

50X1-HUM

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CHEMICAL MATERIALS STANDARDS  
FOR GREASES, NAPHTHA PRODUCTS,  
COOLING LIQUIDS  
and RECTIFIED ETHYLALCOHOL

COPY No

50X1-HUM

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PRAGUE 1957

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Standard 782-53

UNIVERSAL GREASE OF A LOW MELTING POINT "UN"

(Technical vaseline)  
 Technical conditions

1. The present standard is related to a consistent grease designed for greasing lubricating of mechanism, for technological purposes.
2. The grease should correspond to the following requirements:

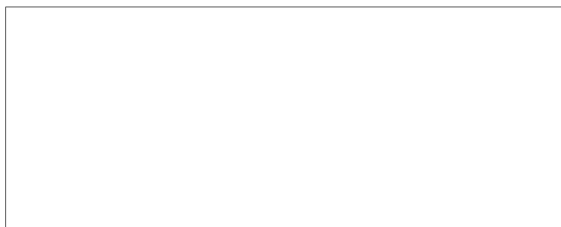
The name of indexes	Norms	Testing methods
1. External appearance	Homogenous grease without pieces of a light-brown till deepbrown colour	
2. The temperature of drop point	54	
3. Cinemtaic viscosity a 60°C in canistocks not less than	20	
4. Corrosion test	Sustains the test	
5. Number of acidity in mg of Ko H for one gr. of grease not less than	0,28	
6. The contents water soluble acids	0	
7. The contents of water soluble alkalies not more than	Traces	
8. Contents of mechanical impurities in % not more than	0,03	50X1-HUM
9. Contents of water	0	
10. Contents of ash in % not more than	0,07	



(-1- Cont.)

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- |   |           |                                  |
|---|-----------|----------------------------------|
| 11. Test of stability of globule pieces of the grease | Satisfies | After par.60 of present standard |
| 12. Solubility in petrol                              | Satisfies | After par.70 of present standard |



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## Notice:

1. Sand and other abrasive materials as well as other mechanical impurities are not admitted.
2. Test of corrosivity is performed on steel plates.
3. The grease can have a smell of a mineral oil.  
The smell of kerosene is not admitted.
4. A grease which is used as a softening agent for rubber mixtures must not have a rest after filtration of the melted grease through a sieve which has 1600 meshes on 1 cm<sup>2</sup>.
5. When determining the drop point the grease is not put into the capsule directly; it is heated to 100°C and poured into the capsules by drops; the capsules are placed on the bottom of a turned over china cup, which is filled from inside with crushed ice. A capsule filled up to its top is left on the bottom of the dish for 20 minutes.
6. For determination of the stability of globule pieces of the grease we put a spatule a piece about 1 ccm of grease on a glass plate, so that we move the spatula on the edge of the glass plate perpendicularly to its surface.

The plate is then fixed vertically into stative, so that the grease is on the upper surface of the plate.

The stative with the glass plate is put into a thermostat in such a manner that the plate doesn't touch the walls and we leave it now for a 15 minutes at a temperature of 20°C. After this period the piece of grease should have such a form as when put on the plate and must not slide or flown down from the plate.

7. For determination of the solubility in petrol we solve the grease in a four fold amount of anhydrated petrol with the beginning of destillation at a temperature of minimum 60 C; at this temperature the grease must form a transparent liquid.
8. Package, marking, storage transportation and overtaking of grease is performed in accordance with standard 1510-50.
9. Sampling if grease is performed in accordance with standard 2517-52. For a control sample we take one kilogram of grease.

Standard 1033-51

#### A UNIVERSAL GREASE OF A MEDIUM MELTING POINT "US"

##### Technical conditions

1. The present standard is related to a universal grease obtained by the solidification of either purified or by washed mineral oils by calcium soaps.
2. There exist three marks of universal medium melting greases: "US-1" ("Press-solidol"), "US-2" ("L"), "US-3" ("T").
3. The grease must correspond to the following physico-chemical characteristics;  
External appearance - homogenous grease of a light-yellow to dark-brown colour.

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Notice: The grease put by a spatula on a glass plate in a layer of 1-2 mm must not contain globules observed in a passing light, without optical devices and must be homogenous.

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Indexes of physico-chemical properties	Norms for the single
	Marks
	US-2 ("L")
1. The content of soaps in % not less than	11
2. The point of dropping off in °C not less than	75
3. Penetration at 25°C in a range of	230-290
4. Corrosion test performed with metallic plates for 3 hours at 100°C	satisfies
5. The contents of free alcalies transfered on NaOH in % not more than	0,2
6. Contents of mechanical impurities in % not more than	0,4
7. Contents of mechanical impurities insoluble in hydrochloric acid	in not admitted
8. Contents of water in per cents not more than	2,0
9. Cinematic viscosity of the oil used in the grease, in a centiclocks at a temperature of 50°C in a range of	17-40
10. Contents of free organic acids	not admitted

Notice: Corrosion tests are performed :

- a. On steel plates
  - b. On brase plates
  - c. The contents of free organic acids is determined at the producing plant of the grease.
4. Package, marking, transportation, storage and acceptance of ~~###~~ the grease is performed in accordance with the standard 1510-50.
5. The sampling is performed in accordance with standard 2517-52. For control samples take one kilogram of grease of each mark.

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Standard 1631-52 50X1-HUM

A UNIVERSAL HIGH MELTING WATER RESISTANT GREASE UTVTechnical conditions

1. This standard is related to an universal grease obtained by concentration of a mineral oil by sodium-calcium soaps.
2. The grease must correspond to the following demands:

The name of indexes	Norms	Testing methods
1. External appearance	Homogenous grease without globules of a light yellow till dark-brown colour	
2. The drop point in °C not less than	120	
3. Penetration: at a temperature of 25°C in a range of	250-290	
at a temperature of minus 40°C not less than	30	
4. Corrosion test at a temperature of 20°C a) with a steel plates for a period of 72 hours b) with bronze plates for a period of 24 hours	sustains the test	
5. Test of thermal stability satisfies		In accordance with par.4 of present standard
6. Test of chemical stability satisfies		In accordance with par.5 of present standard
7. The testing of free alkalies transferred to NaOH in % not less than	0,2	
8. Contents of free acids	not admitted	
9. Contents of mechanical impurities	"	
10. Contents of water in % not more than	0,75	

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4. The test of thermal stability is performed on a sieve with 6400 meshes on 1 cm<sup>2</sup>; the sieve which has a dish-like small pit of a capacity of a 50 ml vessel, into which we weight 10 gr of the grease with an accuracy of 0, 1 g.

The sieve with the grease is placed on the vessel and put into a thermostat, where we keep it for two hours at the temperature of  $116 \pm 1^{\circ}\text{C}$ . The grease is observed as sustaining the test if after two hours there occurs no oil in the vessel.

5. Test for chemical stability is performed in a metal box of a dimension of 50 x 100 mm and a height of about 100 mm, which we put by a spatula the tested grease, whose surface is carefully smoothed. The box with a grease is put into the thermostat heated to  $100 \pm 3^{\circ}\text{C}$  for 72 hours. The second box filled as given above and tightly closed by a lid is put for 72 hours into a dark place of a temperature of 20-25°C. After the testing period is over, both boxes are put on an illuminated place and both samples are compared. We consider tested grease as sustaining the test if on the surface of the sample we observe no films or crusts, and if it is just a bit darker, than the sample in the other box.
6. Packing, marking, storage, transport and receiving of grease is performed accordingly to the standard 1510-50.
7. The taking of samples is carried out accordingly to the standard 2517-52. As a control sample we take 1 kg of the grease.

Standard 2517-52

#### TAKING OF SAMPLES

This standard is related to methods of sampling of nafts products and for testing whether they correspond to the standards and technical conditions.

#### I. The Apparatus For Sampling the Naphta Products

1. For taking of liquid samples of naphta products from tanks and cisterns we use the following equipment:
- a) An apparatus for taking of samples which consists of a metallic vessel with a heavy bottom and with an easily opening lid of a glass bottle, which is put into a metallic frame, The bottle is tightly closed by a stopper, to which a string is fastened.

For the characteristics of the lowest layer of naphta we use the apparatus which makes possible to take samples 3-5 cm from the bottom.

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- b) A metallic ruler with a load.
- 2. For taking of samples of liquid naphta products from smaller vessels (barrels, cans, bottles) we use a glass tube of a diameter of 10-15 mm with a narrow drawn end.

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3. For the taking of solid and powder type samples of naphta--products we use the screw-like sample gauge of a length of 400 mm (when taking samples from sacks, cans or flasks) or of 800 mm length ( when taking samples from barrels and drums)\*

To the downside end of the piston samples guage type along its diameter a wire is soldered.

4. For taking solid samples of naphta-products we use a knife (for melting naphta-products)and a shovel (for not melting products).

## II. Common directions for taking of samples

5. In order to determine whether the samples of the naphta-products satisfy the standards and technical conditions, they are taken in amounts given in the standard and technical conditions for naphta-products.

In case of necessity of a repeated checking of one or two quality indexes (whether they correspond to the requirements of the given standards or technical conditions) We take a sample in and amount that is necessary for performing tests for these indexes.

6. From little vessels samples are taken in a place which is protected against dust and atmospheric effects.
7. Instruments, as well as vessels for taking of samples must be clean. Before use they are washed through by the product from which the sample is taken in case that the product is liquid. If the tested product is greasy or solid, the vessels are washed out with petrol and dried.
8. All samples which must be mixed in order to obtain an average sample are taken by the same sampling device, without washing it before taking of each single sample.

After use, the appatates for taking of samples as well as vessels into which the samples were put are washed out with petrol, dried out and placed to a closed place protected against dust and atmosphere moisture.

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## III. Method for taking of samples of liquid naphta-products from tanks

9. For the characteristics of the quality of a naphta-product in vertical as well as horizontal tanks of a diameter greater than 2500 mm we mix samples taken from three layers:
  - a) 200 mm under the level of the naphta-product (upper layer.
  - b) from the middle layer
  - c) from a layer that is lower by 100 mm than the lower edge of the mile

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If the millet and outlet tube does not exist, or in the case that this tube is nearer than 350 mm from the bottom of the tank we take the sample in a sistance of 250 mm from the bottom.

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The taken samples are mixed in the following proportions:

The layer from which the sample is taken	The amount components contained in the average sample	
	Vertical tank	Horizontal tank of diameter greater than 2500 mm
Upper	1	1
Middle	3	6
Lower	1	1

10. Samples from a horizontal tank of a diameter up to 2500 mm are taken accordingly to par. 16 of this standard in the same manner as samples are taken from cisterns wagons with four axles.

From a horizontal tank of a diameter greater than 2500mm, filled by half its capacity, an average sample is formed by 3 parts taken from the middle part of the liquid and by one part of a sample taken 100 mm below the lower edge of the inlet outlet tube.

11. Before taking the samples the tank must be prepared for delivering of the naphta-products.

When taking a sample with a sampling device, the latter tightly closed, is dipped into reservoir through the opening to the level which is given on the calibrated rod. Then the lid of the sampling device is opened and so the naphta-product gets in, this is shown by occurrence of air bubbles.

From the sampling device we let the naphta-product out into a clean dry vessel, which must be than closed hermetically by a stopper.

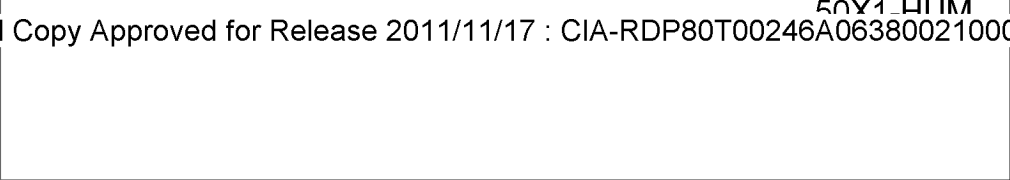
The sampling device is dipped again this time into the next given level without a preliminary washing out in this manner we take a sample from each level.

When taking samples by a flask, this is dipped into the naphta-product to the proper level and its corone plug is pulled out with aid of a string.

If there is no opening in the lid of the tank it is possible to take samples from all sampling cocks along the whole height of the product in equal amounts.

12. From the taken samples we make an average sample by mixing them in the proportions given in the table of par. 9.

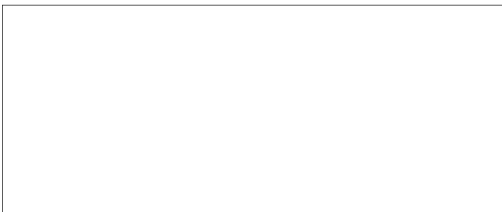
Samples of petrols are preliminary cooled with water of a temperature of 0° - 20°C and we mix them with caution in order to prevent losses of the height fractions.



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IV. Methods for taking samples from tank-ships  
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13. For the characteristics of the quality of naphta-products in the tank-ships loaded by one sort of a naphta-product we take samples from at least 25% of the tanks. From 5% of the tanks placed on the stern of the ship and from 15% of the tanks placed in the middle part.



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Average samples from each tank consists from samples taken from 3 levels: 50X1-HUM

- a) 200 mm below the surface of the naphta-product one part
- b) from the middle part of the naphta product three parts
- c) from the lowest level where the sampling device can reach one part.

Samples are taken with the same manner as is given in par. 11 of the present standard.

- 14. If the ship is loaded with different naphta-products samples are taken not less than from 25% of tanks, filled with the same naphta-product, but at least from two tanks and the average sample for each tank is formed as described in para. 13 of this standard.
- 15. For the evaluation of the quality of rest of products is the ship before its loading we form an average sample from different parts of samples of different volumes which were taken from 25% of all tanks.

V. Methods for taking samples from liquid naphta-products from Cisterns

- 16. For an evaluation of the quality of naphta-products in single cisterns which have two axles we take one sample from the middle of the cistern (i.e. point of intersection of the vertical line passing through the centre of the opening, with the horizontal axis of the cistern), from a cistern having four axles we take two samples: one sample 200 mm from the bottom of the cistern, the second 200 mm from the upper surface of the naphta-product and from both samples we make an average one

Samples are taken in the manner given in par. 11 of the present standard.

- 17. For the evaluation of quality of a naphta-product in a train transport, loaded with the same naphta-product there is taken in accordance with par. 16 of the present standard one sample from the front cistern (i.e. the cistern which is filled first out from the naphta pipeline), and from other cisterns an average sample is made of equal volumes of samples taken from each fourth cistern of the transport, but at least from two cisterns apart from the front cistern (this is meant for the transport with seven or less cisterns).

In the case that the naphta-products in the front-cistern is not of a standard quality we take and analyse samples from the second cistern and so on.

For the evaluation of the quality of a naphta-product in a transport with numbered cisterns an average sample is made from equal volumes of samples taken from each cistern of the transport excluding the front cistern, from which

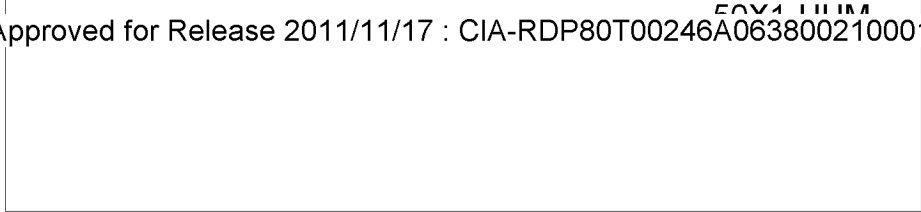
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a sample is taken and stored separately.

