified for Groups of Goods (GG). The list below has to be considered exemplifying, but not exhaustive.

The individuation of the belonging GG of the various products facilitates the choice of the types of package that have to be arranged (see paragraph 5.2.3).




GG	PRODUCTS
<b>A</b>	<b>APPARATUSES</b> <ul style="list-style-type: none"> <li>• Vessels, columns and heaters</li> <li>• Ejectors</li> <li>• Extinguishers</li> <li>• Static filters</li> <li>• Reactors</li> <li>• Heat exchangers</li> <li>• Tanks and vessels (cylindrical and/or spherical, prefabricated or not)</li> <li>• Silos (prefabricated or not)</li> <li>• Agitators</li> <li>• Air Cooler</li> <li>• Steam injector</li> <li>• Internals</li> <li>• Lubricants</li> </ul>
<b>B</b>	<b>MACHINERY (rotating, operating, hoisting and handling machines)</b> <ul style="list-style-type: none"> <li>• Pumps</li> <li>• Lift trucks</li> <li>• Mixers</li> <li>• Screens</li> <li>• Cranes and Hoists</li> </ul>

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<b>GG</b>	<b>PRODUCTS</b>
<b>C</b>	<p><b>PACKAGES</b> (plants installed on skid or single units to be assembled on site)</p> <ul style="list-style-type: none"> <li>• Compressors</li> <li>• Extruders and pelletizing package</li> <li>• Lifts and Goods lifts</li> <li>• Refrigerating groups</li> <li>• Air conditioning systems</li> <li>• Fire fighting systems</li> <li>• Electric transformers</li> <li>• Bagging and packing line system</li> <li>• Conveying system</li> <li>• Mixing screw feeder</li> <li>• Decanter Centrifuges</li> <li>• Vacuum cleaning system</li> <li>• Membrane separation package unit</li> <li>• Dosing package unit</li> <li>• Stabilizer emptying system package unit</li> <li>• Additive big bag package</li> <li>• Homogenization silos and blender drying facility package</li> <li>• Catalyst drum vibrator and gripper package</li> <li>• Flare package</li> <li>• Waste water treatment package</li> <li>• Chemical injection package</li> <li>• Chemical sewer neutralized package</li> <li>• BFW deaerator</li> <li>• Cooling tower and side filter package</li> <li>• Hydrogen generation package</li> <li>• Air dryer package</li> <li>• Nitrogen generation package</li> <li>• MP steam boiler</li> <li>• Potable waste package</li> <li>• RO package</li> <li>• Polishing package</li> <li>• Raw material clarifying package</li> </ul>

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GG	PRODUCTS
<b>D</b>	INSTRUMENTAL, LABORATORY AND ELECTRIC EQUIPMENT sensitive to dust or humidity <ul style="list-style-type: none"> <li>• Various items of laboratory equipment</li> <li>• Analysers</li> <li>• Electric boxes with terminal blocks</li> <li>• Instrumental / Electric panels and cubicles</li> <li>• Power transformers, dry type or not</li> <li>• Electric motors with protection &lt; IP 54</li> <li>• Instrumental and electric components with terminals/contacts (pressure switches, thermostats, circuit breakers, etc.)</li> <li>• FCS/DCS system, ESD system, F&amp;G system, Programmable Logic Controllers (PLC), computers and various microprocessor systems etc.</li> <li>• Gas chromatograph</li> <li>• Flow Transmitter</li> <li>• Level Transmitter</li> <li>• Pressure and temperature transmitter</li> <li>• Density transmitter</li> <li>• Level switch</li> <li>• Differential pressure/temperature transmitter</li> <li>• MV/LV switchgears</li> <li>• NGR</li> <li>• Telecom system</li> <li>• CCTV system</li> <li>• AC/DC UPS</li> </ul>

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GG	PRODUCTS
<b>E</b>	INSTRUMENTAL, LABORATORY AND ELECTRIC EQUIPMENT insensitive to dust or humidity <ul style="list-style-type: none"> <li>• Electric motors with protection <math>\geq</math> IP 54</li> <li>• Electric and instrumental cables</li> <li>• Thermometers</li> <li>• Pressure and Temperature gauges</li> <li>• Electric boxes without terminal blocks</li> <li>• Orifice and rupture discs</li> <li>• Level indicators</li> <li>• Cable glands</li> <li>• Cable trays</li> <li>• Fiber glass protective boxes (for electrical and instrumentation)</li> <li>• Transformer accessories and spare parts</li> <li>• Instrument valves with or without actuator</li> <li>• Desuperheater</li> <li>• Pressure safety valves</li> <li>• Pitot Tubes and Annubars</li> <li>• Flowmeter</li> <li>• Rotameter</li> <li>• Thermowells</li> <li>• Instrument hook up materials</li> <li>• Bus duct</li> <li>• MV/LV cables</li> <li>• Cathodic protection system</li> </ul>

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GG	PRODUCTS
<b>F</b>	<b>PIPING, STEEL STRUCTURES, PLATES</b> <ul style="list-style-type: none"> <li>• Quick couplings</li> <li>• Bolts and nuts and tie rods</li> <li>• Steel structural works</li> <li>• Stairs, ladders, gangways, steps, gratings – whether shaped or not</li> <li>• Flanges, blinds, spacer, spectacle blinds and drip rings</li> <li>• Gaskets</li> <li>• Stainless and special steel rolled sections and structural shapes</li> <li>• Cable trays</li> <li>• Metallic Fittings</li> <li>• Piping valves in general and relevant accessories</li> <li>• Flame Arrestor</li> <li>• Steam Trap</li> <li>• Strainers</li> <li>• Supports</li> <li>• Metallic pipes</li> <li>• Coated steel pipes</li> <li>• Fire-fighting systems (distribution network only)</li> <li>• Pre-fabricated piping (e.g. lateral)</li> <li>• Injection nozzles</li> <li>• Sample coolers</li> <li>• Inspection hatch (sulphur pot)</li> <li>• Exhaust head</li> <li>• Insulation kits and insulation flanges</li> <li>• Flexible non-metallic hoses</li> <li>• Metallic hoses</li> <li>• Lighting pole and brackets</li> </ul>
<b>G</b>	<b>CHEMICAL PRODUCTS</b> <ul style="list-style-type: none"> <li>• Chemicals, whether dangerous or not</li> <li>• Catalysts</li> <li>• Varnishes and solvents</li> <li>• Rock wool and glass fibre</li> <li>• Refractory materials, gravel, sand, and cement</li> <li>• Compressed or liquefied gas cylinders</li> <li>• Paints</li> </ul>




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### 5.2.3 Choice of the generic type of package




The following table suggests the generic type of package that has to be prepared (for example case / crate / saddles etc.) on the basis of the group of goods, the specific product, the way of transport that has been chosen and, if necessary, of other particular specifications. It is a series of typical cases that define some general criteria of choice.

Then the definition of the type of package has to be completed with the choice of the specific type of package among possible different constructive versions (for example small-sized / reduced / standard crate); the following paragraph deals with this question.




GG	PRODUCTS - TRANSPORT - PARTICULAR SPECIFICATIONS	PACKAGE
<b>A</b>	Metallic apparatuses in general (for vessels, hoppers, filters, heat exchangers, tanks, silos etc.) <ul style="list-style-type: none"> <li>• without applied instrumentation or insulation</li> <li>• volume &gt; 5 m<sup>3</sup></li> </ul>	SADDLES
"	<ul style="list-style-type: none"> <li>• without applied instrumentation or insulation</li> <li>• volume ≤ 5 m<sup>3</sup></li> </ul>	CRATE
"	<ul style="list-style-type: none"> <li>• with applied instrumentation (e.g. pressure gauges, electro-valves, etc.) or insulated</li> <li>• of any volume or dimensions</li> </ul>	CASE
<b>A</b>	Non-metallic apparatuses in general (e.g. glass fiber reinforced plastic tanks, silos in PVC, plastic constructions etc.) <ul style="list-style-type: none"> <li>• <u>conventional sea</u> transport / air transport</li> <li>• of any volume or dimensions</li> </ul>	CRATE
"	<ul style="list-style-type: none"> <li>• <u>sea</u> transport in <u>container</u> / road transport / railway transport</li> <li>• of any volume or dimensions</li> </ul>	SADDLES
<b>A</b>	Accessories, parts, spares	CASE
<b>B</b>	Machinery in general (e.g. agitators, generators, pumps, mixers, cranes and hoists, compressors, noise control cabins etc.) <ul style="list-style-type: none"> <li>• road / railway transport</li> <li>• with possible intermediate storages</li> </ul>	CASE
"	<ul style="list-style-type: none"> <li>• road / railway transport</li> <li>• without intermediate storages</li> </ul>	CRATE
"	<ul style="list-style-type: none"> <li>• sea / air transport</li> </ul>	CASE

 	<b>DEHDASHT PETROCHEMICAL INDUSTRY COMPANY</b>  <b>DEHDASHT HIGH DENSITY POLYETHYLENE PROJECT</b>	 شرکت صنایع پتروشیمی خلیج فارس Persian Gulf Petrochemical Industries Co <b>PGPIC</b> شرکت صنایع پتروشیمی دهشت (سهامی عام)																		
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<b>GG</b>	<b>PRODUCTS - TRANSPORT - PARTICULAR SPECIFICATIONS</b>	<b>PACKAGE</b>
<b>C</b>	Packages (e.g. turbines, compressors, generating sets, boilers, extruders, water treatment units, lifts and goods lifts, refrigerating groups, air conditioning systems, firefighting systems, cooling tower, electric transformers, etc.) <ul style="list-style-type: none"> <li>sea / air transport</li> </ul>	CASE
"	<ul style="list-style-type: none"> <li>road / railway transport</li> <li>with possible intermediate storages</li> </ul>	CASE
"	<ul style="list-style-type: none"> <li>road / railway transport</li> <li>without intermediate storages</li> <li>without instrumental equipment sensitive to dust or humidity</li> <li>for onshore HVAC main equipment, crate with nylon coverage</li> </ul>	CRATE
<b>D</b>	Instrumental, laboratory and electric equipment <u>sensitive to dust or humidity</u> (e.g. electric motors with protection < IP 54, electric panels, transformer (for transport by sea) and etc.)	CASE
<b>E</b>	Instrumental laboratory and electric equipment <u>insensitive to dust or humidity</u> (e.g. electric motors with protection ≥ IP 54, pressure gauges etc.)	CASE
<b>E</b>	All types of cables wound in reels	Staved REEL/Steel REEL
<b>E</b>	Cable trays (with small parts pre-packed in small-sized cases) Fiberglass protective boxes without electrical and instrumental components inside	CRATE
<b>F</b>	Plates Lighting poles and brackets	PALLET

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GG	PRODUCTS - TRANSPORT - PARTICULAR SPECIFICATIONS	PACKAGE
F	Quick couplings Bolts and tie rods Expansion bends Flanges (for size larger than 10" on crate or pallet with nylon coverage) Gaskets Fittings (for size larger than 10" on crate or pallet with nylon coverage) Piping valves and relevant accessories Lugs Manifolds	CASE
F	Pre-fabricated steel structural works and structural shapes with sturdy carrying structure $\leq 5$ mm thick Stairs, ladders, guards, parapets, handrails, steps, gratings whether - shaped or not -, cable trays, chequered and/or pre-varnished plates and translucent plates ("ondulit" type), metal and/or pre-varnished panels window and door frames Calendered plates and bearings that can be easily piled up	CRATE
F	Pre-fabricated steel structural works and structural shapes with sturdy carrying structure $> 5$ mm thick	BUNDLE
F	<u>Not sheathed</u> pipes and piping in general: conduit pipes, carbon steel pipes; stainless steel or other metal pipes; non-metallic pipes in general (PVC, fiberglass), pre-fabricated piping, <ul style="list-style-type: none"> <li>• Up to DN80 (3")</li> </ul>	CRATE for pipes
"	<ul style="list-style-type: none"> <li>• From DN100 (4") up to DN250 (10")</li> </ul>	BUNDLE
"	<ul style="list-style-type: none"> <li>• Over DN250 (10")</li> </ul>	LOOSE
F	<u>Bituminized</u> pipes and piping in general <ul style="list-style-type: none"> <li>• Up to DN80 (3")</li> </ul>	CRATE for pipes
"	<ul style="list-style-type: none"> <li>• From DN100 (4") up to DN600 (24")</li> </ul>	BUNDLE
"	<ul style="list-style-type: none"> <li>• Over DN600 (24")</li> </ul>	Double SADDLES
F	<u>Insulated</u> pipes and piping in general <ul style="list-style-type: none"> <li>• transport by sea</li> </ul>	CASE
"	<ul style="list-style-type: none"> <li>• road / railway transport</li> </ul>	CRATE for pipes

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<b>GG</b>	<b>PRODUCTS - TRANSPORT - PARTICULAR SPECIFICATIONS</b>	<b>PACKAGE</b>
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<b>G</b>	Products that are not dangerous (see the safety sheet; e.g. refractory, sand, cement, powders, resins, coal, gravel) and that are pre-packed in metallic drums or sacks (seeds and selected seeds excluded)	PALLET
"	<ul style="list-style-type: none"> <li>• road transport / <u>sea transport in container</u></li> <li>• air transport / <u>conventional sea transport</u></li> </ul>	CASE
<b>G</b>	Products that are not dangerous and that are pre-packed in plastic drums Rock wool and fiber glass pre-packed (e.g. in rolls)	CRATE
<b>G</b>	Products that are not dangerous and that are pre-packed in cartons Food industry products in general Seeds and selected seeds	CASE
<b>G</b>	Dangerous products (see the safety sheet)	HOMOLOGATED PACKAGE

#### 5.2.4 Choice of the specific type of package

The choice table of the preceding paragraph suggests the alternative use of package of main different constructive typology (for example cases / crates / saddles etc.).




Then - for example as in the case of cases and crates - different constructive or dimensional versions (e.g. small-sized / reduced / standard crate) are possible. The complete list of the single specific types of package with the respective use directions is written below.

<b>N</b>	<b>PACKAGE</b>	<b>INDICATIONS</b>
----------	----------------	--------------------

 	<b>DEHDASHT PETROCHEMICAL INDUSTRY COMPANY</b>  <b>DEHDASHT HIGH DENSITY POLYETHYLENE PROJECT</b>	 شرکت صنایع پتروشیمی خلیج فارس Persian Gulf Petrochemical Industries Co <b>PGPIC</b> شرکت صنایع پتروشیمی دشت (سهامی عام)																		
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1	<u>Small-sized CASE plywood / OSB sheathing</u>	<ul style="list-style-type: none"> <li>External volume up to 3 m<sup>3</sup></li> <li>Net weight up to 500 kg</li> </ul>
2	<u>Small-sized CASE wooden board sheathing</u>	<ul style="list-style-type: none"> <li>External volume up to 3 m<sup>3</sup></li> <li>Net weight up to 500 kg</li> </ul>
3	<u>Reduced-size CASE (wooden board sheathing)</u>	<ul style="list-style-type: none"> <li>External dimensions up to 800 x 250 x 250 cm</li> <li>Net weight up to 3.000 kg</li> </ul>
4	<u>Standard CASE plywood / OSB sheathing</u>	<ul style="list-style-type: none"> <li>No limits of dimensions</li> <li>Net weight up to 30.000 kg</li> </ul>
5	<u>Standard CASE wooden board sheathing</u>	<ul style="list-style-type: none"> <li>No limits of dimensions</li> <li>Net weight up to 60.000 kg</li> </ul>
6	<u>Small-sized CRATE</u>	<ul style="list-style-type: none"> <li>External volume up to 3 m<sup>3</sup></li> <li>Net weight up to 500 kg</li> </ul>
7	<u>Reduced-size CRATE</u>	<ul style="list-style-type: none"> <li>External dimensions up to 800 x 250 x 250 cm</li> <li>Net weight up to 3.000 kg</li> </ul>
8	<u>Standard CRATE</u>	<ul style="list-style-type: none"> <li>No limits of dimensions</li> <li>Net weight up to 60.000 kg</li> </ul>
9	<u>CRATE for pipes</u>	<ul style="list-style-type: none"> <li>Pipes (see <b>5.2.3</b> - Choice table)</li> </ul>
10	<u>SADDLES</u>	<ul style="list-style-type: none"> <li>Dimensions of the apparatus &gt; 5 m<sup>3</sup></li> </ul>
11	<u>SADDLES on slides</u>	<ul style="list-style-type: none"> <li>Dimensions of the apparatus &gt; 5 m<sup>3</sup></li> </ul>
12	<u>Double SADDLES</u>	<ul style="list-style-type: none"> <li>Pipes (see <b>5.2.3</b> - Choice table)</li> </ul>
13	<u>BUNDLE</u>	<ul style="list-style-type: none"> <li>Gross weight up to 8.000 kg</li> <li>Dimensions (Width x Height) up to 120 x 150 cm</li> </ul>
14	<u>PALLET</u>	<ul style="list-style-type: none"> <li>(see <b>5.2.3</b> - Choice table)</li> </ul>
15	<u>Staved REEL/Steel REEL</u>	<ul style="list-style-type: none"> <li>All types of cables</li> </ul>
16	<u>HOMOLOGATED PACKAGE</u>	<ul style="list-style-type: none"> <li>Dangerous products</li> </ul>




The constructive executions of the different specific types of packages are described and illustrated in the following chapter; besides, some useful directions to size the package that has been chosen are given (definition of the sections and the thickness of the structural and protective parts).

