



Wolf GmbH & Co.KG

57234 Wilnsdorf

Kom.Nr. 37106

**Air Liquide Purchase-no.:
4500023998**

Project: ASU Kosice No.9

Dokument No. :

Document: Operation Instruction

Description: Direct Contact After Cooler

Tag No.: W13001

Drawing No.: 11435- 0

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Operating Instruction

(in accordance with Pressure Equipment Directive (PED) 97/23/EG, appendix I, Para. 3.4)

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Pressure Equipment: „Direct Contact After Cooler W13001“

Purchaser: Air Liquide AGS GmbH,
 Füttingsweg 34, D-47805 Krefeld, Germany

The Pressure Equipment „Direct Contact After Cooler“ may be used only for the application and for the procedure defined by the purchaser.

-Year of manufacturing: 2005
 -Serial-No.: 25736

Basic Design Data (static internal pressure):

-allowable working pressure min./max.PS: 6 bar (g)
 -allowable Temperature min./max. TS: -10 / +120 °C
 -Corrosion allowance: 3 mm
 -Joint efficiency: 0,85
 -Wind loads: acc. DIN 1055 T4
 -Earthquake loads: acc. Assessment of Seismic Hazard of Construction Edifice 730036

-Test pressure PT:

--Shop pressure test, horizontal position: 11,6 bar (g) (Water)
 --Future pressure test, vertical position, at top of vessel: 9,3 bar (g) (Water)
 -Nominal capacity V: 120 000 L
 -Contents: Air (Fluidgroup 1 acc. to art.9(2) of the PED)
 -Empty weight of the vessel: 31 000 kg
 - Operation weight of the vessel: 82 330 kg
 - Test weight of the vessel: 173 000 kg
 -Design Code: AD2000-rules, PED 97/23/EC
 -Post Weld Heat Treatment PWHT: none

-External forces and moments on nozzle N1,N2: FR=31500N, ML=27400 Nm, MC=22500 Nm.
 -External forces and moments on nozzle N3: FR=9000N, ML=7200 Nm, MC=6400 Nm.
 -External forces and moments on nozzle N4: FR=4500N, ML=3600 Nm, MC=3200 Nm.
 -External forces and moments on nozzle N5: FR=9000N, ML=954 Nm, MC=954 Nm.

Basis of Design:

-The design acc. to AD 2000 rules and PED 97/23/EC performed by WOLF, was conducted for a static internal pressure of 6 bar(g) at a temperature of 120°C.
 - Additionally, the nozzles loads N1 to N5 have been designed acc. to WRC 107-1979/03 for the before mentioned external forces and moments.

-The static design of stability have been performed by Wolf.

Corrosion protection:

-The vessel have been painted with the coating system stipulated by the purchaser.

inside: No coating

outside: Primer Coating 1K-Alkydharz, Zinkphosphat, DFT. 80µm (see drawing)

Erection/Mounting:

-During erection/mounting the " Direct Contact After Cooler " may be forced only by the lifting devices intended for lifting (Lifting Trunnions item 67-69, and Lifting Lugs item 55 of the drawing no. 11435-0).

The " Direct Contact After Cooler" is to handle, erect and fasten in such a manner that any additional forces or loads, which the operational safety can reduce, are avoided.

Any vibrations caused for example by external attachments, pipelines or valves are to avoid basically.

The " Direct Contact After Cooler " is to anchor on the foundation by 24 anchor bolts size M36- Item 86-88.

-The maximum foundation loads, computed by Wolf within the static design of stability for operation-, test- and mounting conditions, may not be overstepped.

The security of equipment parts must be proven by the equipment manufacturer. The pipelines for nozzles N1 up to N5 are to design and to mount in such a way that the additional loads described on sheet 1 of this operating instruction are not overstepped.

It is not allowed to carry out any welding work, heat treatment or other work on pressure retaining walls which can affect the safety of the " Direct Contact After Cooler ".