For the evaluation of quality of spindle-oil mark AU and petrol used as a sdvent we take and analyse samples from each cistern separately.

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18. If a transport is loaded with different naphta-products there are taken samples for the evaluation of quality of each product from each group of cisterns with the given naphta-product accordingly to par.17 of present standard in the same manner as given for transport.

VI. Method of taking samples of liquid naphta-products from  
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Pipe lines  
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19. For the evaluation of quality of naphta-products flowing in the pipe-line we form an average sample from equal volumes of samples taken from sampling cocks on the end of the pipe-line in the following periods of time:

Total time of pumping	Periods of time after which samples are taken
U to one hour	in the beginning and end of the pumping
From one to two hours	In the beginning in the middle and in the end of pumping
From two to 24 hours	In the beginning of pumping and after each hour
More than 24 hours	In the beginning of pumping and after each two hours

The taken samples are mixed in a dry clean vessel with a perfect closure.

VII. A method of taking liquid samples of naphta-products from  
-----  
small vessels  
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20. For the characteristic of the quality of naphta-products stored in small vessels we make an average sample from equal volumes of samples taken in the following amounts from cans, barrels, bottles:  
a) from barrels -- from 5% of the transported number but not less than from two barrels  
b) from cans, bottles and flasks from 2% of the transported number but not less than from two cans, bottles and flasks.

For the characteristic of quality of the spindle-oil AU and petrol for solving and average sample is put together



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for each wagon from 20% of the barrels or cans. Samples from cans are taken before their soldering. For a repeated checking of quality of naphta-products stored in soldered cans not longer than 12 months, we take samples from 5% of the cans and at a longer storage than 12 months from 20% of the cans.

Barrels determined for the taking of samples are rolled forwards and backwards, then turned so that the stoppers are on the top; then the surface of the stopper is wipped

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by a duster, the stopper is put out and put with the plug upside beside the opening of the barrel.

Cans and vessels determined for the taking of samples are shaken and set ~~with~~ with their closures upside, the surface around the opening is cleaned, the covers are put out and placed with their thinner part upside next to the cans and vessels. Bottles are shaken and the stoppers are put out.

22. When taking samples by a tube we dip a clean and dry tube with the naptha product to a depth of 30 cm and the naptha product is let to flow in; then the upper opening of the tube is closed by our thumb, the tube is put out and the whole surface is washed through by the taken product and then the liquid is poured out. Then we again dip the tube into the product, fill the tube close it by our thumb put it out and the taken sample is poured into a clean and dry vessel.

23. From all barrels, cans, bottles and vessels samples are taken in the same quantity. The taken samples are poured into a dry clean vessel and mixed through.

24. After sampling, the barrels, cans, bottles and vessels are closed with stoppers and lids.

VIII. A Method for taking greasy naptha products from vessels.

25. For the evaluation of the quality of greasy naptha products enclosed in small vessels and average sample is put together from equal volumes of the samples taken from 2% of the number of barrels, boxes, drums, cans or vessels but at least from two barrels, boxes, drums, cans or vessels.

26. Barrels, chests, drums, cans or vessels determined for the taking of samples are turned with their bottoms or lids upside, wiped by a duster, then lids are put off from the drums or barrels bottom, the covers are removed from chests, cans or vessels are put with their inside surface upside next to the barrels, boxes, cans and vessels. Then a layer of a depth of 5 mm and a diameter of 200 mm is taken away.

27. The sampler is taken by a screwlike or piston-like sampler. When taking sampler by a screw-like sampler it is driven into the vessels, drums, cans, barrels or chests till to their bottom, the probe is then put out, the grease taken away by a spatula; the upper part of the sample (5mm) from the barrel and ~~in~~ chests is taken away. When taking samples by a piston sampler this is driven till to the bottom of barrels, cans, drums, boxes or vessels, turned around by 180° so that the sample is cut off by the cable, then the probe is put out and if the sample was taken from barrels or boxes, the upper part (5mm) is again removed.

28. From all barrels, chests, drums, cans and vessels are taken in the same quantity samples. The taken samples are put into a dry clean vessel and mixed with a spade.

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29. After the end of sampling the cans, ~~barrels~~ barrels and chests are closed by lids, on the barrels and drums their bottom are put back.

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IX. The use and storage of samples

30. A sample of a liquid naphta-product taken in accordance with par.9-24 of this standard is poured into two clean bottles. The bottles are not filled up to the edge in order that there is enough place for mixing the sample by shaking. A sample of a greasy naphta-product taken accordingly to par.25-29 of this standard is put into two clean glass flasks.

31. Bottles with samples are perfectly closed by stoppers, hermetic lids or by a piece of parchment paper.

32. To each flasks or bottle with a sample of a naphta-product we fasten with a string folded label where the following data are given:

- a) the name of the naphta- product and its mark
- b) the name of the producing plant or base
- c) the number of the lot or numbers of cisterns, barrels, ship=tanks, transport and so on, from which the samples were taken
- d) the data of taking the sample
- e) standard of technical conditions for the naphta-products.

The end of the wire or string is sealed to the stopper, lid or parchment paper.

33. One sample is sent into a laboratory to be analysed and the second one is kept at the supplier for two months for a case of arbitration.

34. The sample for arbitration analysis is kept in a dry place protected from dust and atmosherical effects. Samples with an ethylated petrol are stored in a dark room.

Standard 1957-52

A UNIVERSAL GREASE OF A HIGH MELTING POINT "UT" (FATHY CONSTALIN)

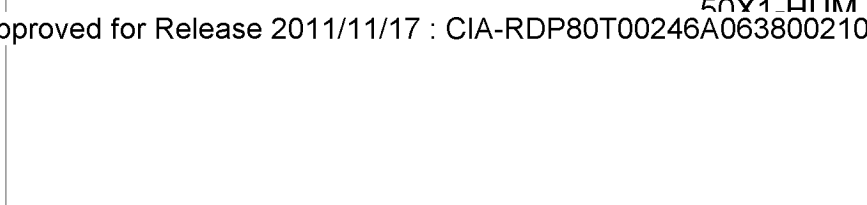
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Technical conditions

1. This standard is related to an universal grease obtained by a solidification of a by-treated or purified mineral oil by natron soaps.

2. There are two marks of a universal high melting oil: "UT - 1",

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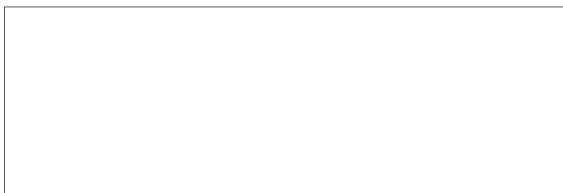
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"UT- 2".

3. The greases must correspond to the following requirements:

(Notice: The corrosion test is performed on:

1. Steel plates
2. Copper plates)



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The name of indexes	Norms for the marks	
	"UT-1"	"UT-2"
1. External apperarance	A homogenous grease without globules, of a yellow-pale till dark brown colour	
2. Drop points in degrees of centigrade lower than	130	150
3. Penetration at 120°C in a range of	225-275	175-225
4. The contents of water in % not higher than	0,5	0,5
5. The contents of free alkalies in % max.	0,2	2,2
6. The contents of free acids	absent	absent
7. The contents of mechanical inclusions	"	"
8. Ash in %	4	4,5
9. Corrosion test of metallic plates for 72 hours	sustains the test	
10. Testing of stability	sustains the test	in accordance with par.4 of this standard
11. The cinematic viscosity of the oil in the grease at 50 C in centistocks in a range	19-45	19-53

4. The testing of stability is performed in a metal sheet-box with dimensions of 50 x 100 mm and a height of about 100 mm. Into a vox we put by a spatula the tested grease surface of which is carefully smoothened. The box with the grease is put into a thermostat heated up to 75 C for a period of six hours. The second box filled in the above given manner with a tightly fitting lid is put for six hours into a dark place at a temperature of 20-25 C. After the testing period is over, both boxes are put into an illuminated place and the samples of grease in the boxes are compared. The grease which was heated is assumed to be suitable if it doesent form layers and if on its surface there doesent occur a visible crust and if its colour didnt become mach darker than the colour of the grease in the second box.

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grease in the second box.

5. Packing, marking, storage, transport and receiving of the grease is performed in accordance with the standard 1510-50.

6. The taking of samples of the grease is performed according to the standard 2517-52 as a control sample we take 1 kg of grease of each mark.

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Standard 2712-52

## THE GREASE A M S

Technical conditions

1. This standard is related to a consistent grease determined for greasing of mechanisms working in water or being in contact with water.
2. There are two marks of this grease: AMS-1, AMS-3.
3. The grease must correspond to the following requirements:

The name of indexes	Norms		
	AMS-1	AMS-3	AMS-3
1. The external appearance	A homogenous grease without globules of a dark colour		
2. Drop point in C not lower than	85	95	
3. Penetration at 20 C in a range of	300-350	200-250	
4. Testing of protective properties on steel and cast iron plates at a temperature of 50 C during 24 hours	sustains the test		
5. Contents of water	absent	absent	
6. Contents of mechanical ingredients	"	"	

5. The testing of protective properties is performed at the same time on two plates:

- a) on plates made of steel
- b) on plates made of cast iron

On each plate we put on one side with a template the grease in a 3 mm layer and the plate is then placed in a horizontal position into a porcelain cup so that on the upper side of the plate we have the layer of grease. The porcelain cup with both plates is put into a exsiccator on a glass plate of porcelan ring with openings. The exsiccator is closed by a cover and to the inside surface of the cover a filter paper is sticked. If after the test there occur in the cup drops of water, the test does not satisfy.

Cast iron plates are inspected after being washed over, if a green colour is present then they are wiped with a hygro-

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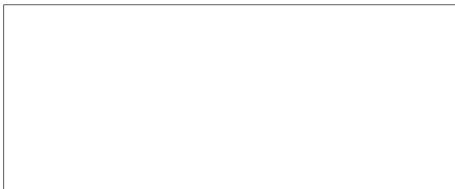


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scopic cotten wool and inspected again.

6. Packing, marking, storage, transport and accepting of the grease is performed in accordance with the standard 1510-50.



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7. The taking of samples is performed in accordance with the standard 2517-52, As a control sample we take 1 kg of grease from each mark.

Standard 3005-51

G U N G R E A S E

( The grease U N Z )

Technical conditions

1. The given standard is related to consistent greases determined for greasing of mechanisms in the summer period and for the protection of metallic surfaces not **protected** in another manner against corrosion.
2. The grease must not correspond to the following requirements. The external appearance and properties: a greasy mass of a colour from light-brown to dark-brown. The grease put on in a 1 mm layer on a glass plate when observed in a passing light must be homogenous without flocks; a fine graining of the grease is allowed.

Indexes of physico-chemical properties	Norms
1. Cinematic viscosity at 60°C in centi-stocks not less than	40
2. Drop point in °C not lower than	50
3. Corrosion test on steel and copper plates at 100°C for a period of 3 hours	sustains the test
4. Testing of protective preparaties on steel plates at 50°C during 30 hours	sustains the test
5. The ability to maintain on the surface a continuous layer at a temperature of 60°C during 24 hours in mg sq.cm not less than	0,6
6. The number of asidity in mg of KOH for 1 g of the grease not more than	0,3
7. The reaction of the grease	neutral or slightly alcalic
8. The contents of water	absent
9. The contents of mechanical ingre-dients in %	0,050X1-HUM

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10. The ash in % not more than

0,07

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**Notice:**

- a. Sand and other abrasive substances as mechanical inclusions are not allowed.
- b. When delivering the grease in barrels we perform a determination of water contents.
4. When determining the drop point the grease is not put into a capsule but is heated up to 100 C and poured by drops into the capsule, placed on the bottom of a turned over cup, which is filled in its inside water crashed ice. The filled capsule is left on the bottom of the cup for 20 minutes.
5. Testing of protective properties is performed at the same time on two steel plates mark 40 or 50. The plates are dipped into the grease, which is kept in a porcelain cup. The layer of the grease on the plates should not be less than 4-5 mm. The cup with the plates are placed into an exsiccator on glass plates or on a porcelain ring with openings.

The exsiccator is closed with a cover to the inside surface of which a filter paper is sticked. If after the testing there appear drops of water in the cups the test does not satisfy. The observation of corrosion attack is made on the upper surface of each plate.

6. For testing the contents of mechanical inclusions in the grease we take 25 g of the grease. The determination is performed at a five fold dilution with petrol with a following washing through with hot benzol.
7. Packing, marking, transport and acceptance of grease is performed according to the standard 1510-50 with the following supplementation: on the side surface of each can ~~of the grease and the date of its production. The inscription should be written with the~~  
we place an inscription with the following data: the name of the grease and the date of its production. The inscription should be written with black enamel paint, not soluble on water and mineral oil. The filled cans are covered on their whole surface with a mixture of the grease contained in the can and a grease according to the standard 3045-51 (1:1) and packed for transport into wooden cages.
8. The taking of samples of the grease is performed according to the standard 2517-52. As control samples we take 1 kg of the grease.

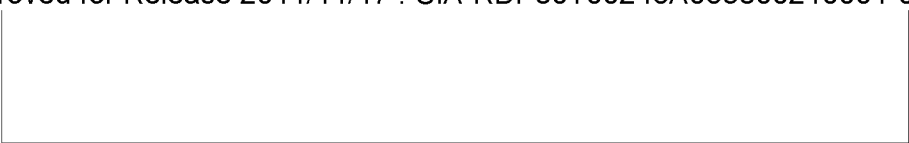
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Standard 3045-51

ARMAMENT GREASE

## Technical conditions

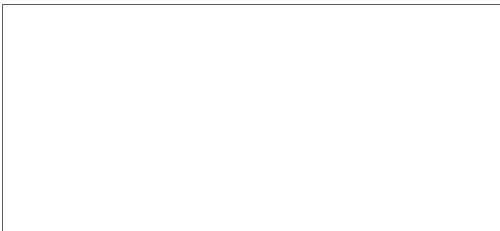
1. This standard is related to a grease determined for the



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(continued)

greasing of the mechanisms and for a short time protection of metallic surfaces against corrosion in summer, spring and in the autumn.



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2. The grease must correspond to the following requirements:  
 External appearance -- the grease poured into the testing tube (of a diameter of 15 - 20 mm, height 150 - 170 mm) made of a colorless glass; when inspected in a passing light has a color from light to dark bronze.

