
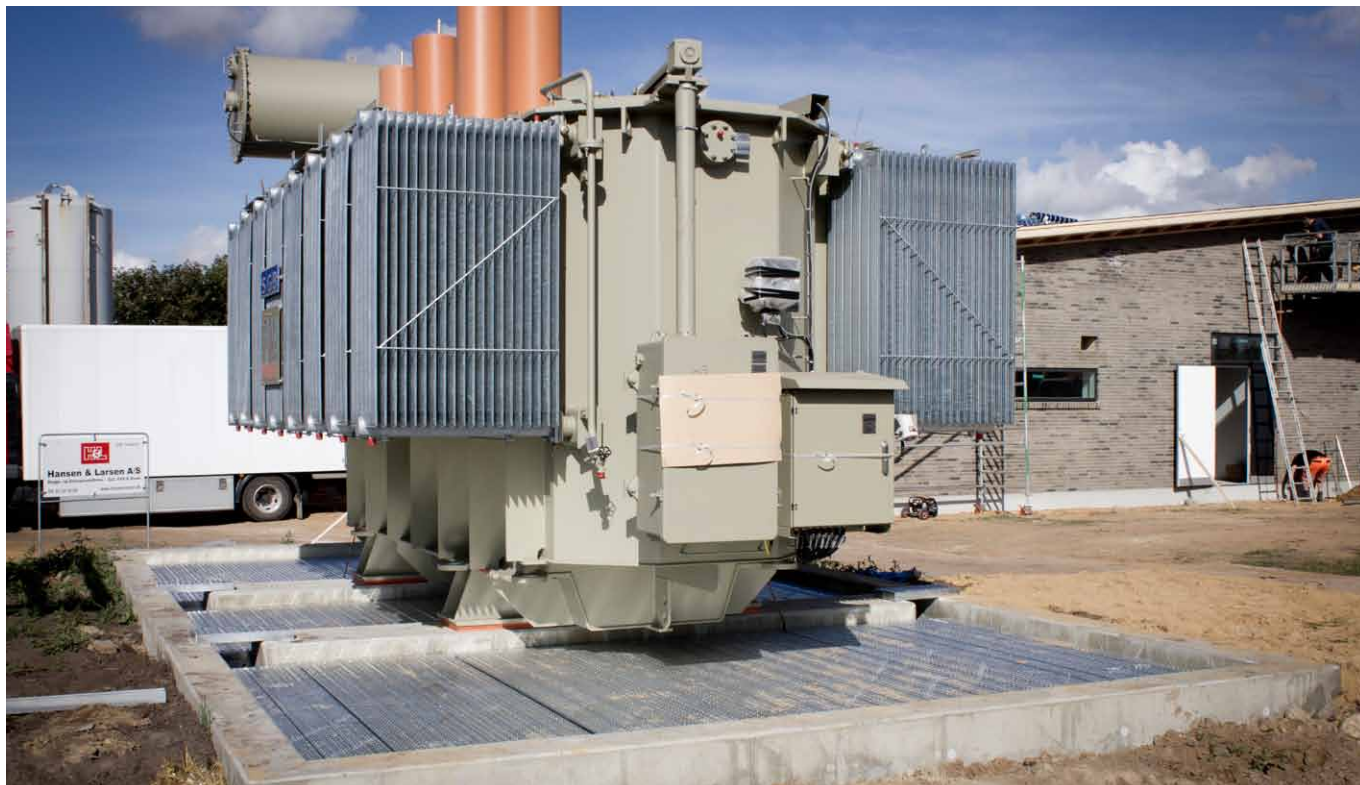




one step ahead 



Fire protection LHD[®] gratings for transformer stations



Benefits of LHD®

- Extinguish quickly oil fires
- Increases personal safety
- Simplifies operation and supervision
- Tested by MFPA Leipzig and SP
- Over 20 years experience
- Lower total economy

Maintenance

It is considerably simpler and less time-consuming to clean and maintain the function of a steel filter than a stone filter. LHD® gratings are a more practical solution because hatches gives faster access the pit.

Fire-extinguishing

Several tests proves that steel filters with LHD® gratings extinguishes oil fires significantly faster than traditional stone filters of macadam, pitl and stone. The surface pattern has less than five percent of air passage.

Environmental costs

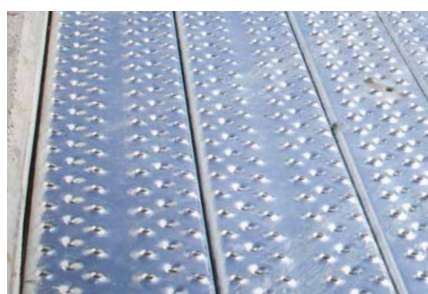
LHD® gratings has a flow capacity of 600 litres oil per m² per minute. The risk of the oil flowing out of the cell and contaminate the outside of the station is considered to be equal to or lower compared to a stone filter.

