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Guidance on Practice for Specification and Use of IBCs for Transporting Lubricants

GP 82-32

BP GROUP
ENGINEERING TECHNICAL PRACTICES

Foreword

This is the first issue of BP Lubricants Supply Chain Guidance on Practice 82-32 that gives recommendations and requirements for the specification and use of intermediate bulk containers for the delivery of lubricants products.

Revision History		
Rev	Date	Comments
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Introduction

The majority of lubricant products are not classified as hazardous for transport purposes. For such materials there is no modal legislation governing the specification of packaging in general and intermediate bulk containers in particular. There are no minimum standards of performance established and it is not mandatory to use U.N. certified packaging.

As a consequence there is an extremely wide choice of containers with varying levels of robustness that may be specified. This Guidance on Practice summarises the precautions and considerations that need to be made to ensure that for any given product, on any given journey, the integrity of the material and the container is not compromised.



1. Scope

This Guidance on Practice details the decision criteria to be used when selecting IBCs for the transport of lubricant products to third party customers. It also gives recommendations for the minimum specification for such containers.

It does not cover the use of IBCs for intra plant use as intermediate blend or storage vessels. These remain captive to site and are likely to undergo more frequent handling but will be restricted to internal plant movements. Additionally, there may be local legislation covering the specification and use of IBCs in such circumstances above those required for the delivery of products.

2. Normative references

The following normative documents contain requirements that, through reference in this text or their related content, constitute requirements of this technical practice. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this technical practice are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies.

BP

GP 82-12	Bulk loading and unloading of lubricants
GP 82-14	Product transfer in lubricant blend plants
GP 82-52	Storage and handling of flammable materials in lubricant blend plants
GP 82-53	Site drainage and containment on lubricant blend plants
GN 82-303	Outside storage of drums and IBCs
GN 82-403	Use of small flexible tanks for bulk liquid transport

Det Norske Veritas

Certification Notes 2.7-1 for Offshore Containers (May 1995)

European Standards

EN 12079	Offshore Containers - Design, Construction, Testing, Inspection and Marking
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U.N.

“Orange Book” Recommendations on the Transport of Dangerous Goods – Model Regulations

U.S. Dept of Transport

Code of Federal Regulations (CFR) for Transportation – CFR49



3. Informative references

GSC Global Packaging Team - Process Capability Audit (PCA) Template (see Annex B)

International Confederation of Container Reconditioners (Japan)

Reusable Industrial Packaging Association (U.S.) – www.reusablepackaging.org

Industrial Packaging Alliance of North America (U.S.)

4. Terms and Definitions

For the purpose of this document the following terms and definitions apply:

Intermediate Bulk Container (IBC)

A rigid, collapsible or flexible intermediate bulk container designed for mechanical handling of a capacity greater than 450 l (120 gal) and less than 3 000 l (800 gal). IBCs are categorised as follows:

Rigid IBC

IBC where the inner vessel retains its shape when empty, without its closures in place, and without the support of the outer casing. Rigid IBCs are typically all metal (mild steel or stainless steel) or all plastic. The latter are usually produced from a combination of polymeric materials such as high density polyethylene (HDPE) and polypropylene (PP).

Composite IBC

IBC with typically a metal outer frame and inner plastic receptacle or “bottle”. So constructed that once assembled forms an integrated single unit to be filled, stored, transported or emptied as such. Composite IBCs have an outer metal frame, an inner polymer container extrusion blow moulded or rotationally moulded from HDPE, and a metal, PE or timber pallet.

Collapsible IBC

IBC with a rigid outer casing manufactured from interlocking components with a flexible inner liner, which may be collapsed once empty to reduce space required for return shipment. Collapsible IBCs have a thin flexible inner liner co-extruded from different polymers with an outer frame of metal, plastic or board – or combination of all three materials.

Flexible IBC

IBC where the body is made from flexible fabric that cannot be manually handled when filled. It is intended for the shipment of solid material in powder, flake or granular form. It does not require further packaging and is designed to be lifted from the top by integral hoops or straps.

Remanufactured IBC

Metal, rigid plastics or composite IBC that is produced as a U.N. certified type from a non-U.N. certified type, or is converted from one U.N. design type to another.

Repaired IBC

Metal, rigid plastic or composite IBC that, as a result of impact or other cause is restored so as to conform to the original design type. Replacement of the rigid inner receptacle of a composite IBC with a receptacle conforming to the original manufacturer’s specification is considered repair.



Routine Maintenance of IBCs

As defined in the U.N. Orange Book this can include cleaning, removal and reinstallation of closures conforming to the original manufacturer's specification, and restoration of structural equipment (not directly performing a dangerous goods containment or discharge pressure function) so as to conform to design type - provided the containment function of the IBC is not affected.

Flammable Liquid

Any liquid having a flashpoint below 38°C (100°F), except any mixture having components with flashpoints of 38°C (100°F) or higher, the total of which make up 99 percent or more of the total volume of the mixture. These liquids shall be known as Class I liquids, which are divided into 3 classes as follows (definitions from NFPA 30):

Class IA

Liquids having flashpoints below 23°C (73°F) and having a boiling point below 38°C (100°F).