If the " Direct Contact After Cooler " is damaged, it is to be put out of operation instantaneously and to introduce to an expert who, if necessary, have to inform the Notified Body for further measures. Before start of dismantling of valves or similar attachments the overpressure is to bring down to atmospheric pressure.

Putting into operation/Use/Maintenance/Inspection:

-It is to be guaranteed that the " Direct Contact After Cooler " is not exposed to a higher pressure than the max. allowable working pressure **PS**. Therefore the pressure gauge have to be set to max. 6 bar(g). The Observance of this limit is to be guaranteed by means of periodical inspections.

-The stated operating temperature range must be observed strictly.

-The external design loads on nozzles N1 up to Nozzle N5 must not be overstepped.

-Inspections in order to observe the safety-related and proper condition of the internal surfaces as well as the thicknesses of the pressure retaining parts and welding seams are to be carried out periodical. The measured wall thicknesses must not be smaller than the wall thicknesses stated in the drawings, reduced by the corrosion allowance of 3 mm. Otherwise the " Direct Contact After Cooler " is to be put out of operation instantaneously and to introduce to an expert of a Notified Body.

-Maintenance and inspections during operation of " Direct Contact After Cooler " are generally in the responsibility of the user or national authority. Inspection periods are laid down in the national rules (Slovak Republic). This periods to be considered by the user for future periodic tests. The method of testing (UT or RT) is to be defined also by national authority.

-Before start of maintenance and/or disassembling of the equipment, i. e. valves, the apparatus has to be offset in a temperatureless and pressureless condition

-The function of the safety valves and the pressure gauges is to examine periodical, but at least once a year.

-The customer is responsible for advising these instructions to the assembling, operating and maintaining personal.

-The manufacturer does not overtake the responsibility for damages caused by non-observing these instruction

-The instructions base on the manufacturer's practical and theoretical experiences. They do not release the customer from its responsibility for the operation and the security of this pressure apparatus as well as from the appropriate training for the personal.

Signature: _____

(Strake)

Date: 18.04.05 _____

Betriebsanleitung nach Richtlinie 97/23/EG /
Operating Instruction in accordance with directive 97/23/EG

Technische Daten: / Technical data:		
Name und Anschrift des Herstellers bzw. andere Angaben zu seiner Identifizierung und ggf. die seines in der Gemeinschaft ansässigen Bevollmächtigten / Name and address of the manufacturer and/or other data to its identification and if necessary the its in the community resident authorized person		WOLF GmbH & Co. KG, Behälter + Apparatebau Dortmunder Str. 2, D-57234 Wilnsdorf/Germany Tel.: +49(0)2739/8970-0 Fax.: +49(0)2739/8970-0
Herstellungsjahr / Year of manufacturing		2005
Fabrikations-Nr. / Fabrikations No.		25736
Herstell-Nr. / Manufacture No.		W13001
Los- oder Typen-Nr. / Loose or type No.		-
Apparate-Beschreibung / Description of apparatus:		Direct Contact After Cooler
Medium: (Fluidgruppen) (Groups of fluids)	Mantel-Raum / shell side:	Fluid group 1 acc. PED
	Rohrraum / Tube side:	-
	Kopf / Head:	-
	Sumpf / Sump:	-
Maximal zulässiger Druck PS [bar_a] / Max. allowable pressure [bar _a]:	Mantel-Raum / shell side:	6 bar g
	special design cases:	
	vacuum case	-
Volumen [Liter] / Nominal capacity [litre]:	Mantel-Raum / shell side:	120 000
Füllgrad (maximal) [%] / Filling degree (max.) [%]:		95 %
Zulässige Temperatur (min./max.) [°C] / Allowable Temperature (min./max.) [°C]	Mantel-Raum / shell side :	-10 / + 120
	Rohrraum / Tube side :	
Prüfdruck PT [bar_a] / Test pressure PT [bar _a]:	Mantel-Raum / shell side:	11,6 (horizontal), 9,3 (vertical)
	Rohrraum / Tube side :	
Prüfmedium / Test medium:		Water
Leermasse [kg] / Empty weight [kg]:		31.000 kg
Regelwerk für die Herstellung / Design Code:		AD 2000 Regelwerk
Leistungsmerkmale / Capability characteristics:		-
Schweißnahtfaktor / joint efficiency		0,85
Spezifizierter Verwendungszweck / Specified intended use:		