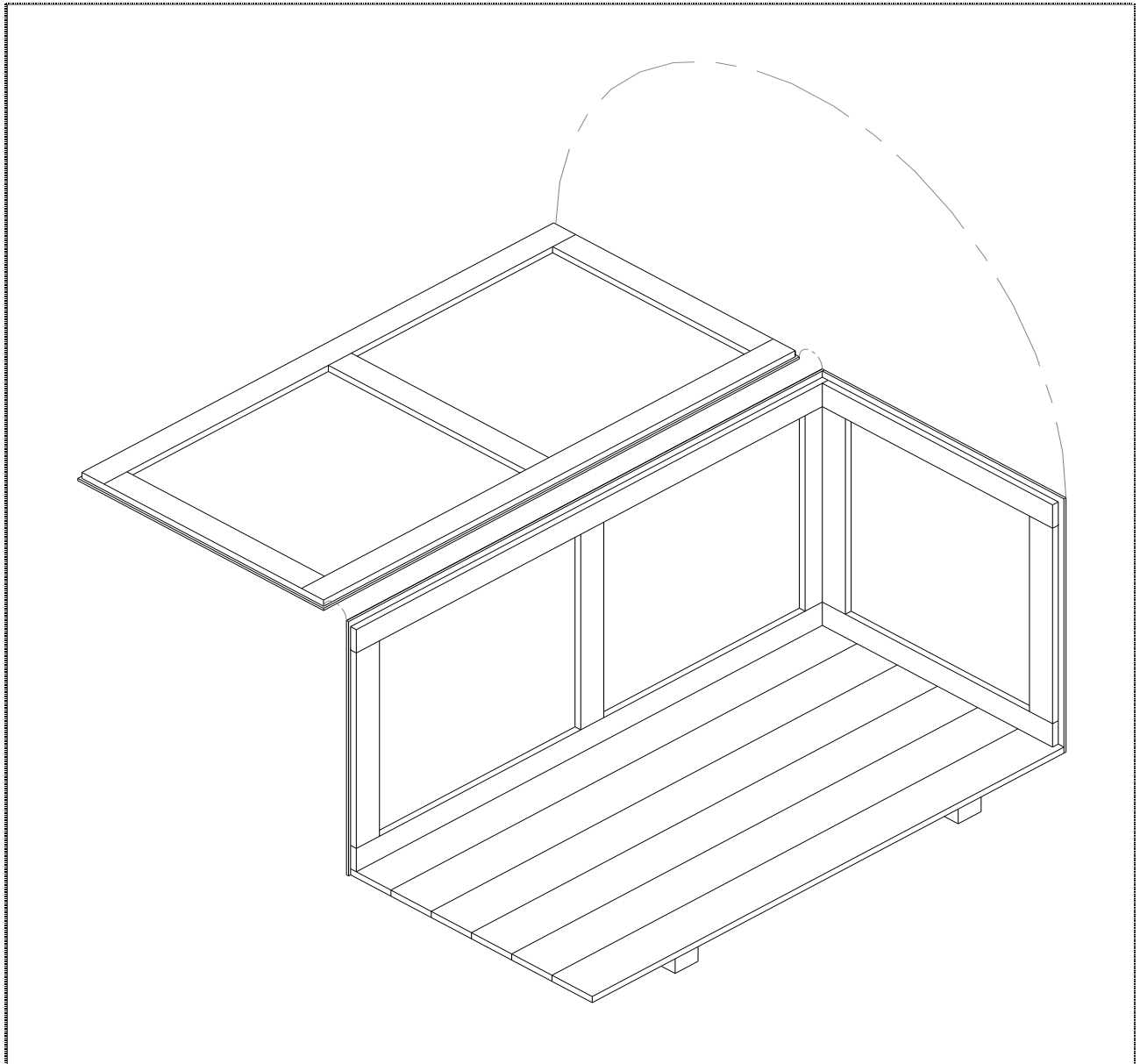
 	<b>DEHDASHT PETROCHEMICAL INDUSTRY COMPANY</b>  <b>DEHDASHT HIGH DENSITY POLYETHYLENE PROJECT</b>	 شرکت صنایع پتروشیمی خلیج فارس Persian Gulf Petrochemical Industries Co <b>PGPIC</b> شرکت صنایع پتروشیمی دہشت (سهامی عام)																		
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A rational choice of the specific type of package among the numerous possible options, as well as its correct sizing, permit the achievement of the highest economy of material and the condition of the greatest possible safety for the forwarding of the material to destination.

### 5.3 CONSTRUCTIVE SPECIFICATIONS



#### 5.3.1 Small-sized CASES - plywood / OSB sheathing

 	<b>DEHDASHT PETROCHEMICAL INDUSTRY COMPANY</b> <b>DEHDASHT HIGH DENSITY POLYETHYLENE PROJECT</b>	 شرکت صنایع پتروشیمی خلیج فارس Persian Gulf Petrochemical Industries Co <b>PGPIC</b> شرکت صنایع پتروشیمی دشت (سهامی عام)																		
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**Indications:**

- External volume up to 3 m<sup>3</sup>
- Net weight up to 500 kg

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## SIZING

These cases can be used as main packing box - for any type of forwarding, but with external volume not less than 0,3 m<sup>3</sup> - or as pre-packing boxes (e.g. for small parts or accessory components, without a minimum limit of volume) to be put, later, in bigger packing boxes. Thanks to their lightness, they are particularly suitable for air shipment, whose costs depend greatly on the weight of the package.

The bottom is made up of longitudinal adjoining boards, nailed to two or more transversal underbeams; the walls and the cover are composed of an internal frame and an external sheathing (see the figure).

The sheathing is composed of adjoining panels with a basis of wood (phenolic plywood or OSB type 3 panels).




Only the cover is waterproofed by a double polyethylene film coating (0,1 mm min. thick) that is put between the frame and the sheathing, and by closing the fissures between the panels with a suitable adhesive (e.g. polyvinyl acetate glue).

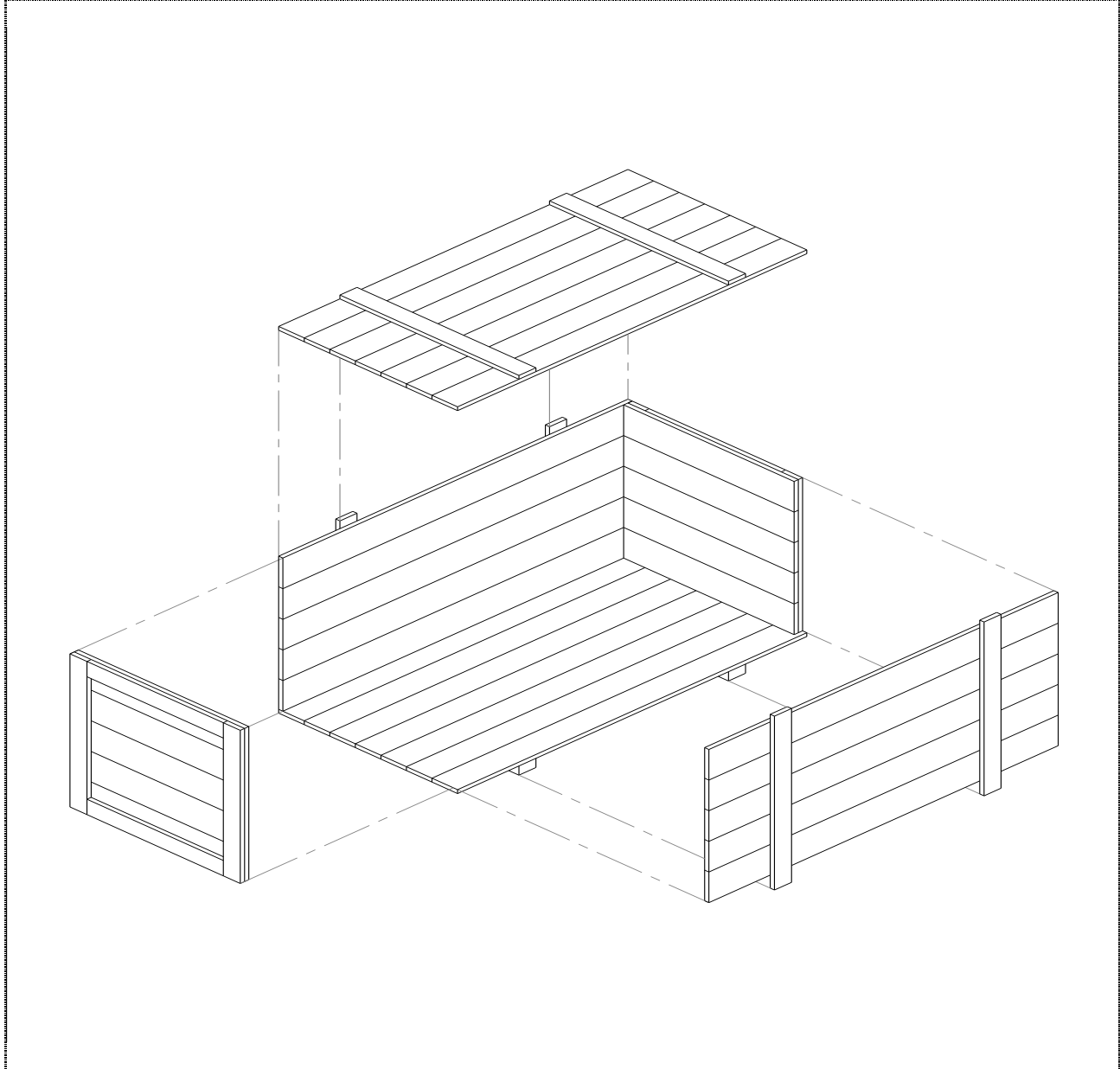
On the contrary, the bottom must permit and facilitate the drainage of possible condensation or liquids.

The minimum sections of the structural parts are written in the following table.

MINIMUM SECTIONS		
Underbeam section [cm]	Internal frame thickness [cm]	Sheathing panel thickness [cm]
8 x 10	2,5	0,8

### 5.3.2 Small-sized Cases - wooden board sheathing



 	<b>DEHDASHT PETROCHEMICAL INDUSTRY COMPANY</b>  <b>DEHDASHT HIGH DENSITY POLYETHYLENE PROJECT</b>	 شرکت صنایع پتروشیمی خلیج فارس Persian Gulf Petrochemical Industries Co <b>PGPIC</b> شرکت صنایع پتروشیمی دهشت (سهامی عام)																		
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**Indications:**

- External volume up to 3 m<sup>3</sup>
- Net weight up to 500 kg

**SIZING**

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<b>Contract No.:</b>  <b>DPIC/98-12</b>	<b>DOCUMENT TITLE: Packing and Marking Procedure</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">Proj. Code</td> <td style="width: 10%;">Area</td> <td style="width: 10%;">Unit</td> <td style="width: 10%;">Disc. Code</td> <td style="width: 10%;">Doc. Type</td> <td style="width: 10%;">Material Code</td> <td style="width: 10%;">Serial. No</td> </tr> <tr> <td>DPIC9812</td> <td>000</td> <td>000</td> <td>PQ</td> <td>PR</td> <td>0000</td> <td>0011</td> </tr> </table>	Proj. Code	Area	Unit	Disc. Code	Doc. Type	Material Code	Serial. No	DPIC9812	000	000	PQ	PR	0000	0011	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;"><b>Class: A</b></td> <td style="width: 50%;"><b>Rev. D0</b></td> </tr> <tr> <td colspan="2" style="text-align: center;"><b>Sheet 27 of 94</b></td> </tr> </table>	<b>Class: A</b>	<b>Rev. D0</b>	<b>Sheet 27 of 94</b>	
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These cases can be used as main packing box - for any type of forwarding, but with external volume not less than 0.3 m<sup>3</sup> - or as pre-packing boxes (e.g. for small parts or accessory components, without a minimum limit of volume) to be put, later, in bigger packing boxes. Particularly in the case of air shipment you'd better use plywood or OSB sheathing cases (see 5.3.1) in order to reduce the total weight of the package and consequently the cost of the transport.

The bottom is made up of longitudinal adjoining boards, nailed to two or more transversal underbeams; the walls and the cover are composed of external crossbeams nailed to an internal sheathing made up of wooden longitudinally adjoining boards (see the figure).

The sheathing boards must be from 12 to 24 cm in width.




The cover and the walls are waterproofed, the cover by a polyethylene film coating (0,1 mm min. thick) and by an undulated or alveolar polypropylene coating (specific weight 250 ÷ 300 g/m<sup>2</sup>), the walls by a polyethylene film coating (0,1 mm min. thick). These coatings are always applied to the internal side.

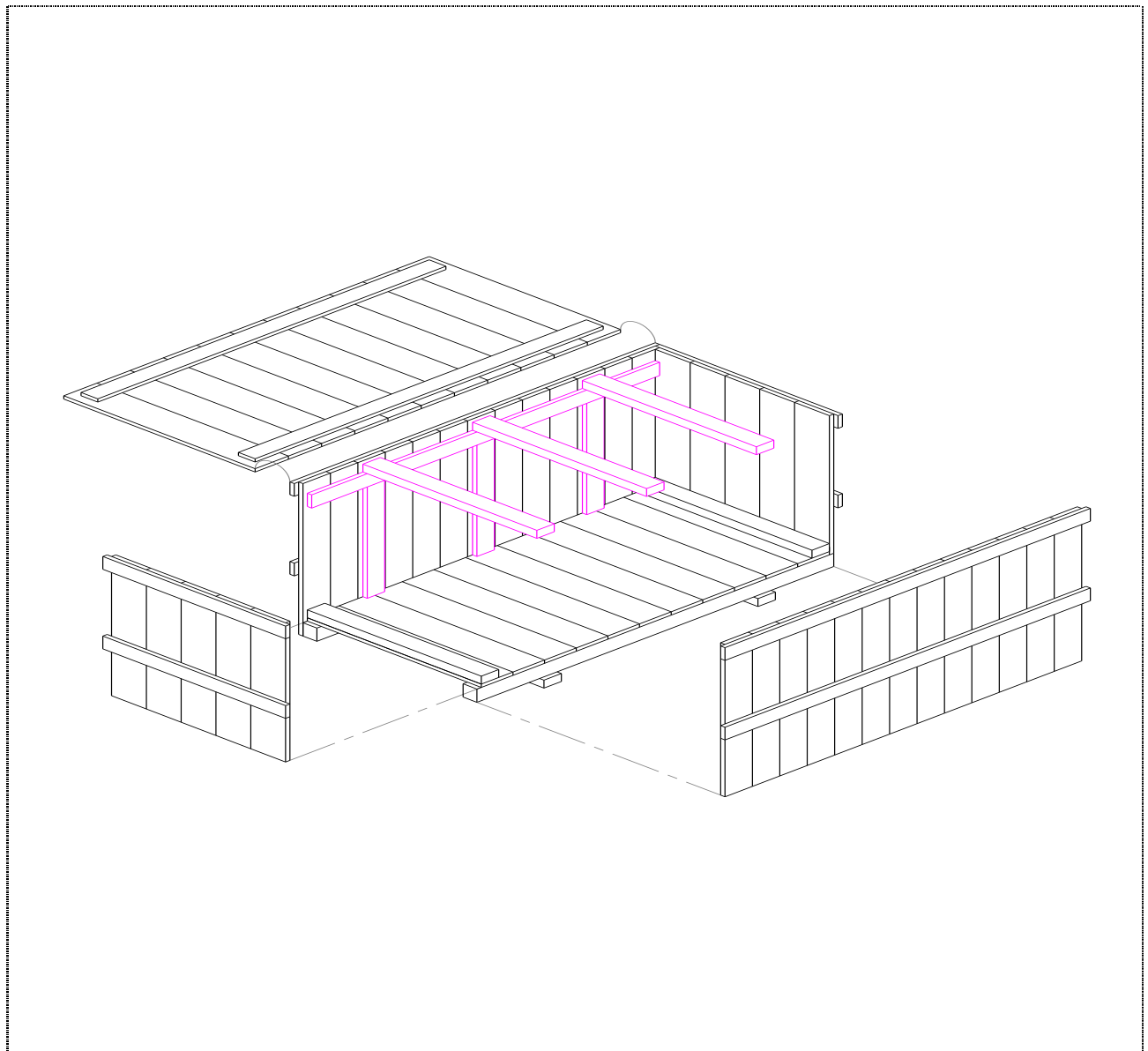
On the contrary, the bottom must permit and facilitate the drainage of possible condensation or liquids.

The minimum sections of the structural parts are written in the following table.

<b>MINIMUM SECTIONS</b>		
Underbeam section [cm]	External crossbeam thickness [cm]	Sheathing board thickness [cm]
8 x 10	2,5	2,5

### 5.3.3 Reduced-size Cases (wooden board sheathing)




 	<b>DEHDASHT PETROCHEMICAL INDUSTRY COMPANY</b>  <b>DEHDASHT HIGH DENSITY POLYETHYLENE PROJECT</b>	 شرکت صنایع پتروشیمی خلیج فارس Persian Gulf Petrochemical Industries Co <b>PGPIC</b> شرکت صنایع پتروشیمی دهشت (سهامی عام)																		
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Indications:

- External dimensions up to 800 x 250 x 250 cm
- Net weight up to 3.000 kg

**THE BOTTOM**

 	<b>DEHDASHT PETROCHEMICAL INDUSTRY COMPANY</b> <b>DEHDASHT HIGH DENSITY POLYETHYLENE PROJECT</b>	 شرکت صنایع پتروشیمی خلیج فارس Persian Gulf Petrochemical Industries Co <b>PGPIC</b> شرکت صنایع پتروشیمی دشت (سهامی عام)																		
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The bottom is made up of wooden adjoining boards that are fixed transversally to two or more longitudinal underlying beams.

Some transversal or longitudinal underbeams are positioned under the longitudinal beams and they are nailed to them. The underbeams raise the bottom from the floor, so they allow the passage and the positioning of lifting ropes or forks.

The bottom is normally strengthened by two transversal head-beams, nailed on the boarding. The load distributors are other further possible components of transversal strengthening for the bottom. They are used to strengthen the case bottom where the two lifting points are situated or to subdivide the load on the longitudinal beams.

