
**Petroleum products — Lubricating
greases — Sampling of greases**

*Produits pétroliers — Graisses lubrifiantes — Échantillonnage des
graisses*

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 28, *Petroleum and related products, fuels and lubricants from natural or synthetic sources*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document was prepared to provide instructions for:

- preparing grease samples intended for production testing at the manufacturing plant stage;
- taking samples at the delivery site.

The methods and the ways of preparing samples differ depending on whether the sampling is performed on manufactured lots in a blending plant or on the delivery site.

ISO 3170 covers the manual sampling of liquid/semi-liquid hydrocarbons from a tank, a drum or a pipeline by manual means but does not include the sampling of greases.

ASTM D 4057^[1] and DIN 51750-3^[2] include specific procedures for sampling of greases. ASTM D 4057 includes specific provisions for sampling greases at the manufacturing stage.

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WARNING — The use of this document can involve hazardous materials, operations and equipment. This document does not purport to address all of the safety problems associated with its use. It is the responsibility of users of this document to take appropriate measures to ensure the safety and health of personnel prior to the application of the standard, and to determine the applicability of any other restrictions for this purpose.

1 Scope

This document specifies methods for obtaining samples of lubricating grease from production lots or shipments and gives instructions for inspecting greases in sales packages.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3170:2004, *Petroleum liquids — Manual sampling*

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

4 General

The procedures described in this document are quite general because a wide variety of conditions are often encountered, and they may be modified to satisfy particular specifications.

Users shall proceed in accordance with ISO 3170:2004, Clause 6 and 7.2 pertaining to precautions, safety, care and cleanliness, except where there is conflict with the instructions given in this document.

5 Sampling equipment

5.1 General

The sampling equipment described hereafter shall be chosen based on the observations done on the samples (control of the homogeneity):

- according to the size and type of container from which the sample is drawn; and
- according to the product and size of the sample.

Users shall ensure that the sampling equipment and its fastenings are clean and dry and that they are not in contact with possible sources of contamination (e.g. rags, dust) and humidity during the sampling operation.

5.2 Spatulas

May be of all appropriate shapes and sizes. The blade of the spatula should be made from stainless steel. It is also possible to use any other material compatible with the product that is sampled, provided that this material is not likely to contaminate the product.

5.3 Ladle, big spoon or grain shovel

Made from stainless steel or any material compatible with the product to be sampled, of appropriate size so as to sample, at once, 500 g to 1 000 g of product.

5.4 Core boring tube

As in [Figure 1](#).