Indexes of physico-chemical properties	Norms
1. Cinematic viscosity in centistokes at 50° C not less than at 100° C not less than	65 10
2. Corrosion test of steel plates at a temperature of 100° C during 3 hours	satisfies
3. The ability to keep on the surface of a metal in a continuous layer at a temperature of 20° during 24 hours in mg/cm <sup>2</sup> not less than	1,5
4. The number of acidity in mg of KOH for 1 gr of grease not more than	0,35
5. Reaction of the grease	neutral or slightly alkalic
6. The content of water	absent
7. The content of mechanical admixtures in % not more than	0,05
8. Ash in % not more than	0,05
9. Test for stability (homogeneity) at a temperature of 15 - 20 ° C during 5 days	satisfies, in accordance with par. 5 of the present standard

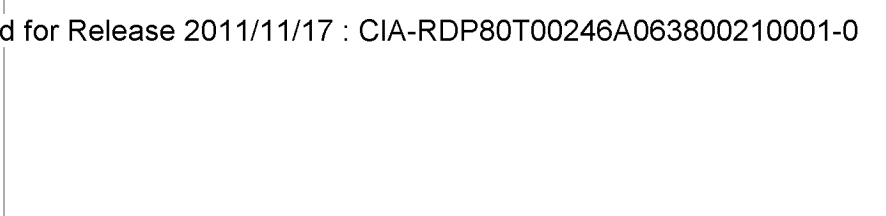
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Notice: Sand and other abrasives matters as mechanical inclusions are not allowed.

4. For testing the grease for contents of mechanical admixtures we take 25 gr. of the grease. The determination is performed at a five-fold dilution of the grease by petrol with a following washing through by hot benzol.

5. For testing of stability (homogeneity), we pour about 40 ml into a test tube with a diameter 15 - 20 mm and a height of 150 - 170 mm, fastened vertically in a stand. The testing tube is closed by a stopper. The grease is taken as convenient if at a temperature of 15 - 20° C after a period of 5 days we shall not observe its division into a transparent and turbid layer, observed in a passing light.

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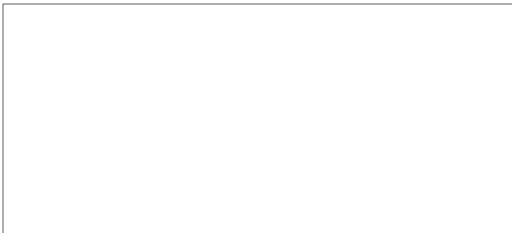
- R. Packing, marking, storage, transport and receiving of the grease is performed accordingly with the standard 1510-50 with the following supplementation: On the one side surface of each can an inscription is written with the following data: the name of the grease and the year of production. The inscription must be written with beach paint insoluble in water and mineral oil.

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The filled cans are covered on their whole surface with a mixture of the grease contained on the can and a grease according to the standard 3005-51 (1:1) and packed for transport into a wooden cages.

6. Taking of a sample of the greases is performed according to the standard 2517-52. As control samples we take 1 kg of the grease.

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## Standard 5703 - 51

## A UNIVERSAL HIGH MELTING SYNTHETIC GREASE

("UTS" - Synthetic constalin)

## Technical Conditions

1. The present standard is related to a universal high melting grease obtained by solidification of a mineral oil with natron scaps, prepared from synthetic fatty-acids.
2. There are two marks of a universal, high melting synthetic grease: "UTS-1" "UTS-2"
3. The grease must correspond to the following physico-chemical requirements: external appearance -- a homogenous grease of a dark brown color.

Notice: A grease put by a spatula on a glass-plate in a larger of 1 - 2 mm should be (when observed visually in a passing light) homogenous without flocks.

Indexes of physico-chemical properties	UTS-1 Norms	UTS-2 Norms
1. drop point in degrees of centigr., not lower than	130	150
2. Penetration at 25° C in a range of	225-275	175-225
3. Contents of water in % not less than	0,5	0,5
4. Contents of free alcalies in % not less than	0,2	0,2
5. Contents of free acids	not allowed	
6. Contents of mechanical impurities insoluble in HCE and unburnable	not allowed	
7. Contents of ash in % not more than	4	4
8. Corrosion test on metallic plates for a period of 72 hours	sustains the test	

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Indexes of physico-chemical properties	Norm for UTS-1	Norm for UTS-2
9. Test of stability		sustains the test
10. Cinematic viscosity of the oil component of the grease at 50°C in centistokes in a range of	19-45	19-53

Notice: The corrosion test is performed on a) steel plates  
b) copper plates

Test of stability is performed in a metallix box of the following dimensions: 50 x 100 mm, height 100 mm into which we put a spatula the tested grease, whose surface is carefully smoothed by the spatula. The box with the grease is then put into a thermostat, heated to 75° C  $\pm$  5° C for a period of 6 hours. The second box with the grease filled in the same maner as described above and closed perfectly by a lid is put for 6 hours into a dark place of a temperature of 20 - 25° C. After this period both boxes are put into an illuminated place and both greases are compared.

The grease which was heated is recognized as suitable if it does not divide into layers and if no crustics on its surface and if the darkening of colour of the grease is only slight when compared with the colour of the grease in the other box.

5. Packing, marking, storage, transport and acceptance of the grease is performed accordingly to the standard 1510-50.
6. Taking of samples of the grease is performed accordinly to the standard 2517-52. As a control sample we take 1 kg of grease from each mark.

Standard 3333 - 46

A GRAPHITE GREASE  
(USA)

Technical Conditions

1. This standard is related to a consistent grease determined for greasing of uncovered cogwheels, of rolling machines and of other parts exposed to a strong friction.
2. The grease must cprrespond to the following demands:  
External appearance and properties -- a homogenous oily grease of a black color and of non fibrous structure.

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physico-chemical properties	Characteristics	Methods of Testing
1. The temperature of drop point in °C not lower than	75	
2. Corrosion test performed on steel plates during 72 hours	satisfies	
3. Test for stability	satisfied	when stored in closed glass bottles there doesn't occur a separation of oil for 1 month
4. The contents of water in % not more than	2	

-----  
Notice: Characteristic of stability is guaranteed by the producing plant.

4. Packing, marking, storing, transporting and acceptance of the grease is performed in accordance with the standard 1510-10.

5. Taking of a sample of the grease is carried out accordingly to the standard 2517-52. As a control sample we take 1 kg of the grease.

Standard 5656 - 51

A GRAPHITE GREASE (BVN - 1)

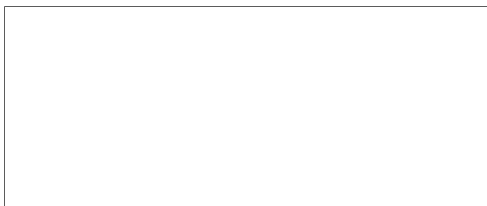
Technical Conditions

This standard is related to a grease used for greasing of contact surfaces of steel pipes, which are exposed to changes of temperature during operation.

1. The grease must correspond to the following physico-chemical demands:

External appearance and properties: a homogenous oily grease without flocks; when rubbing the grease between fingers one should not feel grains of sand or other foreign inclusions.

The grease put in a layer of 1 mm on a glass plate must be homogenous without flocks when observed in a passing light.



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Name of characteristics	Norm
1. Number of acidity in mg of KOH for 1 gr of the grease not more than	50X1-HUM 0,1
2. Contents of water	not allowed
3. The corrosion test on steel plates made from carbon steel during a period of 72 hours at a temperature $18 \pm 2^{\circ}\text{C}$	sustains the test

-----

3. Taking of samples of the grease is performed according to the standard 2517-52 and as a control sample we take 1 kg of the grease

4. The determination of the acidity - number
- a) used reagents and solutions:  
 rectified ethylalcohol 95%  
 benzol  
 potassium hydroxide on 0,1 N ~~MM~~ alcoholic solution  
 phenolphtalein.

An alcoholic benzol mixture is prepared by mixing alcohol with benzol in a ratio 1 : 4 (by volume);

- b) description of the determination:

80 gr of the alcoholic-benzol mixture are refluxed in a conical flask of a capacity of 500 ml for 5 minutes and then neutralized in a hot state by a 1,1 N solution of KOH in the presence of phenolphtalein as an indicator. Then we put about 2 g of the grease, weight with an accuracy of 0,0002 g into a flask, the mixture in the flask is refluxed until the grease is perfectly solved, cooled down to  $50-60^{\circ}\text{C}$ , a few drops of phenolphtalein are added and the contents of the flask is left to settle down. If the solution after setting down has a pink colouring, this shows alkalinity of the solution, if the solution has not got pink colour, it is to be titrated under a strong shaking in a hot state by a 0,1 N solution of KOH until a slight pink colouring occurs. The number of acidity (X) in mg of KOH is calculated by the following formula:

$$X = \frac{v \cdot T}{G} \cdot 1000,$$

where v = the amount of 0,1 N alcoholic solution of KOH, consumed for the titration in ml

T = the titre factor of the alcoholic solution of KOH

G = the weight of the sample in g.

5. Packing, marking, storage and transporting of the grease is performed according to the standard 1510-50 with the following changes and supplements.

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The delivering of the grease is performed in cans of a capacity of 20 l with a wide neck, soldered by a metallic plate after filling.

The marking given in the standard 1510-50 is made by means of a template on the side of each vessel. The marking is written with a dark enamel insoluble in water and mineral oil. Cans with the grease are greased on their external surface with a mixture of armament and gun grease (Lxl) and packed into raddged wooden cages.

Standard 5730-51

A U T O M O B I L E G R E A S E F O R  
T H E F R O N T C A R A N A M

Technical condit.

- 1., The present standard is related to a consistent grease used for greasing of the turning pin of the front cardan assembly.
2. The grease must correspond to the following requirements:  
External appearance and properties - a homogenous longfibrous grease of a dark colour.

Physico-chemical characteristics	Norms
1. Penetration at 25°C in a range of	220-270
2. Pouringpoint in degrees of C not lower than	115
3. Corrosion test performed on steel plates for a period of three hours at a temperature of 100°C	satisfies
4. Contents of free alkalies in % not more than	0,1
5. (contents of free acides	not allowed
6. Content of mechan. impurities	not allowed
7. Content of water in % not more than	0,75

4. Packing, marking, storing, transporting and acceptance of the grease is performed according to the standard 1510-50.
5. Taking of samples is performed accordingly to the standard 2517-52. As a control sample we take 1 kg.

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Standard 5699-51

A P R O T E C T I N G G R E A S E S P - 2 (GREASE 59)

## Technical conditions

1. This standard is related to a grease used for the protecting of inside surfaces of motor and its other parts.
2. The grease must correspond to the following requirements:

Physico-chemical characteristicsNorms

- |  |             |
|--|-------------|
| 1. Test of the corrosion effect of the grease at a temperature of $20 \pm 2^{\circ}\text{C}$ for a period of 24 hours  | satisfies   |
| 2. Contents of ash in % not more than  | 0,013       |
| 3. Contents of water   | not allowed |
| 4. Contents of mechanical inclusions   | "           |
| 5. Reaction of the grease - after heating in a thermostat at a temperature $100 \pm 2^{\circ}\text{C}$ for a period of 6 hours, with a following cooling down to a temperature of $20 \pm 2^{\circ}\text{C}$ | alkalic     |

3. Test of the corrosion effects of the grease are performed parallelly on two plates of a dimension of 50 x 50 mm:
  - a) on plates made of steel
    - plates cleaned by the use of an emery paper of grade 200 or 240
    - the same plates covered with cadmium
    - the same plates zinc coated
  - b) aluminium plates
  - c) plates made of a magnesium-aluminium alloy dichromated
  - d) bronze-plates

Before testing the plates are made degreased by use of a light neutral, petrol free from sulphur, and then with ethylalcohol and finally are dried out with a cotton wool.

For testing of a corroding effect of the grease and emulsion is prepared which consists of the grease and a saturated solution of lead bromid or chloride. The emulsion is prepared in the following manner: Into a 200 ml measuring cylinder we put 00 ml of the grease and 1 ml of a saturated solution of lead bromide or chloride and the contents of the cylinder is shaken until a homogenous emulsion is formed.

On one surface of each plate a thin layer of emulsion is put. The plates are put in horizontal position into a loosely coverer dry vessel with their greased surface upside. The vessel with the plates is put into a thermostat, regulated on a temperature of  $20 \pm 2^{\circ}\text{C}$  and is left at this temperature for 24 hours.

After this period the plates are put out from the vessel, washed with a light neutral petrol free from sulphur, dried with

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a cotten wool dipped in ethylalcohol and then the surface of the plates is observed visually.

The grease is recognized as suitable if we dont find any corrosion points and change of colour.

Notices:

- In the case of zinc, cadmium coated, bronze and magnesium aluminium plates a slight change of colour is permitted.
  - A saturated solution of lead bromide or chloride is prepared in the following manner: 10 g of lead bromide or chloride is solved in 1 l of boiling distilled water. After cooling to a temperature of  $20 \pm 2^{\circ}\text{C}$  and setting down, the solution is separated from the precipitate.
4. The delivering of the grease is performed in metal cans of a maximum contents of 20 l. The side surface of each vessel is provided with an inscription which consist of the following data: The name of the grease, year and month of production. The inscription must ve made with a black enamel, unsoluble in water and mineral oil.
5. As a control sample 1 kg of the grease is taken.

Standard 5570-50

A N I N D U S T R I A L G R E A S E F O R W I R E R O P E S

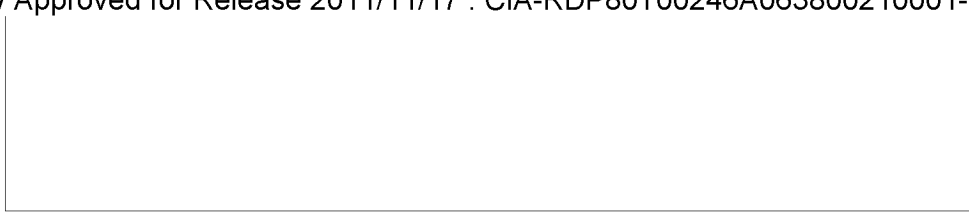
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(A wire rope grease)  
Technical conditions

1. This standard is related to an industrial grea~~s~~e used for greasing of steel wire ropes.
2. This wire rope-grease must correspond to the following requirejents :  
External appearance and properities: a homogenous mass without flocks, of a dark brown till black colour.

Physico-chemical characteristics	Norms
1. Temperature of drop point in degrees of C not lower than	40
2. Relative viscosity at $100^{\circ}\text{C}$ in gradws in a range of	1,4-2,5
3. Corrosion test of steel plates for a period of 72 hours	sustains the test
4. The contents of water-soluble acids and alcalies	is not allowed
5. Contants of water	is not allowed

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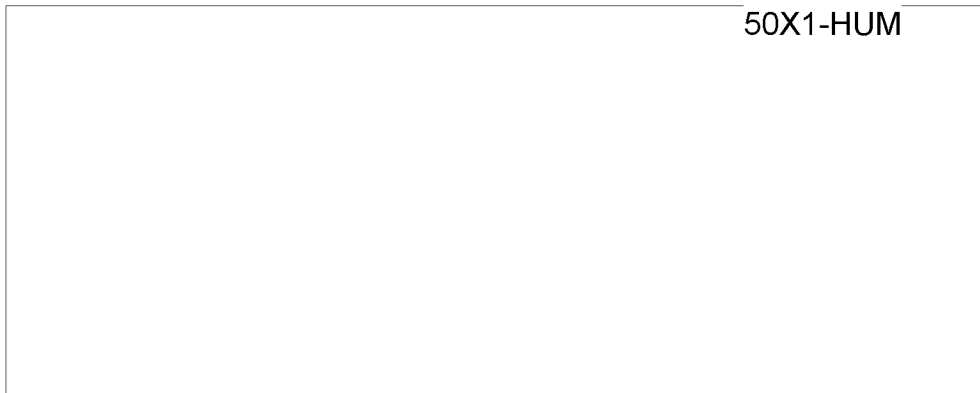


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( C O M P O S I T I O N   A N D   Q U A L I T Y )

Prague 1957



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CYLINDER OIL "6"

Standard No: 6411-52

## Technical Specifications

1. This standard specifications applies to rock-oils, used for lubricating steam engines working with overheated steam and of mechanisms working under high load and slow speed.