The minimum sections of the bottom components are written in the following tables. They are valid as measures of reference with the following specifications:




- the number of the bottom beams is defined on the basis of a maximum centre distance of 100 cm;
- the section of the possible load distributors must be calculated on the basis of the stress that is generated in the bottom during the lifting operations;
- if the bottom is supplied with suitable load distributors, the boarding thickness can be always limited to 2,5 cm;

<b>MINIMUM SECTIONS OF THE BOTTOM BEAMS</b>			
Net weight [kg]	External length of the case [cm]		
	Up to 400	From 401 to 800	Over 800
Up to 1.000	8 x 8	8 x 10	8 x 10
From 1.001 to 3.000	8 x 10	10 x 12	10 x 12

<b>MINIMUM SECTIONS OF THE OTHER BOTTOM COMPONENTS</b>			
Net weight [kg]	Boarding [cm]	Underbeams [cm]	Head-beams [cm]
Up to 1.000	2,5	10 x 6	10 x 4
From 1.001 to 3.000	2,5 / 3	10 x 8	10 x 6

A standard case with plywood / OSB sheathing or a standard case with wooden board sheathing will have to be used for contents that have a net weight over 3.000 Kg.

## **WALLS AND COVER**

 	<b>DEHDASHT PETROCHEMICAL INDUSTRY COMPANY</b>  <b>DEHDASHT HIGH DENSITY POLYETHYLENE PROJECT</b>																			
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The walls (sides and heads) consist of an internal sheathing made up of wooden vertically adjoined boards and of external linking crossbeams that are placed horizontally.

The cover consists of an external sheathing made up of wooden transversally adjoined boards and of internal linking crossbeams that are placed longitudinally.

The boards must be from 12 to 24 cm in width.

The cover and the walls are waterproofed, the cover by a polyethylene film coating (0,1 mm min. thick) and by an undulated or alveolar polypropylene coating (specific weight 250 ÷ 300 g/m<sup>2</sup>) that are placed between the external sheathing and the internal crossbeams; the walls by a polyethylene film coating (0,1 mm min. thick) that is applied to the internal side.

On the contrary, the bottom must permit and facilitate the drainage of possible condensation or liquids.

An auxiliary frame is put in the sidewalls. It consists of an upper horizontal crossbeam and of vertical struts. It strengthens the walls in order to give an appropriate superimposition load to the case.



The minimum sections of the wall and cover components and the minimum number of horizontal crossbeams are written in the following tables.

<b>MINIMUM SECTIONS OF WALL AND COVER COMPONENTS</b>				
Net weight [kg]	Crossbeams [cm]	Sheathing [cm]	Aux. struct. [cm] int. h. up to 200 cm	Aux. struct. [cm] int. h. over 200 cm
Up to 1.000	12 x 2,5	2,5	10 x 2,5	10 x 4
From 1.001 to 3.000	12 x 2,5	2,5	10 x 2,5	10 x 4

<b>MINIMUM NUMBER OF CROSSBEAMS FOR EACH WALL</b>	
External height of the case [cm]	N°
Up to 200	2
Up to 250	3

The vertical struts of the auxiliary frame must be placed at a maximum centre distance of 125 cm.

#### **UNDERCOVER BEAMS**

	<b>DEHDASHT PETROCHEMICAL INDUSTRY COMPANY</b>  <b>DEHDASHT HIGH DENSITY POLYETHYLENE PROJECT</b>																			
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Every case must have undercover beams. They have to be placed transversally; they must be leaned against the auxiliary frame and nailed to the upper edge of the sidewalls.

These structural components have a double function:

- they give a suitable superimposition load to the case and make it walkable;
- together with the cover they bear the transversal compression produced by the ropes during the lifting operations.

The undercover beams will have to be placed at a maximum centre distance of 100 cm and they will have to comply with the minimum sections that are written in the following table.

<b>UNDERCOVER BEAMS</b>		
Net weight [kg]	External width of the case up to 120 cm	External width of the case from 120 to 250 cm
Up to 1.000	6 x 8	8 x 10
From 1.001 to 3.000	6 x 8	8 x 10

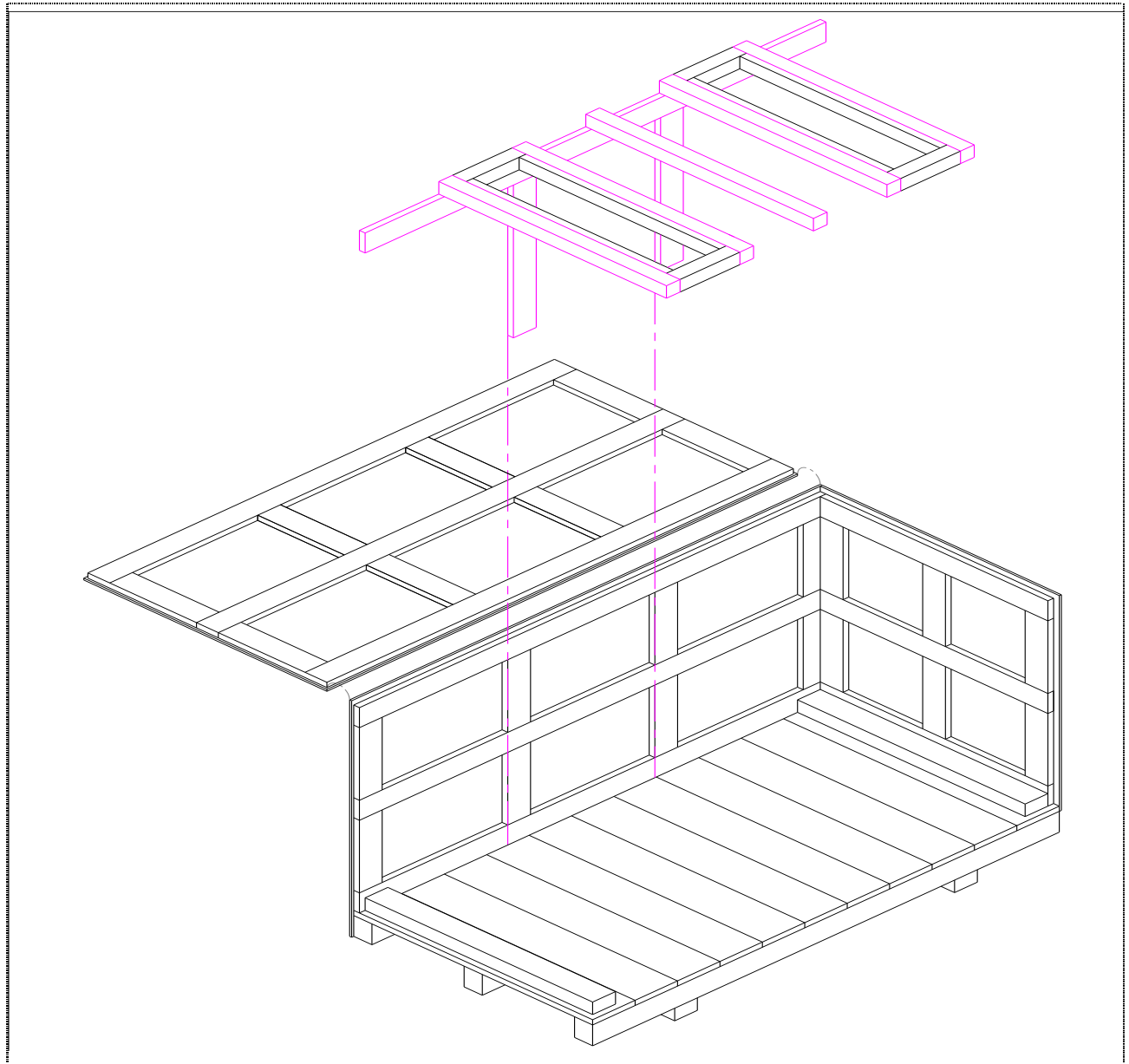
#### 5.3.4 Standard Cases - plywood / OSB sheathing



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Indications:

- No limits of dimensions
- Net weight up to 30.000 kg

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## THE BOTTOM

The bottom consists of wooden adjoining boards that are fixed transversally to two or more longitudinal underlying beams.

Some transversal or longitudinal underbeams are positioned under the longitudinal beams and they are nailed to them. The underbeams raise the bottom from the floor, so they allow the passage and the positioning of lifting ropes or forks.




The bottom is normally strengthened by two transversal head-beams that are fixed on the boarding by nauling - for thickness up to 6 cm or by bolting (for higher thickness).

The load distributors are other further possible components of transversal strengthening for the bottom. They are used to strengthen the case bottom where the two lifting points are situated or to subdivide the load on the longitudinal beams.

The minimum sections of the bottom components are written in the following tables. They are valid as measures of reference with the following specifications:

- the number of the bottom beams is defined on the basis of a maximum centre distance of 100 cm;
- beams of a smaller dimensional category can be used for the packing of skid, that is plants, machineries etc. that have a self-load-bearing structure;
- the section of the possible load distributors must be calculated on the basis of the stress that is generated in the bottom during the lifting operations;
- if the bottom is supplied with suitable load distributors, the boarding thickness can be always limited to 2,5 cm;

MINIMUM SECTIONS OF THE BOTTOM BEAMS			
Net weight [kg]	External length of the package [cm]		
	Up to 400	From 401 to 800	Over 800
Up to 1.000	8 x 8	8 x 10	8 x 10
From 1.001 to 3.000	8 x 10	8 x 10	10 x 12
From 3.001 to 8.000	10 x 12	12 x 15	12 x 15
From 8.001 to 15.000	12 x 15	12 x 15	15 x 20
From 15.001 to 30.000	15 x 20	15 x 20	20 x 20

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MINIMUM SECTIONS OF THE OTHER BOTTOM COMPONENTS				
Net weight [kg]	Boarding [cm]	Underbeams [cm]	Head-beams [cm]	Ø bolts [mm]
Up to 1.000	2,5	10 x 6	10 x 4	-
From 1.001 to 3.000	2,5	10 x 8	10 x 6	-
From 3.001 to 8.000	3	12 x 8	10 x 8	10
From 8.001 to 15.000	4	12 x 10	12 x 10	12
From 15.001 to 30.000	4	12 x 10	15 x 12	16

## WALLS AND COVER

The walls (sides and heads) and the cover consist of an internal frame and an external sheathing. The wall frame is made up of horizontal crossbeams and vertical struts; the cover frame is made up of longitudinal crossbeams and transversal cut-down sizes. The wall and cover sheathing is formed by adjoining plywood or OSB type 3 panels (see the figure).



Only the cover is waterproofed by a double polyethylene film coating (0,1 mm min. thick) that is put between the internal frame and the external sheathing, and by closing the fissures between the sheathing panels with a suitable adhesive (e.g. polyvinyl acetate glue).

On the contrary, the bottom must permit and facilitate the drainage of possible condensation or liquids.

An auxiliary frame is put in the sidewalls. It consists of an upper horizontal crossbeam and of vertical struts. It strengthens the walls in order to give an appropriate superimposition load to the case.

The minimum sections of the wall and cover components and the minimum number of horizontal crossbeams are written in the following tables.

MINIMUM SECTIONS OF WALL AND COVER COMPONENTS				
Net weight [kg]	Frame [cm]	Sheathing [cm]	Auxil. Struct. [cm] int. h. up to 200 cm	Auxil. Struct. [cm] int. h. over 200 cm
Up to 1.000	10 x 4	1	10 x 2,5	10 x 4
From 1.001 to 3.000	10 x 4	1	10 x 2,5	10 x 4
From 3.001 to 8.000	10 x 4	1	10 x 4	10 x 4
From 8.001 to 15.000	12 x 4	1,3	10 x 4	10 x 4
From 15.001 to	12 x 4	1,5	10 x 4	10 x 4

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30.000			
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<b>MINIMUM NUMBER OF CROSSBEAMS FOR EACH WALL</b>	
External height of the case [cm]	N°
Up to 140	2
Up to 240	3
Up to 340	4
Over 340	5

The vertical struts of the auxiliary frame must be placed at a maximum centre distance of 125 cm.

#### UNDERCOVER BEAMS AND STRENGTHENING STRUCTURES




Every case must have undercover beams. They have to be placed transversally; they must be leaned against the auxiliary frame and nailed to the upper edge of the sidewalls.

These structural components have a double function:

- they give a suitable superimposition load to the case and make it walkable;
- together with the cover and the possible strengthening structures they bear the transversal compression produced by the ropes during the lifting operations.

The undercover beams must be placed at a maximum centre distance of 100 cm and they must comply with the minimum sections that are written in the following table.

<b>UNDERCOVER BEAMS</b>				
Net weight [kg]	External width of the case [cm]			
	Up to 120	From 121 to 220	From 221 to 270	Over 270
Up to 1.000	6 x 8	8 x 8	8 x 10	10 x 12
From 1.001 to 3.000	6 x 8	8 x 10	8 x 10	10 x 12
From 3.001 to 8.000	8 x 10	8 x 10	10 x 12	12 x 15
From 8.001 to 15.000	8 x 10	10 x 12	12 x 15	12 x 15
From 15.001 to 30.000	10 x 12	10 x 12	12 x 15	12 x 15

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The cases that have an external width over 270 cm or a net weight over 10.000 kg have to be provided with wooden additional strengthening structures able to support the transversal compression that is produced by the ropes during the lifting operations.

Each strengthening structure consists of a frame that is put between two successive undercover beams (see the figure). The longitudinal cut-down sizes, stressed to flexion, have the same section of the undercover beams; the transversal listels, nailed to the undercover beams and subjected to compression, can have a smaller section (not less than half of the undercover beams).

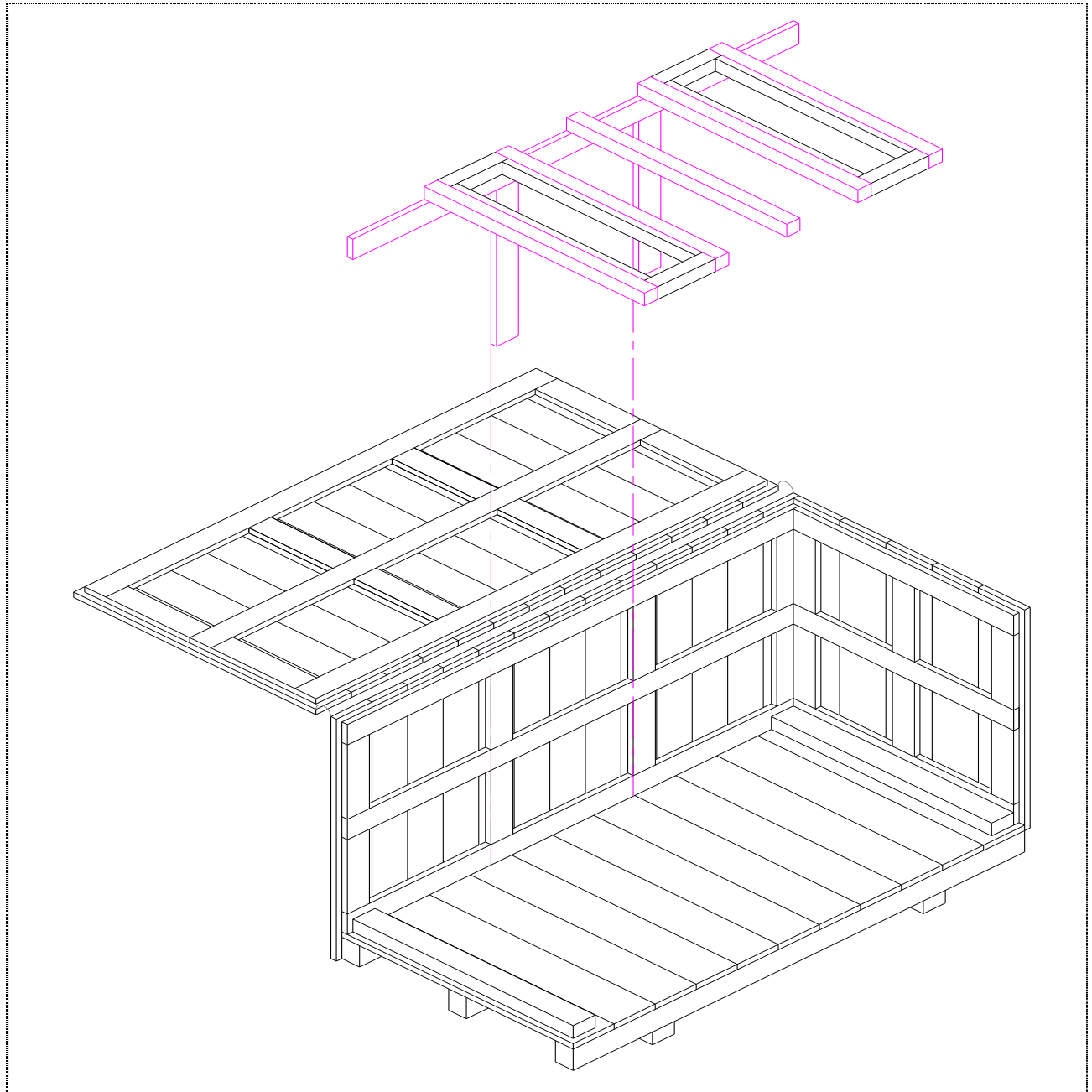
### 5.3.5 Standard Cases - wooden board sheathing



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DEHDASHT HIGH DENSITY POLYETHYLENE PROJECT






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Indications:

- No limits of dimensions
- Net weight up to 60.000 kg

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## THE BOTTOM

The bottom consists of wooden adjoining boards that are fixed transversally to two or more longitudinal underlying beams.

Some transversal or longitudinal underbeams are positioned under the longitudinal beams and they are nailed to them. The underbeams raise the bottom from the floor, so they allow the passage and the positioning of lifting ropes or forks.

The bottom is normally strengthened by two transversal head-beams that are fixed on the boarding by nauling - for thickness up to 6 cm or by bolting (for higher thickness).



The load distributors are other further possible components of transversal strengthening for the bottom. They are used to strengthen the case bottom where the two lifting points are situated or to subdivide the load on the longitudinal beams.