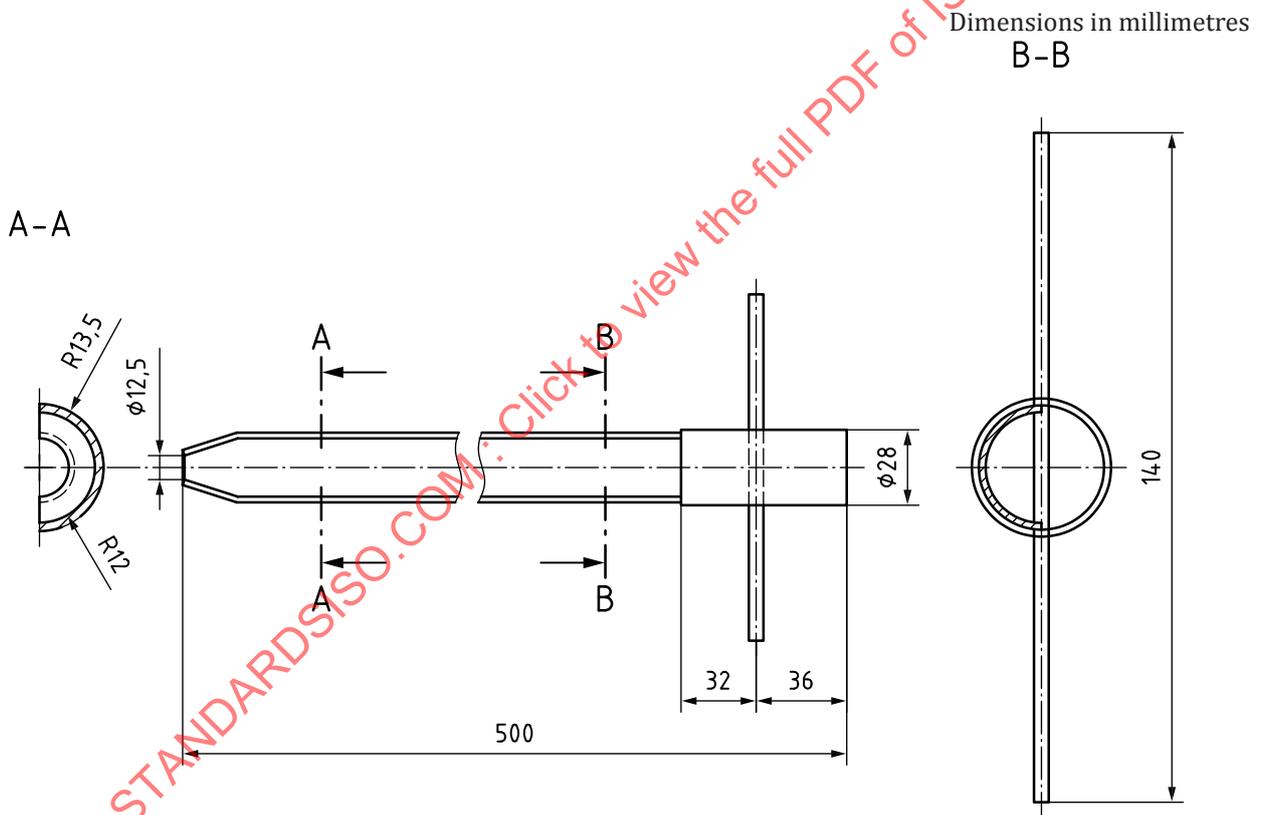


Figure 1 — Channel type auger

5.5 Auger

As in [Figure 2](#).

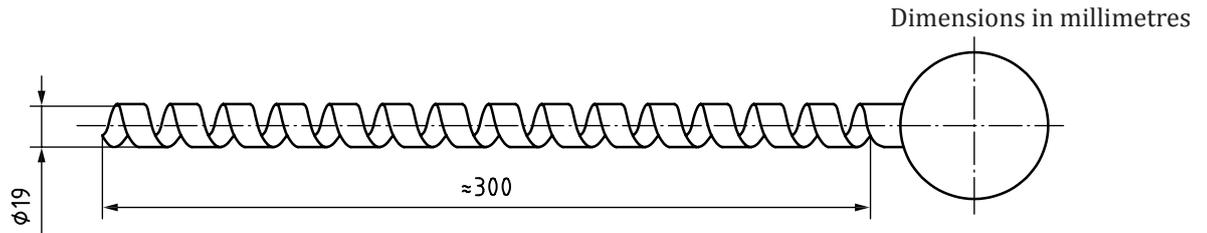


Figure 2 — Ship auger

5.6 Allen Auerbach auger

As in [Figure 3](#).