2. Cylinder oil "38" / cylinder oil "6" / must satisfy the following demands:

Properties Indices	Cylinder oil "38" cylinder "6"
1. Viscosity at 100 Degrees C:	
a/ Kinematic viscosity in units of centi-stokes, within the range of	32 - 44
b/ corresponding conventional viscosity in degrees, within the range	4,5 - 6,0
2. Coking capacity in %, not exceeding	3,0
3. Ash content in percentage not exceeding	0,015
4. Percentage of acids and alkalis soluble in water	free from
5. Percentage of mechanical impurities not exceeding	free from
6. Water content in percentage not exceeding	0,5
7. Flash point, determined in open-cup tester, in degrees C, not below	300
8. Freezing point in degrees C, not exceeding	-17

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3./ 1,5 liters of oil of this brand is taken for control test.

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Standard No: 1805-51

### Technical Specifications

1./ This standard specification applies to mineral oil refined with sulfuric acid, which is used for lubrications of controlling and measuring instruments working at low temperatures.

2./ The instrument oil must satisfy the following requirements:

Physico-chemical properties indice                      Standard specification

- |   |             |
|---|-------------|
| 1. Viscosity at 50 degrees C:   |             |
| a./ kinematic viscosity in units of centi-stokes, within the range of       | 6,3 - 8,5   |
| b./ corresponding conventional viscosity in degrees, within the range of    | 1,51 - 1,72 |
| 2. Acid number in milligrams of KOH per 1 gram of oil, not exceeding        | 0,14        |
| 3. Ash content in %% not exceeding  | 0,005       |
| 4. Percentage of acids and alkalis soluble in water                         | free from   |
| 5. Percentage of mechanical impurities                                      | free from   |
| 6. Water content  | free from   |
| 7. Flash point / determined in covered-cup tester / in degrees C, not below | 120         |
| 8. Freezing point in degrees C, not exceeding                               | - 60        |

-----  
3./ 1,5 liters of oil is needed for control test.

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SPINDLE OIL AU

Standard No: 1642-50

Technical Specifications

1./ This standard specification applies to highly refined spindle oil, intended for special purposes.

2./ Spindle oil AU must satisfy the following demands:

Physico - chemical properties indices                      Standard specification

1./ Viscosity at 20 degrees C:

a./ kinematic viscosity in units of centi-stokes not exceeding                      49,0

b./ corresponding conventional viscosity in degrees, not exceeding                      6,68

2./ Viscosity at fifty degrees C:

a./ kinematic viscosity in units of centi-stokes, within the range of                      12,0 - 14,0

b./ corresponding conventional viscosity in degrees within the range of                      2,05 - 2,26

3./ Acid number in milligrams of KOH per 1 gram of oil, not exceeding                      0,07

4./ Ash content of oil in percentage, not exceeding                      0,005

5./ Corrosion test on steel plates                      withstands the test

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Percentage of acids and alkalis

soluble in water free from

7./ Percentage of mechanical impurities free from

8./ Water content free from

9./ Flash point / determined in open-cup tester / in degrees C, not below 163

10./ Freezing point in degrees C, not exceeding - 45

11./ Density <sup>20</sup>/<sub>4</sub> within the range of 0,888 - 0,896

3./ Two steel plates are chosen for corrosion test, which are put in the oil under test three times, each time 6 hours, with a following interval of 6 hours, when the plates hang in the air.

4./ Packing, labeling, storing, transportation and reception of the spindle oil AU are to be carried out under the standard No: 1510 - 50.

5./ Sampling of spindle oil AU is to be carried out under the standard No: 2517 - 52.1,5 liters of oil is to be taken for control test. Sampling for test is to be carried out according to the order, given in the remarks to %% 20 and 26 of standard No: 2517 - 52.

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## AVIATION OIL

Standard No: 1013 - 49

## Technical Specifications

- 1./ This standard specification applies to rock-oils aviation-refined selectively and by acid-clay process.
- 2./ Designating of aviation oils is carried out according to the method of refining and the value of their kinematic viscosity at 100 degrees C.
- 3./ Aviation oils must satisfy the following physico-chemical specifications:

The appearance of the oil poured in a chemical test-tube :

thick, oily liquid of yellow red colour, fluorescent in reflected light.

Physico-chemical properties indices	Standard specification according to the brand		
	MS-14	MS-20	MK-22
1./ Kinematic viscosity at 100 degrees C in units of centi-strokes, not less than	14	20	22
2./ Ratio of kinematic viscosity at 50°C to kinematic viscosity of 100° not exceeding	6,55	7,85	8,75
3./ Coking capacity according to Conradson's method in %% not exceeding	0,45	0,3	0,7

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4./ Acid number in milligrams of KOH per 1 gram of oil, not exceeding	0,25	0,05	0,1
5./ Ash content in percentage, not exceeding	0,003	0,003	0,004
6./ Percentage of selective solvents		free from	
7./ Percentage of acids and alkalis soluble in water		free from	
8./ Percentage of mechanical impurities		free from	
9./ Water content		free from	
10./ Flash point / determined in the Martens-Penskoy apparatus, in degrees C, not below	200	225	230
11./ Difference of flash points in open-cup tester and according to Martens-Penskoy method in degrees C, not exceeding	20	20	20
12./ Freezing point in degrees C, not exceeding	-30	-18	-14
13./ The colour of a mixture of 15 parts of oil and 85 parts of colourless ligroin according to Duborque's method in millimeters not less than	16	Corresponding to NP A7	

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14/ Density  $\frac{20}{4}$ , not exceeding 0,890 0,895 0,905

4./ 1,5 liters of oil of each brand is needed for control test.

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## INDUSTRIAL OIL / MACHINE OIL SU

Standard No. 1707 - 51

## Technical Specifications

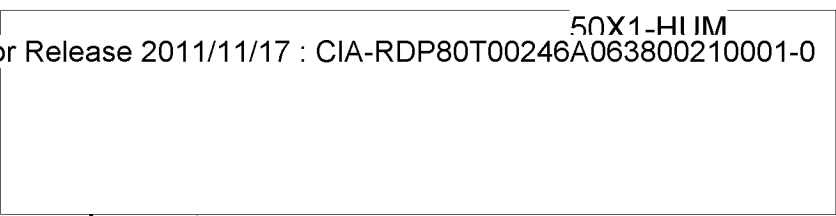
1./ This standard specification applies to oils distilled from petroleum and refined with sulfuric acid, which are used for lubricating machinery and motors as well as in hydraulic systems and in technological procedded.

2./ The physico-chemical properties of the industrial oil 50 must meet the following demands:

Physico-chemical properties indices	Standard specification for the brand
	"50" machine oil <u>"SU"</u>
1./ Viscosity at 50° C:	
a/ kinematic viscosity in units of centistokes within the range of	42 - 58
b/ corresponding conventional vis- cosity in degrees within range	5,76 - 7,86
2. Coking capacity in %% not exceeding	0,2
3. Acid number in milligrams of KOH per 1 gram of oil, not exceeding	0.15
4. Ash content of oil in percentage, not exceeding	0,005
5. Percentage of acids and alkalic soluble in water	free from
6. Percentage of mechanical impurities, not exceeding	0,007

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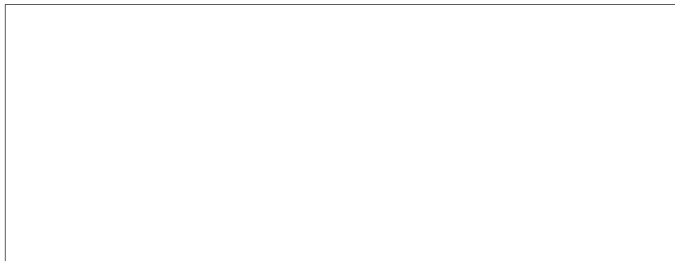
7. Water content	Free from
8. Flash point / determined in open-cup tester / in degrees C, not below	200
9. Freezing point in degrees C, not exceeding	-20

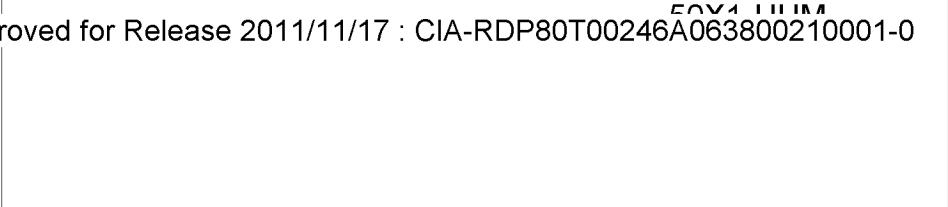
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3./ Packing, labeling, storing, transportation and reception of the industrial oil is to be carried out under standard No: 1510 - 50/.

4./ Sampling of industrial oil for test is to be carried out under the standard No. 2517-52.

1,5 liters of oil is needed for control test.





TURBINE OILS

Standard No. 32 - 53

Technical Specifications

- 1./ This standard specification applies to mineral, acid-clay refined oils, used for lubrication of bearing and auxiliary parts of steam and water turbines.
- 2./ There are the following brands of turbine oils:
  - a/ turbine oil 30 / turbine type UT
  - b/ turbine oil 46 / turbine type T
  - c/ turbine oil 57 / turbine decelerator type

Remark: The brand of the oil is to be mentioned in the order.

- 3./ Turbine oils must conform to the following specifications:

Property Indices	Stand Specifications	
	turbine type 30/	turbine type 46
	/turbine type <u>UT</u> /	/turbine type T/
1. Kinematic viscosity at 50°C in units of centi-stokes within the range of	28 - 32	44 - 48
2. Acid number in milligrams of KOH per 1 gram of oil, not exceeding	0,02	0,02
3. Ash content in %% not exceeding	0,005	0,020
4. Speed of demulsification in minutes, not exceeding	8	8



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5. Percentage of acids and alkalic soluble in water		free from
6. Percentage of mechanical impurities		free from
7. Flash point, determined in open-cup tester, in degrees C, not below	180	195
8. Freezing point in degrees C, not exceeding	-10	-10
9. Sodium test with acidification in grades, not exceeding	2	2
10. Percentage of admixture within the range	-	-
11. Transparency at 0°C		transparent

Test method: The oil poured into a glass test tube, diameter 30-40mm, and cooled to 0°C ought to remain transparent.

-----

4./ Packing, labeling, ~~and~~ storing, transportation and reception of oil are to be carried out under the standard No. 1510-50.

5./ Sampling of oil for test to be carried out under standard No. 2517 - 52.

1,5 liters of oil of each brand is need for control test.

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MOTOR TRACTOR LUBRICATING OILS REFINED BY  
SULFURIC ACID

Standard No. 1862-51

Technical Specifications

- 1./ This standard specification applies to mineral oils refined with sulfuric acid, which are used for lubricating carburetor motors of motorcars and tractors.
- 2./ There are the following brands of motor tractor oils:  
AK-6, AK-10 and AK-15
- 3./ Motor-tractor oils must satisfy the following demands:

Property indices	Standard Specifications according to the brand		
	AK-6 /motoroil 6/	AK-10 /10/	AK-15 /15/
1. Kinematic viscosity in units of centi-stokes:			
a/ at 100° C, not less than	6	10	15
b/ at 00C, not exceeding	-	-	-
2. Ration of kinematic viscosity at 50° C to kinematic viscosity at 100° C not exceeding	7,0	7,0	9,0
3. Temperature viscosity factor TVF <sub>0-100</sub> not exceeding	-	-	-
4. Coking capacity in %% not exceeding	0,30	0,40	0,70

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SLOW SPEED DIESEL OIL / FOR THE USE  
IN MOTORS/

Standard No. 1519 - 42

I. Specification

1./ Slow speed Diesel oil / for use in motors / is distilled lubrication oil extracted from petroleum, used for lubricating cylinders and other parts of internal combustion engines/ petroleum engines, gas engines / with a speed of rotation up to 600 revolutions per minute.

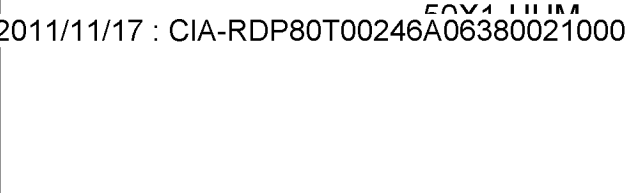
II. Technical specifications

2./ Slow speed Diesel oil has to satisfy the following demands:

physico-chemical properties indices	Standard specification
1. Viscosity at 50° C:	
a./ kinematic viscosity in units of centistokes	62 - 68
b./ corresponding to it conventional viscosity in degrees	8,2 - 9,0
2. Flash point / determined in open-cup tester in degrees C, not below	205
3. Freezing point in degrees C, not exceeding	0
4. Coke content in percentage, not exceeding	0,4
5. Ash content in percentage, not exceeding	0,04
6. Percentage of mechanical impurities, not exceeding	0,007

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- 7. Color in mm / at the place of production /  
not less than 4
- 8. Water content free from
- 9. Percentage of acids and alkalis soluble  
in water free from

-----  
 3./ 1,5 liters of oil is needed for control test.

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CYLINDER OIL 24 / VISCOSINE /

Standard No. 1841-51

Technical Specifications

1./ This standard specification applies to mineral oils used for lubricating of steam engines, working with saturated steam and of mechanisms, working under heavy load with slow speed.

2./ The cylinder oil must satisfy the following demands:

Physico-mechanical properties indices      Standard specification

- 1. Viscosity at 100° C:
  - a/ kinematic viscosity in units of centistokes, ranging from      20 to 28
  - b/ corresponding to it conventional viscosity in degrees, ranging from      2,95 to 3,95
- 2. Coking capacity in %, not exceeding      2,5
- 3. Acid number in milligrams of KOH per 1 gram of oil, not exceeding      -
- 4. Ash content in percentage, not exceeding      0,25
- 5. Percentage of acids and alkalis soluble in water      free from
- 6. Percentage of mechanical impurities, not exceeding      0,1
- 7. Water content in percentage, not exceeding      0,05

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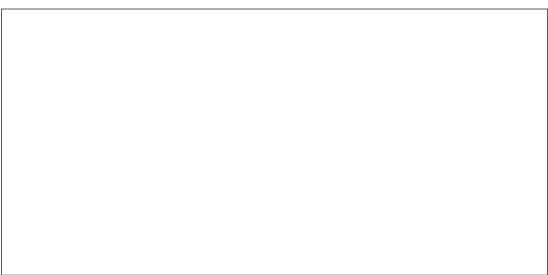
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- 8. Flash point /determined in open-cup tested, in degrees C, not below 240
- 9. Freezing point in degrees C, not exceeding -



3 / 1,5 liters of oil of this brand is needed for control test.



