



EIGA CRYOGENIC GASES COUPLINGS FOR TANKER FILLING

Doc 255/24

Revision of Doc 909/20

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EIGA CRYOGENIC GASES COUPLINGS FOR TANKER FILLING

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Amendments to 909/12

Section	Change
	Minor update to style
Section 3	Addition of definitions
Appendix D	Clarification of DN40 drawing
	Deletion of legacy information

NOTE Technical changes from the previous edition are marked with a line in the left margin

1 Introduction

It is common practice for cryogenic transport tanks to be filled at many locations. These locations may be at their own or a competitor's production site and in a number of different countries.

Most companies had equipped their transport tanks and filling stations with their own coupling systems. These systems were different, within the same company and in different countries. As a consequence, many adapters were in use to allow transport tanks from one company to fill at another site. These had to be made available at the filling stations and required a significant effort to control and use them safely.

The use of a standardised filling coupling system, by all cryogenic gas companies, on transport tanks and at filling stations has avoided the requirement to use adapters and has improved safety.

After the initial introduction of the EIGA coupling, some problems were identified by the European gas industry (see EIGA Training Package TP06) which was solved by increasing the length of the code ring and the wall thickness of the nut [1].¹ The drawings included within this publication are the latest revision.

2 Scope and purpose

2.1 Scope

The EIGA couplings DN60 are intended for use at the filling connection of all transport tanks and transport tank filling points. The EIGA couplings are not intended for any gas return connections.

There is no obligation for companies to adopt the EIGA coupling for their normal internal operation.

This publication gives detailed information on the coupling. The method of attaching the coupling halves to the hose and transport tank is outside the scope of this publication.

The DN40 coupling is a development of the larger DN60 and may be used to allow the transfer of product from the transport tank to the customer station tank.

Specialized vacuum-jacketed bayonet connections, which are required for some cryogenic products, are not included in this standard.

2.2 Purpose

The aim is to establish a gas specific coupling system for safe transport tank filling without the use of adapters. Therefore, this publication includes design details for a coupling system that may be used at production plants to fill transport tanks.

3 Definitions

For the purpose of this publication, the following definitions apply.

3.1 Publication terminology

3.1.1 Shall

Indicates that the procedure is mandatory. It is used wherever the criterion for conformance to specific recommendations allows no deviation.

3.1.2 Should

Indicates that a procedure is recommended.

¹ References are shown by bracketed numbers and are listed in order of appearance in the reference section.

3.1.3 May

Indicates that the procedure is optional.

3.1.4 Will

Is used only to indicate the future, not a degree of requirement.

3.1.5 Can

Indicates a possibility or ability.

3.2 Technical definitions

3.2.1 Cryogenic Gas

A deeply refrigerated liquefied gas in accordance with the transport regulations, for example ADR [2].

3.2.2 Pressure

In this publication bar shall indicate gauge pressure unless otherwise noted i.e., (bar, abs) for absolute pressure and (bar, dif) for differential pressure.

3.2.3 Transport tank

Tanks that are fixed tanks on tankers, tank trailers, rail cars and tank semi-trailers, demountable tanks, tank containers including swap bodies and portable tanks.

4 Design features

The coupling is of the conventional large, screwed nut type with a PTFE seal on the mating faces. The nut is mounted on the hose end with the fixed thread on the transport tank end.

The risk of transferring the incorrect cryogenic gas (oxygen, nitrogen etc.) is avoided by using a mechanical coding system which will not allow couplings of different products be connected.

4.1 Product code

The unique code for each product is given in the table of Appendix A.

Further codes may be allocated by EIGA for particular products. Toxicity, flammability, material compatibility etc. require consideration.

Under no circumstances codes shall be used without the agreement of EIGA as cross product contamination may result.

Additional marking is permitted if required. Companies are recommended to mark the transport tank end as well as the plant hose end wherever practical. Standard recommended product identification marks are listed in Appendix A for example nitrogen, oxygen.

4.2 DN60 Drawings

The drawings for the following items for the DN60 are given in Appendix E.

- tanker coupling;
- hose adapter;
- nut (dimensions);

- nut (code no 1 to 16);
- tanker connector (dimensions);
- tanker connector (code no 1 to 16);
- seal; and
- spanner.

All dimensions are given in millimetres.

The coupling system is designed for a nominal pressure of 40 bar and for a nominal diameter of 60 mm. The coupling system including the codes may be adopted for other diameters or other pressures only with the agreement by EIGA.

Only necessary functional dimensions are shown. This means that some dimensions are left to the user's / manufacturer's discretion, depending on the material and its method of forming etc.

Methods of fixing to the transport tank or hose are at the user's discretion and are not covered except as detailed on the drawings. An ISO 228G, 2½ (right) thread was used for field trials and is given as an example.

4.3 DN40 Coding Drawings

The product specific coding drawing is included in this publication to allow any other potential user of the DN40 to use the same coding for a particular product and therefore reduce the risk of product confusion during delivery.

The coding drawings for the DN40 are given in Appendix D. The DN40 uses the same concept as the DN60 and by using a mechanical coding system which will not allow couplings of different products be connected avoids product confusion during delivery.

4.4 Materials

The use of materials other than those shown on the drawings of Appendixes D and E shall only be permitted if their strength, impact and product compatibility properties are proven.

5 Manufacturing

The manufacturer shall design, prototype test, production test, clean and mark the EIGA coupling in accordance with EN13371 *Cryogenic vessels – Couplings for cryogenic service* (or to an equivalent recognised code /standard) and in accordance with the dimensions and markings given in Appendix D and E [3].

6 Application

6.1 Introducing the EIGA coupling

On the first occasion a coupling is used, reasonable notice shall be agreed between the trading parties before a product is collected from a particular site.

If companies agree to inter-trade and the receiving transport tank presents an EIGA coupling, the supplying company shall be equipped to fill it.

When retrofitting couplings to the revision identified in Appendix E, Appendix C should be followed.

6.2 Adaptors

The use of adaptors is permitted but should be avoided if possible.

If adaptors are used, to fill a transport tank, only one shall be permitted and it shall be a company coupling to EIGA coupling adapter on the plant side.

The use of adaptors on the transport tank side to modify the EIGA system, for filling, is considered an unsafe practice due to the difficulties in controlling their use.

6.3 Coupling, tightening and uncoupling procedures

Coupling, tightening and uncoupling procedures are described in Appendix B and illustrated in EIGA Training Package TP 06 [1].

The amount of force and the spanner to be used for routine coupling and uncoupling however are detailed. The spanner has been designed to eliminate hammering. The coupling should be retightened after cooldown.

6.4 Maintenance

Whilst the EIGA coupling is considered to only require minimal maintenance, some users have reported the screw that is both used for the installation and retention of the ball bearings coming loose resulting in the loss of a number of ball bearings. As a consequence, it is recommended that drivers are instructed to check each time they use the coupling that the retaining screw is in place and not loose. Where the screw is found to be loose or missing, the coupling should not be used until repaired.

Additionally, the coupling should be inspected for wear and corrosion of the ball bearings.

7 References

Unless otherwise specified, the latest edition shall apply.

[1] EIGA Training Package TP06, *EIGA Cryogenic Gases Coupling for Tanker Filling*, www.eiga.eu.

[2] ADR, *European Agreement concerning the International Carriage of Dangerous Goods by Road*, www.unece.org.

[3] EN13371, *Cryogenic vessels. Couplings for cryogenic service*, www.cen.eu.

Appendix A: Application of codes

Table for the application of codes

Code N°	Mark	Product
1	N2	Nitrogen
2	O2	Oxygen
3	Ar-CRUDE	Argon
4	Ar	Pure Argon
5	Air	Synthetic Air
6		Not allocated
7		"
8		"
9		"
10		"
12		"
13		"
14		"
15	N2O	Nitrous Oxide
16	CO2	Carbon Dioxide

Appendix B: Recommended connection and disconnection procedure

Coupling

Check the seal

Having removed the dust cap, check that the seal is free from obvious particles. The colour of the seal gradually becomes dirty looking. This is acceptable. What you should be looking for is grit like particles that are proud of the surface. These shall be wiped clean using approved materials before coupling is made.

Correct Alignment

Approach the male fitting with the stainless steel plug in the coupling on top. The lugs on the male fitting will pass easily through the slots in the code ring on the female nut, when the top of the nut on the hose is aligned with the top of the male fitting on the trailer.

Make the connection

The more force used to tighten the nut, the more is required to undo it. The nut continues to contract after the final tightening because, unlike the other components, it is not in direct contact with the cold product.

Do the nut up using only your gloved hands at first (do not use the coupling spanner at this stage).

When the nut begins to frost over and cool down, it will probably start to leak at this point, push down on the coupling spanner using only thumb pressure.

DO NOT hit the spanner with your hand or anything else. DO NOT jerk the spanner.

Uncoupling

Unscrewing

The C Spanner should be all that is needed with a clout from the hand. If weather conditions are bad, it might require a couple of blows from a hammer. If more effort than this is required to undo, then try to be softer when tightening next time. Remember all hammer blows inflict damage to the ball bearings.

Disconnecting

Remember that after unscrewing, the nut has to pass the code ring security. The nut shall be realigned before the final separation. Do this by rotating the nut until the plug is in the top position. Then pull the coupling apart.

Appendix C: Management of change over to longer EIGA nuts**Fill Points**

Conversion

All fill points should be changed. However, the increased length of the revised nut on the fill point will require some tankers to be modified as soon as possible. Therefore, the timing of each fill point is to be at the discretion of the Plant Manager and local distribution people remembering that the original EIGA couplings if used correctly are safe.

Training

All drivers and all involved persons should be informed that they should not connect the revised EIGA nut to tankers that have not been tested to check their capability of receiving the nut, (see tankers below). They also need to be trained to recognise the longer EIGA coupling.

Autoload Systems

Automatic loading systems should be adjusted to ensure that tankers not suitable for loading with the revised EIGA coupling cannot be connected on the Fill Points fitted with the revised coupling.

Tankers

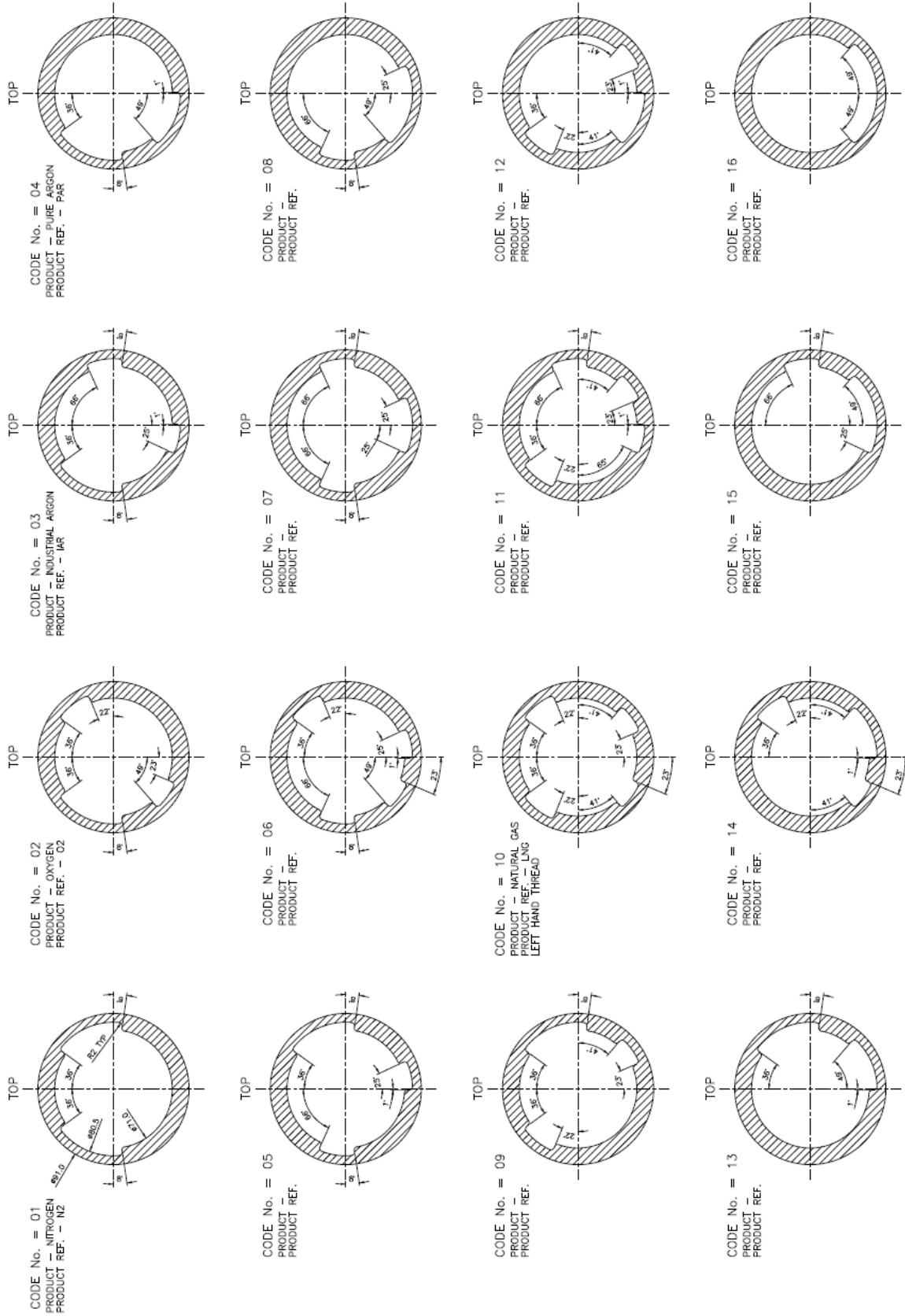
Each Tanker shall be checked to see if there is sufficient clearance for the longer EIGA nut to fit. This should be done using a sample of the longer EIGA nut as a gauge. If successful, the tanker should be identified in a way that the driver is clearly aware of its suitability to be used with the revised EIGA nut. If unsuccessful, the tanker should be scheduled for appropriate modification.

Adapters

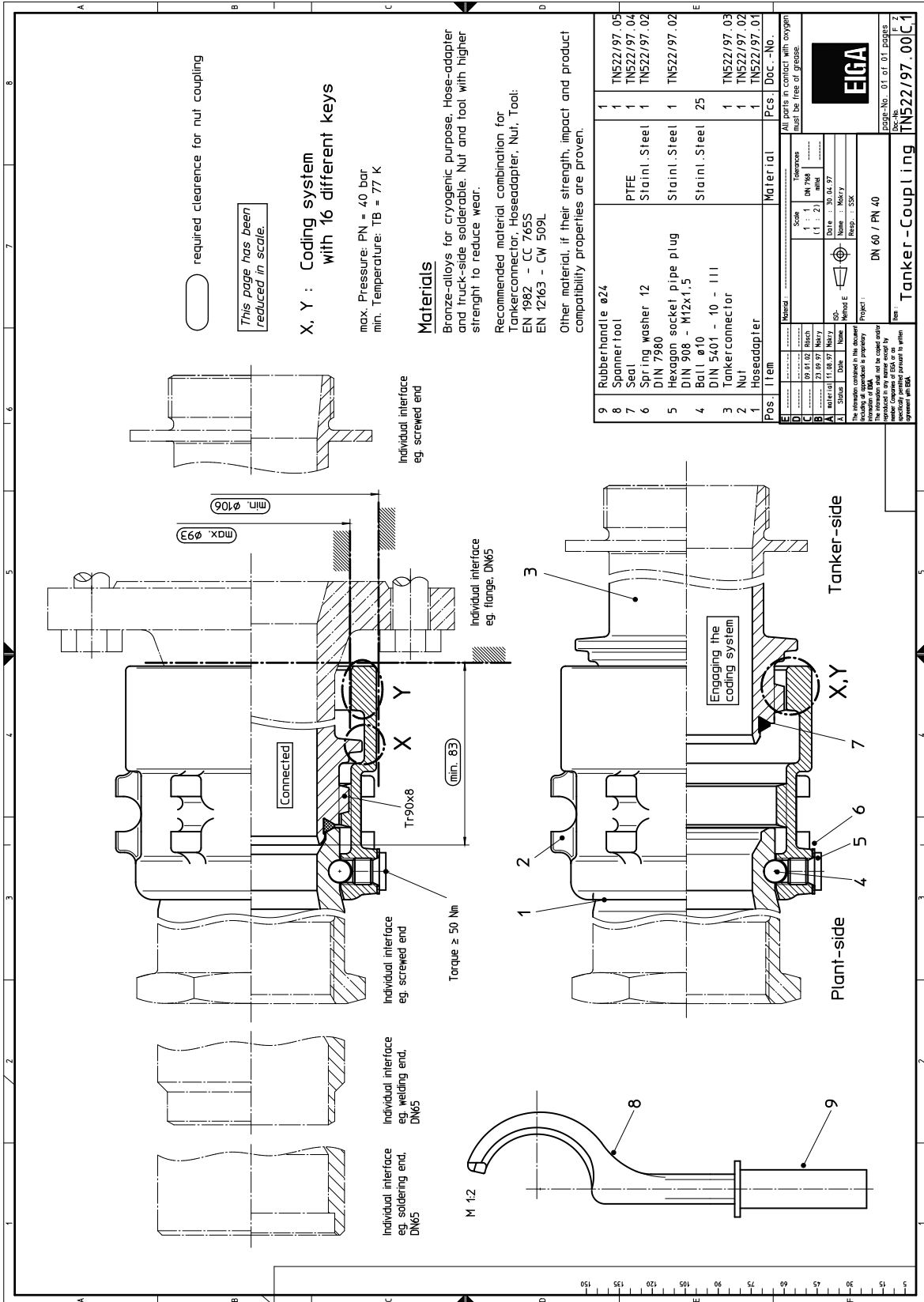
Adapters should be discouraged, but it is recognised that some adapters are necessary.

