

REPORT



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EVALUATION OF THE USE OF FIBRE-OPTIC LIGHT FOC 25

History;

Up to now tanks were cleaned without a possibility to use a lightsource, the reason was that no acceptable lighting existed for zone 0 applications.

CEAG has developed a lampunit for use in zone 0 environments, which is approved by Shell and incorporated in procedure BBS ID 05.00.2116: "Guidelines for electrical handtools and mobile electrical apparatus (SNR/SNC Pernis/Moerdijk)".

It was agreed to perform several tests with the lampunit at Pernis in order to investigate its efficiency. Tests were performed during cleaning activities in cone-roof tanks and floating-roof tanks.

Light availability;

Without using a lightsource, light is obtained through opening of the side manholes and or through opened manholes in the roof of cone-roof tanks.

Dark spots exist in certain parts of the tanks, for instance behind gauge-pipes and in larger tanks dark spots exists because of the larger distances.

Too much light in the tank could cause lightblindness and as a result employees would lose their orientation and possibility to find the escape route.

One of the basic features of the fibre-optic lampunit is to provide light in the direct vicinity of the working area.

Light position;

The zone 0 lampunit should be placed as near to the manhole as possible in order to have maximum benefit of the length of the fibre-optic cable.

The lampunit with the lightsource is suitable for erection in zone 1, whereas the fibre-optic cable can be used in zone 0.

Feeder voltage is 220 V.

The fibre-optic cable is mounted on a standard with swivelhead.



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Test;

The fibre-optic lampunit has been used in Tank 1101 (kerosene) and Tank 1194 (petrol), both tanks have a diameter of 36 meters.

The lamp was applied in the direct vicinity of the working area during the cleaning activities in the tanks. The light-intensity was sufficient, the cleaners inside the tanks were not blinded by the lamp and the point of orientation kept thoroughly visible.

During cleaning a certain haze in the air will be generated which does affect the light-intensity and reflection but this is not regarded as being inconvenient.

The standard with the fixed lamphead of the fibre-optic cable was regularly moved.

Test results;

The safety of cleaning the inside of a tank is increased when using the fibre-optic cable FOC 25 lampunit!

The necessity of moving the standard is not regarded as difficult in any way.

In general the employees of the cleaner (Watco) were enthusiastic when using the lampunit during cleaning.

Mobilising and demobilising of the lamp-unit is regarded as an obstacle.

The zone 0 lamp-unit is to be transported through the tankpit which is not always an easy job and a crane is not always available.

Conclusion;

The use of the fibre-optic lamp increases the safety of cleaning the insides of tanks.

The BBS procedure ID 05.00.2116: "Guidelines for electrical handtools and mobile electrical apparatus" is adhered to.

Attachment: Shell plant temporary-lighting approval list



FOC 25

TEMPORARY-LIGHTING APPROVAL LIST

EQUIPMENT	NON HAZARDOUS				HAZARDOUS	
	Offices, canteens, workshops, controlrooms, a.s.o., outside offices, pumpfloors and tankfarms	Narrow spaces like cellars and crawl spaces	Chimney stacks, tanks, vessels, columns with diameter > 3 mtr. and height > 3 mtr.	Columns, tanks, vessels with diameter < 3 mtr. and height < 3 mtr.	Factories, pumpfloors, tankfarms zone 2 and zone 1	Tanks, columns and vessels zone 0
Handlamp <100W, <50VAC Use: in hand Connection: via safety transformer	●	●	●	●	①	
PL fixture <55W, <50VAC Use: moveable Connection: via safety transformer	●	●	●	●	①	
Halogen floodlight with cover <400W, <50VAC Use: moveable (on tripod) min. 1 mtr. from wall, floor or ceiling Connection: via safety transformer	●	●	●	●	①	
Tanklamp 2 fixtures <250W, <230VAC on tripod incl. safety transformer 42/230 VAC Use: on tripod, min. 1 mtr. from walls Connection: via safety transformer and potential earthconnection	●		●		①	
Halogen floodlight <1000W, <230VAC Use: semi fixed (by skilled worker) Connection: via earthleakage protection and potential earthconnection	●					
Handlamp EEx TL 8W, <24VAC Use: in hand Connection: via safety transformer	●	●	●	●	●	
Fibre-optic cable light for zone 0 - transport trolley with lightsource for zone 1 - fibre-optic cable for zone 0	●	●	●	●	●	●
compressed air fixture	●	●	●	●	●	●

● : Suitable without any restrictions

① : Suitable only with written permission from Chief Safety district and/or high category permit, continuous gas testing is mandatory. In case of gasalarm direct automatic switch off. Apparatus connected to switchboard with gasdetection.