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LUBRICATING DOME OIL.

50X1-HUM

Standard No. 4593-49

I. Technical Specifications.

This standard specification applies to oil, obtained by pressing crystallized bone grease and used for lubrication of mechanisms.

## I. Technical specifications.

1./ Two kinds of this oil are produced:

- a/ a first rate, composed of the first fractions which are obtained by pressing the crystallized bone grease;
- b/ good quality oil, produced from the waste products obtained during the production of the first rate oil.

2./ The oil must have the following organoleptic, physical and mechanical properties:

Properties indices	<u>Specification of brands</u>	
	first rate oil good quality	
1. Appearance and colour at 15-20 °C	fluid, transpar. pale-yellow	
2. Smell	typical smell for this kind of oil	
3. Humidity content in percentage, not exceeding	0,05	
5. Specific gravity $d_{4}^{20}$	0,915- 0,919	
4. Acid number not exceeding	0,2	1,0
6. Iodine number, not below	75	65
7. Flash point according to Brenken's method in degr.C. not below	300	293
8. Conventional viscosity at 20°C	11-13	
9. Freezing point in degrees C, not exceeding	- 18	- 2

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10. Percentage of mechanical impurities free from

---

Remark: Determination of the iodine number is carried out only in purchaser's demand.

II. Containers, packing and labeling.

3./ Oil is delivered in case of tin plates with a capacity not exceeding 20 liters and also in glass bottles with a capacity not exceeding 25 liters. By the purchaser's consent oils may be delivered in zincplated or tinplated iron barrels with a capacity not exceeding 250 liters.

4./ Containers used for oils must be clean, dry and fatresistant. Cans and barrels used for oils must be free from rust.

5./ In order to avoid any deformation and fat-resistance impairment as a result of changes of the surrounding temperature, each container with oil must have a free space about 3 per cent of its total capacity.

6./ Each container, filled with oil must be firmly plugged and sealed with a seal containing the name of the supplier impressed on metal. Cans and barrels are to be plugged by screwing them up with metallic plugs; can be plugged by soldering their openings.

7./ Cans are packed in wooden cases with a gross weight not exceeding 50, -kg and bottles - in wickerbasket covers or lattice cases.

8./ On the outside of bottles, cans barrels, cases and basket covers, the following data must be marked:

- a/ the name of the producing factory
- b/ the designation of the kind and the brand of the oil,
- c/ the gross weight and the net weight; on cases with cans should also be given the consecutive number of the cans in the case and the net weight of each can,
- d/ the batch number and the date of production of the oil,

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e/ The standard No. 4593-49

9./ The marking must be made on the labels attached to the cans and bottles; by means of a stencil on the face of the cases and the bottoms of the barrels; on the tallies attached to the basket covers and the lattice cases.

III. Acceptance regulations:

10./ A quality certificate is issued for each batch of delivered oil, in which the following characteristics should be given:

- a/ the name of the producing factory,
- b/ the batch number and the date of production of the oil as well as the date of issue of the certificate,
- c/ the designation and the kind of the oil,
- d/ the date of the chemical analysis concerning the humidity content, the acid number, the viscosity the flash point and the freezing point,
- e/ the number of packages, the net weight and the gross weight,
- f/ the standard No. 4593-49.

11./ Reception of oils is carried out in accordance with the quality certificate by checking the weight, the state of labeling of containers of the packing and of the integrity of the seals. The oil from defective containers or containers with damaged seals must be additionally tested and in case of lack agreement with the specified standard the oil must be rejected defective.

IV. Sampling and methods of testing.

12./ After inspection of the outward appearance and the state of containers and their marking the receiver should open according to his choice:  
all containers from a batch containing 5 or less packages, 50 per cent of containers from a batch containing more than 5 packages.

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13./ The container with oil chosen for sampling should be carefully shaken and from each of them an equal quantity of oil should be taken so that the sum total of oil taken for sampling may not be less than 800 g.

The oil-sample is taken by means of a clean, dry cylindrical glass tube with fused brims 15 mm of diameter, inserted through the seal opening of the and slowly dipped to the full depth of the oil.

After filling of the glass tube its upper opening is covered tightly by finger, the tube is taken out of the container and its contents is poured into a clean, dry flask with a capacity of about 1 liter. The initial oil sample is carefully stirred and poured in equal amounts into two clean, dry bottles with ground or well fitting stoppers. One of the samples is sent to laboratory for control test, and the other is sealed up and kept not less than 3 months.

14./ Labels with the following data are stucked on the bottles:

- a/ the name of the producing factory,
- b/ the number and the net weight of the batch,
- c/ the date of sampling and of production, the name of the person which carried out the sampling.

15. / The specific gravity is determined by picnometric method.

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TECHNICAL SPECIFICATIONS OF MACHINE OIL.

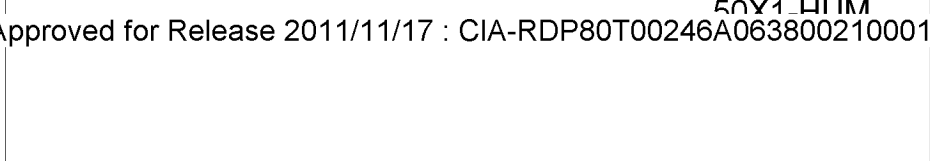
Standard No. 4216-54

Machine oils are intended for lubricating machine bearings and friction joints under working temperature down to  $-70^{\circ}\text{C}$  and for preparation of the low-temperature consistent lubricants.

I. Technical specifications.

Physico-chemical properties indices	Standard specifications according to the brand			
	N-4	N-14	N-16	
	1	2	3	4
Specific gravity $d_4^{20}$		0,940-0,960	0,930-0,950	0,940-0,960
Kinematic viscosity at $50^{\circ}\text{C}$ in units of centi-stokes		11,0-14,0	22,5-28,5	19,0-25,0
Flash point according to Brenken's method in degrees C, not below		160	170	170
Freezing point in degrees C, not exceeding		-70	-70	-70
Acid number in milligrams of KOH, not exceeding		0,2	0,25	0,25
48 Hours-corrosion test on steel, brase, and duralumin plates at a temperature of $-50^{\circ}\text{C}$				with stands the test
Water content				free from

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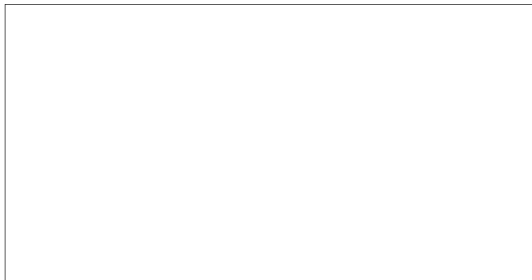


Percentage of mechanical impurities

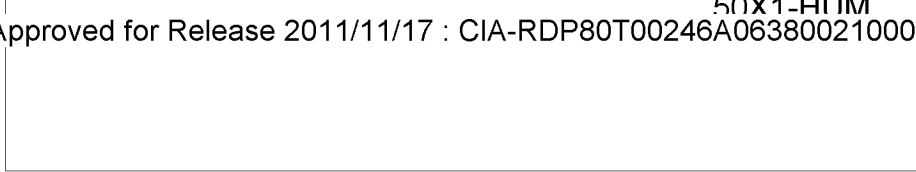
free from

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- Remark: 1. Variation of specific gravity is not the sign of  
flaw material.
2. Storing period of oil is 2 years, after which a control test is to be carried out in order to ascertain the correspondense of all indicas to the above mentioned technical specifications.



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OIL FOR ROLLING MILLS P - 28

/ BRIGHT STOCK /

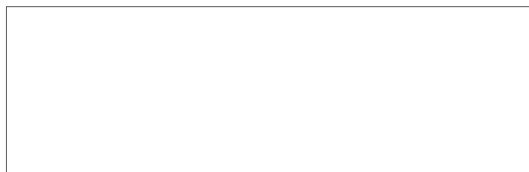
Standard No. 6480 - 53

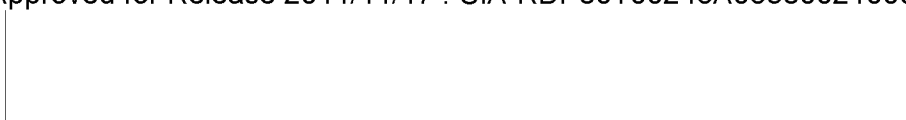
1./ Oil for rolling mills must satisfy the following demands:

properties	standard specifications
1. Viscosity at 100° C :	
a/ kinematic viscosity in units of centistokes, within the range of	26 - 30
b/ corresponding conventional viscosity in degrees, within range of	3,68 - 4,20
2. Coking capacity in percentage, not exceeding	1,0
3. Acid number in milligrams of KOH per 1 gram of oil, not exceeding	0,1
4. Percentage of acids and alkalis soluble in water	free from
5. Percentage of mechanical impurities	free from
6. Water content	free from
7. Flash point, determined in open-cup tester in degrees C, not below	285
8. Freezing point in degrees C, not exceeding	-10
9. 3-hours-corrosion test on steel plates as 100° C	withstands the test

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2./ 1,5 liters of oil is needed for control test.





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COMPRESSOR OIL 19 / "T" /

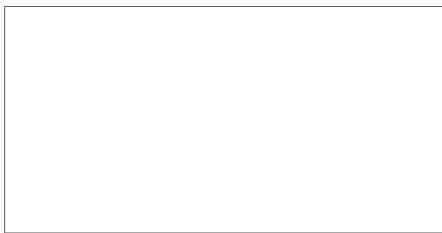
Standard No. 1861-54.

1./ Compressor oil / "T" / is used for lubricating piston and rotary compressors as well as air compressors.

2./ Compressor oil must satisfy the following specifications:

Qualitative indices	19 / "T" /
1. Kinematic viscosity at 100° C in units of centistokes, within range of	17 - 21
2. Acid number in milligrams of KOH per 1 gram of oil, not exceeding	0,10
3. Stability against oxidation: Percentage of sediments after oxidation, not exceeding	0,02
4. Ash content in percentage, not exceeding	0,010
5. Percentage of acids and alkalis soluble in water	free from
6. Percentage of mechanical impurities, not exceeding	0,007
7. Water content	free from

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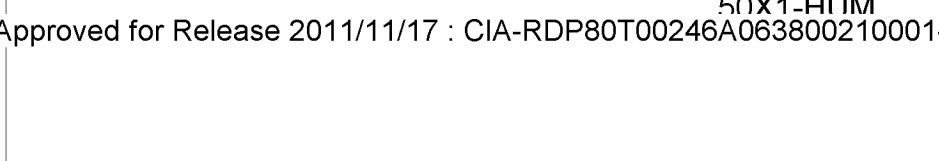
COMPRESSOR OIL 19 / "T" /

Standard No.1861-54.

1./ Compressor oil / "T" / is used for lubricating piston and rotary compressors as well as air compressors.

2. Compressor oil must satisfy the following specifications:

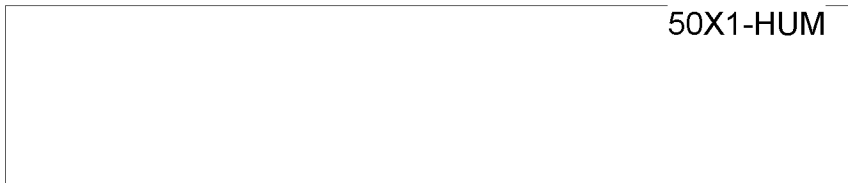
Qualitative indices	19 / "T" /
1. Kinematic viscosity at 100 C in units of centi-stokes, within the range of	17 - 21
2. Acid number in milligrams of KOH per 1 gram of oil, not exceeding	0,10
3. Stability against oxidation: Percentage of sediments after oxidation, not exceeding	0,02
4. Ash content in percentage, not exceeding	0,010
5. Percentage of acids and alkalis soluble in water	free from
6. Percentage of mechanical impurities, not exceeding	0,007
7. Water content	free from



- 8. Flash point according to Brenken's method in degrees G, not below 242
- 9. Corrosion /according to Pinkswitch method /on a lead plate not exceeding 5

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3./ 1,5 liter of oil is needed for control test.





TRANSFORMER OILS.

Standard No. 982-53

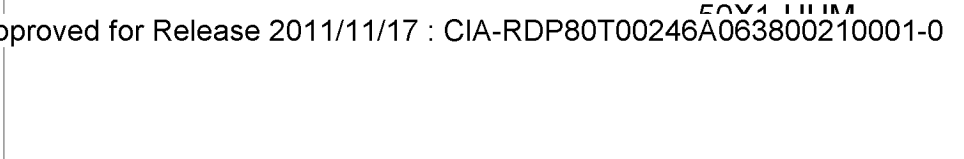
Technical Specifications.

1./ This standard specification applies to rock-oils refined with sulphuric acid used for drenching transformers, oil switches and other high voltage apparatus.

2./ Transformer oils must meet the following demands:

Qualitative indices	Standard specification of transformer oil
1. Kinematic viscosity in units of centistokes:	
a./ at 20 <sup>o</sup> C, not exceeding	30,0
b./ at 50 <sup>o</sup> C, not exceeding	9,6
2. Acid number in milligrams of KOH per 1 gram of oil, not exceeding	0,05
4. Percentage of acids and alkalis soluble in water	free from
3. Ash content in percentage, not exceeding	0,005
5. Percentage of mechanical impurities	free from
6. Flash point, determined in closed-cup tester in degrees C, not bellow	135
7. Freezing point in degrees C, not exceeding	-45
8. Sodium test with acidification in grades, not exceeding	2

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9. Percentage of additives

-

10. Transparency at 5°C

transparent  
Oil, poured into 30 -  
40 mm diameter glass  
test tube, cooled  
to 5°C ought to keep  
transparent.

-----  
3./ Packing, labeling, storing, transportation and accep-  
tance of the transformer oil are to be carried out under standard  
No. 1510-50.

4./ Sampling of oil for test is to be carried out under the  
standard No. 2517-52.

1,5 liter of oil of each brand is needed for control test.

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MOTORTRACTOR TRANSMISSION LUBRICATING OIL

Standard No. 542-50

Technical Specifications.

1./ This standard specification applies to tractor transmission oil which is a viscous direct distillation product of petroleum and which is used for lubrication of transmission gear of gear box, of the gears of the rear axle housing and other similar mechanisms of the machines working on land with mechanical traction.

2./ Two kinds of tractor transmission oil are produced: "winter" type and "summer" type.

3./ Transmission tractor oil is to meet the following demands:

Physico-chemical properties indices	Standard specification	
	according to the brand	
	"winter" type	"summer" type
1. Comertional viscosity at <sup>100</sup> <del>100</del> °C in degrees within the range of	2,7 - 3,2	4,0 - 4,5
2. Percentage of acides and alkalis soluble in water	free	from
3. Percentage of mechanical impurities, not exceeding	0,05	0,05
4. Water content, not exceeding	slight trace	slight trace
5. Flash point /determined in open cup-tester in degrees C, not below	170	180

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- |    |   |                     |    |
|----|---|---------------------|----|
| 6. | Freezing point in degrees C, not exceeding                        | -20                 | -5 |
| 7. | Corrosion test of three hours on steel and copper plates at 100°C | withstands the test |    |

-----

Remark: 1./ sand and other sbresives are not admissible among the mechanical impurities /see item 3 /.