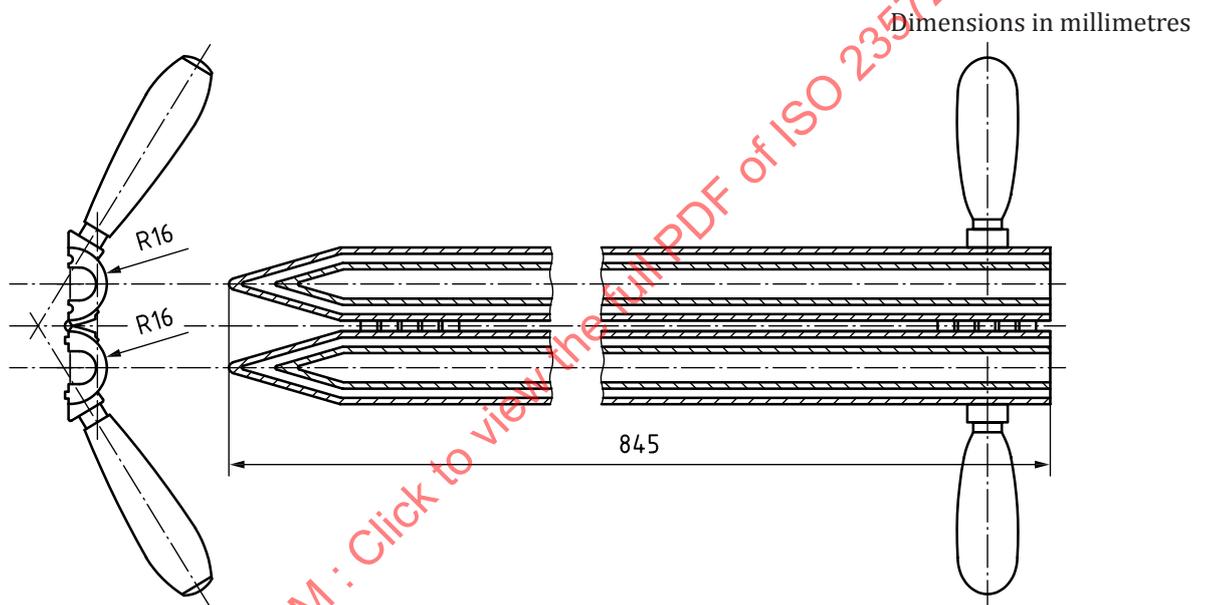


Figure 3 — Allen Auerbach auger

5.7 Containers

The containers intended to receive the samples shall be clean and dry and non-corrodible by the sampled products. When the samples are stored over prolonged periods, the containers shall be resistant to the ambient conditions and well-proof if the container has been obtained by crimping. The containers shall be able to be closed with a tight lid.

6 General measures

6.1 Sampling on the manufacturing site

If the inspection is performed on the manufacturing site, the samples shall be withdrawn from the containers ready for shipping separately on each manufacturing lot. Grease samples shall not be taken directly from grease kettles, cooling pans or tanks of processing equipment.

Do not sample the grease before it has stayed for at least 12 hours in the finished container and has cooled down to a temperature not more than 9 ° above that of the air surrounding the container.

If the same grease batch is packaged in containers of different sizes, treat the grease in each size of container as a separate lot.

6.2 Sampling on the delivery site

When the inspection is made at the place of delivery, obtain a sample from each shipment. If the shipment consists of containers from more than one production batch (lot number), sample each batch separately.

6.3 Sample size

Select containers at random on each lot or each shipment to give the required quantity as specified in [Table 1](#).

Table 1 — Size of grease samples

Container	Lot or shipment	Minimum sample
Cartridges or packages less than 0,5 kg	Any size of the lot or shipment	Enough units to form a 1 kg sample
Cans larger than 0,5 kg up to and including 2 kg		Three cans
Cans larger than 2 kg up to and including 5 kg		One can
Larger than 5 kg	Less than 5 tons	1 kg to 1,5 kg from one or more containers
	5 tons to 20 tons	1 kg to 2,5 kg from two or more containers
	Above 20 tons	1 kg to 2,5 kg from three or more containers

7 Procedure

7.1 Inspection

Examine the open containers to determine whether the grease is homogeneous. Compare the appearance, texture and consistency of the grease that stays in the vicinity of the surface with the grease located at least 15 cm below the surface. When more than one container of a lot or shipment is opened, proceed to the same examinations as before on all opened containers.

7.2 Sampling

If, when inspecting, no marked difference is evident, withdraw one portion from the approximate centre and at least 6,5 cm below the surface of each opened container in sufficient quantity to provide a composite sample of the desired quantity (see [Table 1](#)).

Withdraw portions with a clean spatula ([5.2](#)) and a ladle, big spoon or grain shovel ([5.3](#)) and place them in a clean container ([5.7](#)). For soft and very soft greases, it is preferable to use a ladle with a volume of approximately 0,5 l.

If there is any marked difference in appearance or texture of the grease from the various locations of an open container, take two separate samples of approximately 0,5 kg each, one from the top of the surface near the walls and the other from the centre of the container, at least 15 cm below the surface.

If any marked variations are noted between different containers of a lot or shipment, take separate samples of approximately 0,5 kg.

If, because a lack of uniformity, more than one sample of a batch or shipment is taken, the samples shall be sent for laboratory inspection as separate samples.

7.3 Handling of grease samples

If more than one portion is required to represent a lot or shipment of grease with a penetration larger than 175 units of 0,1 mm tested in accordance with ISO 2137, a composite sample shall be prepared by blending aliquot portions thoroughly. This composite sample shall be prepared in a clean container, using a spatula, avoiding a too intense mixing and the inclusion of air bubbles.

As the grease samples become partially worked in being removed from containers, the procedure is not valid when “unworked” penetration is determined.

7.4 Particular cases

When specific properties are determined on a product (e.g. thixotropic properties of a grease), the sampling process shall be performed following specific instructions made by the requestor of the analysis.

The sampling equipment of the products for which the structure shall not be disturbed (greases on which the unworked penetration is determined) shall be agreed upon.

7.5 Use of a ship auger

This type of sampling equipment is recommended for taking samples from any level of the product.

7.6 Use of a channel type auger

This type of tube is recommended when top samples, middle samples and bottom samples are taken.

7.7 Use of an Allen Auerbach auger

This type of tube enables the determination of the degree of homogeneity in a package. It also traps the layers of impurities at the bottom of a package that are not taken by the sampling equipment with non-closed bottoms. The tube is introduced in the package in its open position, then closed and withdrawn.