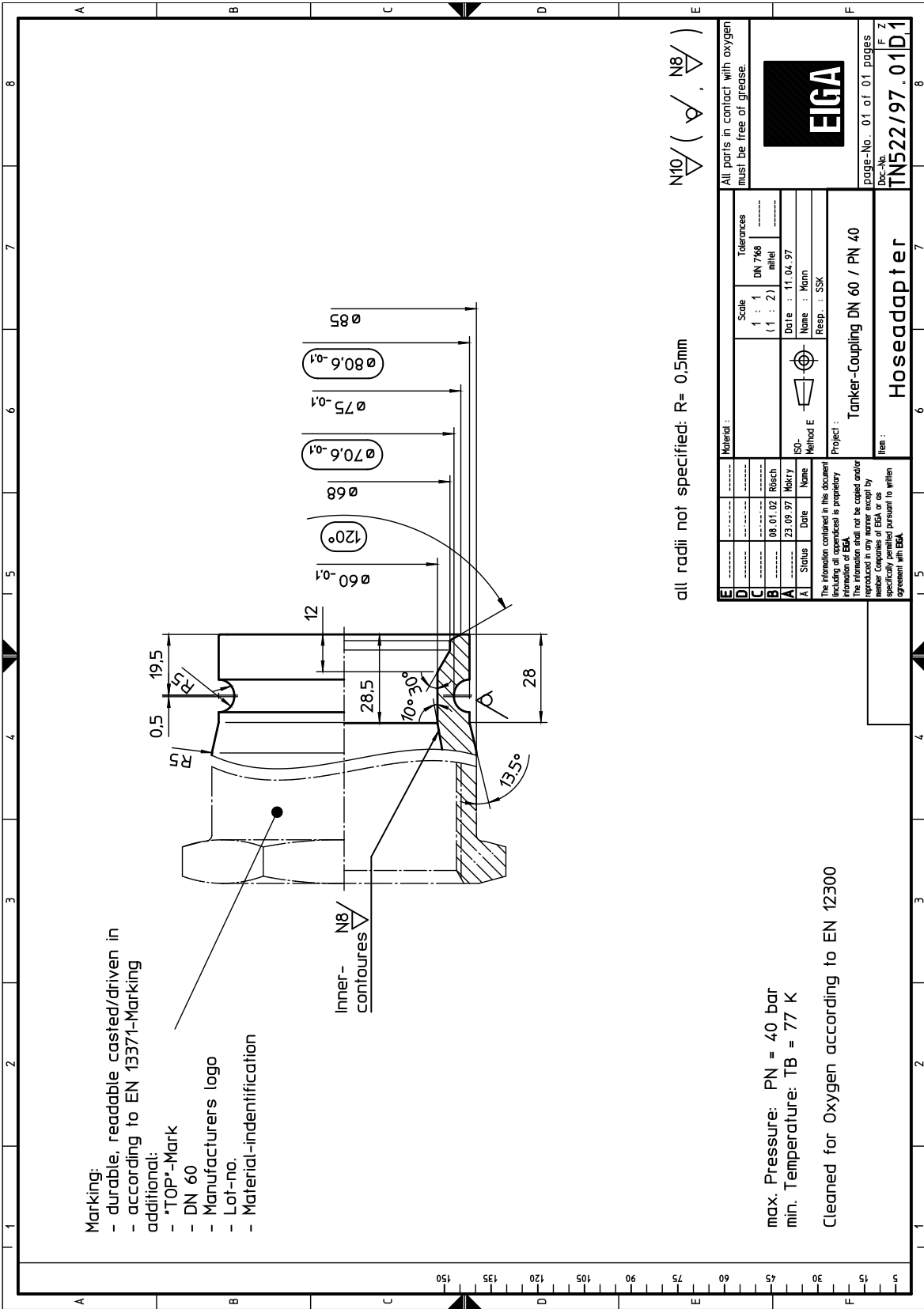
Male adapters (tanker connector) shall be checked to ensure that the revised EIGA nut will fit.

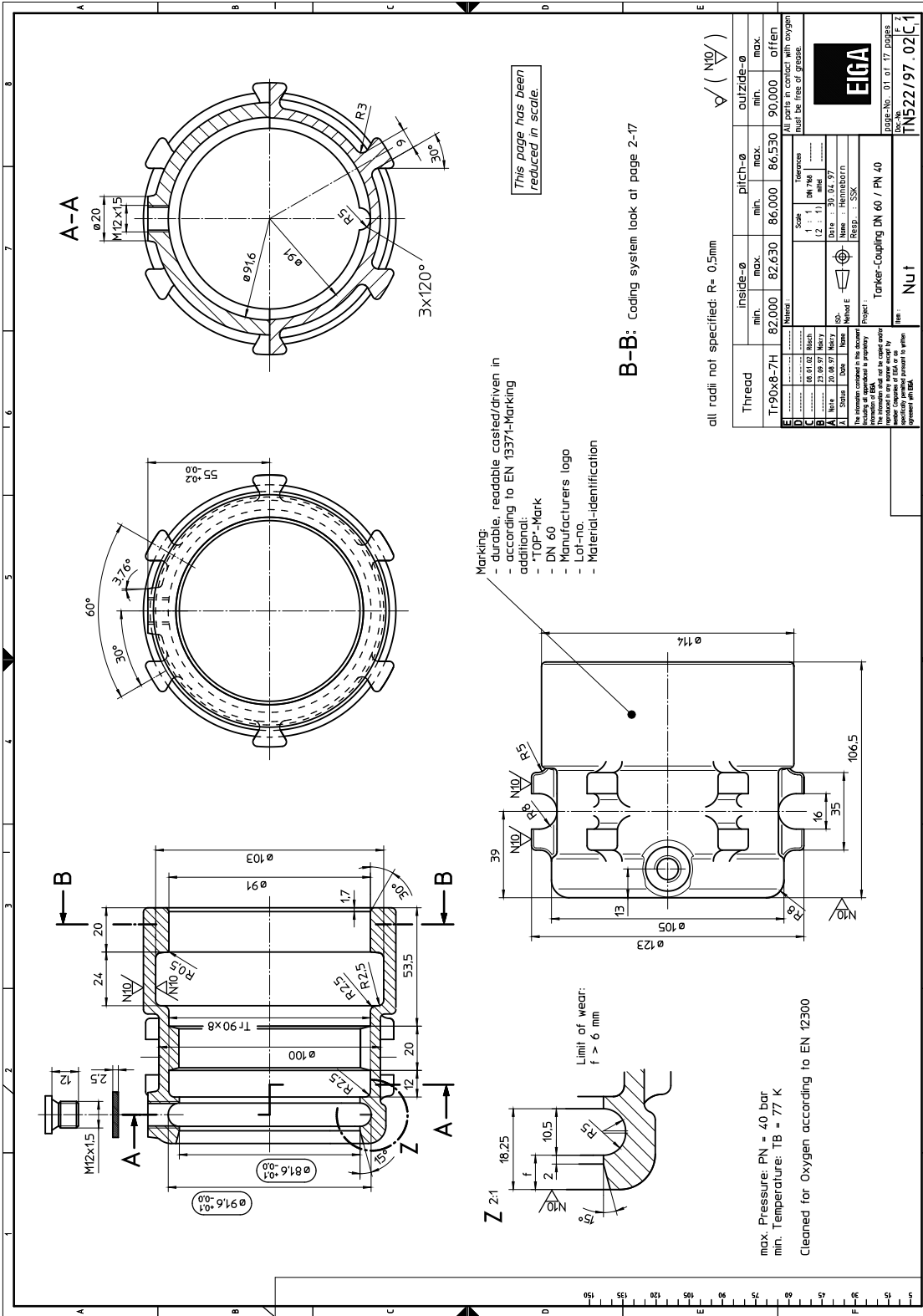
Appendix D: Drawing of EIGA Coupling DN40



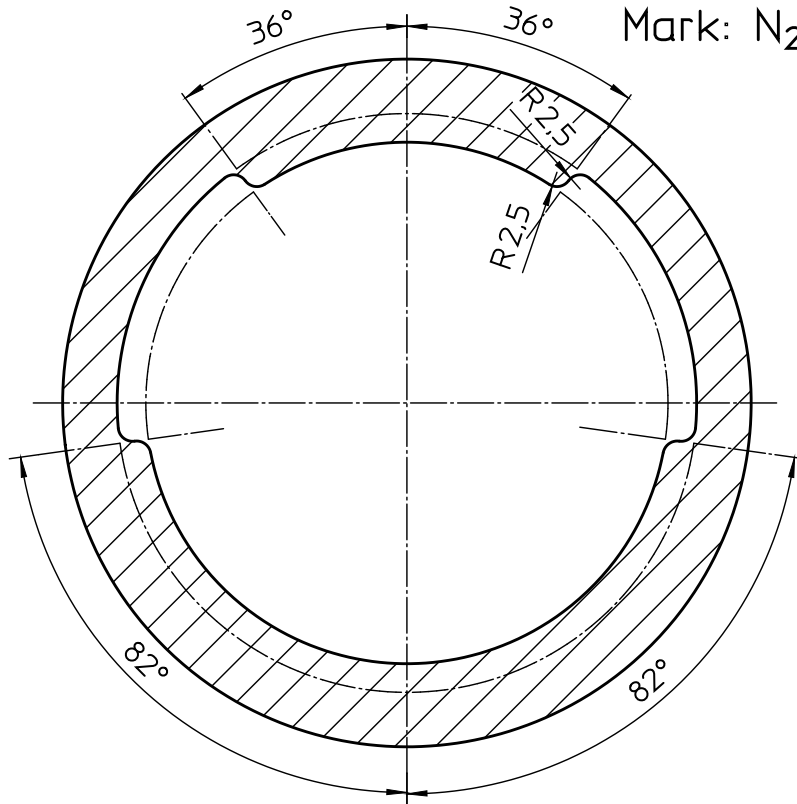
Appendix E: Drawing for EIGA coupling DN60



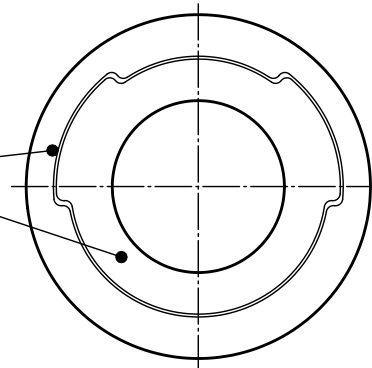



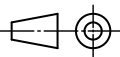


Contour B-B: Code-No. 1: Product: Nitrogen
Mark: N₂

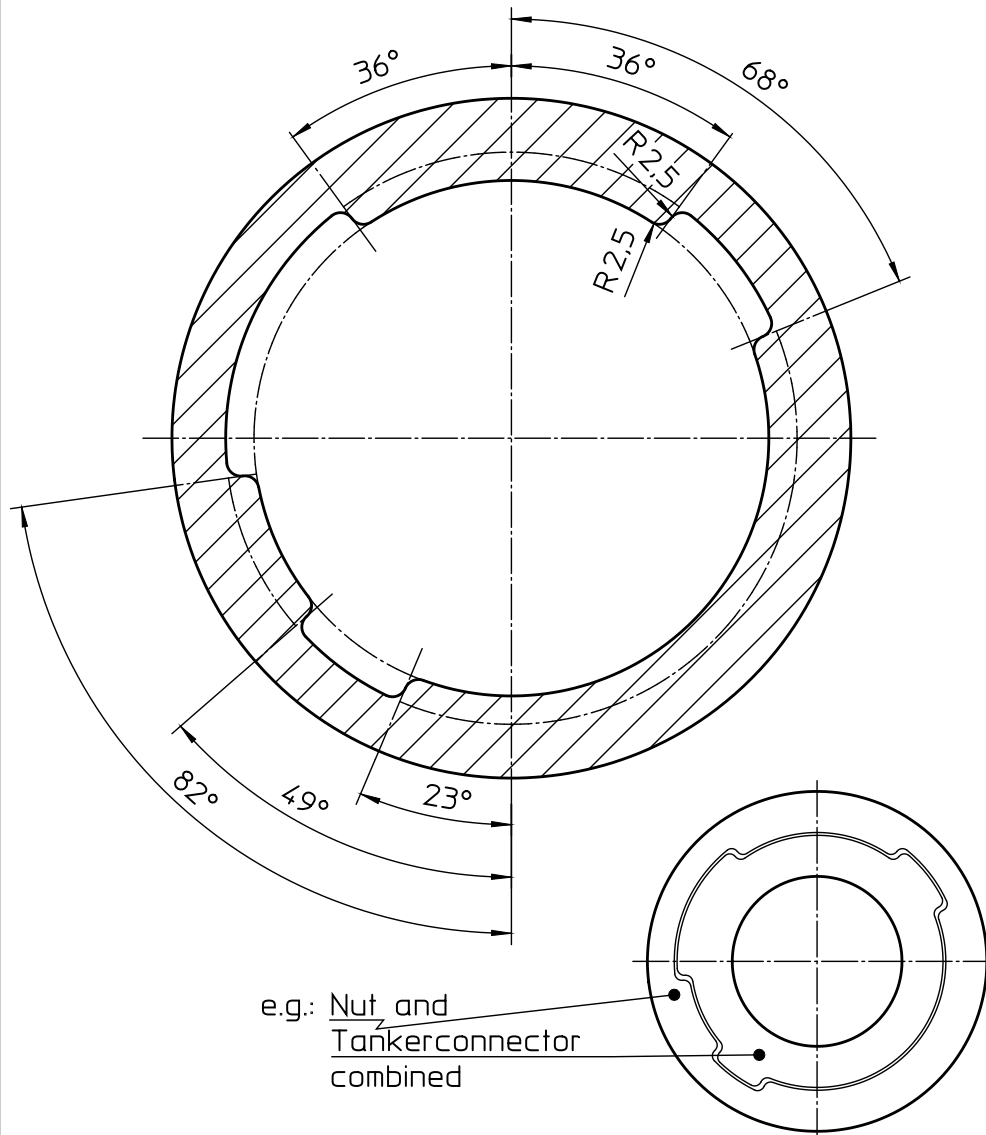



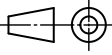
e.g.: Nut and
Tankerconnector
combined



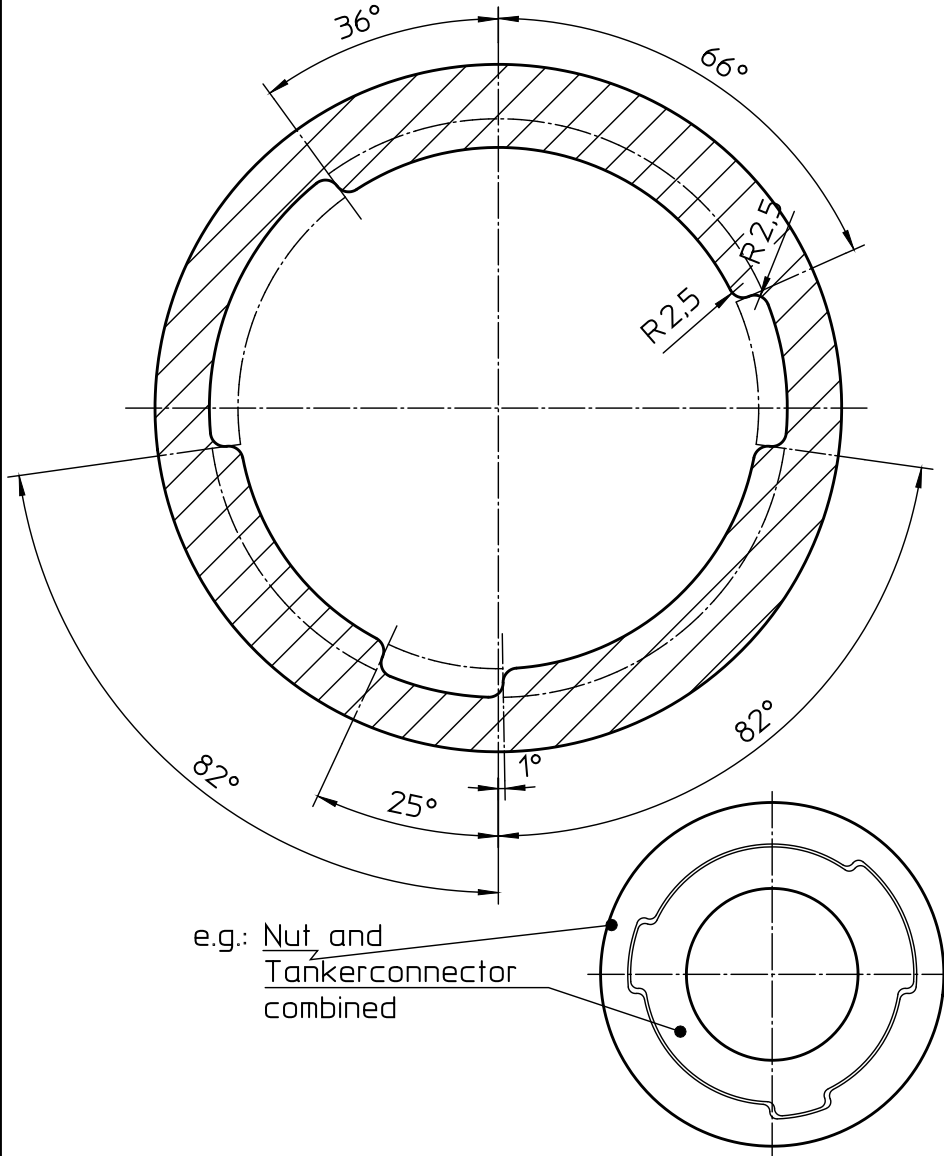
E	-----	-----	-----	Material : see Page 1	All parts in contact with oxygen must be free of grease.	
D	-----	-----	-----	Scale 1 : 1 (1 : 2)	Tolerances DIN 7168 mittel	
C	-----	-----	-----		Date : 30.06.97	
B	-----	-----	-----	Name : Mann		
A	-----	-----	-----	Resp. : SSK		
Ä	Status	Date	Name	ISO-Method E 	Projekt : Tanker-Coupling DN 60 / PN 40	
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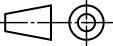
Contour B-B: Code-No. 2: Product: Oxygen
Mark: O₂