Berücksichtigte besondere Auslegungsdaten / Considered special design data:

Äußere Lasten / Exterior loads:	windloads, snow loads , external nozzle loads, earthquake
Externer Brand / External fire:	
- Windlasten / Wind loads:	acc. DIN 1055
- Erdbeben / Earthquake:	acc. Assessment of Seismic Hazard of Construction Edifice 730036
- Externe Lasten z.B. durch / External loads e.g. through:	
- Rohranschlüsse / Pipe connections:	see drawing 11435-0
- Betriebsgewicht / weight in operation:	82.330 kg
- Sonstige / Other one:	-
Wechselbeanspruchung / Alternating stress:	-
- > 1000 Lastwechsel (Anzahl) / > 1000 load changes (quantity)	-
- schwellende Belastung / swelling load:	
- max. / min. (bar):	-
- ΔP (bar):	-
- Lebensdauer / life span:	-
Zeitstandauslegung (h) / Creep interpretation (h):	-
Korrosionszuschlag [mm] / Corrosion allowance [mm]:	3 mm / Internals 1,5 mm
Andere / Other one:	-

Sicherheitsbedingungen / Safety conditions**Druckabsicherung / Pressure security:****Temperaturabsicherung / Temperature security:****Betriebshinweise / Operating instructions:**

Montage (Transport):

Einschließlich Verbindung verschiedener Druckgeräte

Assembly (transport):

Including connection of different printing devices

- During erection / mounting the Cooler may be forced only by the devices intended for lifting (lifting lugs, tailing lug) The Cooler is to handle, erect and fasten in such a manner that additional forces or loads, which the operational safety can reduce, are avoided.
The security of equipment parts must be proven by the equipment manufacturer.
The Cooler has to be fixed with 24 anchor bolts size M36 at the foundation. The maximum foundation loads, computed by Fa. Wolf within the static and dynamic design of stability for operation-, test- and mounting conditions, may not be overstepped.
It is not allowed to carry out any welding work, heat treatment or other work on pressure retaining walls which can affect the safety of the drum.

-Bei der Aufstellung/Montage/Transport darf der Apparat nur über die dafür vorgesehenen Vorrichtungen (Tragstutzen, Nachführöse) belastet werden. Der Apparat ist so zu befestigen, aufzustellen oder zu handhaben, daß Zusatzbelastungen vermieden werden, welche die Betriebssicherheit herabsetzen können. Schwingende Beanspruchungen, die bei unsachgemäßer Verwendung, z.B. über Anbauteile und Ventile eingeleitet werden können, sind grundsätzlich zu vermeiden. Dies ist bei der Ausrüstung der Apparate zu beachten. Die Sicherheit von Ausrüstteilen muß durch den Ausrüster nachgewiesen werden.

Der Apparat ist mit je 24 Ankerschrauben M36 auf dem Fundament zu verankern. Die maximalen Fundamentlasten, errechnet von der Fa. Wolf unter Berücksichtigung statischer und dynamischer Lasten bei Betrieb-, Test und Aufstellungsbedingungen dürfen nicht überschritten werden.

An den drucktragenden Wandungen des Apparates dürfen keine Schweißarbeiten, Wärmebehandlungen oder sonstige die Sicherheit betreffende Eingriffe vorgenommen werden.

- It is to be guaranteed that the drum is not exposed to a higher pressure than the max. allowable working pressure **PS**. Therefore the Pressure gauge has to be set to max. and min. level mentioned on page one. The observance of this limit is to be guaranteed by means of periodical inspections.

- The stated operating temperature range must be observed strictly.

-Es ist sicherzustellen, daß der Apparat keinem höheren Druck als dem maximal zulässigen Betriebsüberdruck **PS** ausgesetzt wird.