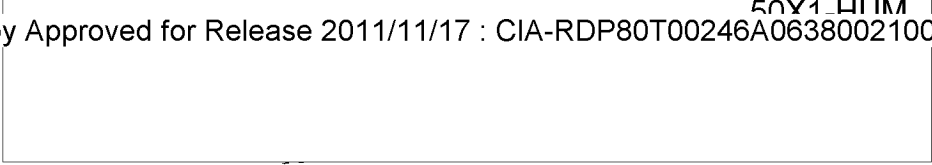
2./ It is permitted to add to the "Winter" type tractor transmission oil a depressing agent.

4./ Packing, labeling, transportation, storing and acceptance of the tractor transmission oil are to be carried out under standard No. 1510-50.

5./ Sampling of the tractor transmission oil for test is to be carried out under standard 2517-52. For sampling 1,5 liter of oil of each brand is needed.

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7. Percentage of mechanical impurities	free from
8. Water content	free from
9. Flash point, determined in closed cup tester, in degrees C, not below	135
10. Freezing point in degrees C, not exceeding	-55
11. Sodium test with acidation in grades, not less than	2
12. Aniline point in degrees C, not less than	79
13. Density $\rho_{4}^{20}$ not exceeding	0,885

---

3./ Packing, labeling, storing, transportation and acceptance of oil are to be performed in iron barrels or cans.

4./ 1,5 liter of oil is needed for control sampling.



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OIL MK-8

Standard No. 6457-53

Technical Specifications.

1./ This standard specification applies to rock-oil, acid-clay refined, designated according to the method of refining and the kinematic viscosity value at 50°C.

2./ The oil must correspond to the following characteristics:

Qualitative induces	Standard specification
1. Kinematic viscosity in units of centi-stokes	(8)
a/ at 50 C, not less than	0,3 ( 8,3)
b/ at 20°C, not exceeding	30,0
2. The ratio of kinematic viscosity at minus 20°C to kinematic viscosity at plus 50°C, not exceeding	60
3. Acid number in milligrams of KOH per 1 gram of oil not exceeding	0,04
4. Ash content in percentage, not exceeding	0,005
5. Sulphur content in percentage, not exceeding	0,14 ( 0,14)
6. Percentage of acids and alkalis soluble in water	free from

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- 5. Flash point /determined in open-cup tester in degrees C, not below 165
- 6. Freezing point in degrees C, not exceeding -20
- 7. Nitrobenzene content free from

-----

Remark: Sand and other abrasives are not admissible among the mechanical impurities.

3./ Packing, labeling, storing, transporation and delivery of the transmission oil are to be carried out under the standard No. 1510-50.

4./ Sampling of the oil for test is to be carried out under the standard No. 2517-52. For control test 1,5 liter of oil is needed.



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MOTORCAR TRANSMISSION LUBRICATING OIL. \_ \_

Standard 3781-53

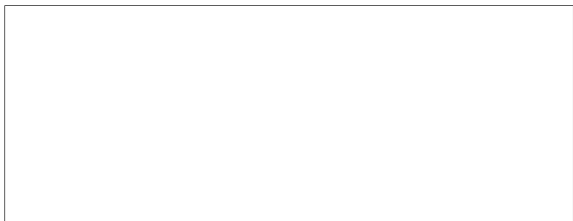
Technical Specifications. \_ \_

1./ This standard specification applies to the oil which is a mixture of selective refining extract of residual resinous oils and of spindle distillate and which is used for lubrication of the gearings of the rear axle housing gear box and the steering gear box of motorcars.

2./ This transmission lubricant must satisfy the following demands:

Qualitative indices	Standard specifications
1. Viscosity at 100°C:	
a/ kinematic viscosity in units of centi-stokes within the range of	20,5 - 32,4
b/ corresponding conventional viscosity in degrees, ranging from	3,0 - 4,5
2. Percentage of acids and alkalis soluble in water	free from
3. Percentage of mechanical impurities not exceeding	0,15
4. Water content in percentage, not exceeding	0,05

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	<u>DP-8</u>	<u>D-11</u>	<u>Dp-11</u>	<u>Dp-14</u>
8. Water content not exceeding	trace	free from	trace	trace
9. Flash point /determined in open-cup tester /in degrees C not less than	200	200	190	210
10. Freezing point in degrees C, not exceeding	-25	-18	-15	-10
11. Furfurel content	-	-	-	free from

Remark: Sand and other abrasives are not admissible among mechanical impurities.

3./ Ash content of Diesel-oil Dp-11 in a mixture with 5 per cent of Azn II-CIATIN-1 should not be less than 0,18 per cent.

4./ packing, labeling, storing, transportation and acceptance of Diesel-oils are to be performed under standard No. 1510-50.

5./ Sampling of Diesel-oils is to be carried out under standard No. 2517-52.. For control test 1,5 liter of oil of each branch is needed.

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2.	The ratio of kinematic viscosity at 50°C to kinematic viscosity at 100°C, not exceeding	6	7,3	6,5	7,75
3.	Coking capacity before adding admixture, not exceeding in %	0,2	0,4	0,4	0,55
4.	Acid number of oil in milligrams of KOH per 1 gram:				
	a/ with no admixture, not exceeding	-	0,15	1	-
	b/ in a mixture with <u>AzNII-CIA</u> <u>TIM-1</u> not exceeding	0,15	-	0,20	0,22
5.	Ash content of oil in percentage:				
	a/ with no admixture, not exceeding	0,005	0,005	0,005	0,006
	b/ in a mixture with <u>AzNII-CIA</u> <u>TIM-1</u> , not less than	0,12	-	0,12	0,12
6.	Percentage of water soluble acids and Alkalis in oil:				
	<del>w</del> ith no additive in a mixture with <u>AzNII-CIATIM-1</u>		free	from	
7.	Percentage of mechanical impurities in oil:				
	a/ with no admixture		free	from	
	b/ with admixture, not exceeding=	0,01	-	0,01	0,01

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DIESEL LUBRICATING OILS.

Standard No. 5304 - 54

Technical specifications.

1./ This standard specification applies to highly purified rock-oil, used for lubricating high-speed Diesel-engines.

Remark: This standard specification does not concern oils intended for Diesel engines type V-2-.

2./ There are the following brands of Diesel's oils.

Dp-8 - with addition of 3 - 0,2 per cent of AzNII-CIATIM-1:

D-11 - with no admixture,

D-11 - with addition of 3 - 0,2 per cent of AzNII-Ciatim-1,

Dp-14 - with additor of 3 - 0,2 per cent of AzNII-Ciatim-1.

Remark: On consumers demand the oil Dp-11 has to be delivered with addition of 5 per cent of AzNII-CIATIM-1.

The Diesel-oils must correspond to the following demands.

Qualitative indices	Standard specification according to the brand			
	Dp-8	D-11	Dp-11	Dp-14
1. Kinematic viscosity at 100° in units of centi-stokes, of	8-9	10,5-12,5	10,5-12,5	13,5-15,5

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LUBRICATING GREASE CIATIM - 201.

/LUBRICANT UTVMA/.

Standard 6267-52

Technical specification.

1./ The present standard specification applies to consistent lubricant used for lubricating of instruments and mechanisms working at temperatures within the limits of minus 60 to plus 120°C.

2./ The lubricant is subjected to the following requirements to which it must correspond:

Qualitative indices	Standard
1. Outward appearance	Homogenous grease without clots, coloured pale-yellow to dark-yellow
2./ Drooping - point temperature in C degrees not below	170
3./ Penetration at the temperature:	
a/ 25°C, within the range of	270 - 320
b/ minus 60°C, not below	50
4./ Corrosion test	Withstands
5./ Thermal stability at the temperature 100°C during 50 hours:	
a/ oil separating in %% not exceeding	4
b/ vaporizability in %% not exceeding	13

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- 6./ Chemical stability at the temperature of 100°C and the pressure of 8 kg force /cm<sup>2</sup> during 100 hours:
- a/ pressure drop kgforces/cm<sup>2</sup> nor exceeding 0,35
- b/ acid number after oxidation in mg of KOH per 1 g of the grease not exceeding 1,0
- 7./ Free alcali content calculated in NaOH in % not exceeding 0,1
- 8./ Water content None
- 9./ Mechanical impurities content None
- 10./ Mobility of the grease at the temperature minus 60°C in seconds per one turn of the bearing, not exceeding 10
- 

N O T E: The corrosion test is carried out:

- a/ on electrolytic copper plates and
- b/ on non coated aluminium plates.

3./ Thermal stability test.

In a cone of 60° angle and 52 mm upper diameter, made of stainless steel not having 576 meshes in 1 cm<sup>2</sup>, 10 g of the lubricant are weighed.

The cone with the lubricant is placed on a laboratory glass cup, weighed previously, having 100 ml capacity, into a thermostat and is kept there at the temperature of 100 - 2°C during

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50 hours, before testing the surface of the grease is smoothed out. Then the test is finished, the glass cup and the cone with the lubricant are weighed.

All weighings are made with precision of 0,01g.

The separating of oil from the greases in percents / X / is calculated by the following formula.

$$X = \frac{G_1 - G_2}{10} \cdot \frac{100}{G_1 - G_2}, \dots \text{/I/}$$

where:

G<sub>1</sub> - the weight of the glass cup after the test, in g,  
 G<sub>2</sub> - the weight of the glass cup before testing, in g,  
 10 - the weighed quantity of the lubricating being tested, in g.

The vaporizability of the lubricant in percents /X/ is calculated by the formula:

$$X = \frac{G_3 - G_4}{10} \cdot \frac{100}{G_3 - G_4}, \dots \text{/II/}$$

where:

G<sub>3</sub> - the weight of the cone with the grease and the cup before testing, in g,  
 G<sub>4</sub> - the weight of the cone with the grease and the cup after testing, in g,  
 10 - the weighed quantity of the lubricating being tested, in g.

h./ The mobility test of the lubricant at the temperature minus 60°C is carried out in the CIATIM instrument, consisting of a cooling chamber and of four bushings with shafts for attaching of the

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bearings / for four simultaneous analyses/.

The chamber of cooled with a blend of ligroin and acidified carbon dioxide or liquid nitrogen. This blend is contained in a rubber tank. Uniform air temperature in the chamber is kept up by means of a ventilator.

The bearing No. 20<sub>1</sub> is washed first in light direct distilled benzine and then in the mixture of ethyl alcohol and benzene /in proportion of 1:4/, whereafter it is dried and weighed with the preciseness of 0,1 g. The lubricant to be tested is placed into the bearing from both sides of the balls and the face surfaces of the bearings rings are wiped with a filter paper.

The bearing with the lubricant is weighed with the preciseness of 0,1g. The weight of the lubricant in the bearing ought to be : 3 - 1 g.

Then the bushing /see the drawing/ is mounted, by placing from one side the bearing of the bushing with the tested lubricant, and from the other side - the bearing without the lubricant. The mounted bushing is inserted into the cooling chamber by the end in which the bearing with the lubricant is placed in such way that the other end remains outside the chamber. On the shaft of the protruding part of the bushing a cylinder of about 50 mm diameter is slid on, provided with a thread for hanging up a load and with a shaft turn reading indicator.

The temperature of the bearing is measured by a thermocouple with a galvanometer.

In course of 1,5 h the temperature of the bearing is brought down to minus 60°C - 1°C and the bearing is kept at this temperature during 2 hours, where at the shaft of the bushing is turned every 15 minutes by the handle, namely alternately to both sides, two turns each side every time. After 2 hours

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a load of 800 g is suspended on the thread of the cylinder and the time of the first turn of the shaft is noted by a stopwatch. At the end of 15 minutes the thread of the cylinder is wound to the other side and the time of the first turn of the shaft to the other side is noted.

As an indicator of the mobility of the lubricant at minus 60°C the arithmetic mean of the duration of both tests /shaft turnings/ in seconds is assumed. The variation of the result of each test from the arithmetic mean shall not exceed 10%.

5./ The packing, labeling, storing, transportation and the reception of the lubricant are carried out in tin cans of not more than 1 kg weight, or in tubes.

6./ 1 kg of lubricant is needed for the test sample.

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FUEL OIL TS - 1. Standard No. 7149 - 54.

Technical specifications.

1./ This standard specification applies to fuel oil obtained by direct distillation of sulfurous petroleum.

2./ Fuel oil TS - 1 must satisfy the following specifications:

Properties indices	Standard specifications
1. Density $\rho_{4}^{20}$ , not less than	0,775
2. Composition of fractions:	
a/ Setting-in distillation temperature in degrees C, not exceeding	150
b/ 10 per cent is distilled at a temperature in degrees C, not exceeding	165
c/ 50 percent is distilled at a temperature in degrees C, not exceeding	195
d/ 90 per cent is distilled a temperature in degrees C, not exceeding	250
e/ 98 per cent is distilled at a temperature in degrees C, not exceeding	250
f/ sum total of residue and losses in %% not exceeding	2

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3. Kinematic viscosity in units of centi-stokes: a/ at 20°C, not less than	1,25
b/ at 0°C, not exceeding	2,5
c/ at minus 40°C, not exceeding.	8,0
4. Acidity in milligrams of KOH per 100 milliliters of fuel oil, not exceeding	1,0
5. Flash point, determined in closed-cup tester, in degrees C, not below	28
6. The temperature at which the crystallization sets in, in degrees C, not exceeding	-60
7. Clouding point in degrees C, not exceeding	-50
8. Iodine number in grams of iodine per 100g of fuel oil, not exceeding	3,5
9. Aromatic hydrocarbon content in %, not exceeding	22
10. Actual resin content in milligrams per 100 millilitres of fuel oil:	
a/ at the works of production of the fuel oil, not exceeding	7
b/ at the place of consumption of fuel oil, not exceeding	10
11. Total sulfur content in %, not exceeding including meraptan sulfur in %, not exceeding	0,25 0,01
12. Copper plate test	withstands the test
13. Percentage of acids and alkalis soluble in water	free from

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14. lowest heat of combustion in large  
calories per kg, not less than 10250
15. Ash content of mechanical impurities  
and water free from

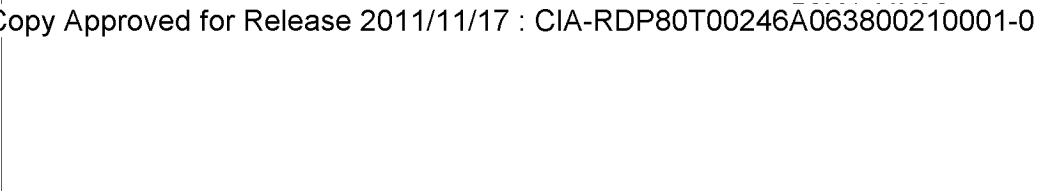
Fuel oil, poured into a glass  
cylinder of a diameter of 40 - 50  
mm should be transparent and free  
from any foreign body either in  
suspension or as precipitate --  
including water.