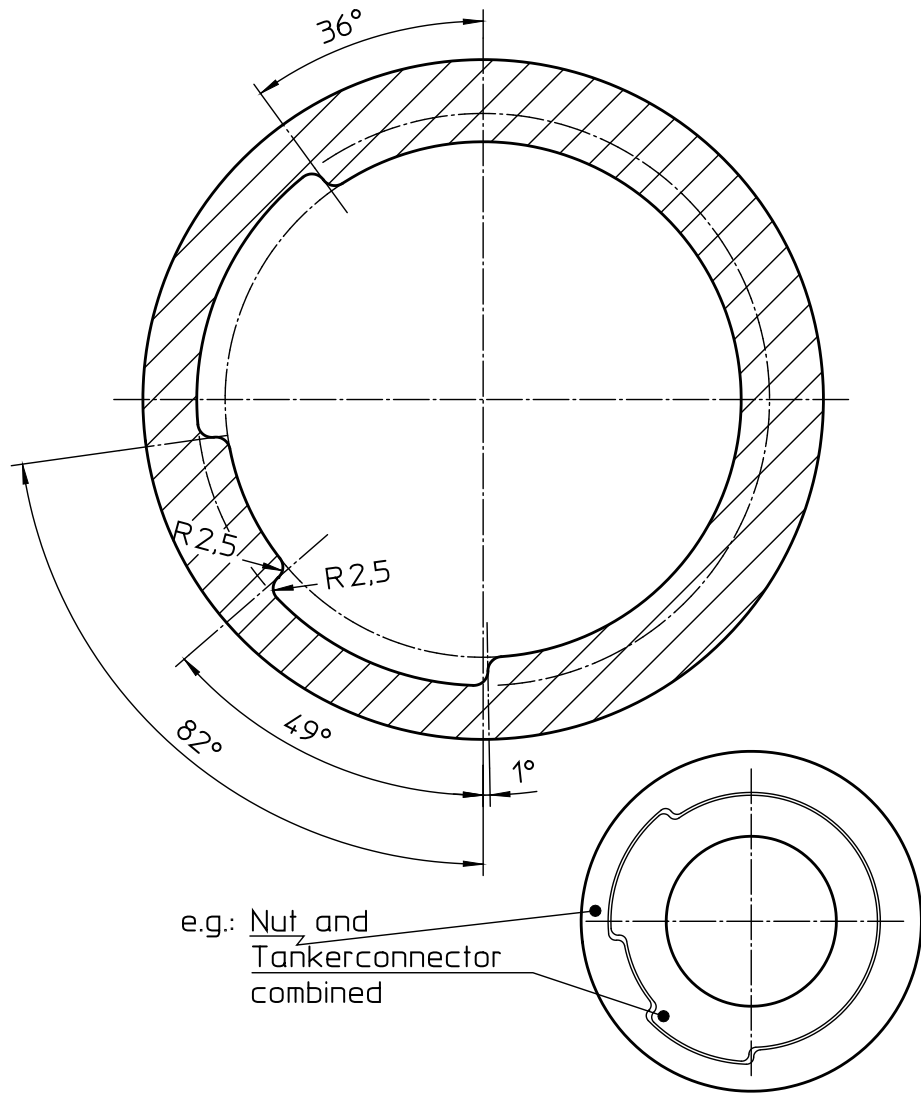
E	-----	-----	-----	Material : see Page 1	All parts in contact with oxygen must be free of grease.	
D	-----	-----	-----	Scale 1 : 1 (1 : 2)	Tolerances DIN 7168 mittel	
C	-----	-----	-----		Date : 30.06.97	
B	-----	-----	-----	Name : Mann		
A	-----	-----	-----	Resp. : SSK		
A	Status	Date	Name	ISO-Method E 	Projekt : Tanker-Coupling DN 60 / PN 40	
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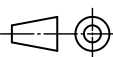
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Mark: Ar CRUDE



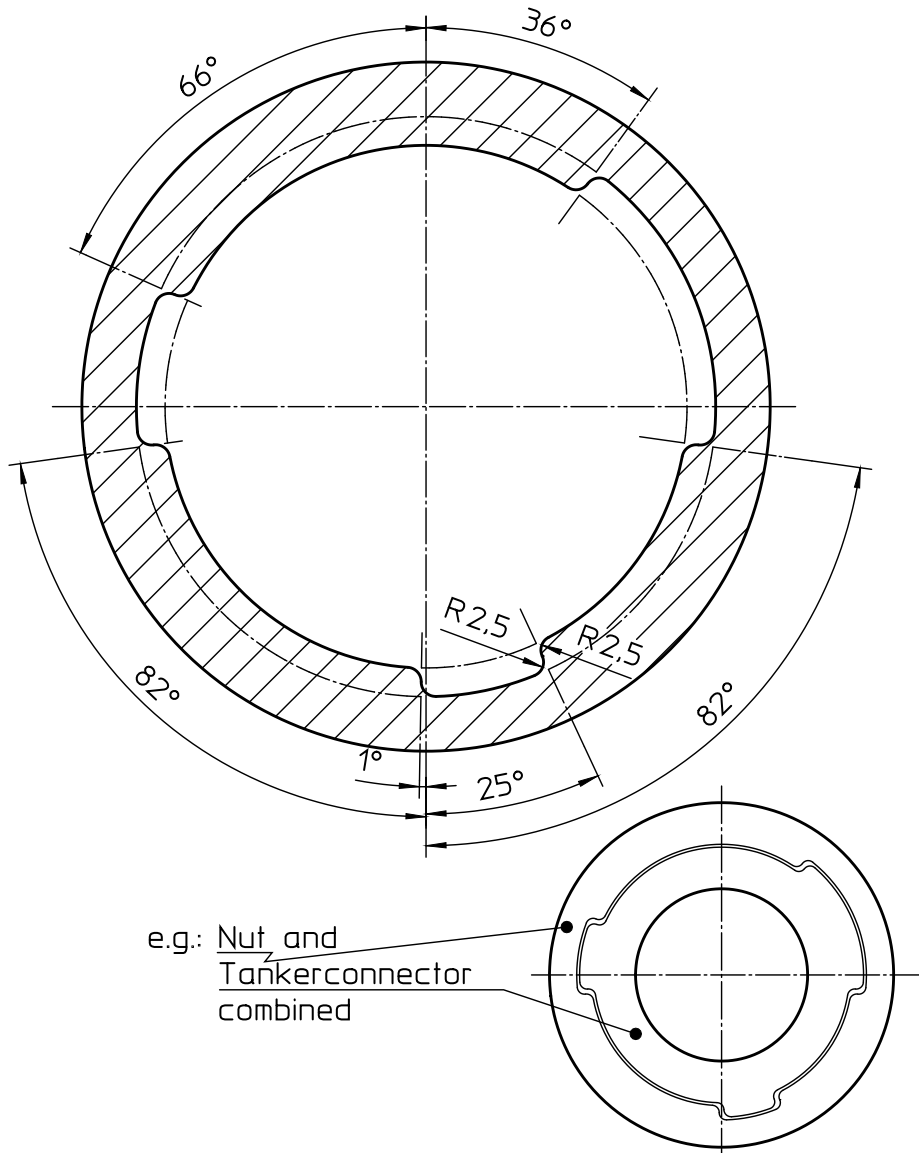
E	-----	-----	-----	Material : see Page 1	All parts in contact with oxygen must be free of grease.	
D	-----	-----	-----	Scale 1 : 1 (1 : 2)	Tolerances DIN 7168 mittel	
C	-----	-----	-----		Date : 30.06.97	
B	-----	-----	-----	Name : Mann		
A	-----	-----	-----	Resp. : SSK		
Ä	Status	Date	Name	ISO-Method E 	Projekt : Tanker-Coupling DN 60 / PN 40	
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Mark: Ar


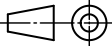


E	-----	-----	-----	Material : see Page 1	All parts in contact with oxygen must be free of grease.	
D	-----	-----	-----	Scale 1 : 1 (1 : 2)	Tolerances DIN 7168 mittel	
C	-----	-----	-----		Date : 30.06.97	
B	-----	-----	-----	Name : Mann		
A	-----	-----	-----	Resp. : SSK		
Ä	Status	Date	Name	ISO-Method E 	Projekt : Tanker-Coupling DN 60 / PN 40	
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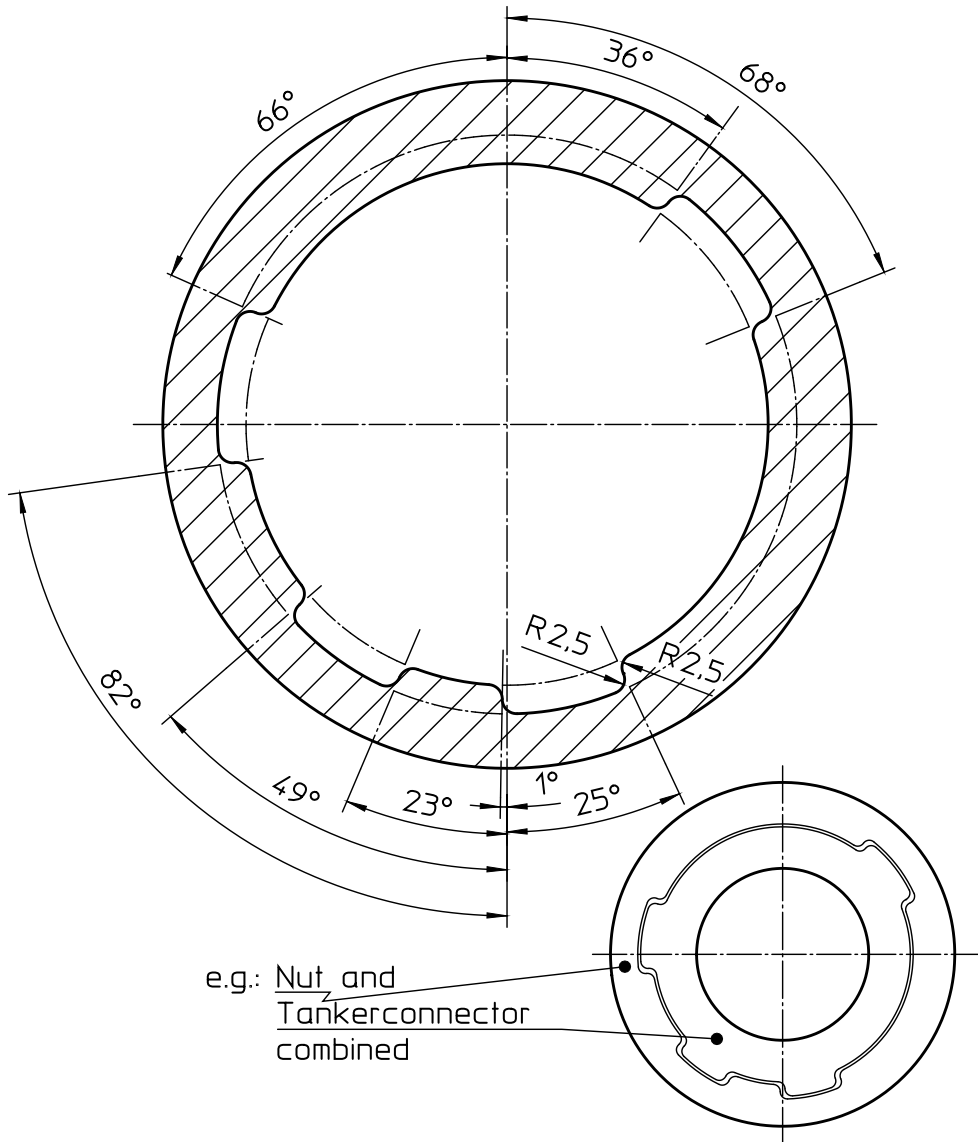
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Mark: AIR


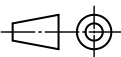


e.g.: Nut and Tankerconnector combined

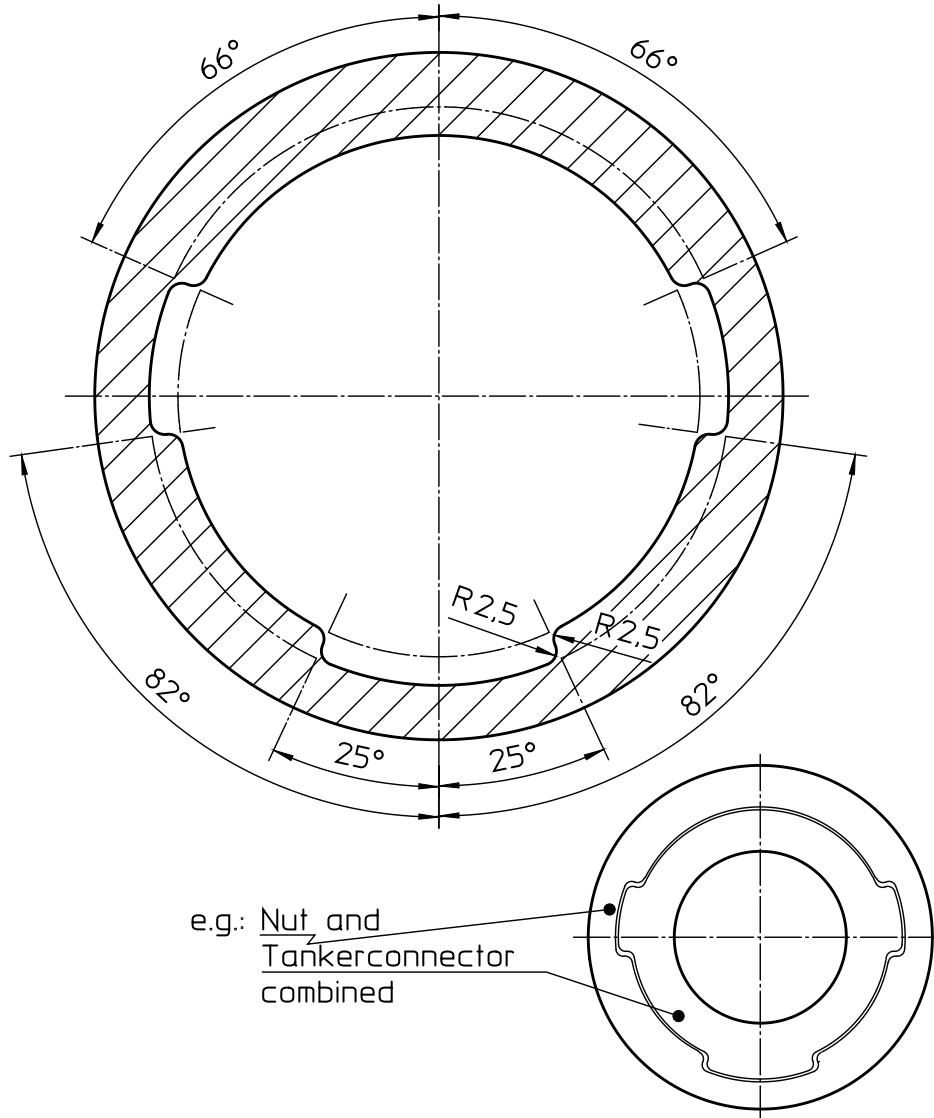
E	-----	-----	-----	Material : see Page 1	All parts in contact with oxygen must be free of grease.					
D	-----	-----	-----	Scale 1 : 1 (1 : 2)	Tolerances DIN 7168 mittel					
C	-----	-----	-----		Date : 30.06.97					
B	-----	-----	-----	Name : Mann						
A	-----	-----	-----	Resp. : SSK						
Ä	Status	Date	Name	ISO-Method E 	Projekt : Tanker-Coupling DN 60 / PN 40					
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F	Z									
E	1									

Contour B-B: Code-No. 6: Produkt: ...
Mark: ...



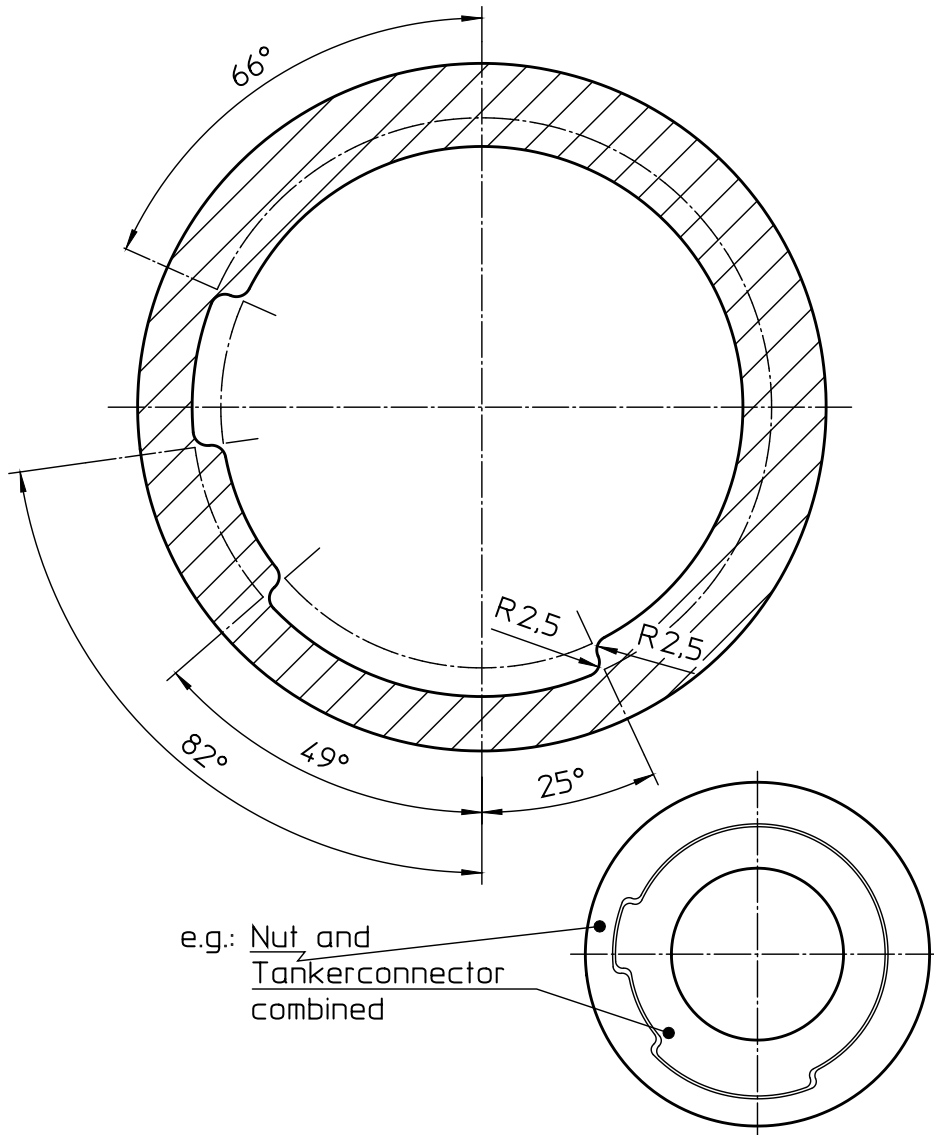
E	-----	-----	-----	Material : see Page 1	All parts in contact with oxygen must be free of grease.	
D	-----	-----	-----	Scale 1 : 1 (1 : 2)	Tolerances DIN 7168 mittel	
C	-----	-----	-----		Date : 30.06.97	
B	-----	-----	-----	Name : Mann		
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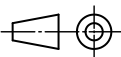
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Mark: ...