The minimum sections of the bottom components are written in the following tables. They are valid as measures of reference with the following specifications:

- the number of the bottom beams is defined on the basis of a maximum centre distance of 100 cm;
- beams of a smaller dimensional category can be used for the packing of skid, that is plants, machineries etc. that have a self-load-bearing structure;
- the section of the possible load distributors must be calculated on the basis of the stress that is generated in the bottom during the lifting operations;
- if the bottom is supplied with suitable load distributors, the boarding thickness can be always limited to 2,5 cm;

<b>MINIMUM SECTIONS OF THE BOTTOM BEAMS</b>			
Net weight [kg]	External length of the case [cm]		
	Up to 400	From 401 to 800	Over 800
From 3.001 to 8.000	10 x 12	12 x 15	12 x 15
From 8.001 to 15.000	12 x 15	12 x 15	15 x 20
From 15.001 to 30.000	15 x 20	15 x 20	20 x 20
From 30.001 to 45.000	15 x 20	20 x 20	20 x 25
From 45.001 to 60.000	20 x 20	20 x 25	20 x 25

<b>MINIMUM SECTIONS OF OTHER BOTTOM COMPONENTS</b>
--

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Net weight [kg]	Boarding [cm]	Underbeams [cm]	Head-beams [cm]	Ø bolts [mm]
From 3.001 to 8.000	3	12 x 8	10 x 8	10
From 8.001 to 15.000	4	12 x 10	12 x 10	12
From 15.001 to 30.000	4	12 x 10	15 x 12	16
From 30.001 to 45.000	5	15 x 10	15 x 12	16
From 45.001 to 60.000	5	18 x 10	20 x 15	n° 2 Ø16

For net weight up to 30.000 Kg you'd better use the standard case with plywood / OSB sheathing.

## WALLS AND COVER

The walls (sides and heads) and the cover consist of an internal frame and an external sheathing. The wall frame is made up of horizontal crossbeams and vertical struts; the cover frame is made up of longitudinal crossbeams and transversal cut-down sizes. The wall and cover sheathing is formed by wooden adjoining boards (see the figure).




The beams must be from 12 to 24 cm in width.

The cover and the walls are waterproofed, the cover by a polyethylene film coating (0,1 mm min. thick) and by an undulated or alveolar polypropylene coating (specific weight 250 ÷ 300 g/m<sup>2</sup>); the walls by a polyethylene film coating (0,1 mm min. thick). These coatings are put between the external sheathing and the internal frame.

On the contrary, the bottom must permit and facilitate the drainage of possible condensation or liquids.

An auxiliary frame must be put in the sidewalls. It consists of an upper horizontal crossbeam and of vertical struts. It strengthens the walls in order to give an appropriate superimposition load to the case.

The minimum sections of the wall and cover components and the minimum number of horizontal crossbeams are written in the following tables.

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<b>MINIMUM SECTIONS OF WALL AND COVER COMPONENTS</b>				
Net weight [kg]	Frame [cm]	Sheathing [cm]	Auxil. struct. [cm] int. h. up to 200 cm	Auxil. struct. [cm] int. h. over 200 cm
From 3.001 to 8.000	10 x 4	2,5	10 x 2,5	10 x 4
From 8.001 to 15.000	12 x 4	2,5	10 x 2,5	10 x 4
From 15.001 to 30.000	12 x 4	2,5	10 x 2,5	10 x 4
From 30.001 to 45.000	12 x 4	2,5	10 x 4	10 x 6
From 45.001 to 60.000	12 x 4	2,5	10 x 4	10 x 6

<b>MINIMUM NUMBER OF CROSSBEAMS FOR EACH WALL</b>	
External height of the case [cm]	N°
Up to 140	2
Up to 240	3
Up to 340	4
Over 340	5

The vertical struts of the auxiliary frame must be placed at a maximum centre distance of 125 cm.



### **UNDERCOVER BEAMS AND STRENGTHENING STRUCTURES**

Every case must have undercover beams. They have to be placed transversally; they must be leaned against the auxiliary frame and nailed to the upper edge of the sidewalls.

These structural components have a double function:

- they give a suitable superimposition load to the case and make it walkable;
- together with the cover and the possible strengthening structures they bear the transversal compression produced by the ropes during the lifting operations.

The undercover beams must be placed at a maximum centre distance of 100 cm and they must comply with the minimum sections that are written in the following table.

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<b>UNDERCOVER BEAMS</b>				
Net weight [kg]	External width of the case [cm]			
	Up to 120	From 121 to 220	From 221 to 300	Over 270
From 3.001 to 8.000	8 x 10	8 x 10	10 x 12	12 x 15
From 8.001 to 15.000	8 x 10	10 x 12	12 x 15	12 x 15
From 15.001 to 30.000	10 x 12	10 x 12	12 x 15	12 x 15
From 30.001 to 45.000	10 x 12	12 x 15	12 x 15	12 x 15
From 45.001 to 60.000	10 x 12	12 x 15	12 x 15	12 x 15

The cases that have an external width over 270 cm or a net weight over 10.000 kg have to be provided with wooden additional strengthening structures able to support the transversal compression that is produced by the ropes during the lifting operations.

Each strengthening structure consists of a frame that is put between two successive undercover beams (see the figure). The longitudinal cut-down sizes, stressed to flexion, have the same section of the undercover beams; the transversal listels, nailed to the undercover beams and subjected to compression, can have a smaller section (not less than half of the undercover beams).

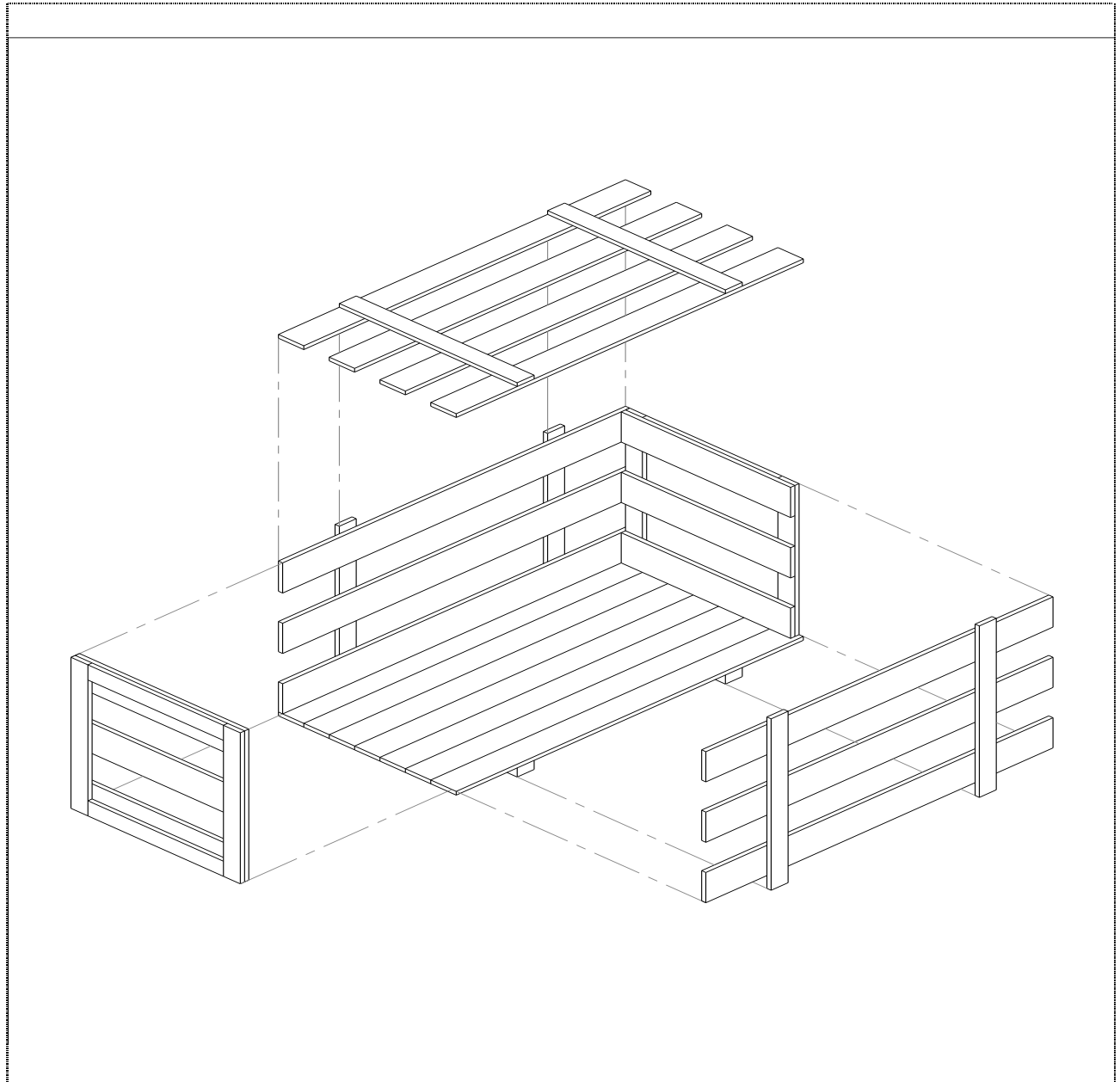
### 5.3.6 Small-sized Crates



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Indications:

- External volume up to 3 m<sup>3</sup>
- Net weight up to 500 kg

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## SIZING

These crates can be used for any type of forwarding, but with external volume not less than 0,3 m<sup>3</sup>.




The bottom consists of longitudinal boards that are adjoined or spaced out and nailed to two or more transversal underbeams; the walls and the cover are composed of external crossbeams nailed to an internal boarding made up of wooden boards that are placed longitudinally and spaced out (see the figure).

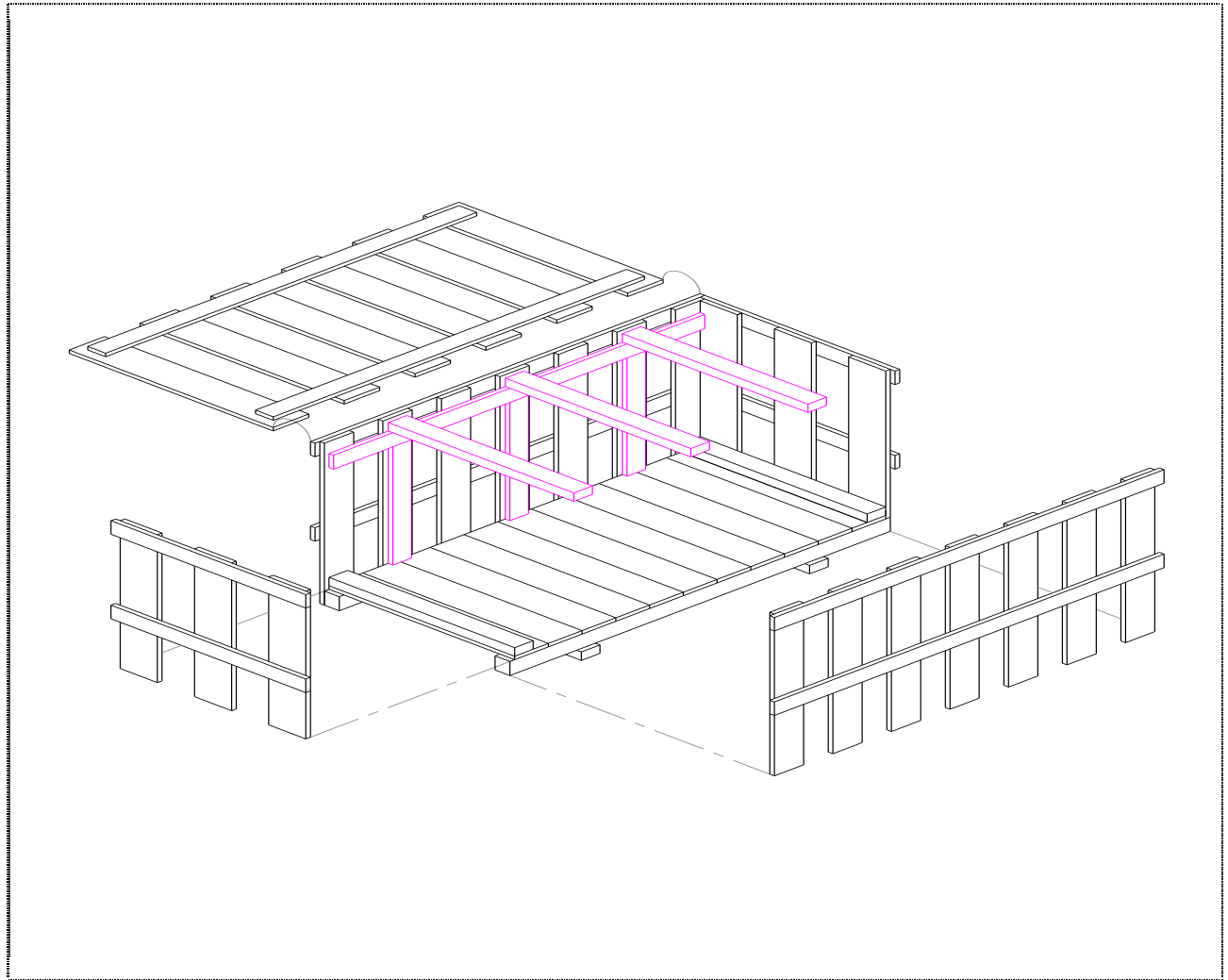
The wall and cover sheathing boards have to generate plenum surfaces not less than 45% of the total; if the contents makes it possible, also the bottom boarding can be discontinuous (crate boarding) with a plenum surface not less than 60%.

The minimum sections of the structural parts are written in the following table.

MINIMUM SECTIONS		
Underbeam section [cm]	External crossbeam thickness [cm]	Sheathing board thickness [cm]
8 x 10	2,5	2,5




### 5.3.7 Reduced-size Crates

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**Indications:**

- External dimensions up to 800 x 250 x 250 cm
- Net weight up to 3.000 kg

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## THE BOTTOM

The bottom is made up of wooden adjoining boards that are fixed transversally to two or more longitudinal underlying beams. If the contents makes it possible, the bottom boarding can be discontinuous (crate boarding) with a plenum surface not less than 60%.

Some transversal or longitudinal underbeams are positioned under the longitudinal beams and they are nailed to them. The underbeams raise the bottom from the floor, so they allow the passage and the positioning of lifting ropes or forks.

The bottom is normally strengthened by two transversal head-beams that are nailed on the boarding.



The load distributors are other further possible components of transversal strengthening for the bottom. They are used to strengthen the crate bottom where the two lifting points are situated or to subdivide the load on the longitudinal beams.

The minimum sections of the bottom components are written in the following tables. They are valid as measures of reference with the following specifications:

- the number of the bottom beams is defined on the basis of a maximum centre distance of 100 cm;
- the section of the possible load distributors must be calculated on the basis of the stress that is generated in the bottom during the lifting operations;
- if the bottom is supplied with suitable load distributors, the boarding thickness can be always limited to 2,5 cm;

MINIMUM SECTIONS OF THE BOTTOM BEAMS			
Net weight [kg]	External length of the package [cm]		
	Up to 400	From 401 to 800	Over 800
Up to 1.000	8 x 8	8 x 10	8 x 10
From 1.001 to 3.000	8 x 10	10 x 12	10 x 12

MINIMUM SECTIONS OF THE OTHER BOTTOM COMPONENTS			
Net weight [kg]	Boarding [cm]	Underbeams [cm]	Head-beams [cm]
Up to 1.000	2,5	10 x 6	10 x 4
From 1.001 to 3.000	2,5 / 3	10 x 8	10 x 6

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A standard crate will have to be used for contents that have a net weight over 3.000 Kg.

### WALLS AND COVER

The walls (sides and heads) consist of an internal sheathing made up of wooden boards, that are placed vertically and spaced out, and of external linking crossbeams placed horizontally.

The cover consists of an external sheathing made up of wooden transversally adjoined boards and of internal linking crossbeams that are placed longitudinally.

The boards must have a constant width, from 12 to 18 cm. They must generate plenum surfaces not less than 45% of the total.

An auxiliary frame must be put in the sidewalls. It consists of an upper horizontal crossbeam and of vertical struts. It strengthens the walls in order to give an appropriate superimposition load to the crate.

The minimum sections of the wall and cover components and the minimum number of horizontal crossbeams are written in the following tables.



<b>MINIMUM SECTIONS OF WALL AND COVER COMPONENTS</b>				
Net weight [kg]	Crossbeams [cm]	Sheathing [cm]	Aux. struct. [cm] int. h. up to 200 cm	Aux. struct. [cm] int. h. over 200 cm
Up to 1.000	12 x 2,5	2,5	10 x 2,5	10 x 4
From 1.001 to 3.000	12 x 2,5	2,5	10 x 2,5	10 x 4

<b>MINIMUM NUMBER OF CROSSBEAMS FOR EACH WALL</b>	
External height of the package [cm]	N°
Up to 200	2
Up to 250	3

The vertical struts of the auxiliary frame must be placed at a maximum centre distance of 125 cm.

You have to use a crate with plenum heads for the packing of loose parts that are smaller than the distance between the sheathing boards.

### UNDERCOVER BEAMS

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Every case must have undercover beams. They have to be placed transversally; they must be leaned against the auxiliary frame and nailed to the upper edge of the sidewalls.

These structural components have a double function:

- they give a suitable superimposition load to the crate and make it walkable;
- together with the cover they bear the transversal compression produced by the ropes during the lifting operations.

The undercover beams must be placed at a maximum centre distance of 100 cm and they must comply with the minimum sections that are written in the following table.