Der minimale und der maximale Verfahrensüberdruck überschritten werden. Dazu muss der Druckregler auf die auf Seite 1 genannten Auslegungsdaten (Druckregelgrenzen eingestellt sein. Die Einhaltung dieser Grenzen ist durch regelmäßige Überprüfung zu gewährleisten.

-Der angegebene Betriebstemperaturbereich muß eingehalten werden.

Inbetriebnahme / Start-up:

Normalbetrieb (Benutzung) / Normal operation (use):	
Störungen / Disturbances:	<p>If the Cooler is damaged it is to be put out instantaneously and to introduce to an expert who, if necessary, have to inform the Notified body for further measures</p> <p>Bei Beschädigung des Coolers ist dieser sofort ausser Betrieb zu nehmen und einem Experten zu melden, der wenn nötig, die zuständige benannte Stelle informiert und die Weitere Vorgehensweise abstimmt.</p>
Außerbetriebnahme / Putting out of operating:	<p>All work at the cooler has to be done from well educated and instructed staff. Before start of Maintenance or dismantling of valves or similar attachments the overpressure is to bring down to atmospheric pressure and the temperature to normal temperature of the area around.</p> <p>Alle Arbeiten am Kühler sind von gut ausgebildeten und unterwiesenen Personal auszuführen. Bei der Wartung oder Demontage von Ausrüstteilen, z.B. Ventilen, ist der Apparat in einen drucklosen Zustand zu versetzen und die Temperatur auf Umgebungstemperatur zu senken.</p>
<u>Wartung einschließlich Inspektion durch den Benutzer</u> Maintenance including inspection by the user	<p>-Inspections in order to observe the safety-related and proper condition of the internal surfaces as well as the thicknesses of the pressure retaining parts and welding seams are to be carried out periodical. -The measured wall thicknesses must not be smaller than the wall thicknesses stated in the drawings reduced by the corrosion allowance of 3 mm. Otherwise the cooler is to be put out of operation instantaneously and to introduce to an expert of a notified body. - Maintenance and inspections during operation of the drum are generally in the responsibility of the user or national authority. Inspection periods are laid down in the national rules (Norway). These periods are to be considered by the user for future tests. The method of testing (UT or RT) is to be defined also by national authority.</p> <p>-Inspektionen zur Feststellung des sicherheitstechnisch, ordnungsgemäßen Zustandes der inneren Wandung sind durchzuführen. -Die drucktragenden Wandungen beinhalten einen Korrosionszuschlag von 3 mm. Die in der Zeichnung angegebenen Wanddicken, vermindert um den Betrag des Korrosionszuschlages, dürfen nicht unterschritten werden. Dies ist durch regelmäßige Wanddicken-Kontrollmessungen zu prüfen und zu dokumentieren. Wenn die Wanddicke einer drucktragenden Komponente die vorgenannten Grenzen unterschreitet, ist der betreffende Apparat unverzüglich außer Betrieb zu nehmen und einem Sachverständigen einer benannten Stelle vorzustellen. -In Bezug auf die Prüfintervalle sind harmonisierte, oder ggf. nationale Normen zu berücksichtigen.</p>

Besondere Hinweise zur Druckprüfung durch den Benutzer (falls erforderlich) Special references to compression test by the user (if necessarily)	The pressure test given at the drawing shall not be overstepped. Der in der Zeichnung angegebene Prüfdruck darf nicht überschritten werden.
Warnhinweise auf unsachgemäße Verwendung, die erfahrungsgemäß möglich sind Warning references to inappropriate use, which are possible according to experience	If the drum is damaged it is to be put out instantaneously and to introduce to an expert who , if necessary, have to inform the Notified body for further measures Wird der Apparat beschädigt, ist er unverzüglich außer Betrieb zu setzen und einem Sachkundigen vorzustellen, welcher ggf. den Sachverständigen einer benannten Stelle einschaltet.

Unterschrift / Signature: Berthold Strake
(Strake)

Datum / Date: 24.11.2004