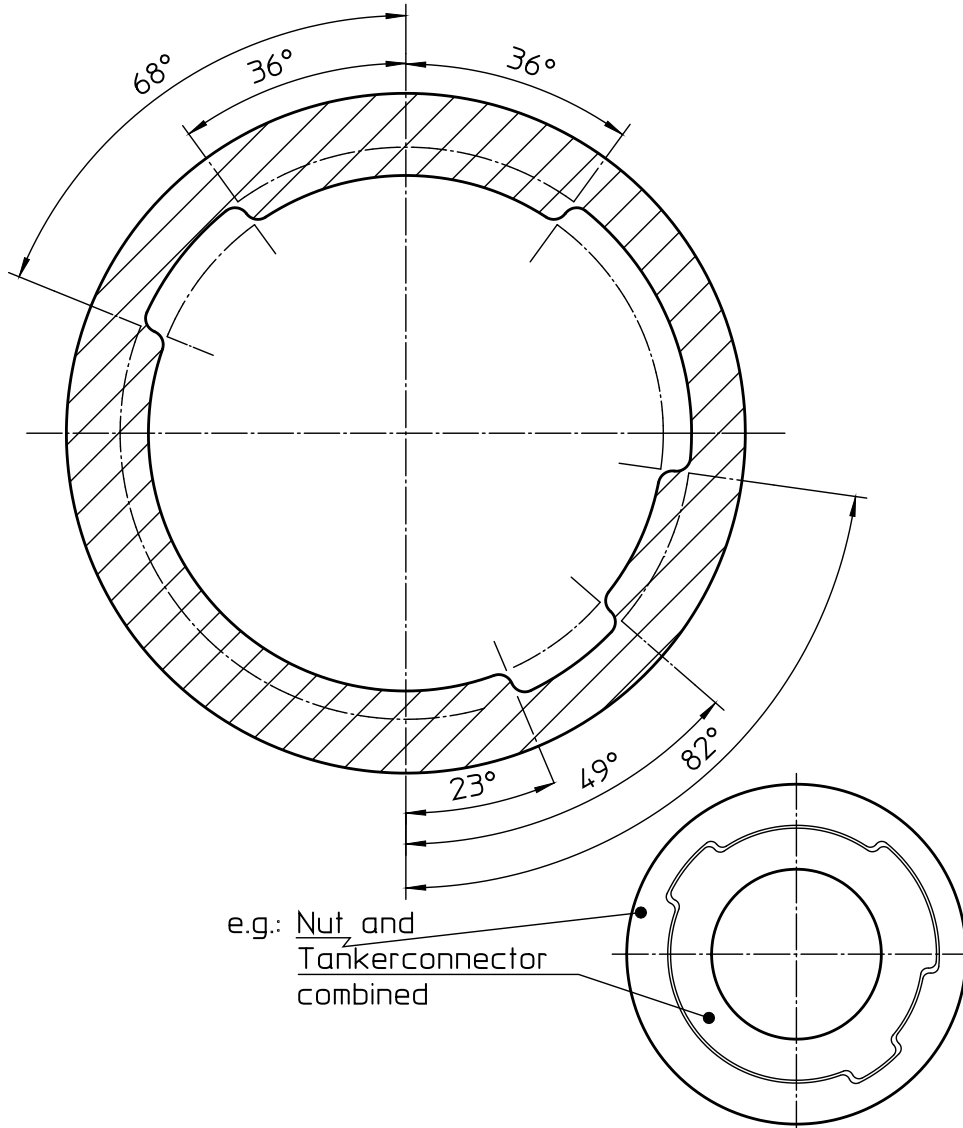
E	-----	-----	-----	Material : see Page 1	All parts in contact with oxygen must be free of grease.		
D	-----	-----	-----	Scale 1 : 1 (1 : 2)	Tolerances		
C	-----	-----	-----		DIN 7168	-----	
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Ä	Status	Date	Name	ISO-Method E	Resp. : SSK		
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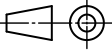
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Mark: ...



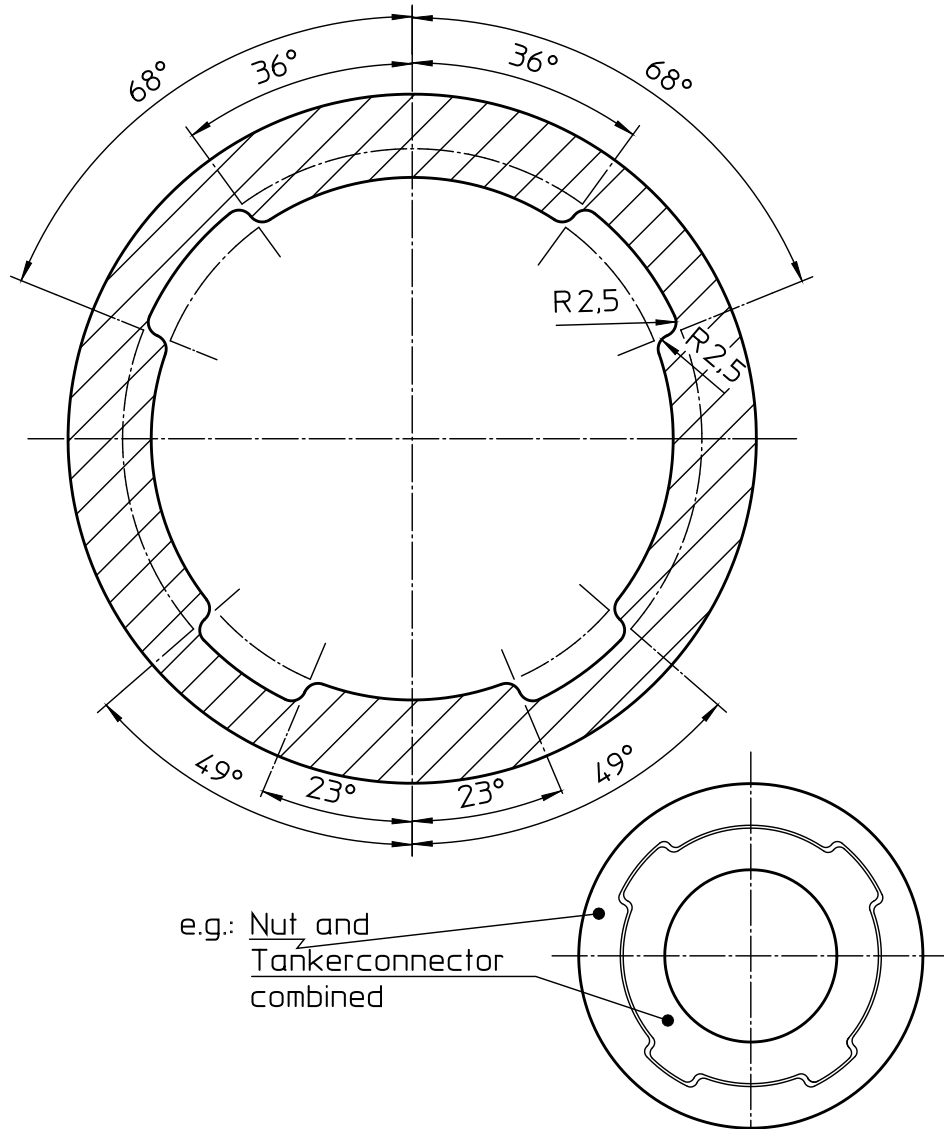
E	-----	-----	-----	Material : see Page 1	All parts in contact with oxygen must be free of grease.			
D	-----	-----	-----	Scale 1 : 1 (1 : 2)	Tolerances DIN 7168 mittel			
C	-----	-----	-----		Date : 30.06.97			
B	-----	-----	-----	Name : Mann	page-No. 09 of 17 pages			
A	-----	-----	-----	Resp. : SSK	Doc.-No. TN522/97.02			
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				Item : Nut				

Contour B-B: Code-No. 9: Product: ...
Mark: ...



E	-----	-----	-----	Material : see Page 1	All parts in contact with oxygen must be free of grease.	
D	-----	-----	-----	Scale 1 : 1 (1 : 2)	Tolerances DIN 7168 mittel	
C	-----	-----	-----		Date : 30.06.97	
B	-----	-----	-----	Name : Mann		
A	-----	-----	-----	Resp. : SSK		
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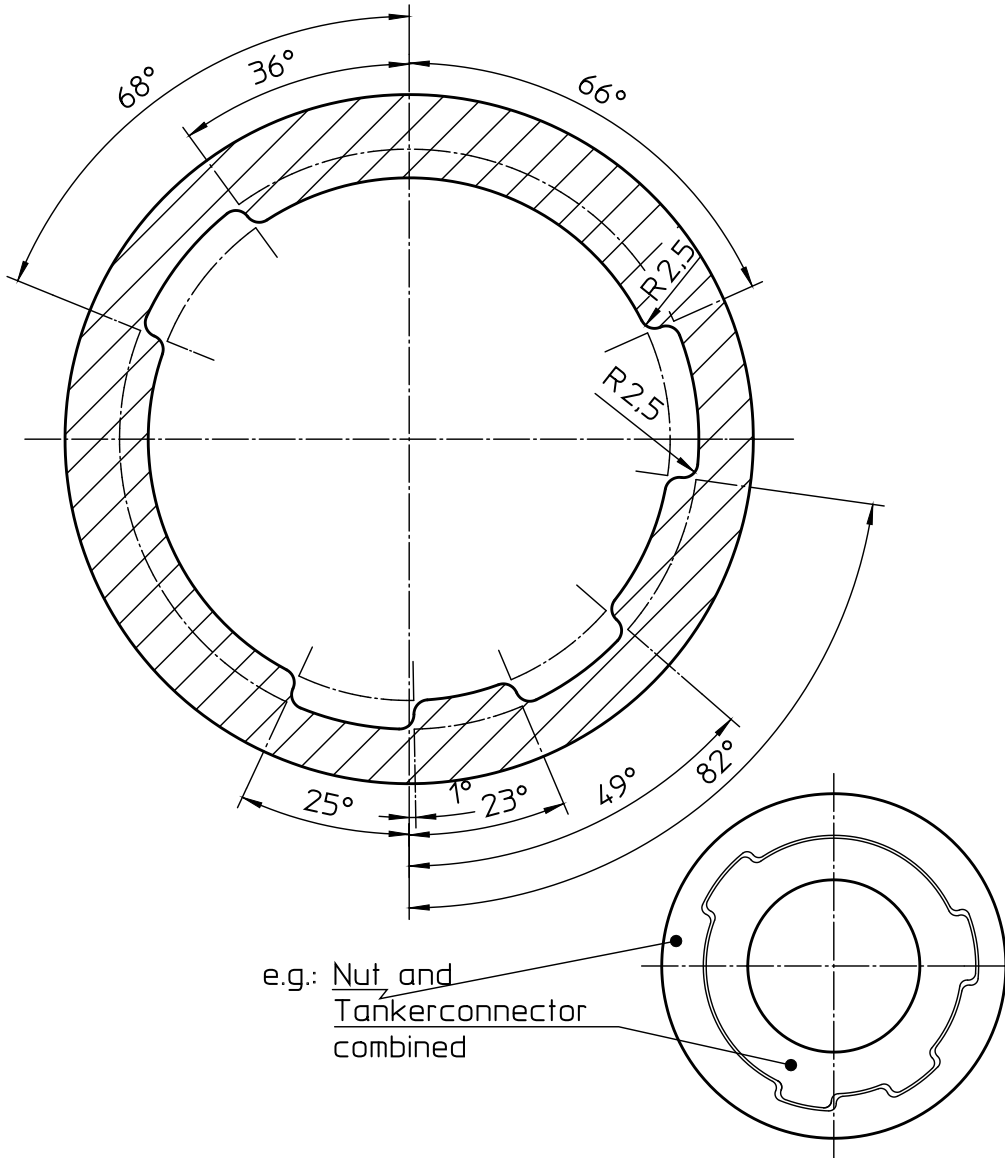
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Mark: ...


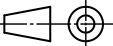


e.g.: Nut and Tankerconnector combined

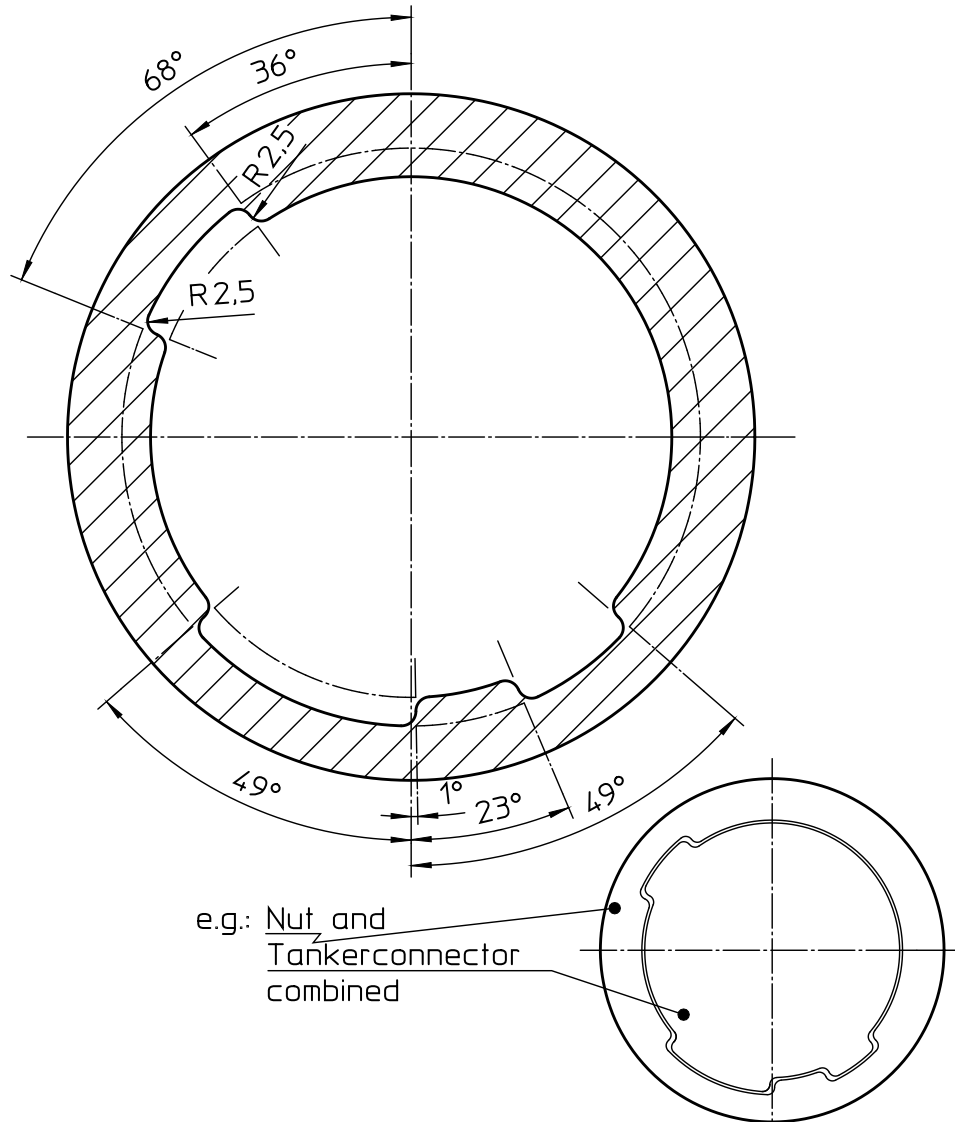
E	-----	-----	-----	Material : see Page 1	All parts in contact with oxygen must be free of grease.		
D	-----	-----	-----	Scale 1 : 1 (1 : 2)	Tolerances		
C	-----	-----	-----		DIN 7168	-----	
B	-----	-----	-----	Date : 30.06.97	mittel		
A	-----	-----	-----	Name : Mann	Resp. : SSK		
Ä	Status	Date	Name	ISO-Method E	 page-No. 11 of 17 pages Doc.-No. TN522/97.02E,1 F Z		
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Projekt :				Tanker-Coupling DN 60 / PN 40			
Item :				Nut			


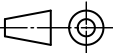
Contour B-B: Code-No. 11: Product: ...
Mark: ...