<b>UNDERCOVER BEAMS</b>		
Net weight [kg]	External width of the package up to 120 cm	External width of the package from 120 to 250 cm
Up to 1.000	6 x 8	8 x 10
From 1.001 to 3.000	6 x 8	8 x 10

### 5.3.8 Standard Crates



DEHDASHT PETROCHEMICAL INDUSTRY COMPANY

DEHDASHT HIGH DENSITY POLYETHYLENE PROJECT



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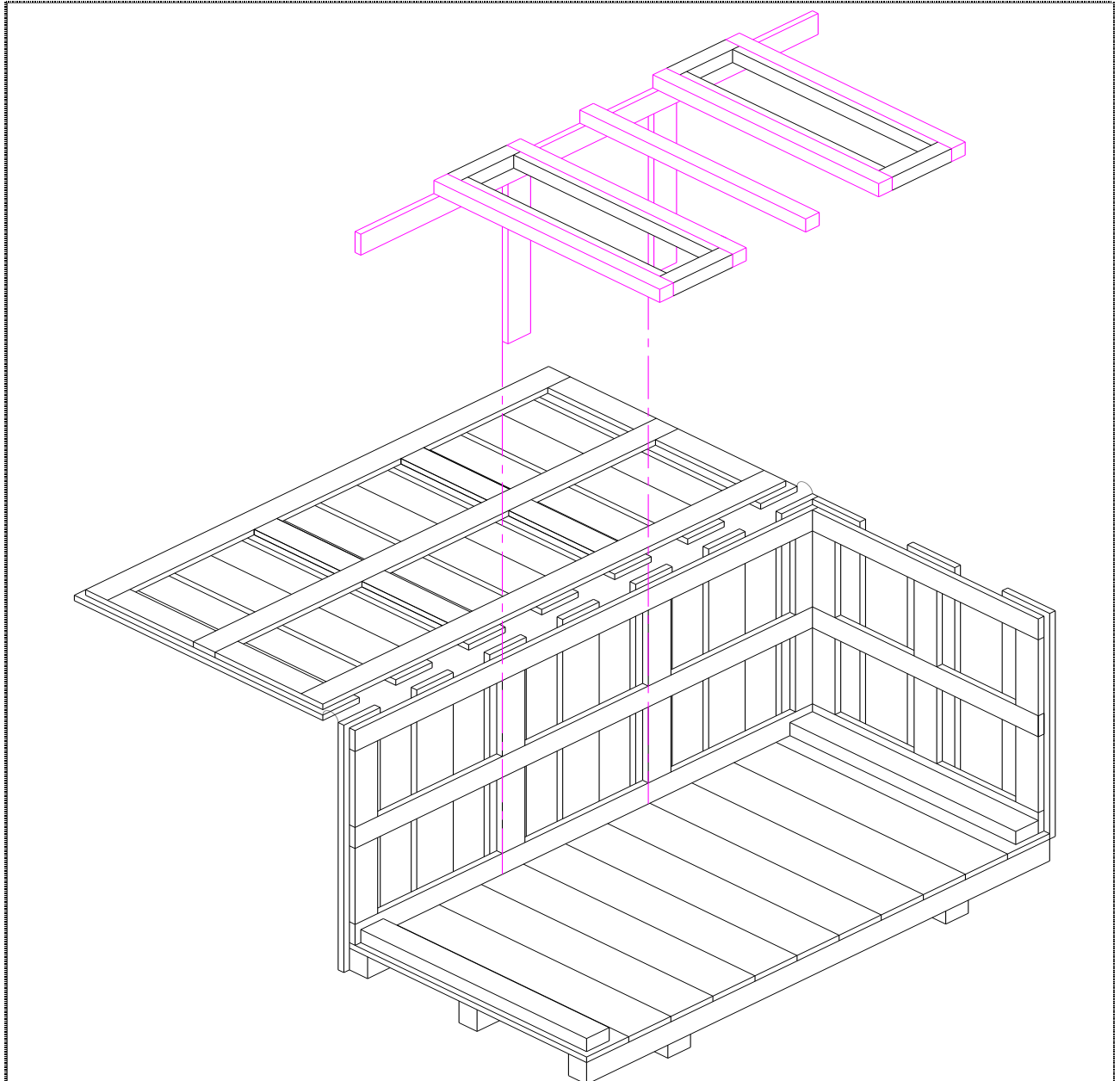
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Indications:

- No limits of dimensions
- Net weight up to 60.000 kg

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## THE BOTTOM

The bottom consists of wooden adjoining boards that are fixed transversally to two or more longitudinal underlying beams. If the contents makes it possible, the bottom boarding can be discontinuous (crate boarding) with a plenum surface not less than 60%.

Some transversal or longitudinal underbeams are positioned under the longitudinal beams and they are nailed to them. The underbeams raise the bottom from the floor, so they allow the passage and the positioning of lifting ropes or forks.




The bottom is normally strengthened by two transversal head-beams that are fixed on the boarding by nauling - for thickness up to 6 cm or by bolting (for higher thickness).

The load distributors are other further possible components of transversal strengthening for the bottom. They are used to strengthen the crate bottom where the two lifting points are situated or to subdivide the load on the longitudinal beams.




The minimum sections of the bottom components are written in the following tables. They are valid as measures of reference with the following specifications:

- the number of the bottom beams will be defined on the basis of a maximum centre distance of 100 cm;
- beams of a smaller dimensional category can be used for the packing of skid, that is plants, machineries etc. that have a self-load-bearing structure;
- the section of the possible load distributors must be calculated on the basis of the stress that is generated in the bottom during the lifting operations;
- if the bottom is supplied with suitable load distributors, the boarding thickness can be always limited to 2,5 cm;

<b>MINIMUM SECTIONS OF THE BOTTOM BEAMS</b>			
Net weight [kg]	External length of the package [cm]		
	Up to 400	From 401 to 800	Over 800
From 3.001 to 8.000	10 x 12	12 x 15	12 x 15
From 8.001 to 15.000	12 x 15	12 x 15	15 x 20
From 15.001 to 30.000	15 x 20	15 x 20	20 x 20
From 30.001 to 45.000	15 x 20	20 x 20	20 x 25
From 45.001 to 60.000	20 x 20	20 x 25	20 x 25

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<b>MINIMUM SECTIONS OF OTHER BOTTOM COMPONENTS</b>				
Net weight [kg]	Boarding [cm]	Underbeams [cm]	Head-beams [cm]	Ø bolts [mm]
From 3.001 to 8.000	3	12 x 8	10 x 8	10
From 8.001 to 15.000	4	12 x 10	12 x 10	12
From 15.001 to 30.000	4	12 x 10	15 x 12	16
From 30.001 to 45.000	5	15 x 10	15 x 12	16
From 45.001 to 60.000	5	18 x 10	20 x 15	n° 2 Ø16

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## WALLS AND COVER

The walls (sides and heads) and the cover consist of an internal frame and an external sheathing. The wall frame is made up of horizontal crossbeams and vertical struts; the cover frame is made up of longitudinal crossbeams and transversal cut-down sizes.



The wall and cover sheathing is formed by wooden spaced out boards (see the figure). The boards must have a constant width, from 12 to 18 cm. They must generate plenum surfaces not less than 45% of the total.

An auxiliary frame must be put in the sidewalls. It consists of an upper horizontal crossbeam and of vertical struts. It strengthens the walls in order to give an appropriate superimposition load to the crate.

The minimum sections of the wall and cover components and the minimum number of horizontal crossbeams are written in the following tables.

MINIMUM SECTIONS OF WALL AND COVER COMPONENTS				
Net weight [kg]	Frame [cm]	Sheathing [cm]	Auxil. struct. [cm] int. h. up to 200 cm	Auxil. struct. [cm] int. h. over 200 cm
From 3.001 to 8.000	10 x 4	2,5	10 x 2,5	10 x 4
From 8.001 to 15.000	12 x 4	2,5	10 x 2,5	10 x 4
From 15.001 to 30.000	12 x 4	2,5	10 x 2,5	10 x 4
From 30.001 to 5.000	12 x 4	2,5	10 x 4	10 x 6
From 45.001 to 60.000	12 x 4	2,5	10 x 4	10 x 6

MINIMUM NUMBER OF CROSSBEAMS FOR EACH WALL	
External height of the package [cm]	N°
Up to 140	2
Up to 240	3
Up to 340	4
Over 340	5

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The vertical struts of the auxiliary frame must be placed at a maximum centre distance of 125 cm.

You have to use a crate with plenum heads for the packing of loose parts that are smaller than the distance between the sheathing boards.

### UNDERCOVER BEAMS AND STRENGTHENING STRUCTURES

Every crate must have undercover beams. They have to be placed transversally; they must be leaned against the auxiliary frame and nailed to the upper part of sidewalls.

These structural components have a double function:



- they give a suitable superimposition load to the crate and make it walkable;
- Together with the cover and the possible strengthening structures they bear the transversal compression produced by the ropes during the lifting operations.

The undercover beams have to be placed at a maximum centre distance of 100 cm and they have to comply with the minimum sections that are written in the following table.

<b>UNDERCOVER BEAMS</b>				
Net weight [kg]	External width of the package [cm]			
	Up to 120	From 121 to 220	From 221 to 300	Over 270
From 3.001 to 8.000	8 x 10	8 x 10	10 x 12	12 x 15
From 8.001 to 15.000	8 x 10	10 x 12	12 x 15	12 x 15
From 15.001 to 30.000	10 x 12	10 x 12	12 x 15	12 x 15
From 30.001 to 45.000	10 x 12	12 x 15	12 x 15	12 x 15
From 45.001 to 60.000	10 x 12	12 x 15	12 x 15	12 x 15

The crates that have an external width over 270 cm or a net weight over 10.000 kg have to be provided with wooden additional strengthening structures able to support the transversal compression that is produced by the ropes during the lifting operations.

Each strengthening structure consists of a frame that is put between two successive undercover beams (see the figure). The longitudinal cut-down sizes, stressed to flexion, have the same section of the undercover beams; the transversal listels, nailed to the undercover beams and subjected to compression, can have a smaller section (not less than half of the undercover beams).

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### 5.3.9 Crates for pipes

The packing of pipes in crates is provided in the following cases:

- Bituminized or not sheathed pipes and pipe-lines up to DN80 (3")
- Insulated pipes and pipe-lines in general - road / railway transport

From a structural point of view, the crates for pipes are not different from the small-sized, reduced-size and standard crates. To choose among them the following indications of volume and net weight are valid.

N	PACKAGE	INDICATIONS
6	<b><u>Small-sized CRATES</u></b>	Volume up to 3 m <sup>3</sup> Net weight up to 500 kg
7	<b><u>Reduced-size CRATES</u></b>	<ul style="list-style-type: none"> <li>• External dimensions up to 800 x 250 x 250 cm</li> <li>• Net weight up to 3.000 kg</li> </ul>
8	<b><u>Standard CRATES</u></b>	<ul style="list-style-type: none"> <li>• No limits of dimensions</li> <li>• Net weight up to 60.000 kg</li> </ul>

Some constructive or stowage peculiarities that must be adopted to prevent the pipes from coming out or to protect their integrity distinguish the crates for pipes:

in case of packing of pipes (or other loose parts) that are smaller than the distance between the sheathing boards, the crate must have plenum heads;

the bituminized pipes must be stored up in separate layers to avoid that, in case of high environmental temperatures, the bituminized sheathings of superimposed pipes adhere one on another and tear irreparably when each pipe is taken.

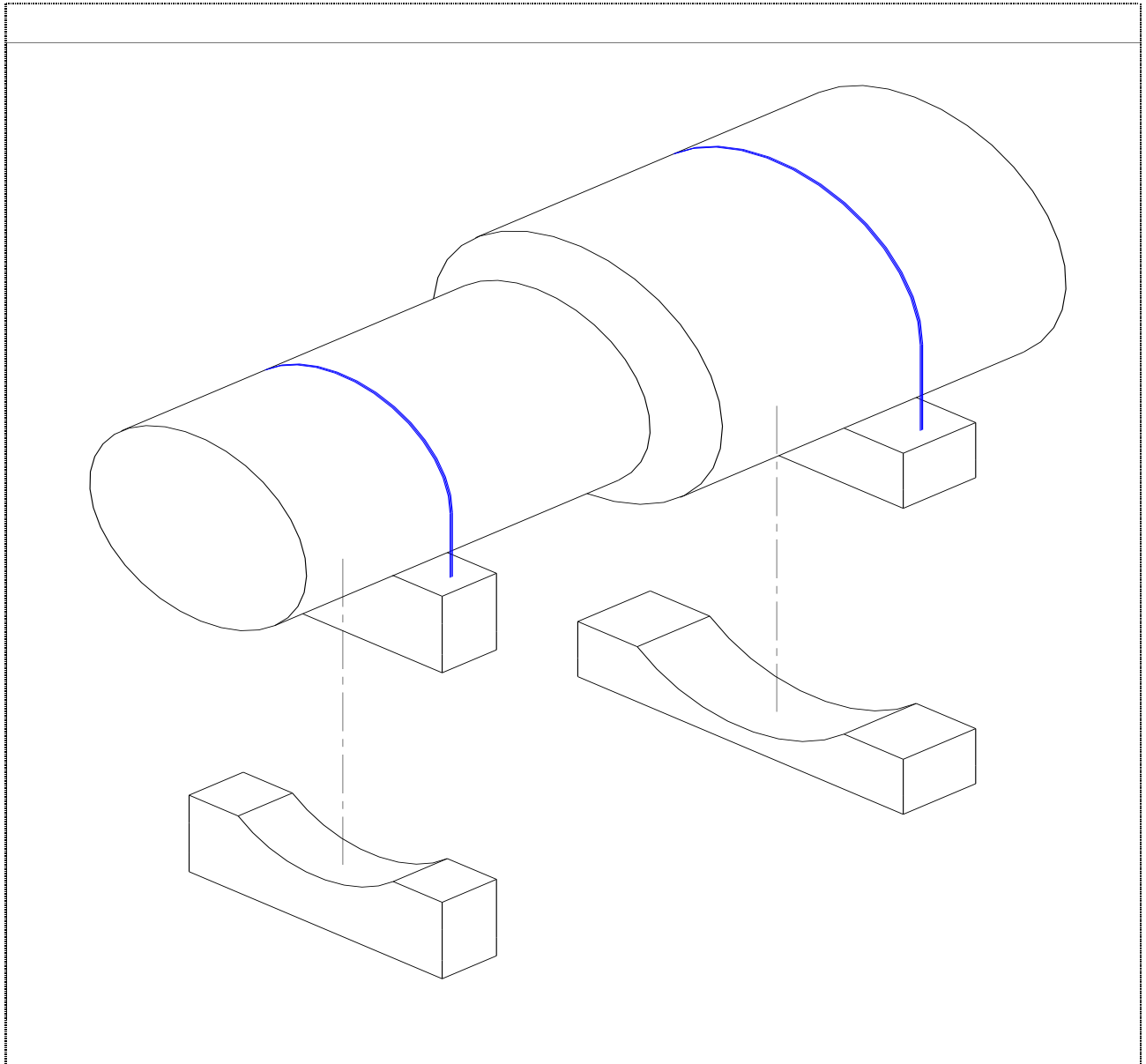
### 5.3.10 Saddles



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Indications:

- Dimensions of the apparatus > 5 m<sup>3</sup>

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The saddles are shaped structures, normally concave, in wood/steel (for Onshore equipment) and in steel (for Offshore equipment) and they are secured to the apparatus to be packed; they have got the simple function of support and ground hold, but they don't offer other kinds of protection (against bumps, dust, humidity, etc.).

The saddles are suitable - as the paragraph 5.2.3 says in detail - to pack self-load-bearing apparatuses, metallic - provided that they aren't supplied with instrumentation or insulation - and non-metallic - provided that air transport or conventional sea transportation isn't arranged.

On the contrary, if the apparatus has got its own hold structures, these ones must be equipped with simple wooden baseboards that are fixed to the base plates by bolts or passing thread bars.




#### Constructive notes

The minimum indicative length of the saddles must be at least the same as the external diameter of the apparatus (D) to facilitate the anchorage between the saddles and the apparatus itself.

The width of the saddles is suggested by the following table; as a rule the baseboards are built with the same length and width as the plates to which they are fixed.

<b>SADDLE WIDTH</b>	
Net weight [kg]	Width [cm]
Up to 2.000	15
From 2.001 to 6.000	20
From 6.001 to 10.000	30
From 10.001 to 20.000	40
Over 20.000	50

The depth of the cradle (that is of the shaped part) - measured on the vertical - must be at least equal to 15% of the diameter D. For example, for the apparatuses that have got a diameter of 2 m, the depth of the cradle must be of 30 cm at least (200 x 0,15). It should be noted that a hold arc of about 90°, generally enough to guarantee a stable accommodation of the apparatus, corresponds to this minimum depth.

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The ground elevation reached by an apparatus put on the saddles must be as minimum as possible in order not to compromise the strength of the saddles themselves and the passage of the lifting ropes (unless it is used another kind of lifting, for example by eyebolts).

The number of saddles to be prepared (2, 3 or more) is defined on the basis of the technical information of the manufacturer. Particularly this number will depend on the apparatus weight and rigidity; besides, the type of planned transport will be considered to ensure a correct distribution of the weight on the load plane.

The combination of the length and width measures, the number of the saddles or of the baseboards and the total weight (apparatus + saddles) must generate a **bearing load** not over **10.000 kg/m<sup>2</sup>**. For example 2 saddles of 200 x 50 cm are suitable to support a total weight not over 20.000 kg (2 x 0,5 x 2 x 10.000).

The saddles are built with a single beam in wood/steel or by superimposing more beams in crossed layers; in this second case the beams that go from the base to the lowest point of the cradle will be kept in an only piece in order not to compromise the strength of the cradles themselves.

The saddles must be firmly anchored to the apparatus, alternatively by:



- steel rope, of suitable section, covered by a protective rubber sheath;
- steel hoop, of suitable section (min. 50 x 3 mm), by putting a protective strip between the hoop and the apparatus.

In the case of rope anchorage, the connection with the saddle can be realized by a passing thread bar and an eyebolt or by a head-screwed plate; a closed eye turn-buckle of adjustment must always be interposed.