Class IB

Liquids having flashpoints below 23°C (73°F) and having a boiling point at or above 38°C (100°F).

Class IC

Liquids having flashpoints at or above 23°C (73°F) and below 38°C (100°F).

Combustible Liquid

Any liquid that has a closed-cup flash point at or above 38°C (100°F). Combustible liquids are classified as Class II or Class III as follows (definitions from NFPA 30):

Class II - Liquids having a flash point at or above 38°C (100°F) and below 60°C (140°F)

Class III - Liquids having a flash point at or above 60°C (140°F), but below 93°C (200°F).

Bund (Dike)

A rigid wall, normally of reinforced concrete, surrounding a tank compound or other storage area to contain spillage.

Packing group

Any product classified as hazardous for transport and having a four digit U.N. reference will also have a U.N. Packing Group classification. There are three categories from PG I (highest hazard) to PG III (lowest hazard). Each level details the performance requirements and U.N. certification level required for a container for the product concerned.

Intermodal

The transfer of containers between different "modes", e.g. road to rail, rail to ship etc.

Tote

North American term commonly used for intermediate bulk containers.



5. Symbols and Abbreviations

For the purpose of this document the following symbols and abbreviations apply:

DNV	Det Norske Veritas
HDPE	High Density Polyethylene
IBC	Intermediate Bulk Container
ILS	Industrial Lubricants and Services (a Business Unit of BP)
ISO	International Standards Organisation
MSDS	Material Safety Data Sheet
OEM	Original Equipment Manufacturer
PP	Polypropylene

6. Hazardous products

A number of lubricant products, notably within ILS, are classified as hazardous for transport purposes. For a determination on product classification and packing group always refer to the Material Safety Data Sheet.

6.1. Lubricants Classified as Hazardous for Transport

- Rigid plastic and composite IBCs shall not be used for the transport of Class I flammable liquids.
- Where a product is classified as hazardous for transport it is a minimum legal requirement that the IBC specified shall be U.N. certified. The certification shall also comply with the appropriate U.N. Packing Group category.
- To obtain a U.N. certification for a container a supplier shall submit samples to an accredited laboratory for performance testing against the requirements of the U.N. Orange Book. If the container meets or exceeds the requirements of the test program it will be allocated a certification number applicable only to that supplier and container. This detail is included in the mandatory markings that shall then be applied to each container produced to that specification.

It is the filler/consignor's responsibility to ensure that any IBC specified and used for their products is "fit for purpose" and in accordance with any national or international modal regulations.

6.2. Non Hazardous Lubricants

- There are no international or inter modal regulations concerning container specification for such products.
- Any local or national regulations, specific modal requirements (e.g. air freight), or industry guidelines shall be complied with when specifying a containers for non-hazardous products.
- Any IBC specification chosen shall ensure that for typical operating conditions, and for a typical journey, the container could be mechanically handled safely with the product fully contained and free from risk of contamination.



7. Life Cycle of IBC

The following factors should be examined to determine whether an IBC specification is suitable for a product or range of products, and for a market.

1. Is the container to be filled and used once (single trip) or will it be emptied, cleaned and returned for reuse (multiple trip)?
2. What are the most arduous filling, handling, storage and delivery conditions it is likely to experience?
3. How will they be received, filled, handled and stored on site?
4. What is the maximum length of time product will be stored in the IBC?
5. What types of mechanical handling equipment will be used?
6. What types of transport equipment will be used?
7. Will IBCs be exported?
8. Will there be any deep-sea exports and if so to which markets?
9. What receiving, handling & storage capability are customers likely to provide?
10. Are there any specific product requirements (e.g. brake fluids, transformer oils)?
11. Are there any special customer requirements? (For example, customers in the offshore/marine sector and in the mining industry may have specific needs).
12. How will product be discharged from the IBC?
13. How completely can it be emptied and what level of residues will remain?
14. If intended as a single trip IBC how will it be safely disposed of or recycled?
15. If it is a multiple trip IBC what collection, inspection and verification system is in place to ensure the container is safe to reuse and will be clean and dry internally?

8. Principles and guidelines

The key question is which type to specify. Where required, a risk assessment of the operating conditions and typical journey should be used to determine this.

8.1. Principles

- a. Rigid plastic and composite IBCs shall not be used for the transport of Class I flammable liquids.
- b. Rigid plastic and composite IBCs may be used for the transport of Class II combustible liquids, but the polymers used in their construction shall have antistatic properties.
- c. Rigid plastic and composite IBCs may be used for the transport of Class III combustible liquids, but a risk assessment of the filling operation shall be undertaken to ensure that no risk of static discharge from the container is present. The polymers used in their construction should have antistatic properties to further minimise this risk.
- d. For any hazardous product the U.N. certification shall confirm with the Packing Group designated for the product.
- e. Flexible IBCs shall not be specified for use with lubricant products.
- f. IBCs with timber pallets shall not be specified.
- g. For multiple trip operation only rigid IBCs should be used, either all metal, all polymer or of composite material construction.