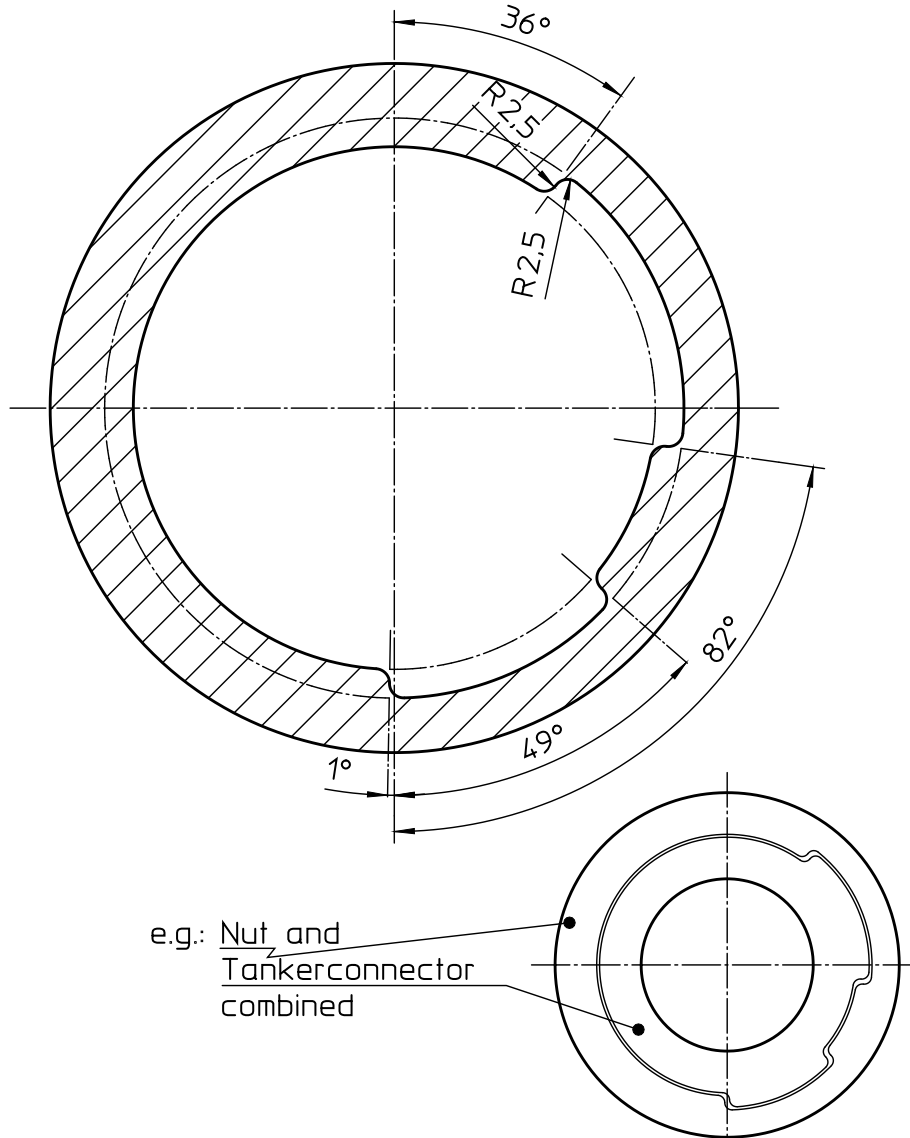
E	-----	-----	-----	Material : see Page 1	All parts in contact with oxygen must be free of grease.	
D	-----	-----	-----	Scale 1 : 1 (1 : 2)	Tolerances DIN 7168 mittel	
C	-----	-----	-----		Date : 30.06.97	
B	-----	-----	-----	Name : Mann		
A	-----	-----	-----	Resp. : SSK		
Ä	Status	Date	Name	ISO-Method E 	Projekt : Tanker-Coupling DN 60 / PN 40	
<p>The information contained in this document (including all appendices) is proprietary information of EIGA. The information shall not be copied and/or reproduced in any manner except by member Companies of EIGA or as specifically permitted pursuant to written agreement with EIGA.</p>				Item : Nut	page-No. 12 of 17 pages Doc.-No. TN522/97.02E,1 F Z	


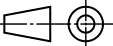
Contour B-B: Code-No. 12: Product: ...
Mark: ...



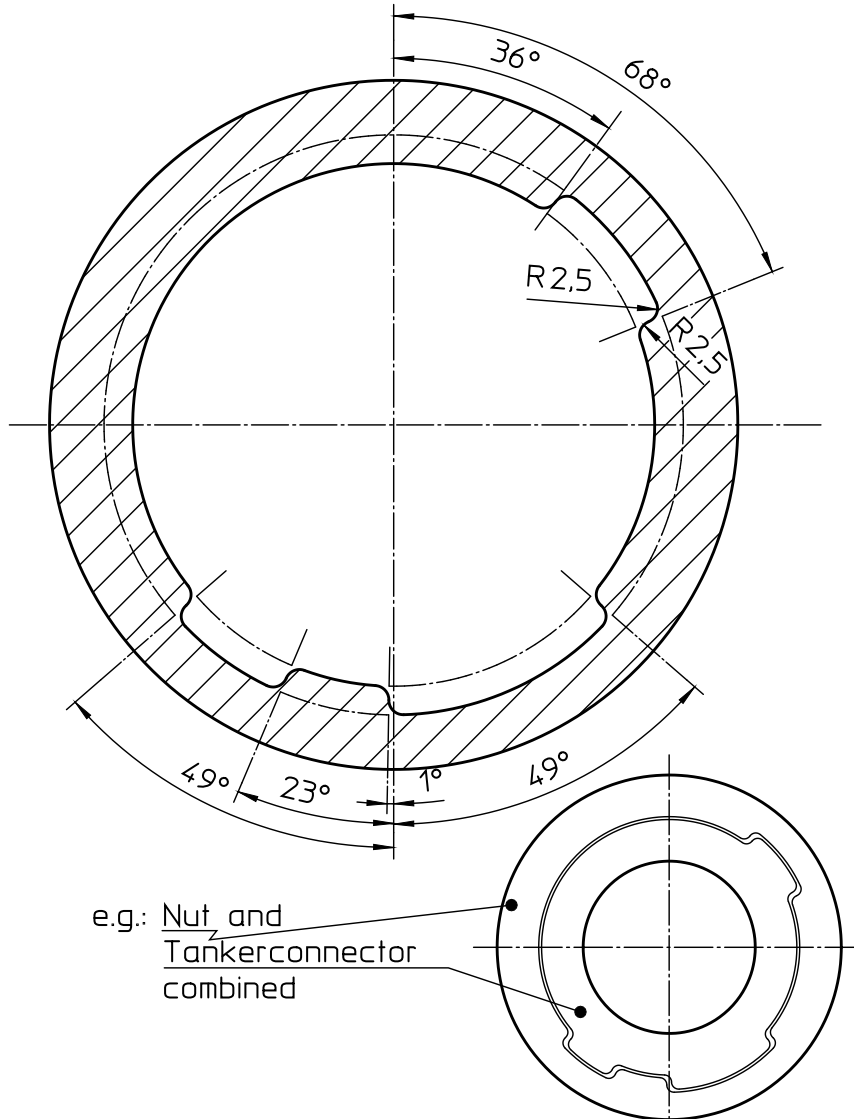
E	-----	-----	-----	Material : see Page 1	All parts in contact with oxygen must be free of grease.			
D	-----	-----	-----	Scale 1 : 1 (1 : 2)	Tolerances DIN 7168 mittel			
C	-----	-----	-----		Date : 30.06.97			
B	-----	-----	-----	Name : Mann	page-No. 13 of 17 pages			
A	-----	23.09.97	Mokry	Resp. : SSK	Doc.-No. TN522/97.02			
Ä	Status	Date	Name	ISO-Method E 	F Z			
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				Item : Nut	E, 1			

Contour B-B: Code-No. 13: Product: ...
Mark: ...



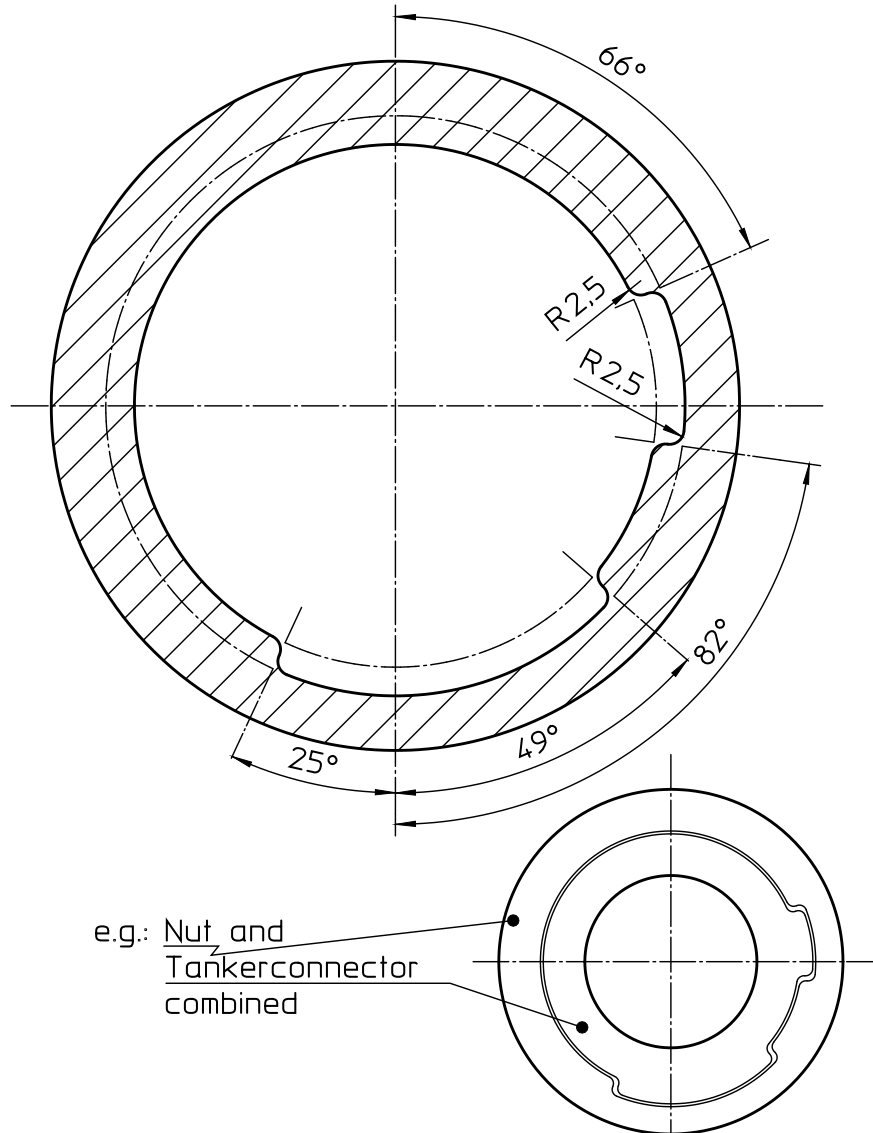
E	-----	-----	-----	Material : see Page 1	All parts in contact with oxygen must be free of grease.	
D	-----	-----	-----	Scale 1 : 1 (1 : 2)	Tolerances DIN 7168 mittel	
C	-----	-----	-----		Date : 30.06.97	
B	-----	-----	-----	Name : Mann		
A	-----	-----	-----	Resp. : SSK		
Ä	Status	Date	Name	ISO-Method E 	Projekt : Tanker-Coupling DN 60 / PN 40	
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Contour B-B: Code-No. 14: Product: ...
Mark: ...



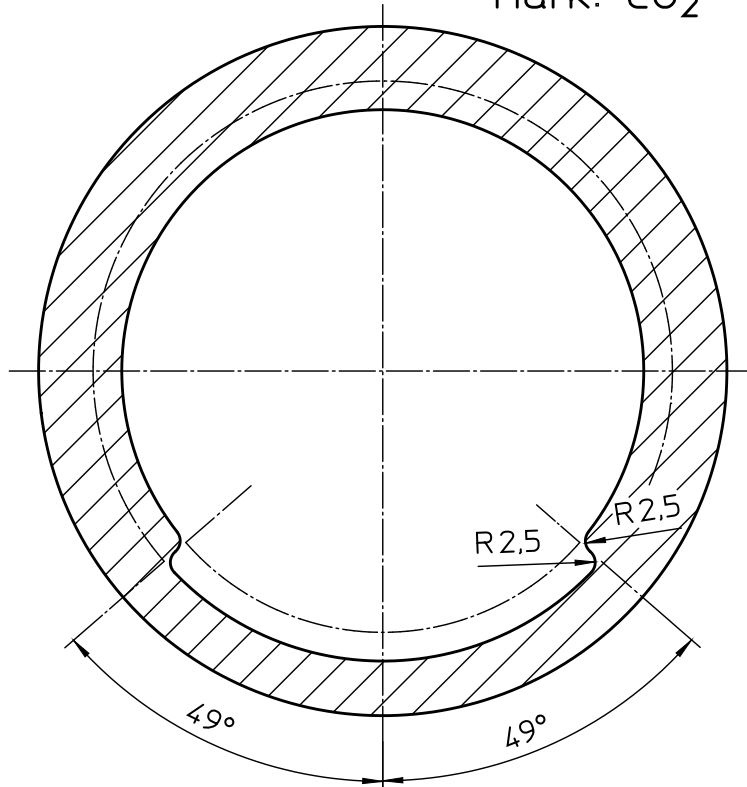
E	-----	-----	-----	Material : see Page 1	All parts in contact with oxygen must be free of grease.		
D	-----	-----	-----	Scale 1 : 1 (1 : 2)	Tolerances		
C	-----	-----	-----		DIN 7168	-----	
B	-----	-----	-----	Date : 30.06.97	mittel		
A	-----	-----	-----	Name : Mann	Date : 30.06.97		
Ä	Status	Date	Name	ISO-Method E	Resp. : SSK		
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				Item : Nut			 page-No. 15 of 17 pages Doc.-No. TN522/97.02E,1 F Z

Contour B-B: Code-No. 15: Product: Nitrous Oxide
Mark: N₂O

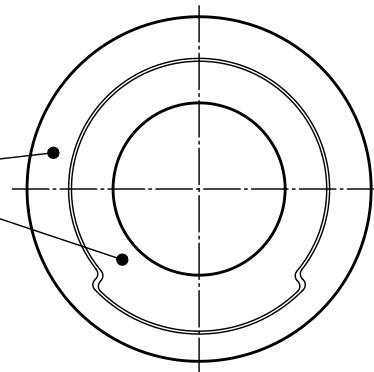


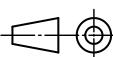

E	-----	-----	-----	Material : see Page 1	All parts in contact with oxygen must be free of grease.		
D	-----	-----	-----	Scale 1 : 1 (1 : 2)	Tolerances		
C	-----	-----	-----		DIN 7168	-----	
B	-----	-----	-----	Date : 30.06.97	mittel		
A	Text	30.10.02	Wege	Name : Mann	Date : 30.06.97		
Ä	Status	Date	Name	ISO-Method E	Resp. : SSK		
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				Item : Nut			
				page-No. 16 of 17 pages			
				Doc.-No. TN522/97.02E,1		F Z	

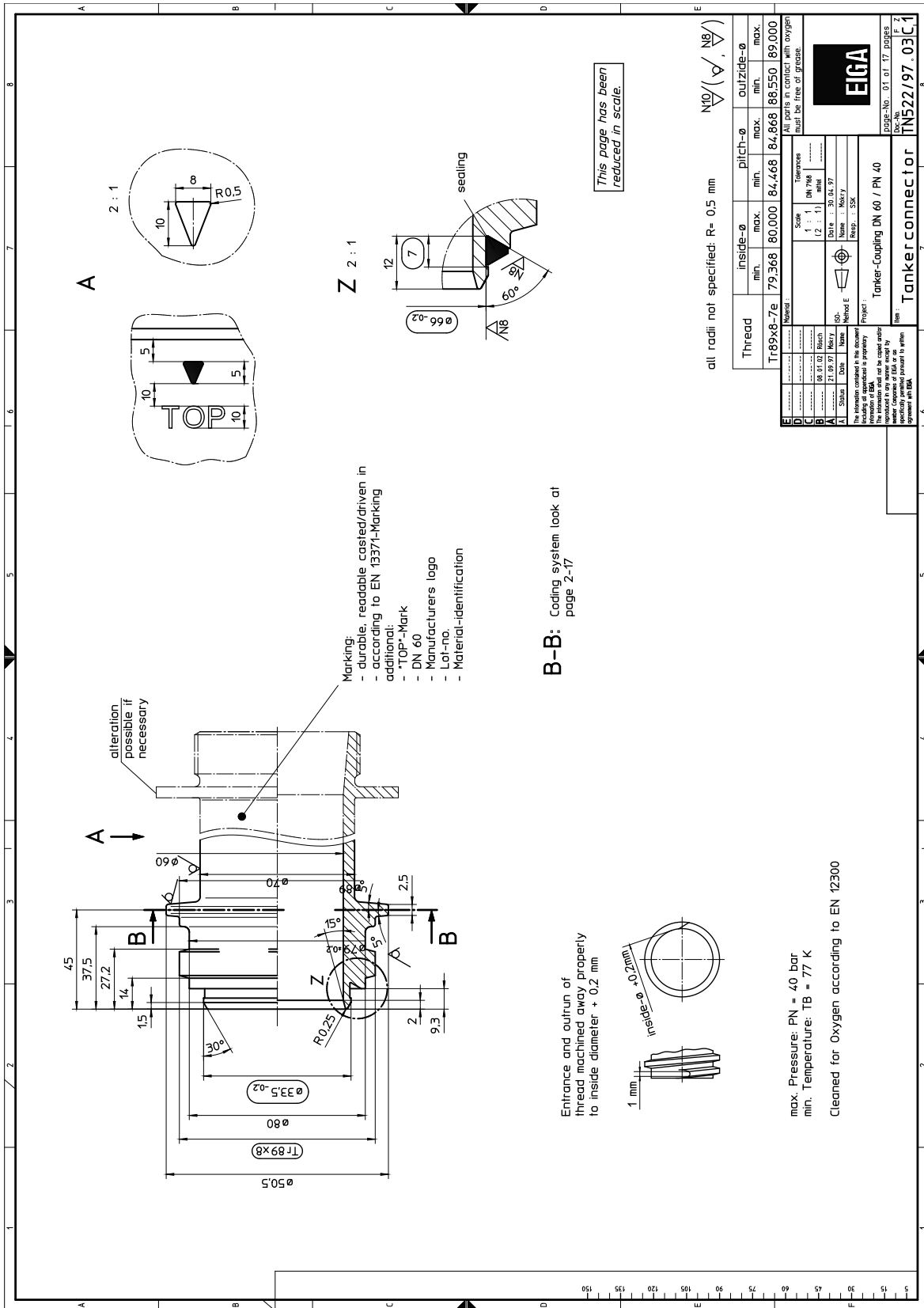
Contour B-B:Code-No.16: Product: Carbon Dioxide
Mark: CO₂