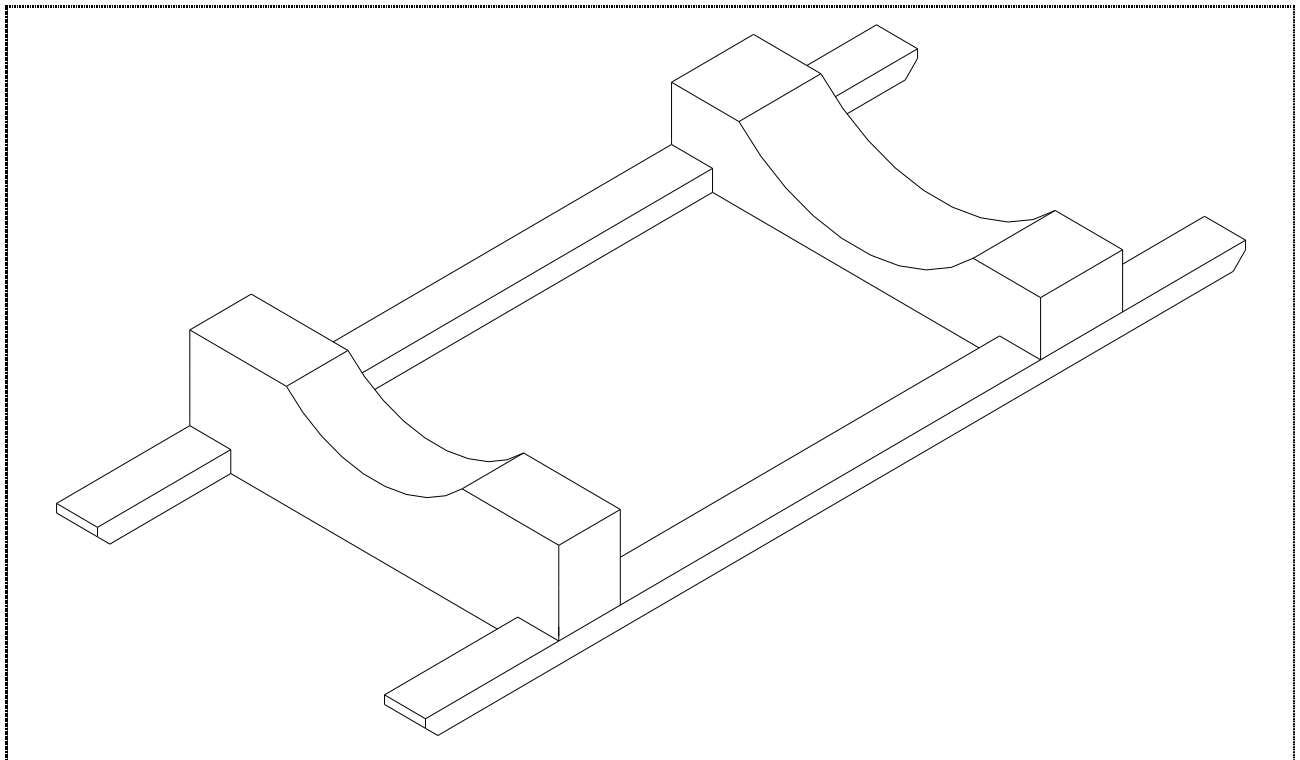
In the case of hoop anchorage, the connection with the saddle is realized by a passing thread bar that operates on a bracket shut to each end of the hoop; the adjustment of the tightening force is achieved by operating on a nut-counternut couple.

The **VENDOR** has the right to build sheet-steel saddles. In this case they must be equipped with:

- rubber strips put between the saddles and the apparatus to protect the apparatus itself;
- wooden baseboards fixed to the saddle base plates by bolts or passing thread bars.

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### 5.3.11 Saddles on slides





#### Indications:

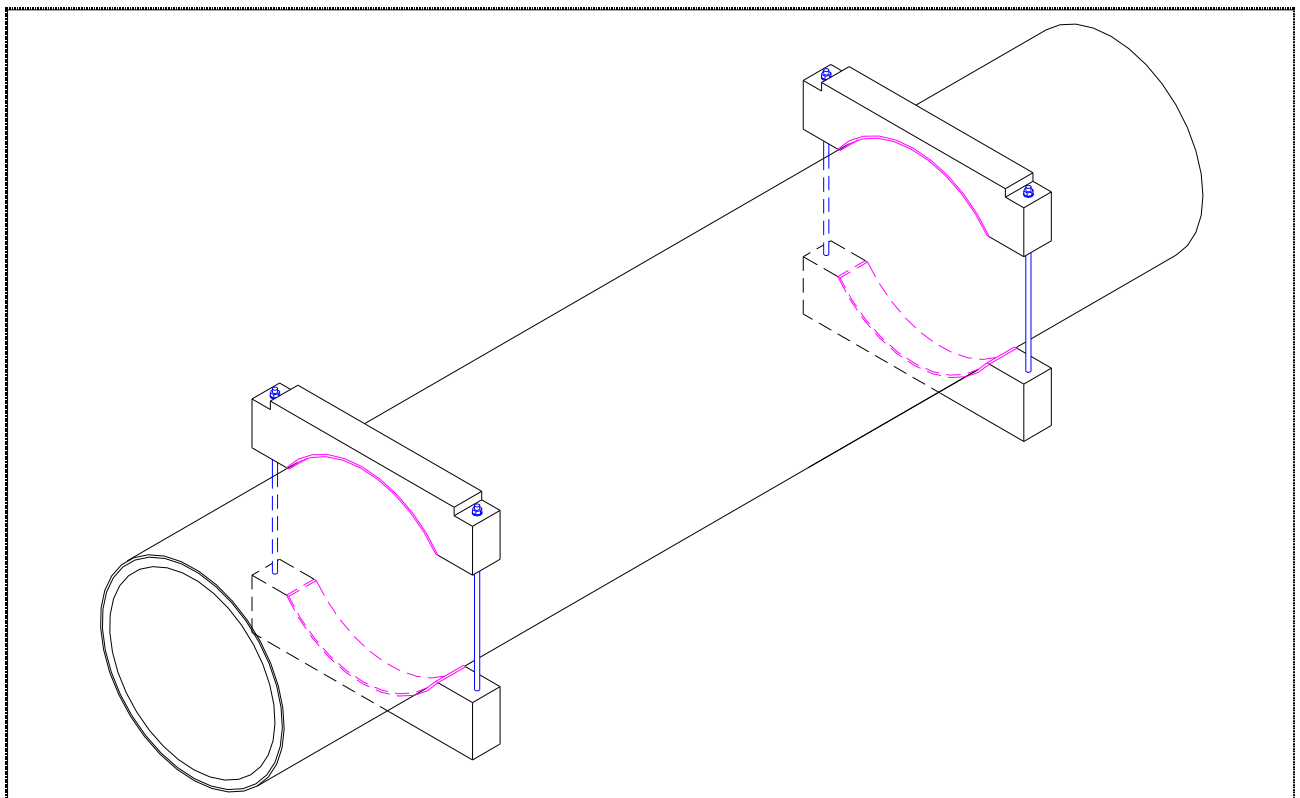
- Dimensions of the apparatus > 5 m<sup>3</sup>
- for insertion in containers with frontal opening

The saddles on slides are normal saddles of the kind that is described in the preceding paragraph that are connected to each other by longitudinal boards (slides - see the figure). The slides facilitate the insertion of the packages in box-type containers (with frontal opening).

For this type of packing the constructive specifications concerning the independent saddles are applied in full, with the exception of the bearing load that, in this case, can reach higher values; as regards the slides, they must be made in an only piece and they must have a head chamfer to facilitate the sliding of the package on the container bottom.

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### 5.3.12 Double Saddles



Indications:

- Bituminized pipes and pipe-lines in general over DN600 (24") While the pipes of big dimensions that are not bituminized or insulated can be sent as loose parts (without packing), the bituminized pipes of big dimensions request to be put on double saddles that are necessary to protect the integrity of the bituminous layer; for the same reason a straw mattress - or a similar product - must be put between the support cradles and the pipe (see the figure). The following table suggests the width of the saddles and the depth of the cradle (that is of the only shaped part, measured on the vertical) on the basis of the nominal diameter of the pipe.

<b>DIMENSIONS OF THE CRADLES</b>	
Nominal diameter [mm]	Width x Depth [cm]



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Up to 800	12 x 15
Over 800 up to 1.200	15 x 20
Over 1.200	20 x 25

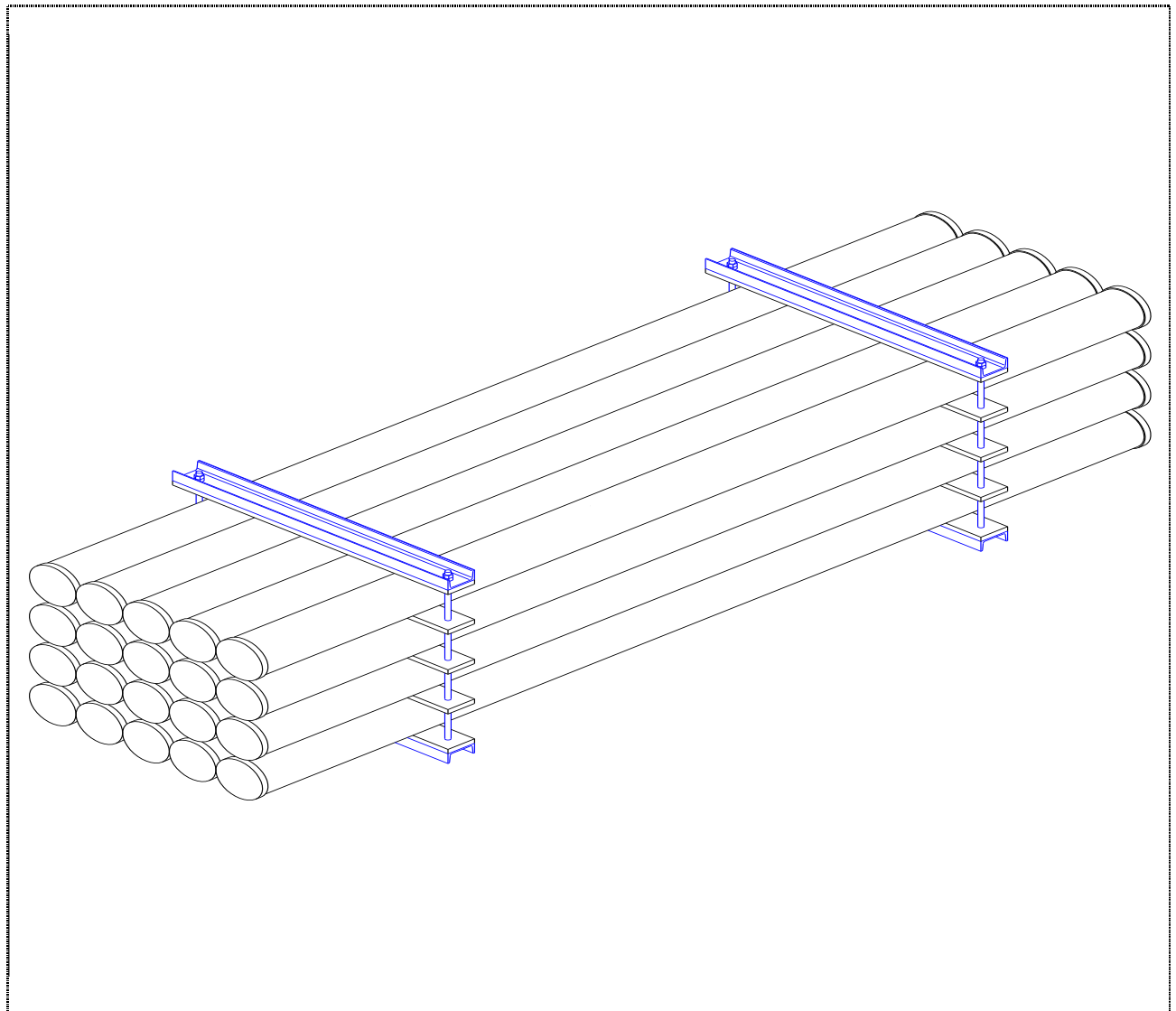
On the contrary, the following dimensions are common specifications:

Minimum section in height (saddle and counter-saddle): ..... 6 cm min.  
Milling depth on the counter-saddle: ..... 4 cm min.  
Diameter of the thread bars: ..... M12 min.  
Distance of the bars from the borders: ..... 4 cm min.

As for the rest the indications given in the previous paragraphs (5.3.10 - SADDLES, 5.3.11 - SADDLES on slides) are valid.

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### 5.3.13 Bundles



Indications:

Gross weight up to 8.000 kg

- Dimensions (Width x Height) up to 120 x 150 cm

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The bundles are groups of rigid parts (self-load-bearing) that are stacked and fixed to each other by suitable fasteners or ties (see the figure). They are typically used to pack pipes, parts of heavy carpentry and bearings that can be easily piled up.

The bundles are suitable to pack the pipes that have a diameter included in the interval DN80–250 mm (or even more, if there are advantages regarding the handling or the marking), while, as a rule, the pipes that have big dimensions are sent one by one.

Essentially the number of fasteners depends on the length of the bundle. Approximately:

- for bundles of a length  $\leq 6$  m: two fasteners are used;
- for bundles of a length  $> 6$  m: three or more fasteners are used.

In the case of road transport without intermediate storages and gross weight up to 1.500 kg, the bundles can be tied with simple steel straps or wire rods, of suitable section; the distance between two successive ties mustn't be over 1,5 m.

If in the bundle formation, where the fastening points are situated, some empty spaces are generated by the different dimensions of the piled components, these empty spaces will have to be filled up by wooden baseboards in order to guarantee a suitable fastener clamping.

The section bars that are used for the fasteners must be zinc-plated or painted with antirust enamel in order not to dirty the transported material.

The pipe ends must be plugged as it is shown in the paragraph 5.4.1.

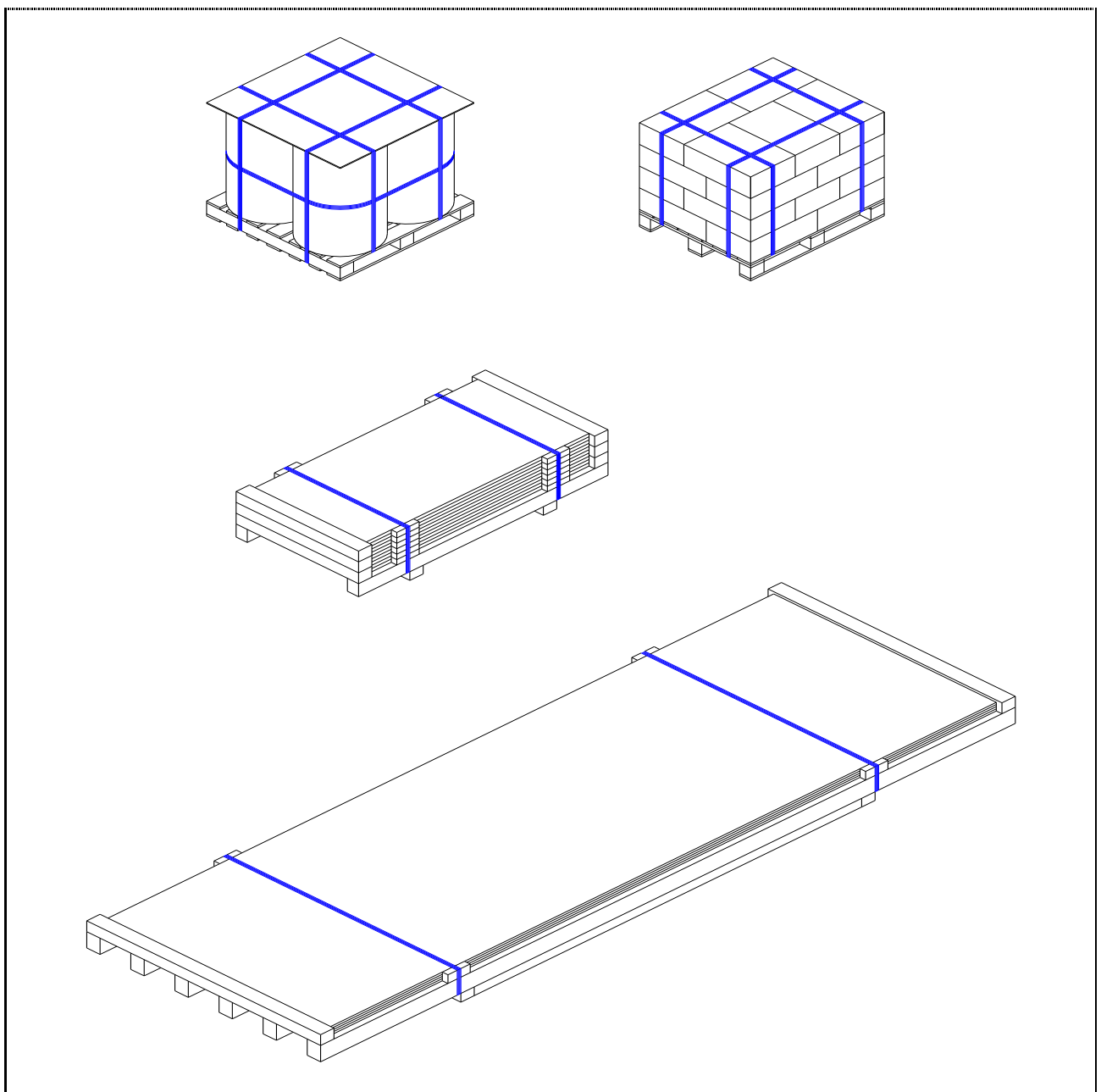





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### 5.3.14 Pallets



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Indications:

- Plates
- Products that are not dangerous and that are prepacked in metallic drums or sacks

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The pallets are wooden bases that are used for the storage and the transport of goods that need a distributed support, such as plates, metallic drums or sacks, but that don't require any special mechanical guards.