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2 liters of this fuel oil are needed for control test.

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FUEL OIL T-2.

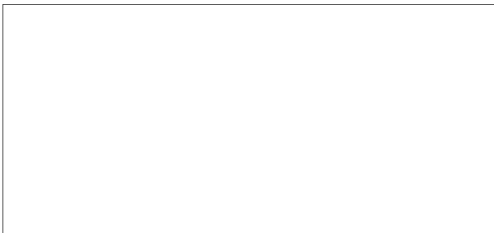
Technical Specifications 535-55

1./ This standard specification applies to fuel ~~oil~~ oil T-2 containing lightened fractions.

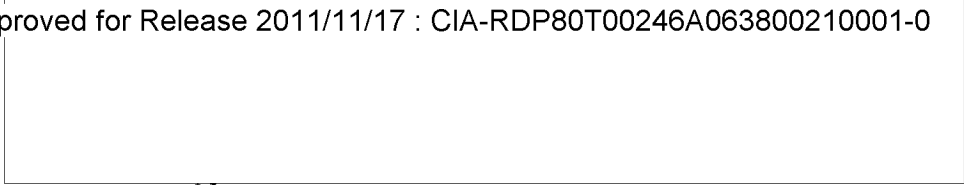
2./ Fuel oil T - 2 must satisfy the following specifications:

Property indices	Standard specifications
1. Density $\frac{200}{4}$ , not less than	0,770
2. Composition of fractions:	
a/ setting-in distillation temperature in degrees C, not below	60
b/ 10 per cent is distilled at a temperature in degrees C, not exceeding	145
c/ 50 per cent is distilled at a temperature in degrees C, not exceeding	195
d/ 90 per cent is distilled at a temperature in degrees C, not exceeding	250
e/ 98 per cent is distilled at a temperature in degrees C, not exceeding	280
f/ sum total of residue and losses in %, not exceeding	2,0

3. Kinematic viscosity in units of centistokes:



a/ at 20° C, not less than	1,05
b/ at 0° C, not exceeding	2,0
c/ at 40° C, not exceeding	6,0
4. Acidity in milligrams of KOH per 100 milliliters of fuel oil, not exceeding	1,0
5. Temperature at which the crystallization sets in, in degrees C, not exceeding	-60
6. Clouding point in degrees C, not exceeding	-50
7. Iodine number in grams of iodine per 100 g of fuel oil, not exceeding	3,5
8. Aromatic hydrocarbon content in %, not exceeding	22
9. Actual resin content in milligrams per 100 milliliters of fuel oil:	
a/ at the works of production of the fuel oil, not exceeding	7
b/ at the place of consumption of fuel oil, not exceeding	10
10. Sulfur content in %, not exceeding <span style="background-color: black; color: black;">XXXXXXXXXX</span>	0,25
including mercaptan sulfur in % not exceeding	0,01
11. Copper plate test	withstands the test
12. Percentage of acids and alkalis soluble in water	free from
13. Lowest heat of combustion in large calories per kg not bellow	10,250



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- 14. Ash content in ~~8%~~, not exceeding 0,005
- 15. Percentage of mechanical impurities and water free from

Fuel oil, poured into a glass cylinder of a ~~100 mm~~ diameter of ~~100~~ 40 - 55 mm should be transparent and free from any foreign body either in suspension or as precipitate - including water.

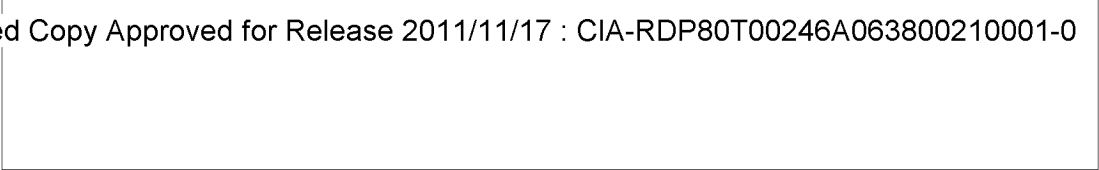
- 16. Pressure of saturated vapors at 38° C in mm of mercury col., not exceeding 166

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3./ 2 liters of this fuel oil are needed for control test.



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FUEL OIL T - 1

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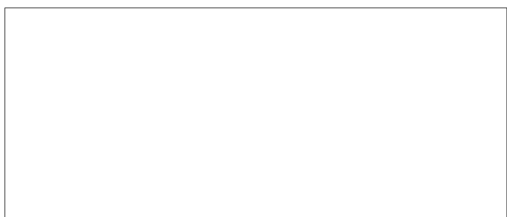
Standard No. 4138 - 49

Technical specifications

1./ This standard specifications applies to fuel oil, obtained by direct distillation of petroleum.

2./ Fuel Oil T-1 must satisfy the following requirements.

Properties indices	Standard specifications
1. Density $\frac{20}{4}$ , within the range of	0,800 - 0,850
2. Compension of fractions:	
a/ Starting distillation temperature in degrees C, not exceeding	150
b/ 10% is distilled at a temperature in degrees C, not exceeding	175
c/ 50 per cent is distilled at a temperature in degrees C, not exceeding	225
d/ 90 per cent is distilled at a temperature in degrees C, not exceeding	270
e/ 98 per cent is distilled at a temperature in degrees C, not exceeding	280
f/ Sum total of residue and losses in percentage, not exceeding	2
3. Kinematic viscosity in units of centi-stokes:	



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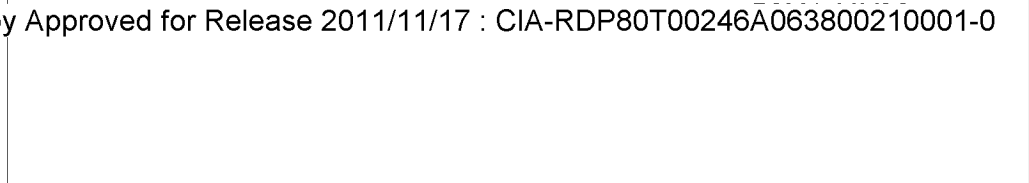
## NOFORN/CONTINUED CONTROL

a/ at a temperature of 20° c, not less than	1,5
b/ at a temperature of 0° C not exceeding	4
c/ at a temperature minus 10° C not exceeding	16
d/ at a temperature minus 50° C not exceeding	25
4. Acidity in milligrams of KOH per 100 milliliters of fuel oil, not exceeding	1,0
5. Flash point determined in closed-cup tester in degrees C, not below	30
6. Temperature at which the crystallization sets in, in degrees C, not exceeding	-60
7. Clouding point in degrees C, not exceeding	-50
8. Iodine number in grams of iodine per 100 g of fuel oil, not exceeding	2
9. Aromatic hydrocarbon content in %, not exceeding	25
10. Actual resin content in milligrams per 100 milliliters of fuel oil:	
a/ in the fuel oil producing works not exceeding	8
b/ at the place of consumption of fuel oil, not exceeding	11
11. Total sulfur content in %, not exceeding	0,01

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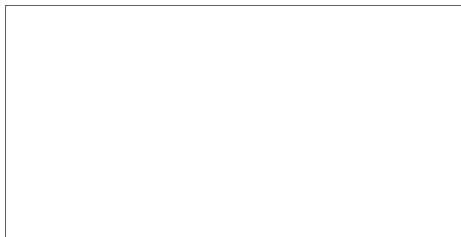
- |   |           |
|---|-----------|
| 12. Percentage of solids and alkalis soluble in water                 | free from |
| 13. Lowest heat of combustion in large calories per kg, not less than | 10250     |
| 14. Ash content in %, not exceeding                                   | 0,005     |
| 15. Percentage of mechanical impurities and water                     | free from |

Fuel oil, poured into a glass cylinder of a diameter of 40 - 55 mm should be transparent and free from any foreign body, either in suspension or as precipitate -- including water.

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4./ 2 liters of this fuel oil are needed for control test.

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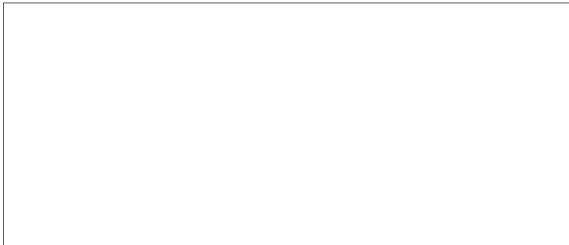
FUEL OIL FOR HIGH SPEED DIESELS

Standard No. 4749 - 49

Technical Specifications

- 1./ This standard specification applies to fuel oil for high speed Diesel-engines obtained from products of the ██████ direct distillation of petroleum.
- 2./ Three brands of high-speed Diesel fuel oil are produced:
  - a/ winter type Diesel fuel oil "DZ" intended for use at ambient air temperature higher than - 30° C.
  - b/ summer type Diesel fuel oil "DL" intended for use at ambient air temperatures higher than 0° C;
  - c/ special Diesel fuel oil "DS".
3. High speed Diesel fuel oil must satisfy the following specifications:

Physico-mechanical properties	Standard specification according to the brand		
	"DZ"	"DL"	"DS"
1. Cetane numbers not less than	40	45	50
2. Composition of fractions:			
a/ 10 per cent is distilled at a temperature in degrees C, not below	200	-	-
b/ 50 per cent is distilled at a temperature in degrees C, not exceeding	275	290	280



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	"DZ"	"DL"	"DS"
c/ 90 per cent is distilled at a temperature in degrees C, not exceeding	335	350	-
d/ 96 per cent is distilled at a temperature in degrees C, not exceeding	-	-	340
3. Viscosity at 20° C:			
a/ kinematic viscosity in units of centi-stokes	3,5-6,0	3,5-8,0	-
b. corresponding conventional viscosity in Engler's degrees	1,25 - 1,45	1,25 - 1,7	-
4. Viscosity at 50° C:			
a/ kinematic viscosity in units of centi-stokes	-	-	2,5-4,0
b/ corresponding conventional viscosity in Engler's degrees	-	-	1,15 - 1,3
5. Coking capacity according to Conradson's method in percentage, not exceeding	-	-	-
6. Acidity in milligrams of KOH per 100 milliliters of fuel oil, not exceeding	5	5	5
7. Ash content in %% not exceeding	0,02	0,02	0,02
8. Sulfur content in %% not exceeding	0,2	0,2	0,2
9. Copper plate test	withstand the test		
10. Percentage of acids and alkalis soluble in water	free from		

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	"DZ"	"DL"	"DS"
11. Percentage of mechanical impurities		free from	
12. Water content		free from	
13. Flash point / determined in Martens-Penskyi's apparatus / in degrees C, not below	50	60	90
14. Freezing point in degrees C, not exceeding	-45	-10	-15
15. Coking capacity of the 10 per cent residue in percentage, not exceeding	0,5	0,5	0,5
16. Clouding point in degrees C, not exceeding	-35	-5	-10

4./ Packing, labeling, storing, transportation and reception of fuel oil for high speed Diesel engines are to be carried out according to standard No. 1510-50.

5./ Sampling of fuel oil for high speed Diesel engines for test is to be carried out according to standard No. 2517-52.

2 liters of fuel oil of each brand are needed for control tests.

KERSENE FOR TRACTORS

Standard No. 1842 - 52.

Technical Specifications

- 1./ This standard specification applies to kerosene used as fuel oil in carburetor tractor motors.
- 2. Following brands are produced:
  - 1/ tractor kerosene with an octane number less than 40,
  - 2/ high octane number tractor kerosene with an octane number not less than 45.
- 3/ Tractor kerosene must satisfy the following requirements:

Properties indices	Standard Specifications	
	Tractor kerosene	High octane number tractor kerosene
1. Octane number, not less than	40	45
2. Composition of fractions:		
a/ 10 per cent is distilled at a temperature in degrees C, not below	110	110
b/ at a temperature in degrees C, not exceeding	180	-
c/ 50 per cent is distilled at a temperature in degrees C, not below	190	190
d/ 90 per cent is distilled at a temperature in degrees C, not below	240	240

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	Tractor kerosene	High octane number tractor kerosene
d/ 98 per cent is distilled at a temperature in de- grees C, not exceeding	300	290
3. Acidity in milligrams of KOH per 100 ml of kerosene, not exceeding 4,5		4,5
4. Ash content in %, not exceeding	0,005	0,005
5. Actual resin in milligrams per 100 millilitres of kerosene, not exceeding	40	40
6. Sulfur content in %, not exceeding	1,0	1,0
7. Copper plate test	withstands the test	
8. Percentage of acids and alkalis soluble in water	f r e e f r o m	
9. Percentage of mechanical impurities	f r e e f r o m	
	Kerosene, poured into a glass cylinder of a diameter of 35-40 mm at a temperature of 15°-20°C, should be free from any mechanical impurities either in suspension or as precipitate	
10. Water content, not exceeding	trace	

h./ 2 liters of kerosene are needed for control test.

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OIL "MT - 16p " -

Standard No. 6360-52

## Technical specifications.

1./ This standard specification applies to rock-oil selecti-  
vely refined with 3 - 4% addition of AzNII-CIATIM - 1.

2./ The oil must satisfy the following demands:

Properties indices	Standard specification
1. Kinematic viscosity at 100°C in units of centi-stokes within the range of	16,0 - 17,5
2. Ratio of kinematic viscosity at 50°C to kinematic viscosity at 100°C, not exceeding	7,0
3. Coking capacity of oil in %, not exceeding	0,60
4. Acid number in milligrams of KOH per 1 gram of oil, not exceeding	0,20
5. Ash content of oil in percentage, not less than	0,12
6. Percentage of selective solvents	free from
7. Percentage of acids and alkalis soluble in water	free from
8. Percentage of mechanical impurities in oil, not exceeding	0,01

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- 9. Water content free from
- 10. Flash point /determined in covered-cup tested in degrees C, not below 200
- 11. Difference of flash points of oil in covered and in open-cup tested in degrees C, not exceeding 20
- 12. Freezing point of oil in degrees C, not exceeding -25
- 13. Density  $\frac{20}{4}$  not exceeding 0,890

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 Remark: Sand and other abrasives are not admissible among mechanical impurities.

3./ Packing, labeling, storing, transportation and delivery of the oil "MT - 16p" are to be carried out under standard specification No. 1510-50.

4./ Sampling of the oil for test is to be carried out under standard specification No. 2517 - 52. 1,5 liters of oil is needed for control test.

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Motor tractor lubricating oils refined  
by sulfuric acid.

Technical specifications.