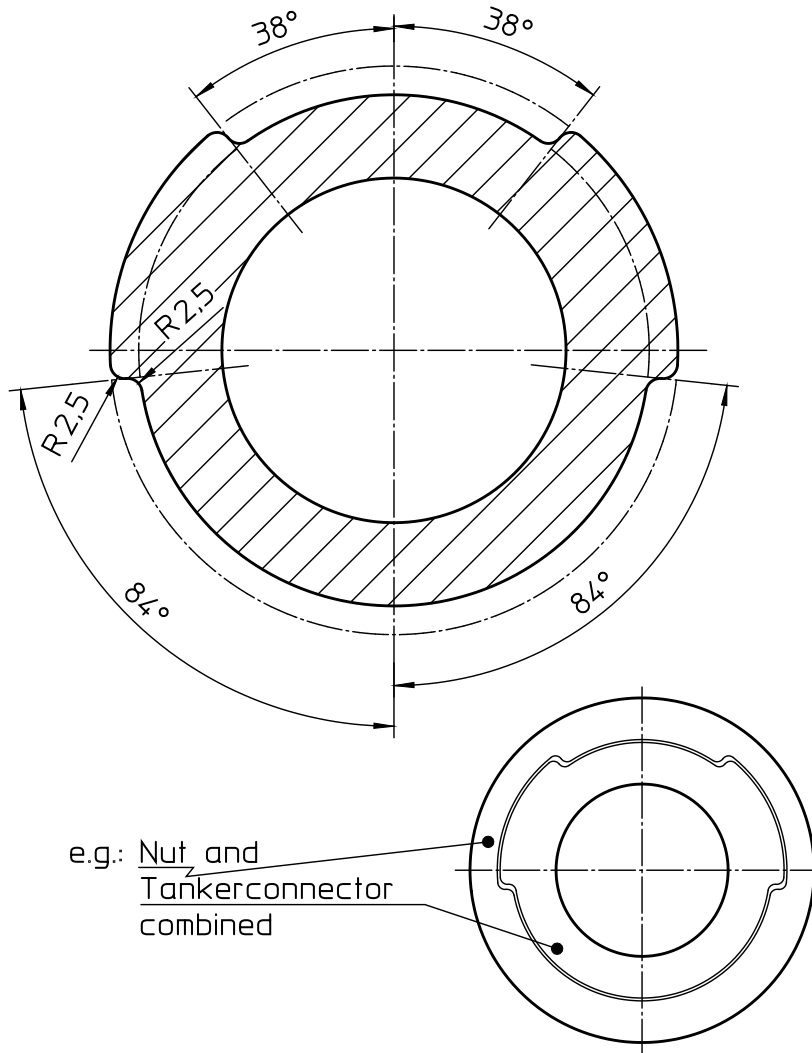
e.g.: Nut and Tankerconnector combined

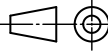



E	-----	-----	-----	Material : see Page 1	All parts in contact with oxygen must be free of grease.		
D	-----	-----	-----		Scale	Tolerances	
C	-----	-----	-----		1 : 1	DIN 7168	-----
B	-----	-----	-----		(1 : 2)	mittel	
A	-----	-----	-----		Date : 11.04.97		
Ä	Status	Date	Name	ISO-Method E 	Name : Mann		
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				Tanker-Coupling DN 60 / PN 40			
				Item :	page-No. 17 of 17 pages		
				Nut	Doc.-No.	TN522/97.02E,1	

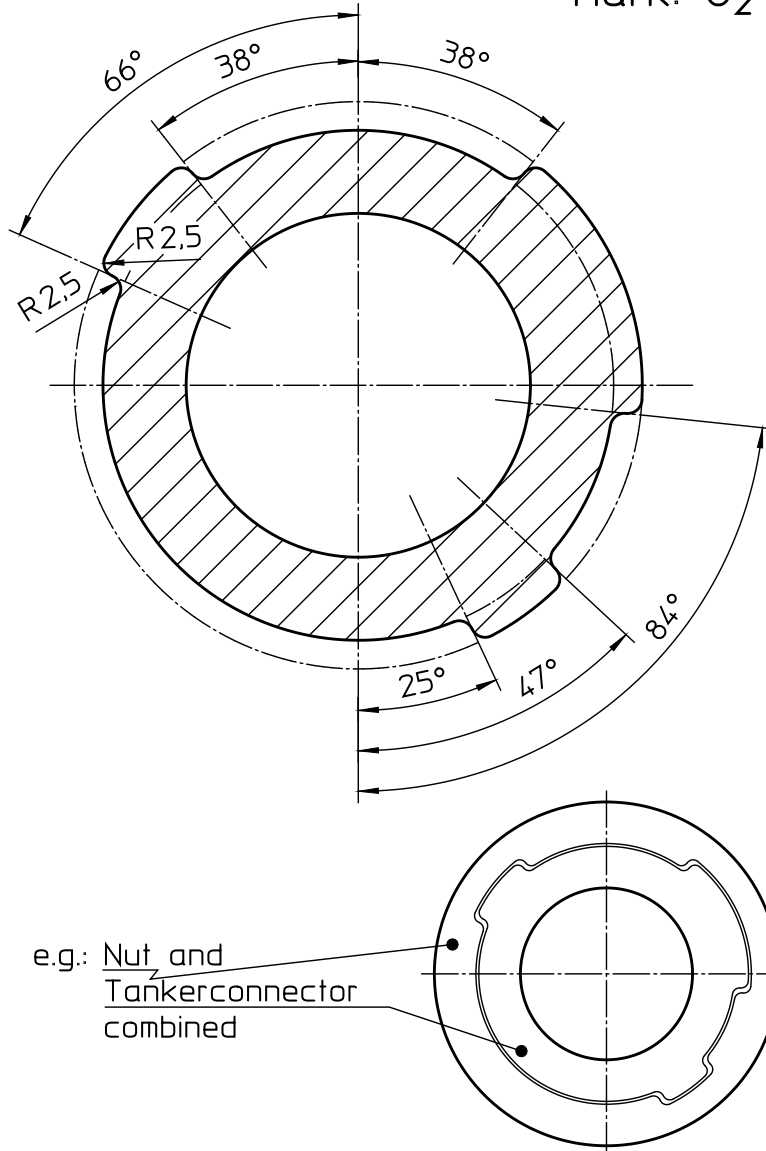



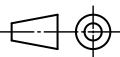
Contour B-B: Code-No. 1: Product: Nitrogen
Mark: N₂



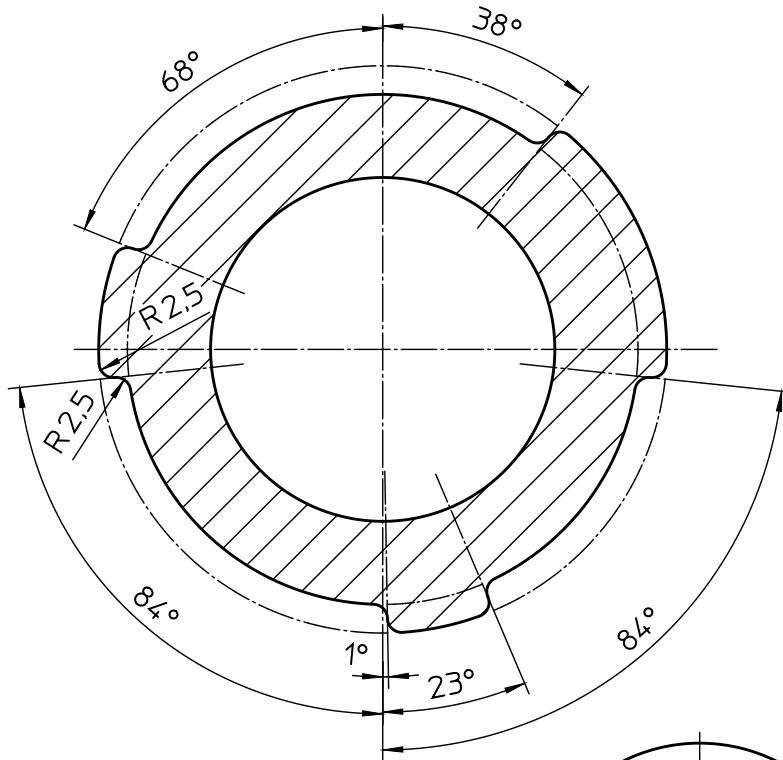
E	-----	-----	-----	Material : see Page 1	All parts in contact with oxygen must be free of grease.		
D	-----	-----	-----		Scale	Tolerances	
C	-----	-----	-----		1 : 1	DIN 7168	-----
B	-----	-----	-----		(1 : 2)	mittel	
A	-----	-----	-----	ISO- Method E 	Date : 30.06.97		
Ä	Status	Date	Name		Name : Mann		
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				Item :			
				Item :	Tankerconnector	Doc.-No.	TN522/97.03
						F Z	E,1
						page-No. 02 of 17 pages	

Contour B-B: Code-No. 2: Product: Oxygen
Mark: O₂

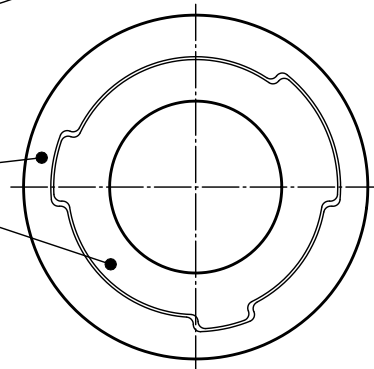



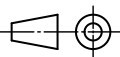
E	-----	-----	-----	Material : see Page 1	All parts in contact with oxygen must be free of grease.	
D	-----	-----	-----	Scale 1 : 1 (1 : 2)	Tolerances	
C	-----	-----	-----		DIN 7168	-----
B	-----	-----	-----	Date : 30.06.97	mittel	
A	-----	23.09.97	Makry	Name : Mann		
Ä	Status	Date	Name	Resp. : SSK		
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				Item : Tankerconnector	page-No. 03 of 17 pages	
					Doc.-No. TN522/97.03E,1	F Z

Contour B-B: Code-No. 3: Product: Argon
Mark: Ar CRUDE

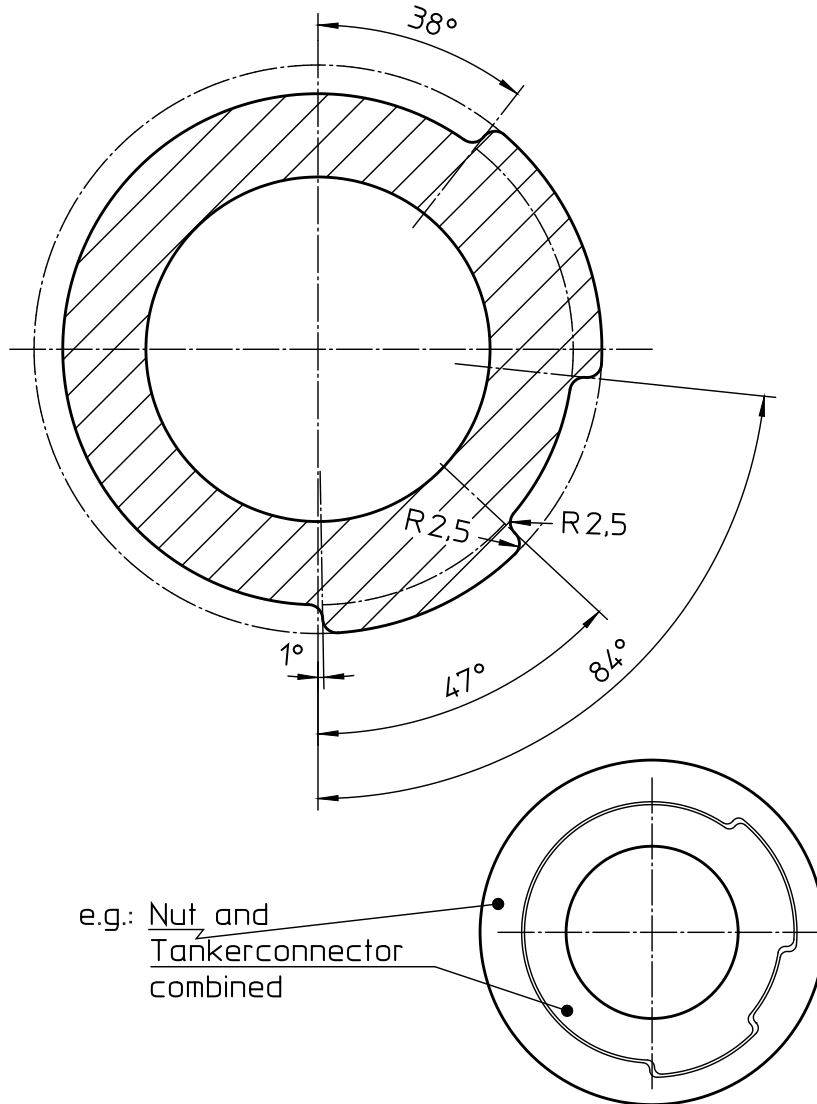



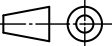
e.g.: Nut and Tankerconnector combined



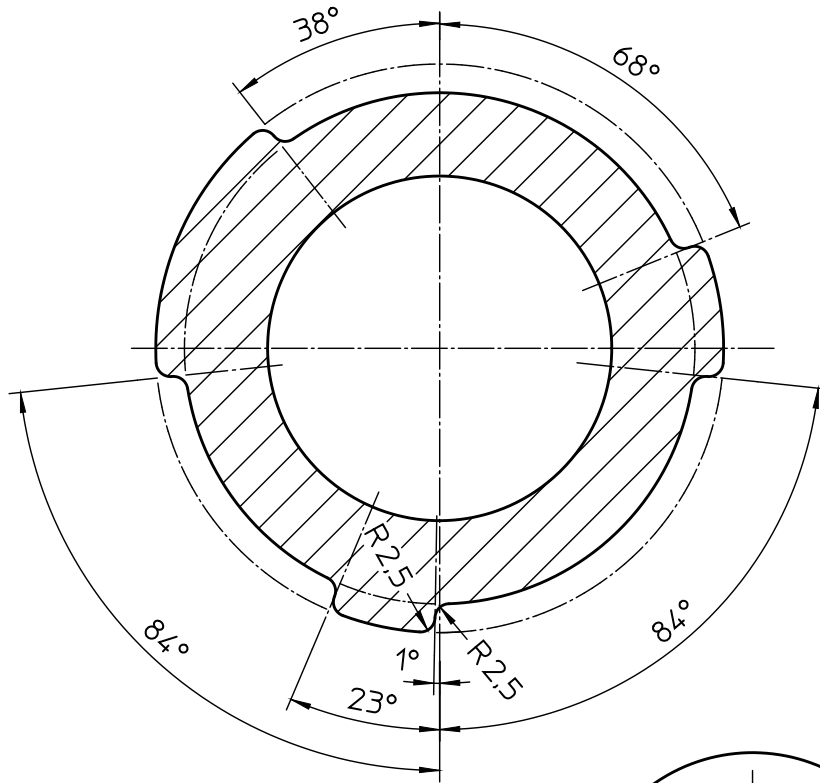
E	-----	-----	-----	Material : see Page 1	All parts in contact with oxygen must be free of grease.			
D	-----	-----	-----	Scale 1 : 1 (1 : 2)	Tolerances DIN 7168 mittel			
C	-----	-----	-----		Date : 30.06.97			
B	-----	-----	-----	Name : Mann	page-No. 04 of 17 pages			
A	-----	-----	-----	Resp. : SSK	Doc.-No. TN522/97.03E,1			
Ä	Status	Date	Name	ISO-Method E 	Projekt : Tanker-Coupling DN 60 / PN 40			
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Contour B-B: Code-No. 4: Product: Pure Argon
Mark: Ar

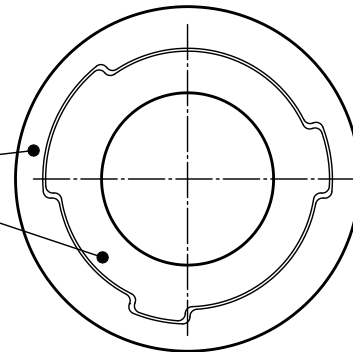



E	-----	-----	-----	Material : see Page 1	All parts in contact with oxygen must be free of grease.			
D	-----	-----	-----	Scale 1 : 1 (1 : 2)	Tolerances DIN 7168 mittel			
C	-----	-----	-----		Date : 30.06.97			
B	-----	-----	-----	Name : Mann	page-No. 05 of 17 pages			
A	-----	-----	-----	Resp. : SSK	Doc.-No. TN522/97.03E,1			
Ä	Status	Date	Name	ISO-Method E 	Projekt : Tanker-Coupling DN 60 / PN 40			
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Contour B-B: Code-No. 5: Product: Synthetic Air
Mark: AIR