Generally, for the packing of goods that can be stacked, such as metallic drums or sacks, the commercial standardized pallets are used, naturally within the fixed limits of load.

In this case, and if the nature of the goods makes it possible, the placing of the goods on the pallet will have to favour the stacking of identical palletized packages.

Pallets made to measure, that are similar in the construction to the bottom of the cases are used for the packing of very bulky or heavy goods, such as the plate packages (actually the pallets can be seen as cases or crates without walls and cover).

The pallets for the plate packing must have head-beams with a height that is at least equal to the thickness of the plate package so as to form a strong control side.




All the goods must be adequately tied to each other and secured to the pallet on which they are placed and, if necessary, they must be wrapped up with extensible or thermo-shrinking film.

The minimum sections of the structural components are written in the following tables.

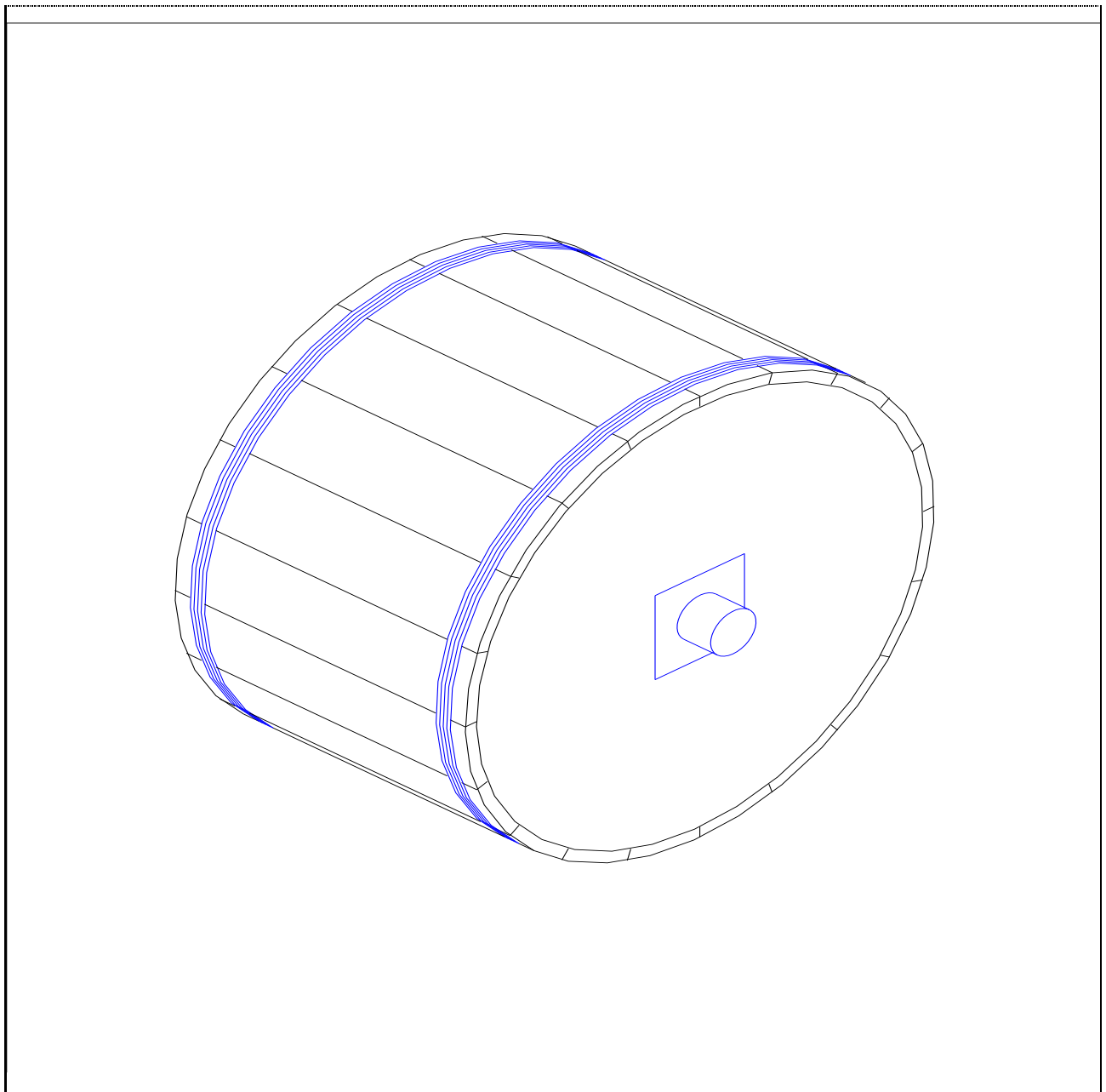
<b>MINIMUM SECTIONS OF THE LONGITUDINAL BEAMS</b>			
Net weight [kg]	External length of the package [cm]		
	Up to 400	From 401 to 800	Over 800
Up to 1.000	8 x 8	8 x 10	8 x 10
From 1.001 to 3.000	8 x 10	8 x 10	10 x 12
From 3.001 to 8.000	10 x 12	12 x 15	12 x 15



<b>MINIMUM SECTIONS OF THE OTHER PALLET COMPONENTS</b>		
Net weight [kg]	Boarding [cm]	Underbeams [cm]
Up to 1.000	2,5	10 x 6
From 1.001 to 3.000	2,5	10 x 8
From 3.001 to 8.000	3	12 x 8

In the case of rigid plate packing, the bottom boarding may be omitted.

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### 5.3.15 Staved Reels/Steel Reels



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The reels of big diameter - provided that new or in good condition - that contain electrical or instrumental cables are sent like they are, but the external surface included between the two reel flanges must be closed before. The closing is realized by wooden adjoining boards or nylon plast covering that are nailed to the flange edges (staving).

The staving must be realized by using new boards of a width that is suitable to the flange diameter; particularly too large boards mustn't be used in order to avoid fissurations or breaks.

Afterwards the boards must be tied by steel straps of suitable section; the strapping must be executed near the flanges (no more than 5 cm far) in order not to unnailed and stress the boards.




The approximate sections of the boards are written in the following table.

<b>STAVING</b>		
Flange diameter [cm]	Board width [cm]	Minimum thickness [cm]
< 200	8 ÷ 10	2,5
≥ 200	8 ÷ 12	4

The minimum distance between the outer cable layer and the head of the flange shall be 2D, but at least 5cm (D is the outer diameter of cable). Barrel diameter of delivery drums should be greater than 18D, the maximum value according to relevant cable standard of manufacture's value.

The cable ends have to be sealed during transport, storage and laying to prevent ingress of water. The cable ends shall be fastened properly.

Steel Reels could be applied by manufacturer based on his standard and responsibility. In this case external surface shall be protected with minimum 2 nylon plast layers.

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### 5.3.16 Homologated Packages

The products that are classified as dangerous (see the safety sheet) must be packed in special homologated containers, in accordance with the instructions included in the specific national and international rules or laws that are written below.

TRANSPORT	NORMS
Road	<ul style="list-style-type: none"> <li>ADR: Accord européen relatif au transport international des marchandises Dangereuses par Route</li> </ul>
By railway	<ul style="list-style-type: none"> <li>RID: Règlement International concernant les transports des marchandises Dangereuses</li> </ul>
By sea	<ul style="list-style-type: none"> <li>Ministero della Marina Mercantile – DPR del 9.5.1968 - n° 1008 e successive modifiche</li> <li>IMCO: Intergovernmental Maritime Consultative Organization</li> </ul>
By air	<ul style="list-style-type: none"> <li>IATA: International Air Transport Association – Dangerous goods regulations</li> </ul>

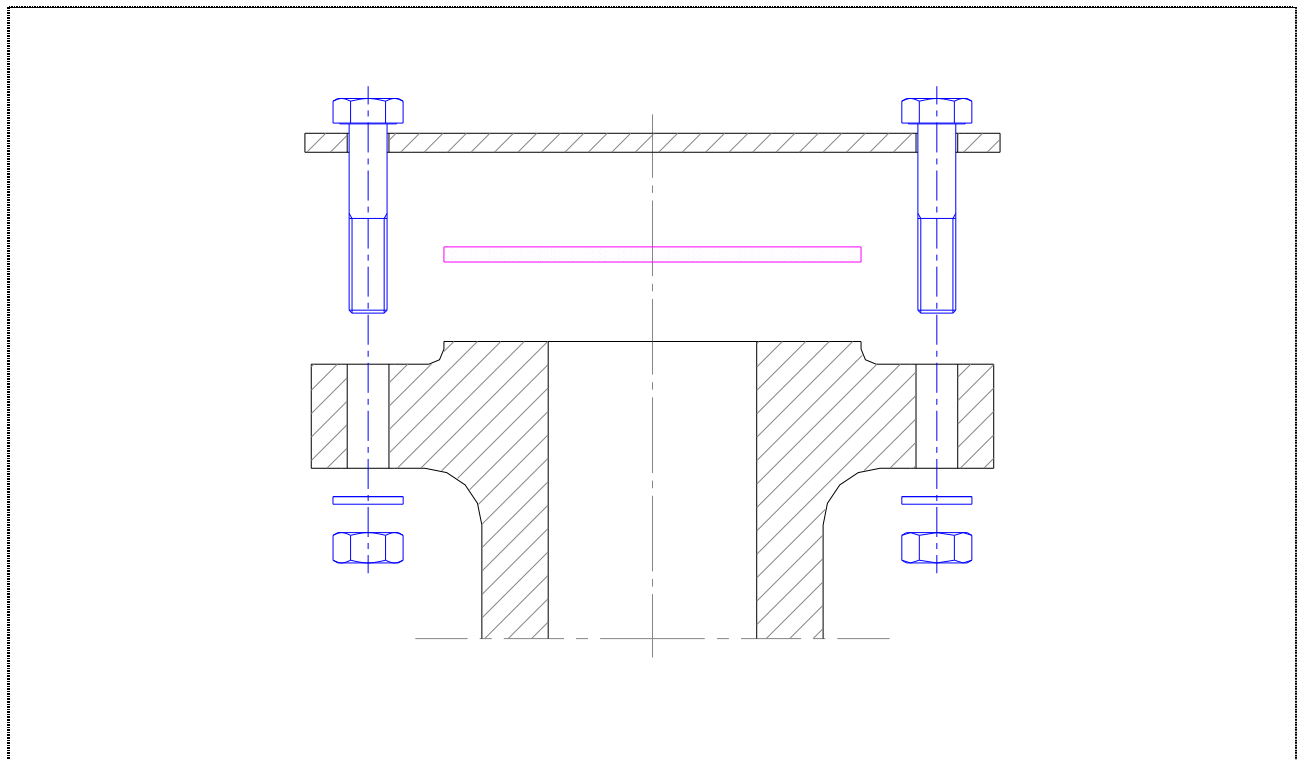
The VENDOR must comply scrupulously with the above-said rules or laws by enforcing those that regulate the main transport. He will be regarded responsible for any consequences that may occur to the CONTRACTOR if said rules are not observed.

On the homologated packages the specific markings of danger provided by the enforced norms must be executed.

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## 5.4. Complements

### 5.4.1 Plugging





If it isn't differently specified, the nozzles, the pipe ends or other openings on the goods to be packed must be appropriately plugged.

The nozzles provided with flanges that are present on the apparatuses packed on saddles have to be plugged as it is shown in the figure (rubber gasket + plywood disc, all closed by a suitable number of bolts and taped).

The ends of the pipes that are packed in bundles must be plugged:

- or singly, by plastic plugs fixed to the pipe by linen tape;
- or as a whole, by a double polyethylene film coating (0,1 mm min. thick) fixed to the bundle by linen tape and wooden covers made to measure and secured to the bundle by strapping.

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The ends of the pipes that are sent singly must be plugged:

- or by plastic plugs fixed to the pipe by linen tape;
- or, if - for big diameters - the above-said plastic plugs weren't available, by wooden plugs connected to each other by a steel wire stretched in the pipes.

The openings present on goods that are packed in cases or in crates must be always plugged by plastic plugs or plywood discs, secured with linen tape.

#### 5.4.2 Stowage




The goods must be secured to the package so as to avoid falls or shifts that are dangerous, above all, during the lifting and transport operations. For the same reason, in the case of transport in containers, the package must be immobilized towards the container.

Where it is possible, the material must be directly secured to the bottom by bolts, tie-rods, clamps or other suitable fasteners. The possible holders or fasteners to the walls mustn't bear static loads (i.e. loads that are present when the package is motionless); if necessary, they can be prepared to contribute to bear dynamic loads (i.e. loads that are generated by the lifting and transport operations).

Where it is possible, it is better to place the heaviest parts or items in the lower part so as to increase the package stability. The stainless steel pipes packed in a crate must be placed in the upper part and must be separated from the carbon pipes by wooden boards or panels. The possible small parts will be pre-packed in wooden small-sized cases placed in the main package. In the case of transport in containers, the filling operations of the container and the immobilization measures of the load in the container are charged to the **VENDOR**.

The main dynamic loads to which the package is subjected during the transport operations are listed in the following table.

TRANSPORT	MANOEUVRES	DYNAMIC LOADS
Road	<ul style="list-style-type: none"> <li>• heavy accelerations or decelerations</li> <li>• curve running</li> </ul>	<ul style="list-style-type: none"> <li>• inertial force</li> <li>• centrifugal force</li> </ul>
Railway	<ul style="list-style-type: none"> <li>• heavy braking</li> <li>• impact with buffers</li> </ul>	<ul style="list-style-type: none"> <li>• inertial force</li> <li>• impact force</li> </ul>
Sea	<ul style="list-style-type: none"> <li>• rolling</li> <li>• pitching</li> </ul>	<ul style="list-style-type: none"> <li>• loss of balance</li> <li>• loss of balance</li> </ul>





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Air	<ul style="list-style-type: none"> <li>• take-off</li> <li>• landing</li> </ul>	<ul style="list-style-type: none"> <li>• loss of balance</li> <li>• loss of balance</li> </ul>
-----	---	--

The goods sensitive to humidity (typically the ones belonging to the group of goods D (Equipment sensitive to dust or humidity) must be closed in a suitable barrier bag - according to MIL B131 E Class 1 - that, with a suitable quantity of dehydrating salt, can keep a humidity rate below 35% - at the temperature of 20°C - for the period of one year. The remaining material (packed in cases or crates) must be covered with a polyethylene film hood (minimum thickness 0,1 mm) not sealed to avoid the formation of condensation.

When the plants belonging to the group of class C (Packages) are equipped with components belonging to the group of goods D (Equipment), the package must be protected in full with a barrier bag; alternatively it is possible to cover only the equipment by using specific products (sponges, films etc.) that release progressively protective substances (VCI). If it is necessary to perforate the barrier bag to allow the passage of fastening bolts, the bag integrity must be restored with suitable gaskets.

In the case of a gross weight over 2.000 kg, cases and crates must be equipped with steel strengthening brackets and angle bars that are fixed respectively to the bottom and to the upper edges of the sidewalls where the ropes pass (see Attachment 6.1). They must be sized so as to avoid abrasions and damages produced by the action of the lifting ropes or chains. During the lifting of apparatuses that are packed on saddles some protective rolling shutters must be put between the ropes and the apparatus.

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### 5.4.3. Preservation

#### 5.4.3.1 Preservatives

All commodities could be exposed to severe climate conditions. The nature of the commodity will determine the type of preservative to be used.

All metal commodities subject to corrosion (rust) shall be processed with a suitable preservative in accordance with manufacturer's specifications. Preservatives must be easily applied to all kinds of metal surfaces by a variety of methods and must coat the surface with a sufficiently thick film to exclude moisture and air. This film must remain in position for an indefinite period of time and yet be completely removable without undue labor. The preservatives themselves must have no corrosive action of any kind on metal.

Equipment and components that require to be protected from the atmosphere must be processed in one or more of the following ways:




- Wrapping in Vapour Corrosion Inhibitor (VCI) wraps (film or emitters) with all lines, joints and folds sealed with linen tape.
- Packing in totally closed wooden boxes coated with plastic film or other waterproof preservatives impregnated with VCI.

When it is impractical to protect equipment from the atmosphere by VCI products, external and internal metal unpainted surfaces that do not require sandblasting and painting on site must be protected as follows:

- External non-painted surfaces, except air cooler finned tubing, including bolting and flange faces, must be thoroughly cleaned and given a coating of a P1 preservative.




Exposed shafts and shaft couplings shall be coated with a P1 preservative and wrapped with waterproof moldable cloth. The shafts shall be free to rotate.

- Internal surfaces of equipment shall be thoroughly cleaned of metal particles, dirt and debris and shall be protected with Vapour Space Inhibiting (VSI) Circulating Oil or Vapour Corrosion Inhibiting (VCI) powder.
- Oil lubricated pump bearing housings, equipment cases, stuffing boxes and gearboxes must be fogged and filled 10 to 50 percent of the internal volume with VSI circulating Oil and then all openings must be tightly sealed.
- Internal surfaces of equipment that can be made airtight by flanges or plugs must be dusted with VCI and the openings sealed. VSI circulating oil or - if necessary - VCI emitters will be preferred for the surfaces which later will be in touch with lubricating oil. Equipment will be tagged. Tags will be waterproof, tear-resistant and attached with stainless steel wire. They will have to indicate the parts preserved, type and number of preservatives used, date and location and they will be signed by the

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person responsible. For multiple chambered equipment, each chamber will be individually tagged.

- Items in leather, mica, rubber and similar material mustn't be coated with the preservatives to avoid damaging.
- Austenitic stainless steel equipment must be protected with a waterproof wrap to prevent any chloride contaminations. The wrap will have to be chloride free.