Standard No. 1862-51

- 1./ This standard specification applies to mineral oils refined with sulfuric acid, which are used for lubricating carburetor motors of motorcars and tractors.
- 2./ There are the following brands of motor tractor oils: AK-6, AK-10, and AK-15.
- 3./ Motor tractor oils must satisfy the following demands:

Properties indices

Standard specification according to the brand

AK-6/oil 6/AK-10/oil 10 /AK-16/oil

1

1 / Kinematic viscosity in units of centi-stokes:

a/ at 100°C, not less than	6	10	15
b/ at 0°C, not exceeding	-	-	-

2 / Ratio of kinematic viscosity at 50°C to kinematic viscosity at 100°C not exceeding

7,0	7,0	9,0
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3 / Temperature viscosity factor /TVF 0 - 100/, not exceeding

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4 / Coking capacity in % %, not exceeding

0,30	0,40	0,70
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AK-6/oil 6/ AK-10 /oil 10/ AK-6/oil 1  
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5. Acid number in milligrams of KOH per 1 gram of oil, not exceeding	0,15	0,25	0,35
Acid number of oil with added CIATIM-331 in milligrams of KOH not exceeding	-	-	-
6. Ash content of oil in %% not exceeding	0,01	0,02	0,025
Ash content of oil with added AzNII-b in %% not exceeding	-	-	-
Ash content of oil with added CIATIM-331 in %% not exceeding	-	-	-
5. Percentage of acids and alkalis soluble in water		free from	
8. Percentage of mechanical impurities in oil		free from	
Percentage of mechanical impurities in oil with additives, not exceeding		-	
9. Water content not exceeding		slight trace	
10. Flash point /determined in open-cup tester in degrees C, not below	185	200	215
11. Freezing point in degrees C, not exceeding	-30	-25	±5 (-5)
12. Colour in mm, not less than	-	3,5	-

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Remakr: Sand and other abrasives are not admissible among the mechanical impurities.

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4./ Packing, labeling, storing, transportation and delivery of these oils are to be performed under standard No. 1510-50.

5./ Sampling for test is to be carried out under standard No. 2517-44.

1,5 liter of oil of each brand is needed for control test.

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REFRIGERATING MACHINES LUBRICATING OILS.

Standard No. 5546-54.

Technical Specifications.

1./ This standard specification applies to rock-oils, used for lubricating the refrigerating compressor machines.

2./ There are the following brands of oils intended for refrigerators:

a/ oil ChA - intended for refrigerating machines, working with amonia or carbon dioxide,

b/ oil ChF12 - intended for refrigerating machines working with Freon / refrigerant / 12.

3./ Oils intended for refrigerators must satisfy the following demands:

Properties indices	Standard specification according to the brand	
	<u>ChA</u>	<u>ChF12</u>
1. Kinematic viscosity at 50°C, in units of centi-stokes	Within the range 11,5-14,5	Not less than 18
2. Acid number in milligrams of KOH per gram oil, not exceeding	0,14	0,03
3. Ash content of oil in ‰ not exceeding	0,012	-
4. Corrosion test	withstand the test	
5. Percentage of acids and alkalis soluble in water	free from	



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	ChA	ChF12
6. Percentage of mechanical impurities	free	from
7. Water content	free	from
8. Flash point, determined in open-cup tester, in degrees C, not below	160	160
9. Freezing point, determined in open-cup tester, in degrees C, not below	160	160
9. Freezing point in degrees C, not exceeding	-40	-40
10. Turbidity temperature of a mixture of oil with Freon in degrees C, not exceeding	-	-28
11. Colour determined with glass No. 2 in mm, not less than	-	25
12. Percentage of <u>VTL</u> = <u>1</u> additive not exceeding	-	0,02

Remark: Corrosion test is carried out on copper plates-.

b./ Determination of turbidity temperature of a mixture of oil with Freon. Before the test, the oil is subject to heat treatment, i.e a test - tube with oil is placed in a water bath with the temperature 90 - 5°C and kept there until the oil temperature rises to 50 - 1°C.

The test is carried out in a test-tube provided with an outer glass jacket; the diameter of the inner test-tube is 25 - 33 mm, and the diameter of the outer tube is 35 - 43 mm, the length of the inner test-tube is 145 - 155 mm.

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On the inner test-tube two marks are made, which correspond to 1 millimeter and 10 milliliters. The oil under test is poured into the test tube up to the first mark and cooled down in a cooling bath down to minus 27°C. When Freon is pored carefully into the test tube containing the cooled oil up to the second mark. The content is then mixed with a ring stirrer until the oil is completely dissolved in Freon. If the solution of oil in Freon is transparent, the test tube is put in a cooling bath and the turbidity is observed at every degree. During the test the temperature of the cooling mixture is kept by 5°C lower than the expected temperature of turbidity.

By the temperature of turbidity such temperature is meant at which a slight formation of paraffin falling out of the solution can be observed.

The difference between two parallel determinations must not exceed - 1°C.

5./ Oil  $\text{C}_6\text{H}_{12}$  is delivered in tin cans with a capacity not exceeding 100 liters-.

6./ 1,5 liters of oil of each brand is taken for control test.

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AVIATION SPIRITS /GASOLINE/

Standard No. 1012 - 5h.

Technical specifications.

1./ This standard specification applies to aviation spirits obtained from direct distillation and catalytic cracking with admixture of high quality components, ethyl liquid and anti-oxident.

2./ Aviation spirits must satisfy the following requirements:

Properties indices	Standard specifications according to the brand		
	<u>B-95/130</u>	<u>B91/115</u>	<u>B-70</u>
1. Content of Tetraethyl lead in grams per 1 kg of gasoline, not exceeding	3,3	2,5	-
2. Detonation stability:			
a./ octane number, motor method, not less than	95	91	70
b./ octane number, temperature method, not less than	-	-	-
c/ Lowest heat of combustion in large calories per kg, not less than	130	115	-
3. Lowest heat of combustion in large calories per kg, not less than	10300	10300	1

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    B-95/130    B-91/115    B-70

## 17. Composition of fractions:

a/ starting distillation temperature in degrees C, not below	40	40	40
b/ 10 per cent is distilled at a temperature in degrees C, not exceeding	82	82	88
c/ 50 per cent is distilled at a temperature in degrees C, not exceeding	105	105	105
d/ 90 per cent is distilled at a temperature in degrees C, not exceeding	145	145	145
e/ 97,5 per cent is distilled at a temperature in degrees C, not exceeding	180	180	180
f/ residue and losses in percentage, not exceeding	2,5	2,5	2,5
g/ residue in percentage, not exceeding	1,5	1,5	1,5
5. Saturated vapor pressure in mm of mercury col. not less than not exceeding	220 360	220 360	■ - 360
6. Acidity in milligrams of KOH per 100 milliliters of benzine, not exceeding	1	1	1
7. Starting crystallization temperature in degrees C, not exceeding	-60	-60	-60

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B-95/130    B-91/115    B-70

	B-95/130	B-91/115	B-70
8. Iodine number in grams of iodine per 100 g of benzine, not exceeding	12	10	10
9. Aromatic hydrocarbon content in percentage, not exceeding	-	.. a	-
10. Actual resin content in milligrams per 100 millilitres of benzine, not exceeding	2	2	2
11. Sulfur content in percentage, not exceeding	0,05	0,05	0,05
12. Copper plate test	withstands the test		
13. Percentage of acids and alkalis soluble in water	Free from		
14. Percentage of mechanical impurities and water	free from		
Benzene, poured into a glass, cylinder of a diameter of 40 - 55 mm, should be transparent and free from any foreign substance either in suspension or as precipitate - including water			
15. Transparency	transparent		
16. Colour	yellow    green    colourless		
Transparency and colour are determined visually.			

Remarks: 1./ Aviation spirits delivered after a long storage / over

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6 month / are liable to a variation of the characteristics of the fractions of 10 per cent and 50 per cent by 2°C and of 90 per cent fraction by 1°C.

- 2./ The lower saturated vapor pressure limit of aviation spirits during the period from 1st of May to 1st of October is **not** a sign of flaw.
- 3./ 0,001 - 0,005 per cent of para-*oscy*-diphenylemine should be added to the aviation brands B-95/130 and B-91/115.
- 4./ It is admissible to add altogether not more than 20 per cent of toluene, alkylbenzol and pyrobenzol to aviation spirits obtained by direct distillation. It is not admissible to add toluene more than 20 per cent, alkylbenzol No. 1 more than 20 per cent, alkylbenzol No. 2 more than 10 per cent, alkylbenzol No. 3 more than 6 per cent and pyrobenzol more than 10 per cent. Hereby the total content of aromatic hydrocarbons in benzene brand B-70 should not exceed 20 per cent.  
  
It is admissible to add alkylbenzol No.1,2 and 3 not exceeding altogether 6 per cent to aviation spirits brand B-95/130 obtained by catalytic cracking.
- 5./ The actual resin content, iodine number and acidity are determined before ethylization of benzine.  
Octane number by temperature method and the heat of combustion are determine in the benzine production works.
- 6./ 5 liters of benzine brand B-95/130, B-91/115 each and 3 liters of benzine brand B-70 are needed for control test.

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ILLUMINATING KEROSENE.

Standard No. 4753 -49

Technical specifications.

1./ This standard specification applies to lamp kerosene, obtained from direct distillation of petroleum and intended for use in lamps, kerosene stoves and primuses.

2./ Illumination kerosene must satisfy the following demands:

Physico-chemical properties	Standard indices
1. Density $\frac{20}{4}$ , not exceeding	0,840
2. Colour according to Stammer's colorimeter in marks, not exceeding	3,0
3. Length of a non-smoking flame in millimeters, not less than	20
4. Flash point / determined in the Martens Pensky's apparatus /in degrees C, not below	40
5. Cloud point in degrees C, not exceeding	-12
6. Acidity in milligrams of KOH per 100 milliliters of kerosene, not exceeding	1,4
7. Ash content in percentage. not exceeding	0,005
8. Composition of fraction:	
a/ up to a temperature of 270°C is	

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- |   |           |
|---|-----------|
| distilled in percentage, not less than                                    | 70        |
| b/ up to a temperature of 315°C is distilled in percentage, not less than | 98        |
| 9./ Sulfur content in percentage, not exceeding                           | 0,1!      |
| 10. Percentage of acids and alkalis soluble in water                      | free from |
| 11. Percentage of mechanical impurities                                   | free from |

Kerosene, poured into a glass cylinder of a diameter of 35 - 40 mm at a temperature of 15 - 20°C should be transparent and free from any foreign admixture either in suspension or as precipitate- including water.

3./ The test for lack of turbidity of kerosene is carried out according to the method, used for determining the freezing point, including the moment at which the temperature of kerosene cooled down in the test tube, reaches minus 12°C. Then kerosene is left 5 more minutes in the cooling mixture at this temperature after which the test tube with the connecting piece is carefully taken out of the cooling mixture, without shaking the kerosene. The connecting piece is cleaned from outside and the lack of turbidity of kerosene is checked by observing it in the passing x through light. In the case of any cloudiness being discovered in the whole sample of kerosene or only at the bottom of the test

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tube, the kerosene is regarded as not having withstood the test. The whole process of determination, from the moment when the best tube containing kerosene is taken out of the cooling mixture until the final termination, should not last more than 8 seconds.

h./ 2 liters of kerosene are needed for control test.

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AUTOMOBILE GASOLINES.

Standard No. 2084-51.

Technical specifications.

- 1./ This standard specification applies to gasolines used as fuel oil in carburetor motors of automobiles and motorcycles.
- 2./ Two brands of automobile gasoline are produced:
  - 1/ Automobile gasoline with an octane number not less than 66 - brand A66
  - 2/ Automobile gasoline with an octane number not less than 70 - brand A70.
- 3./ Automobile gasolines must satisfy the following specifications:

Physico-chemical properties indices	Standard specifications according to brand	
	A 66	A 70
1. Octane number, not less than	66	70
2. Liquid ethyl P-9 content in 1 kg of gasoline in milliliters, not exceeding	1,5	1,5
3. Composition of fractions:		
a/ starting distillation temperature in degrees C, not below	-	-
b/ 10 per cent is distilled at a temperature in degrees C, not exceeding	79	79

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c/ 50 per cent is distilled at a temperature in degrees C, not exceeding	115	115
d/ 90 per cent is distilled at a temperature in degrees C, not exceeding	195	195
e/ End boiling point in degrees C, not exceeding	205	205
f/ residue in flask in percentage not exceeding	1,5	1,5
g/ sum total of residue and loss in percentage, not exceeding	4,5	4,5
h. Vapor pressure according to method in mm of mercury, not exceeding	500	500
5. Actual resin content in milligrams per 100 milliliters of gasoline, not exceeding	10	10
6. Induction period in minutes, not less than	210	210
7. Sulfur content in percentage, not exceeding	0,15	0,15
8. Copper plate test	withstands the test	
9. Percentage of acids and alkalis soluble in water	free from	
10. Percentage of mechanical impurities and water	free from	

Gasoline, poured into a glass cylinder of diameter of 40-55 mm

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A-66

A 70

should be transparent and free from any foreign body either in suspension or as precipitate-including water.

11. Acidity in milligrams of KOH per 100 milliliter of gasoline, not exceeding

3

3

12. Iodine number in grams of iodine per 100 grams of gasoline, not exceeding

not indicated

- Remarks:
- 1./ In the period lasting from October to February it is permitted to produce gasoline A66 and A70 with vapor tension not exceeding 600 mm of mercurycol.
  - 2./ Sulfur content in gasoline A66 and A70 produced from sulfurous petroleum should not exceed 0,6 per cent.
  - 3./ At the place of delivery gasoline A66 and A70 to the customer, an increase of actual resin content up to 25 milligrams per 100 milliliters of gasoline, and increase of distillation temperature of 1°C for the 10 per cent fraction, of 2°C for intermediate points of 3°C for end boiling temperature and an increase of 0,3 per cent of residue in flask, are admissible.
  - 4./ Actual resin content and induction period are determined at the place of gasoline production before

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its ethylation.

5. Packing, transportation, storing and reception of automobile gasoline are to be carried out in accordance with standard N. 1510-50

6. Sampling of automobile gasolines for test is to be performed according to standard No. 2517 - 52.

2 liters of gasoline are needed for control test.

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## Standard No. 1626 - 53.

## Technical Specifications

1./ This standard specification applies to boiler petroleum fuel oil used in vessels and ships as well as the stationary plants.

2./ Two brands of marine fuel oil are produced: 12 and 20.

Remark: The brand of marine oil is to be indicated in the order.

3./ Marine fuel oil should staisfy the following specifications:

Properties Indices	Standard specifications according to brand	
	12	20
1. Conventional viscosity in degrees:		
a/ at 50°C, within the range of	6,0 - 12,0	-
b/ at 75°C, within range of	-	2,0 - 6,0
2. Ash content in percentage, not exceeding	0,15	0,15
3. Sulfur content in percentage, not exceeding	0,8	0,8
4. Percentage of acids and alkalis soluble in water		free from
5. Percentage of mechanical impurities, not exceeding	0,25	0, 25

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	32	20
6. Content of resinous material in %%, not exceeding	50	50
7. Water content in %%, not exceeding	1	1
8. Freezing point in degrees C, not exceeding	-8	-5
9. Flash point, determined in closed-cup tester, in degrees C, not below	90	90
10. Lowest calorific power for dry fuel oil in calories per gram, not less than	9870	9870

Remarks: 1/ Calorific power of marine fuel oil is determined in the fuel oil production works.

2/ The delivery and receipt of marine fuel oil with a water content up to 2 per cent is admissible; these 2 per cent may counted off from total quantity of the marine fuel oil.

Before the delivery of marine fuel oil to ship and vessels the oil should be left standing in order to reduce its water content to 1 per cent.

4./ 1,5 liters of marine fuel oil of each brand is needed for control test.

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