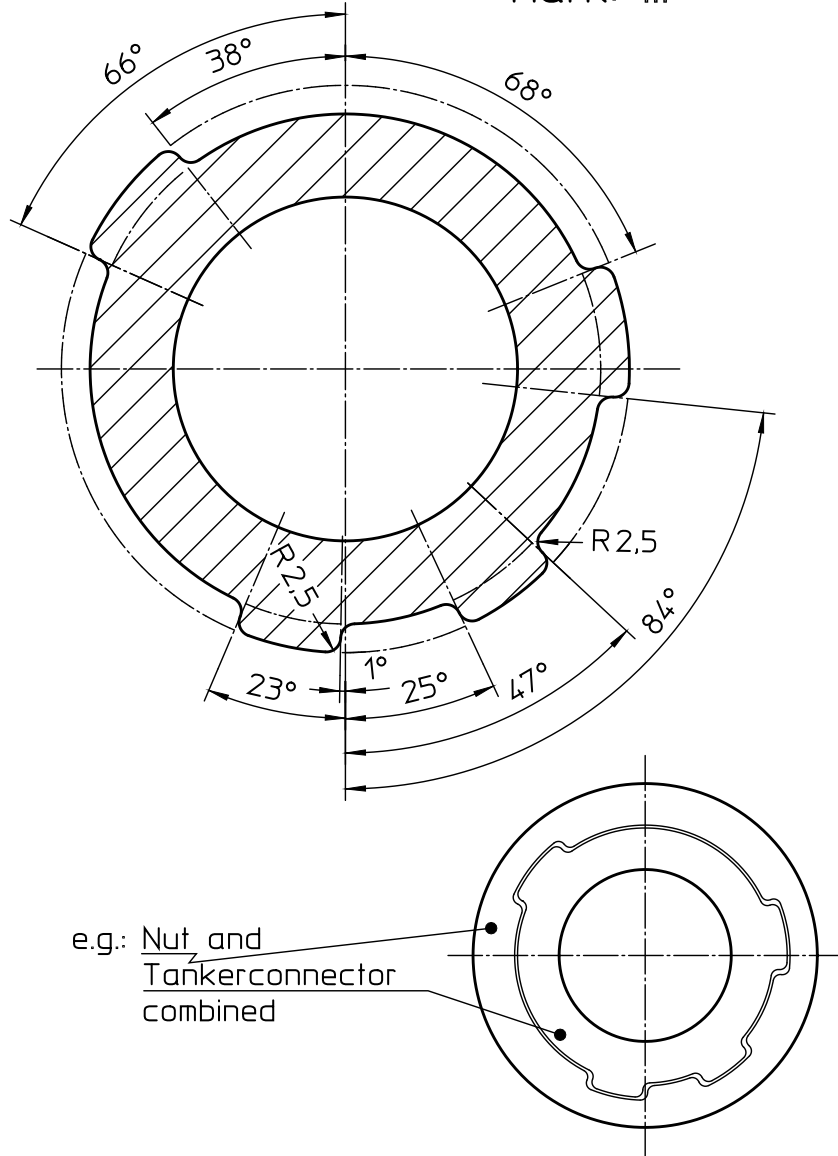



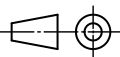
e.g.: Nut and Tankerconnector combined



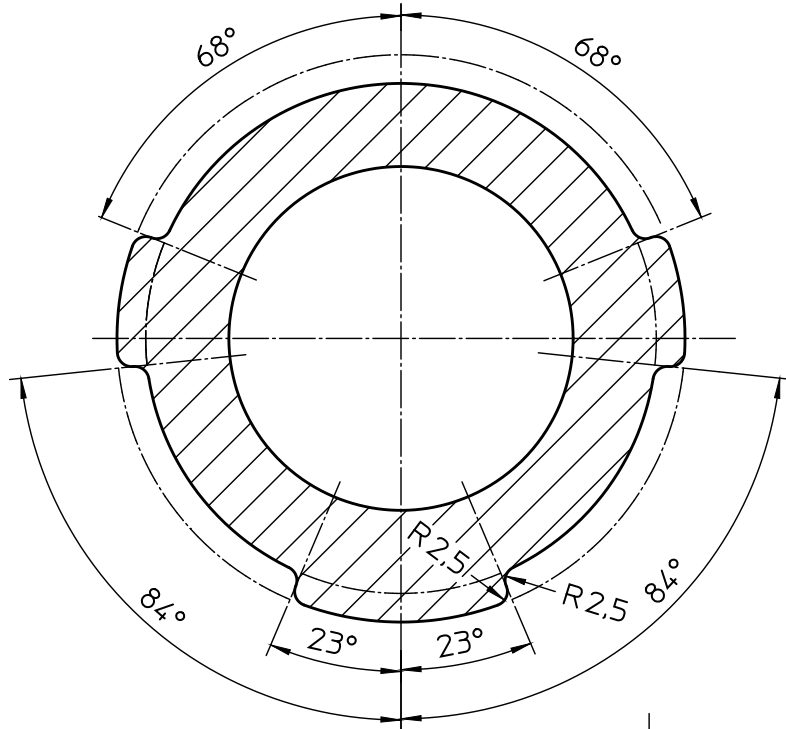
E	-----	-----	-----	Material : see Page 1	All parts in contact with oxygen must be free of grease.		
D	-----	-----	-----	Scale 1 : 1 (1 : 2)	Tolerances		
C	-----	-----	-----		DIN 7168	-----	
B	-----	-----	-----	Date : 30.06.97	mittel		
A	-----	-----	-----	Name : Mann	Resp. : SSK		
Ä	Status	Date	Name	ISO-Method E	 page-No. 06 of 17 pages		
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Item : Tankerconnector				Doc.-No. TN522/97.03E,1	F	Z	

Contour B-B: Code-No. 6: Product: ...
Mark: ...

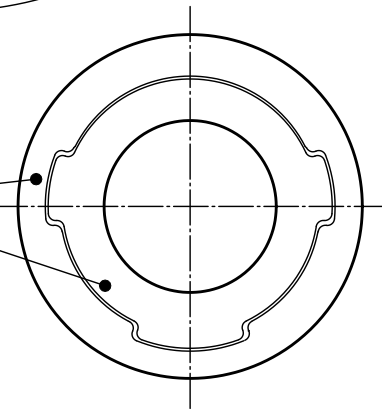



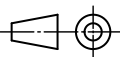
E	-----	-----	-----	Material : see Page 1	All parts in contact with oxygen must be free of grease.	
D	-----	-----	-----	Scale 1 : 1 (1 : 2)	Tolerances DIN 7168 mittel	
C	-----	-----	-----		Date : 30.06.97	
B	-----	-----	-----	Name : Mann		
A	-----	-----	-----	Resp. : SSK		
Ä	Status	Date	Name	ISO-Method E 	Projekt : Tanker-Coupling DN 60 / PN 40	
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Contour B-B: Code-No. 7: Product: ...
Mark: ...

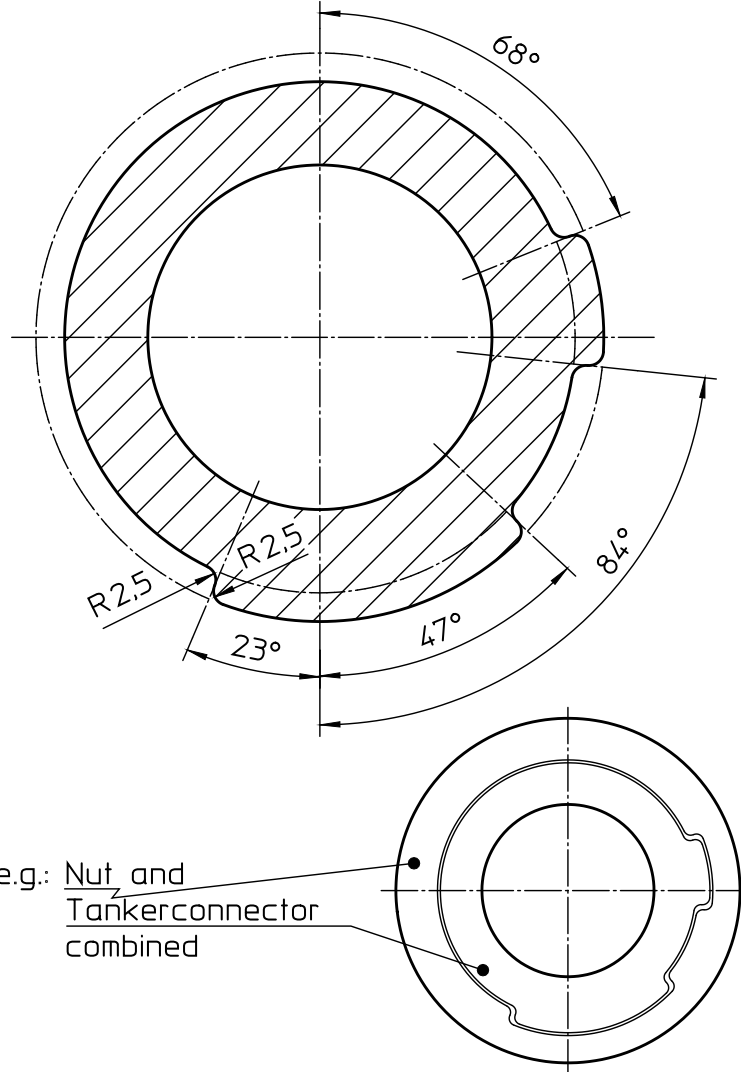


e.g. Nut and
Tankerconnector
combined



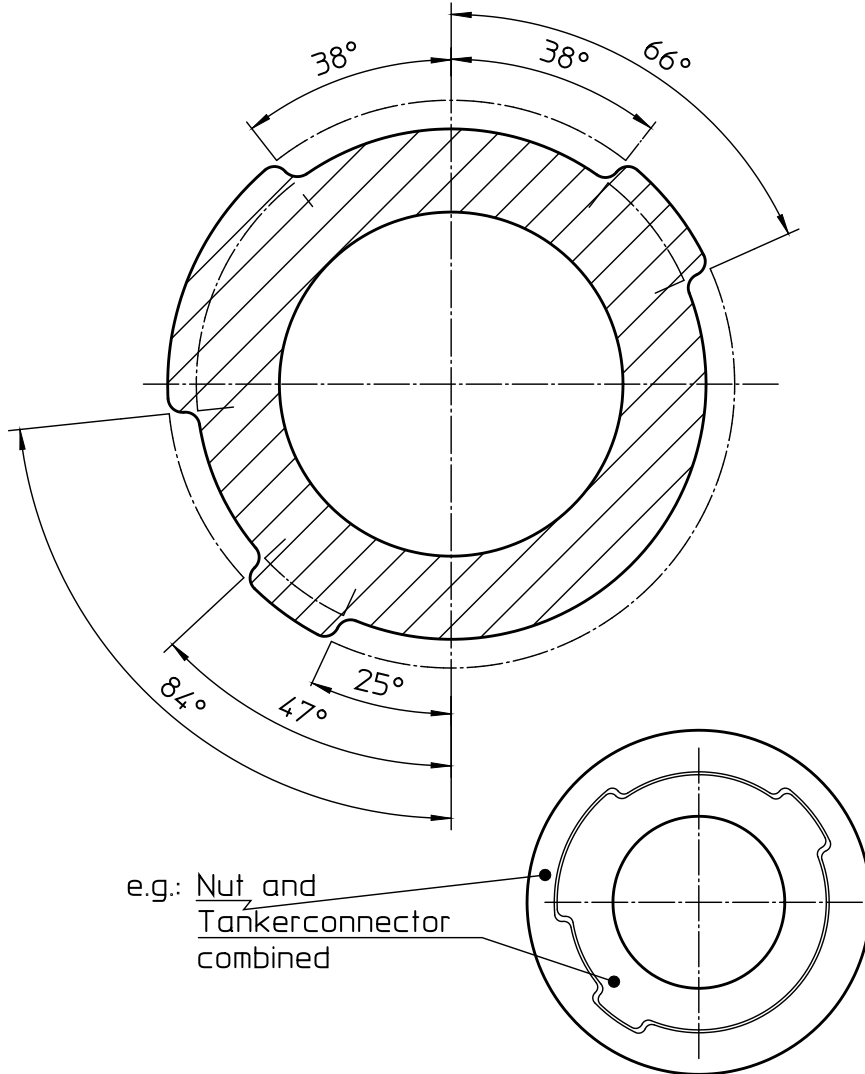
E	-----	-----	-----	Material : see Page 1	All parts in contact with oxygen must be free of grease.	
D	-----	-----	-----	Scale 1 : 1 (1 : 2)	Tolerances DIN 7168 mittel	
C	-----	-----	-----		Date : 30.06.97	
B	-----	-----	-----	Name : Mann		
A	-----	-----	-----	Resp. : SSK		
Ä	Status	Date	Name	ISO-Method E 	Projekt : Tanker-Coupling DN 60 / PN 40	
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Contour B-B: Code-No. 8: Product: ...
Mark: ...



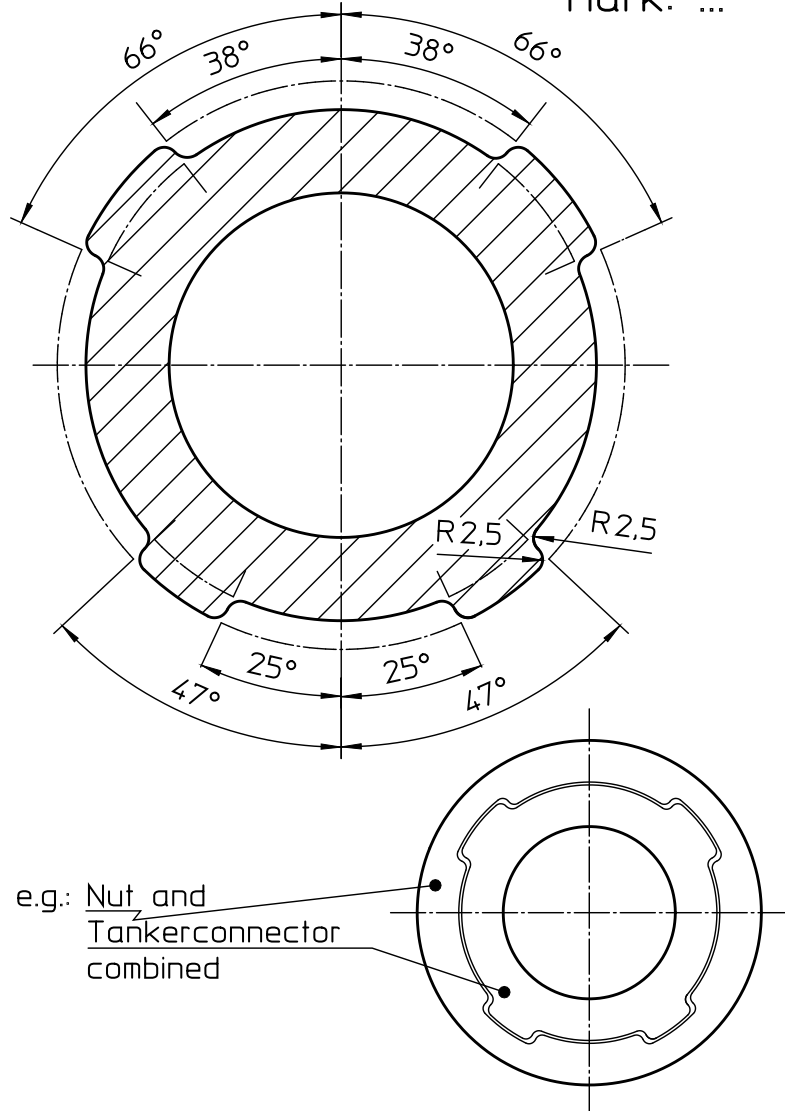
E	-----	-----	-----	Material : see Page 1	All parts in contact with oxygen must be free of grease.		
D	-----	-----	-----		Scale	Tolerances	
C	-----	-----	-----		1 : 1	DIN 7168	-----
B	-----	-----	-----		(1 : 2)	mittel	-----
A	-----	-----	-----		Date : 30.06.97		
Ä	Status	Date	Name	ISO-Method E	Name : Mann		
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				Tanker-Coupling DN 60 / PN 40			
				Item :	page-No. 09 of 17 pages		
				Tankerconnector	Doc.-No.	TN522/97.03E,1	

Contour B-B: Code-No. 9: Product: ...
Mark: ...



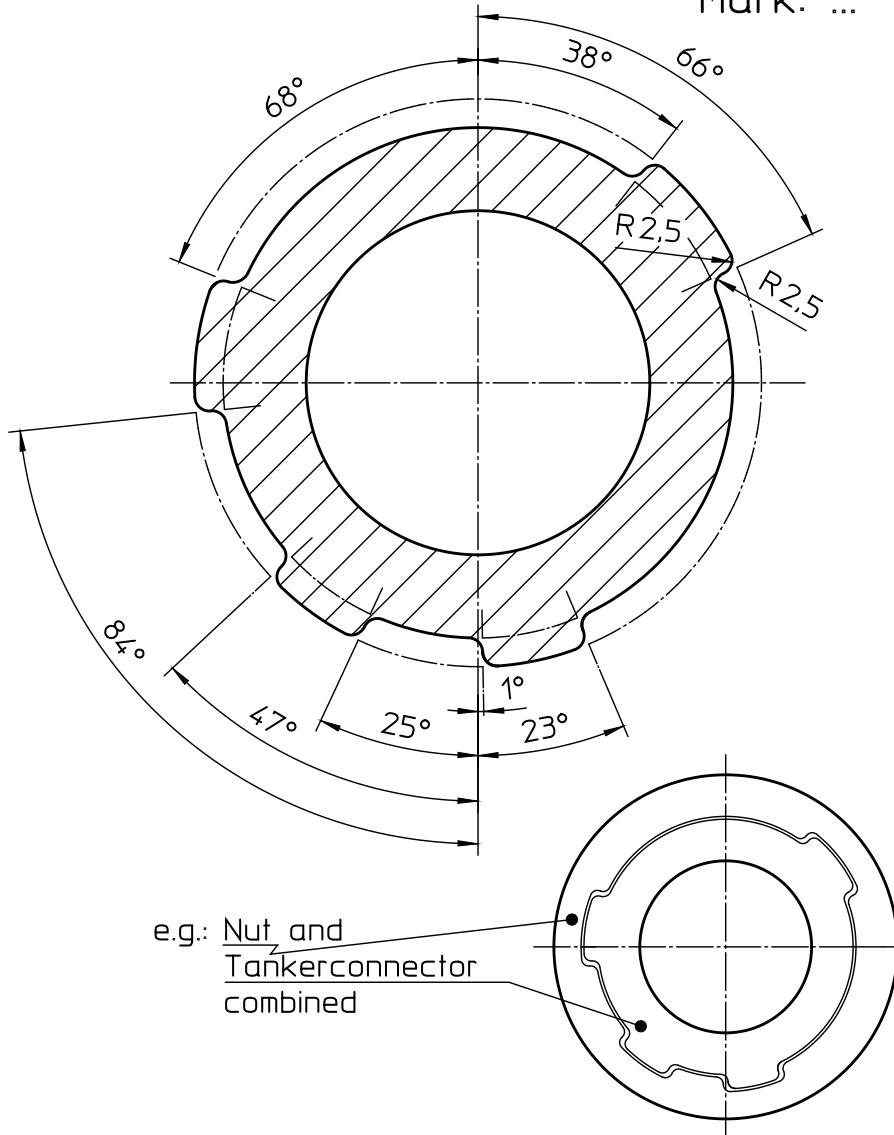
E	-----	-----	-----	Material : see Page 1	All parts in contact with oxygen must be free of grease.	
D	-----	-----	-----	Scale 1 : 1 (1 : 2)	Tolerances	
C	-----	-----	-----		DIN 7168	-----
B	-----	-----	-----	Date : 30.06.97	mittel	
A	-----	-----	-----	ISO-Method E	Name : Mann	
A	Status	Date	Name	Resp. : SSK		
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				Tanker-Coupling DN 60 / PN 40	Doc.-No.	
				Item :	F Z	
				Tankerconnector	TN522/97.03E, 1	


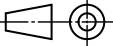
Contour B-B: Code-No. 10: Product: ...
Mark: ...