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#### 5.4.3.2 Product classification



Mil-P 116G Types	P1	P2	P3
Kind	<ul style="list-style-type: none"> <li>- Cold application cut-back solvent</li> <li>- Firm / Black / Opaque Film</li> <li>- Flash 38 °C min</li> </ul>	<ul style="list-style-type: none"> <li>- Cold application cut-back solvent</li> <li>- Soft / Amber / Transparent Film</li> <li>- Flash 38 °C min</li> </ul>	<ul style="list-style-type: none"> <li>- Cold application cut-back solvent</li> <li>- Oily / Light / Amber / Transparent Film</li> <li>- Flash 38 °C min</li> </ul>
Indications of use	<ul style="list-style-type: none"> <li>- General preservatives: indoors or outdoor, with or without cover, for domestic and overseas shipment (Firm film)</li> </ul>	<ul style="list-style-type: none"> <li>- Extended undercover</li> <li>- Protection of interior or exterior surfaces of machinery, instruments, bearings etc. to be stored indoors</li> <li>- For limited periods of outdoor protection with metal temperatures that do not produce flow of film</li> </ul>	<ul style="list-style-type: none"> <li>- Where water must be displaced and corrosion prevented or arrested</li> <li>- For protection of interior surfaces of machinery, instruments or material under cover for limited periods</li> </ul>
Application methods	<ul style="list-style-type: none"> <li>- Spray</li> <li>- Dip</li> <li>- Brush</li> <li>-</li> </ul>	<ul style="list-style-type: none"> <li>- Spray</li> <li>- Dip</li> <li>- Brush</li> <li>- Flush</li> </ul>	<ul style="list-style-type: none"> <li>- Spray</li> <li>- Dip</li> <li>- Brush</li> <li>- Flush</li> </ul>
Temperature	5÷350 °C	5÷350 °C	5÷350 °C
Removal methods	<ul style="list-style-type: none"> <li>- Pet. solvent</li> <li>-</li> <li>-</li> <li>- Vapor</li> <li>- Degreaser</li> </ul>	<ul style="list-style-type: none"> <li>- Pet. solvent</li> <li>- Lube oil</li> <li>- Hot alkali</li> <li>- Wash</li> <li>- Vapor</li> <li>- Degreaser</li> </ul>	<ul style="list-style-type: none"> <li>- Pet. solvent</li> <li>- Lube oil</li> <li>- Hot alkali</li> <li>- Wash</li> <li>-</li> <li>-</li> </ul>

#### 5.4.3.3. Manufacturers' brand names

Manufacturer	P1	P2	P3
ASHLAND	Tectyl 890	Tectyl 502	Tectyl 894

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Manufacturer	P1	P2	P3
DAUBERT CHEM	NR 201B	NR 207	NR 208
EXXON	Rust-Ban 373	-	Rust-Ban 392
E.F. HOUGHTON	- Rust Veto 344	Cosmoline 1102 Rust Veto 342	Cosmoline 1104 Rust Veto 853
TECHNOLUBE	FE 003 Grade 1	FE 003 Grade 2	FE 003 Grade 3
SHELL	-	Ensis Fluids S	Ensis Fluid SDB

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#### 5.4.3.4 Vapour Corrosion Inhibitor (VCI) products

Vapor Corrosion Inhibitor or Volatile Corrosion Inhibitor (VCI) is generic terms to indicate corrosion preventive products that contain environmentally safe chemicals.

##### VCI powder

VCI is a powder and is used to protect exposed metal surfaces; excellent protection is given to ferrous metals, most nonferrous metals and nonmetallic materials.

VCI reaches the metal surfaces in the vapor phase and is absorbed on the metal to form an invisible film which prevents corrosion. VCI assures constant protection for as long as two years.

VCI can be applied dry by use of suitable guns or other devices. Application must be executed in accordance with manufacturer's instructions.

##### VCI papers

VCI Vapor Barrier is a Kraft paper that is coated with a rust inhibiting chemical. It is supplied in rolls, sheets and strips. It offers excellent protection for up to two years if applied correctly.

VCI papers give off invisible vapor that prevents oxygen in moisture from combining with iron to form rust. Materials protected with these papers must be stored in dry, cool or shaded area. Packages may be opened briefly for inspection without loss of protection, but they must be immediately resealed after the check.

##### VCI emitters




VCI Emitters are sponges that have been treated with Vapor Corrosion Inhibitor. Generally they have an adhesive backing for attachment to the surface to be protected. These emitters are convenient and are an acceptable alternative to porous pouches of VCI.

#### 5.4.3.5 Vapor Space Inhibiting (VSI) circulating oil

VSI circulating oil contains an oil soluble, volatile anti-rust compound. This corrosion inhibitor evaporates to form a preventive barrier towards the oxygen that is present in the moisture and in the atmosphere. VSI oil is available in several viscosity grades and is suitable to protect hydraulic components, turbines and lubricating systems.

#### 5.4.3.6 Watertight integrity

When expressly required in the Material Requisition, the interiors of vessels and exchangers shipped separately must have an additional protection from the intrusion of moisture or other




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contaminants. Unless it is explicitly specified, the protection method will be arranged with the manufacturer.

If desiccants are used, type, amount, container and placement must be indicated.

If inert gases are used, gas type, pressure and precautions of use must be indicated.

Warning tags saying "Depressurize before opening" will be attached on each opening.

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#### 5.4.4 Marking

The package marking must allow a sure identification of the items (for example n° of order, destination place etc.) and give useful information to carry out the lifting, transport and storage operations correctly (for example gross weight, guaranteed superimposition load, environmental conditions that are tolerated etc.). The marking information is written in the "Purchase Conditions" that are enclosed with the Order.

Units or parts belonging to main equipment but separately packed shall be clearly marked for easy identification with the main equipment to which they relate.

The package marking must be clear, indelible and proportionate to the package dimensions. It can be executed directly on the package by black characters on light background, or indirectly on A3-size plastic-coated signboards (mm 420x297) filled in by black characters on white background.

On each case, crate and apparatus on saddles the gross weight, the centre of gravity and the lifting or forking points (symmetrical and adequately placed out from the load barycentre) must be clearly marked; each package must be marked on two adjoining walls (sidewall and head) and on the cover.

If it is necessary, the maximum superimposition load that is guaranteed must be marked on the four case or crate walls - in the upper right corner. For the crates, the marking must be written on suitable plywood - minimum thickness 3 mm.

For the apparatuses that are positioned on saddles, the marking can be executed directly on the apparatus or on the saddles.




For the bundles, the marking must be made with metallic plates or with two plastic-coated signboards fixed on plywood panels. They must be placed on the two sidewalls and tied with wire or steel straps.

For the pallets the marking must be made on two adjoining sides and on the upper part.

For the reels the marking must be made on the flanges.




On the homologated packages that contain products which are classified as "dangerous", the specific markings of danger that are provided by the reference norms must be executed.

The markings must be executed in accordance with the international symbols (see Attachment 6.2). The **VENDOR** will give the instructions relating to the affixing of the following further conventional indications concerning the storage on the Packing Lists and on the markings:

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- A Outdoors
- B Outdoors, sheltered
- C Indoors
- D Indoors, heated area
- E Indoors, air-conditioned area

If it is required by the CONTRACTOR, the upper corners of the packages will have to be marked by an identification coloured strip (to be defined) that is executed with indelible paint. For the perishables, the package marking will have to include the words "PERISHABLE GOODS".

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<b>Sheet 79 of 94</b>																				




### MAIN SHIPPING MARK FOR SEAFREIGHT

	<b>Project format shall be added here.</b>
<b>PURCHASER</b>	
<b>PROJECT</b>	
<b>PORT OF DESTINATION</b>	
<b>CONSIGNEE</b>	
<b>VENDOR'S NAME</b>	
<b>P.O / REQUISITION N°</b>	
<b>ITEM N°</b>	
<b>P.L. N°</b>	
<b>PACKAGE N°</b>	
<b>N.W. : .....KGs</b>	<b>G.W. : .....KGs</b>
<b>DIMENSIONS IN CMS</b>	<b>L x W x H</b>
<b>STORAGE CODE</b>	

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<b>Class: A</b>	<b>Rev. D0</b>																			
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### MAIN SHIPPING MARK FOR AIRFREIGHT

	Project format shall be added here.
<b>PURCHASER</b>	
<b>PROJECT</b>	
<b>AIRPORT OF DESTINATION</b>	
<b>CONSIGNEE</b>	
<b>VENDOR'S NAME</b>	
<b>P.O / REQUISITION N°</b>	
<b>ITEM N°</b>	
<b>P.L. N°</b>	
<b>PACKAGE N°</b>	
<b>N.W. : .....KGs</b>	<b>G.W. : .....KGs</b>
<b>DIMENSIONS IN CMS</b>	<b>L x W x H</b>
<b>STORAGE CODE</b>	

 	<b>DEHDASHT PETROCHEMICAL INDUSTRY COMPANY</b>  <b>DEHDASHT HIGH DENSITY POLYETHYLENE PROJECT</b>	 شرکت صنایع پتروشیمی خلیج فارس Persian Gulf Petrochemical Industries Co <b>PGPIC</b> شرکت صنایع پتروشیمی دہشت (سهامی عام)																		
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<b>Class: A</b>	<b>Rev. D0</b>																			
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### MAIN SHIPPING MARK FOR ONSHORE

	<b>Project format shall be added here.</b>
<b>PURCHASER</b>	
<b>PROJECT</b>	
<b>DESTINATION</b>	
<b>CONSIGNEE</b>	
<b>SUPPLIER'S NAME</b>	
<b>P.O / REQUISITION N°</b>	
<b>ITEM N°</b>	
<b>P.L. N°</b>	
<b>PACKAGE N°</b>	
<b>N.W. : .....KGs</b>	<b>G.W. : .....KGs</b>
<b>DIMENSIONS IN CMS</b>	<b>L x W x H</b>
<b>STORAGE CODE</b>	

 	<b>DEHDASHT PETROCHEMICAL INDUSTRY COMPANY</b>  <b>DEHDASHT HIGH DENSITY POLYETHYLENE PROJECT</b>	 شرکت صنایع پتروشیمی خلیج فارس Persian Gulf Petrochemical Industries Co <b>PGPIC</b> شرکت صنایع پتروشیمی دشت (سهامی عام)																		
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#### 5.4.5 Packing list

The packing list will be prepared on CONTRACTOR'S standard forms and will show the summary of the content of each package.




Only one Packing List Number shall be given by CONTRACTOR in due time for each summary of the content of each definite batch of GOODS, corresponding to CONTRACTOR'S RELEASE FOR PACKING. This Number is allocated by CONTRACTOR Expediting.

Two (2) copies of the packing list in waterproof plastic envelope must be securely nailed under a steel sheet, on the outer surface of the first package of the batch with the associated packing note corresponding to the package, as per clause 4 of this procedure.

The description of the packing list must correspond exactly to the detailed contents of number of packages summary.





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DPIC9812	001	000																		
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#### 5.4.6 Packing note

The description of the packing note must correspond exactly to the detailed contents of each package. The expression "accessories for" or "batches of nuts and bolts" for example, are formally forbidden.

One copy of the packing note shall be placed in a waterproof plastic envelope inside of each package. Another copy, in a waterproof plastic envelope shall be placed outside of the package under a steel sheet as per clause 4 of this procedure.








**DEHDASHT PETROCHEMICAL INDUSTRY COMPANY**  
**DEHDASHT HIGH DENSITY POLYETHYLENE PROJECT**



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	<b>DPIC9812</b>	<b>001</b>	<b>000</b>					<b>Sheet 87 of 94</b>	




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#### 5.4.7 Testing

The CONTRACTOR reserves the right to check the suitability of packing and stowage and the right marking. Should all this result not in conformity with this specification or with any exceptions as may be provided for in the M.R. or Purchase Order, the VENDOR will be bound to complete or to remake the packing - whether entirely or partially - at his own care and expense, in due time so to meet the delivery term provided for in the contract.

On packing completion, the VENDOR will have to give the CONTRACTOR the packing test certificate. He will have to use the special form (see Attachment 6.3) duly stamped and signed.

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	DPIC9812	001	000					<b>Sheet 89 of 94</b>	

## 6. ATTACHMENTS

### 6.1 Lifting



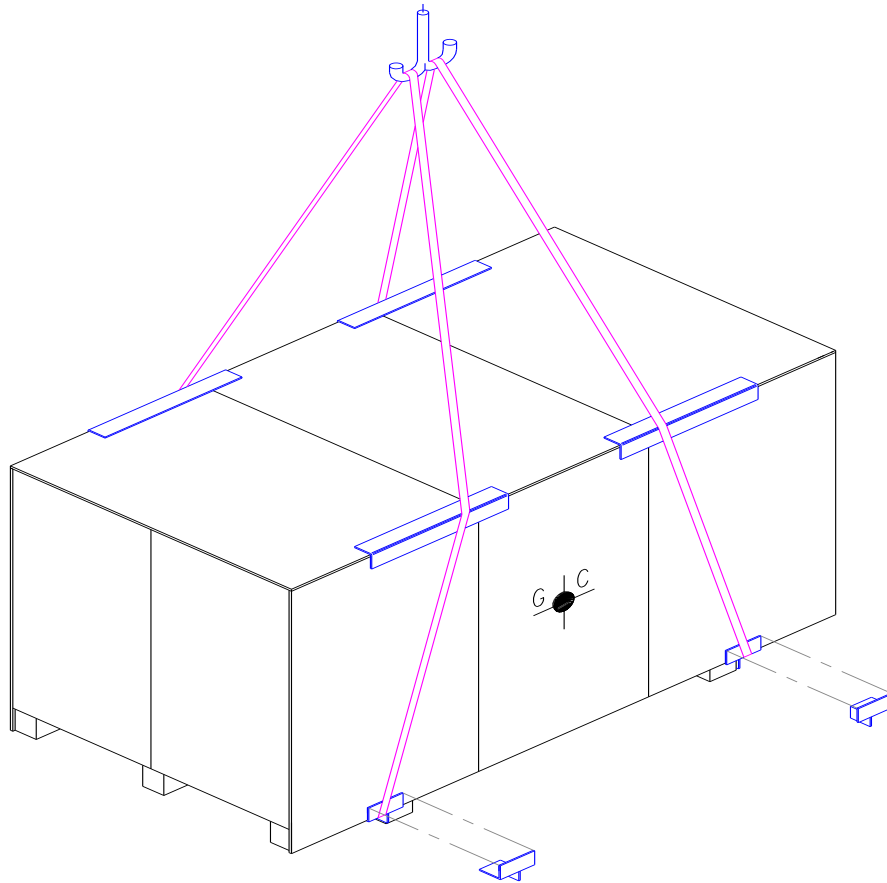
DEHDASHT PETROCHEMICAL INDUSTRY COMPANY

DEHDASHT HIGH DENSITY POLYETHYLENE PROJECT





شرکت صنایع پتروشیمی خلیج فارس  
Persian Gulf Petrochemical Industries Co  
PGPIC  
شرکت صنایع پتروشیمی دهشت (سهامی عام)








Contract No.:  DPIC/98-12	DOCUMENT TITLE: General Specification For Instrument Cable							Class: A	Rev. D0
	Proj. Code	Area	Unit	Disc. Code	Doc. Type	Material Code	Serial. No		
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## 6.2 International symbols

SYMBOL	DESCRIPTON	REMARKS
	HANDLE WITH CARE	To be shown on one side and on the top at least (preferably on all sides)
	THIS WAY UP	To be shown on all top covers
	SLING HERE	To be shown on slinging points, depending on centre of gravity
	KEEP DRY	To be shown on one side and on the top at least (preferably on all sides)
	CENTRE OF GRAVITY	
	DO NOT USE HOOKS	To indicate that hooks are forbidden for the package lifting
	KEEP AWAY FROM HEAT	To indicate that the package must be kept away from heat

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	<b>DO NOT ROLL</b>	To indicate that the package must not be rolled
	<b>NO HAND TRUCK HERE</b>	To indicate that hand trucks or dollies must not be in the package handling area

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### 6.3 Test certificate

<b>ACCOUNT</b> <input type="checkbox"/>	<b>BALANCE</b> <input type="checkbox"/>
<b>VENDOR</b>	
<b>ORDER</b>	
<b>JOB</b>	
<b>TYPE OF GOODS</b>	
<b>ITEM</b>	
<b>MANUFACTURED BY</b>	
<b>CASE/CRATE TYPE</b>	
<b>OTHER PACKING</b>	
<b>PRESERVATIVES</b>	
BARRIER BAG <input type="checkbox"/>	
VCI <input type="checkbox"/>	Type ..... Int. <input type="checkbox"/> Ext. <input type="checkbox"/>
VSI <input type="checkbox"/>	
WATERTIGHT INTEGRITY <input type="checkbox"/> Type .....	
DESICCANT SALT <input type="checkbox"/> m <sup>3</sup> ..... Kg.....	
<b>CERTIFICATION</b>	
ON DATE (In data) ...../...../..... THE PACKING OF THE ABOVE MENTIONED ORDER HAS BEEN CHECKED AND FOUND IN ACCORDANCE WITH:	
<input type="checkbox"/> PACKING SPECIFICATIONS	
<input type="checkbox"/> VENDOR PACKING SPECIFICATION:	
.....	
<input type="checkbox"/> OTHER: .....	
<b>TESTS PERFORMED</b>	
CASES/CRATES CHECK	ACCEPTED <input type="checkbox"/> REJECTED <input type="checkbox"/>
WRAPPING CHECK	ACCEPTED <input type="checkbox"/> REJECTED <input type="checkbox"/>

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STOWAGE CHECK	ACCEPTED <input type="checkbox"/> REJECTED <input type="checkbox"/>
MARKING CHECK	ACCEPTED <input type="checkbox"/> REJECTED <input type="checkbox"/>
PACKING LIST CHECK	ACCEPTED <input type="checkbox"/> REJECTED <input type="checkbox"/>

REMARKS .....

.....

.....

VENDOR's STAMP AND SIGNATURE

WITNESSED BY

--	--