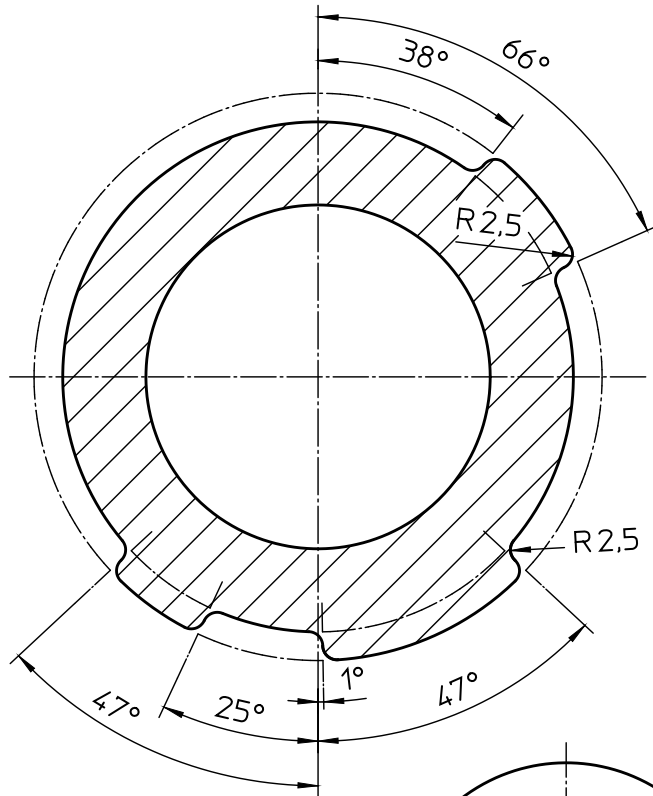
E	-----	-----	-----	Material : see Page 1	All parts in contact with oxygen must be free of grease.			
D	-----	-----	-----	Scale 1 : 1 (1 : 2)	Tolerances			
C	-----	-----	-----		DIN 7168	-----		
B	-----	-----	-----	Date : 30.06.97	mittel			
A	-----	-----	-----	Name : Mann	-----			
Ä	Status	Date	Name	ISO-Method E	Resp. : SSK			
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				Tanker-Coupling DN 60 / PN 40	Doc.-No.			F Z
				Item :	TN522/97.03E,1			
				Tankerconnector				

Contour B-B: Code-No. 11: Product: ...
Mark: ...

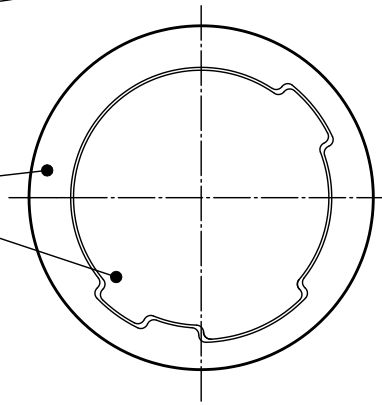



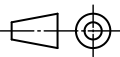
E	-----	-----	-----	Material : see Page 1.....	All parts in contact with oxygen must be free of grease.	
D	-----	-----	-----	Scale 1 : 1 (1 : 2)	Tolerances DIN 7168 mittel	
C	-----	-----	-----		Date : 30.06.97	
B	-----	-----	-----	Name : Mann		
A	-----	-----	-----	Resp. : SSK		
A	Status	Date	Name	ISO-Method E 	Projekt : Tanker-Coupling DN 60 / PN 40	
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Contour B-B: Code-No. 12

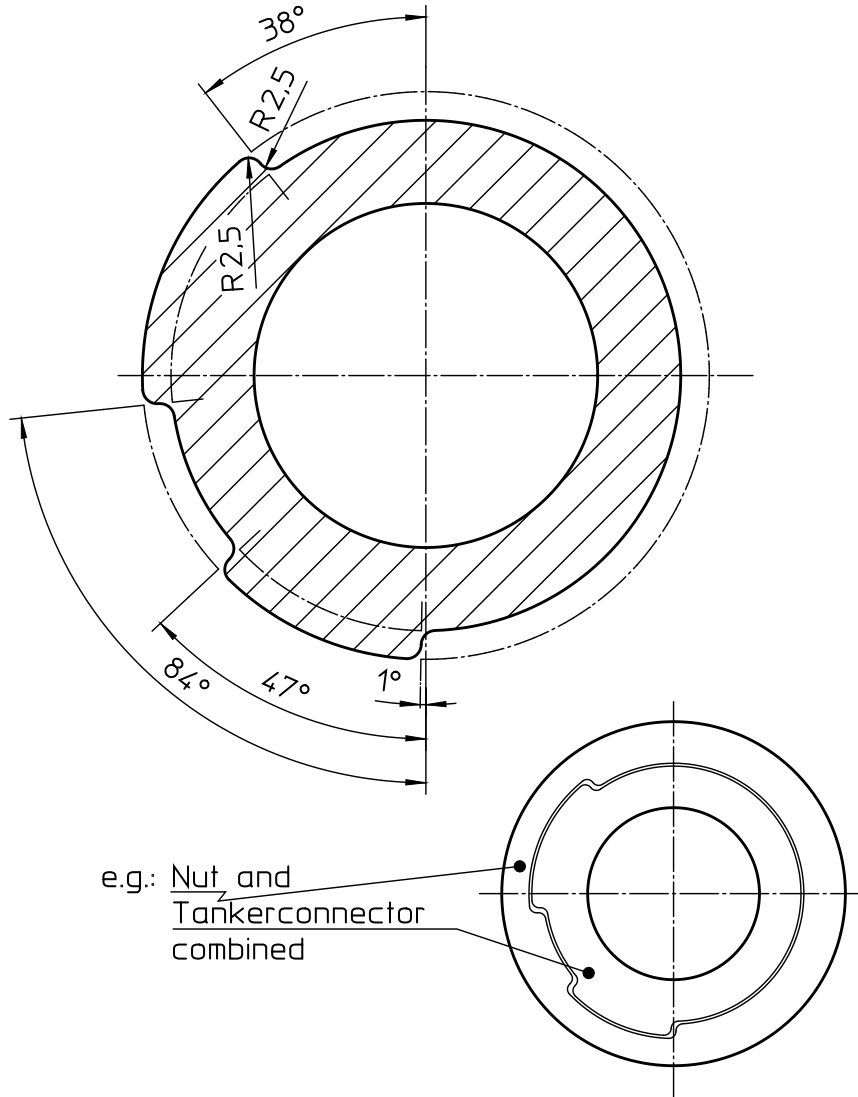



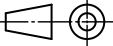
e.g.: Nut and Tankerconnector combined



E	-----	-----	-----	Material : -----	All parts in contact with oxygen must be free of grease.	
D	-----	-----	-----	Scale 1 : 1 (1 : 2)	Tolerances DIN 7168 mittel	
C	-----	-----	-----		Date : 30.06.97	
B	-----	-----	-----	Name : Mann		
A	-----	23.09.97	Makry	Resp. : -----		
Ä	Status	Date	Name	ISO-Method E 	Project : Tanker-Coupling DN 60 / PN 40	page-No. 13 of 17 pages
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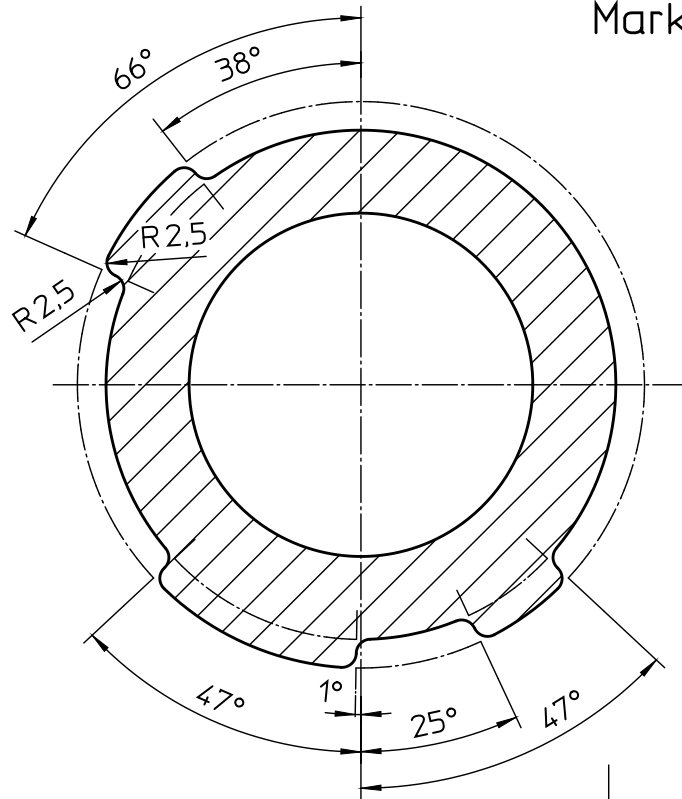
Contour B-B: Code-No. 13: Product: ...
Mark: ...



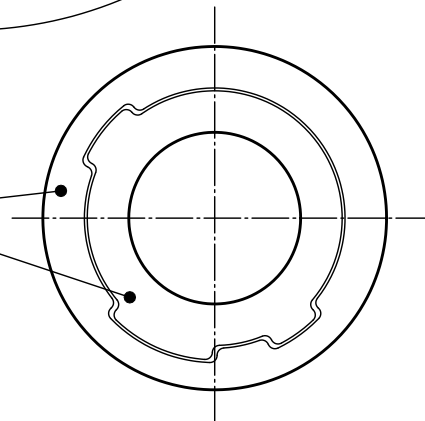
E	-----	-----	-----	Material : see Page 1	All parts in contact with oxygen must be free of grease.	
D	-----	-----	-----	Scale 1 : 1 (1 : 2)	Tolerances	
C	-----	-----	-----		DIN 7168	-----
B	-----	-----	-----	Date : 30.06.97	mittel	
A	-----	-----	-----	Name : Mann		
A	Status	Date	Name	ISO-Method E 		
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				Tanker-Coupling DN 60 / PN 40	Doc.-No.	
				Item :	F Z	
				Tankerconnector	TN522/97.03E,1	


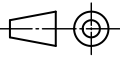
Contour B-B: Code-No. 14: Product: ...

Mark: ...

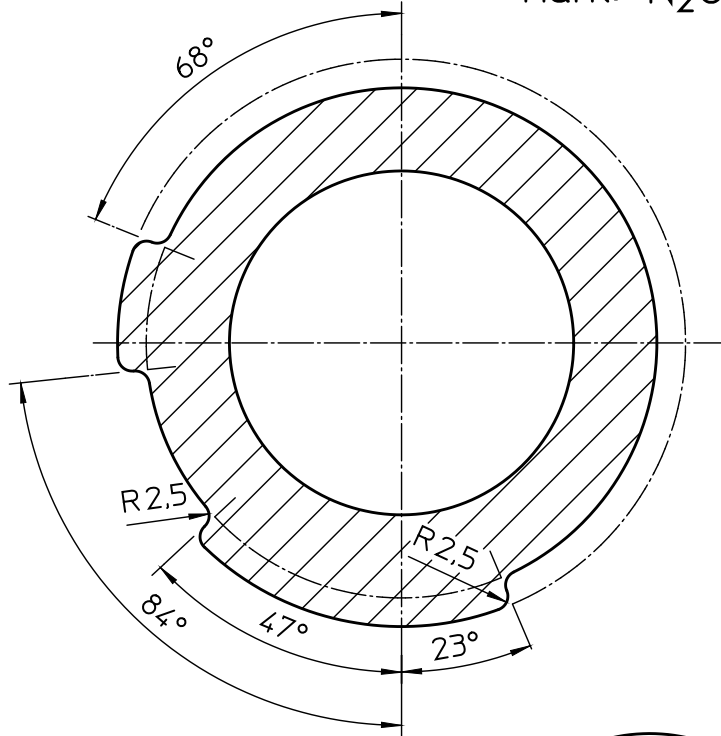


e.g.: Nut and Tankerconnector combined

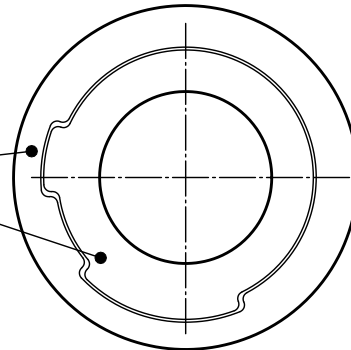



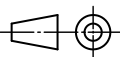
E	-----	-----	-----	Material : see Page 1	All parts in contact with oxygen must be free of grease.	
D	-----	-----	-----	Scale 1 : 1 (1 : 2)	Tolerances DIN 7168 mittel	
C	-----	-----	-----		Date : 30.06.97	
B	-----	-----	-----	Name : Mann		
A	-----	-----	-----	Resp. : SSK		
Ä	Status	Date	Name	ISO-Method E 	Projekt : Tanker-Coupling DN 60 / PN 40	
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Contour B-B: Code-No. 15: Product: Nitrous Oxide
Mark: N₂O

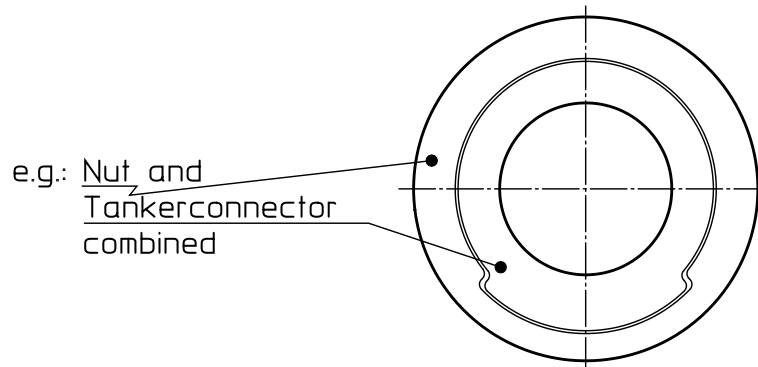
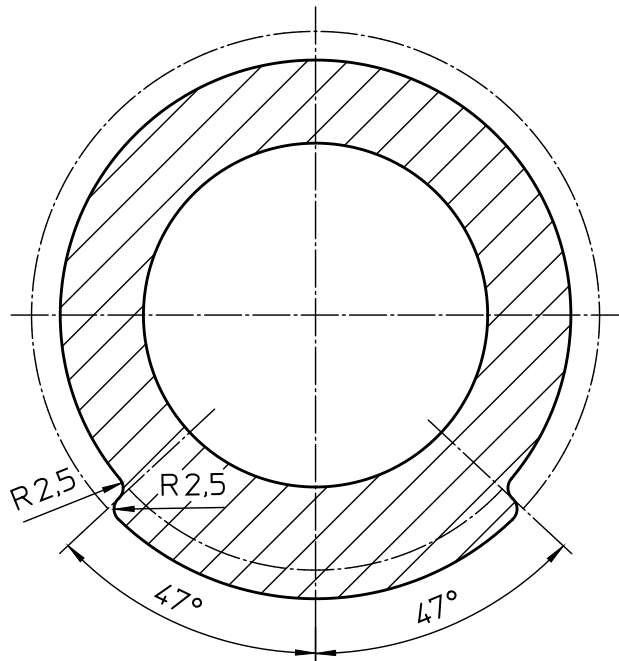



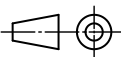
e.g.: Nut and
Tankerconnector
combined

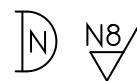
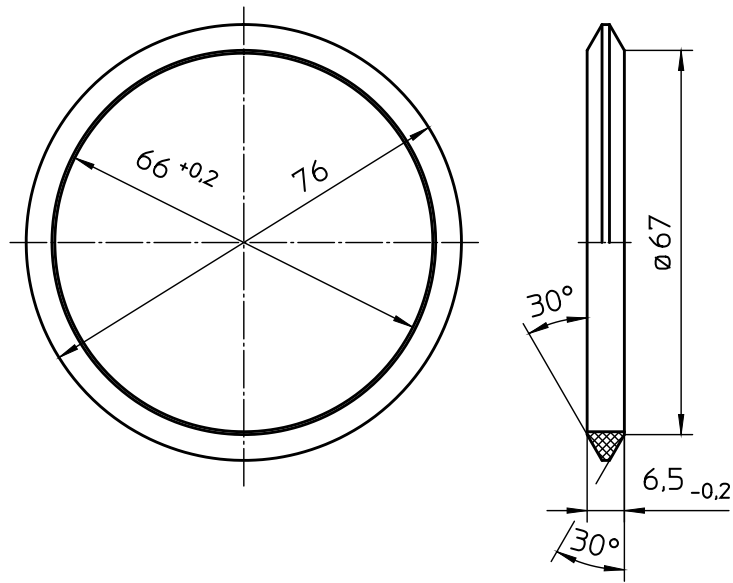



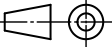
E	-----	-----	-----	Material : see Page 1	All parts in contact with oxygen must be free of grease.		
D	-----	-----	-----	Scale 1 : 1 (1 : 2)	Tolerances DIN 7168 mittel		
C	-----	-----	-----		Date : 30.06.97		
B	-----	-----	-----	Name : Mann			
A	Text	30.10.02	Wege	ISO- Method E 	Resp. : SSK		
Ä	Status	Date	Name	Projekt : Tanker-Coupling DN 60 / PN 40			
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Contour B-B: Code-No.16: Product:Carbon Dioxide
Mark: CO₂



E	-----	-----	-----	Material : see Page 1	All parts in contact with oxygen must be free of grease.	
D	-----	-----	-----	Scale 1 : 1 (1 : 2)	Tolerances DIN 7168 mittel	
C	-----	-----	-----		Date : 30.06.97	
B	-----	-----	-----	Name : Mokry		
A	-----	-----	-----	Resp. : SSK		
Ä	Status	Date	Name	ISO-Method E 	Projekt : Tanker-Coupling DN 60 / PN 40	
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				Doc.-No.	TN522/97.03E,1	
				page-No. 17 of 17 pages		F Z



E	-----	-----	-----	Material : PTFE	All parts in contact with oxygen must be free of grease.	
D	-----	-----	-----	Scale 1 : 1 (: :)	Tolerances DIN 7168 m S	
C	-----	-----	-----		Date : 30.04.97	
B	-----	-----	-----	Name : Henneborn		
A	-----	23.09.97	Mokry	Resp. : SSK		
A	Status	Date	Name	ISO-Method E 	Project : Tanker-Coupling DN 60 / PN 40	page-No. 01 of 01 pages
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