Personal safety

The LHD® grating surface pattern, approved in slip resistance class R11 according to DIN 51130, provides a better and non-slip surface to walk on, and reduces the risk of slipping.

Installation

Fire Protection LHD® gratings are placed with max. 3 mm 'air' in both directions and with approximately 10 mm distance to the concrete structure. PcP. recommends totally closed platforms. It is the customer's responsibility to ensure a minimum of 'air'.



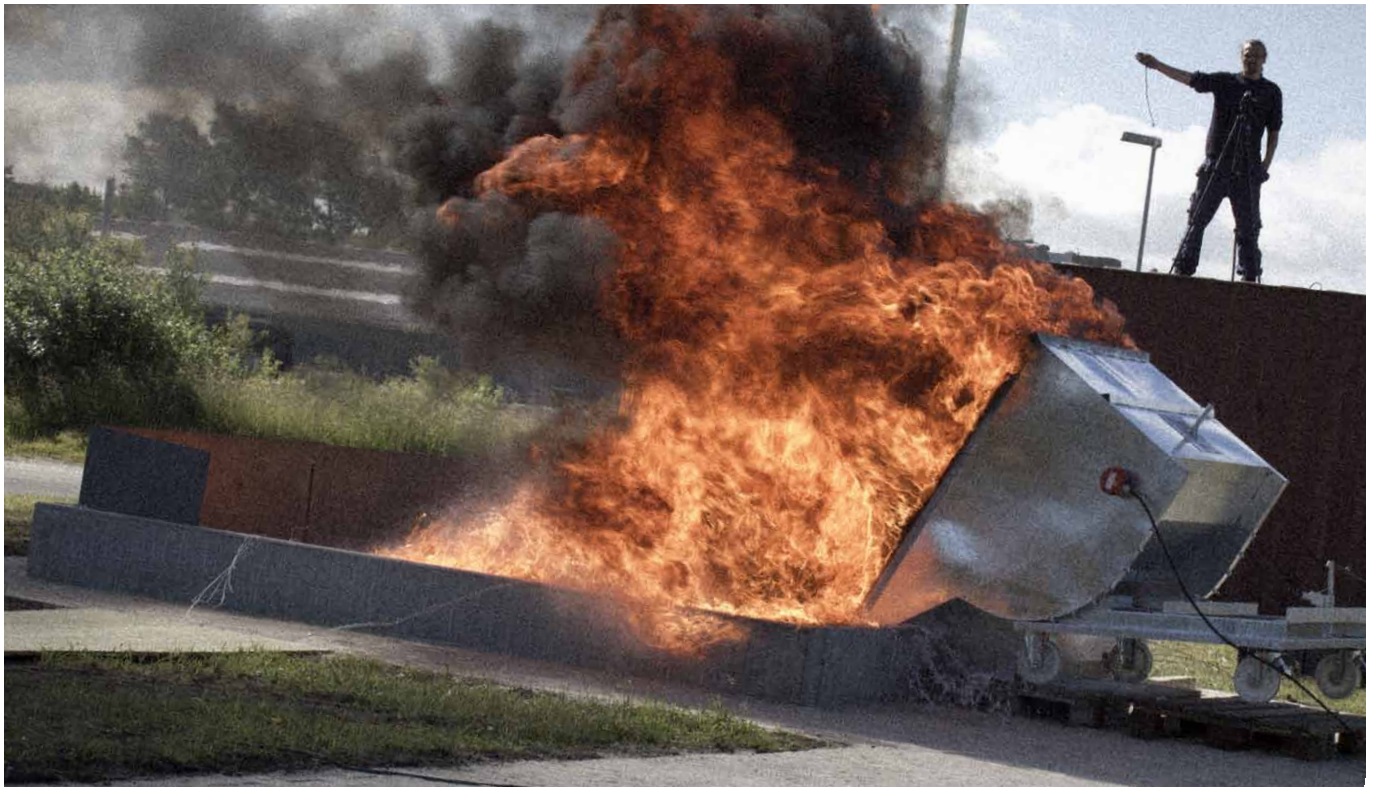
Standard- or specialdimensioned



Example of earthing



Practical access to the pit



Test of LHD® gratings conducted by SP Borås in 2015

Type LHD® vs. Stone filter

Stone filter

Conducted by	SINTEF NBL Tydal 2013
Oil quantity	400 litres
Oil type	Nytro 10XN
Flash point	144°C
Unloading	~1 second
Pit dimension	6x2,4x0,3 metres
Pit material	Steel
Result	The fire extinguished in three minutes

Fire protection gratings Type LHD®

Udført af	SP Borås 2015
Oil quantity	370 litres
Oil type	Nytro 10XN
Flash point	144°C
Unloading	~1 second
Pit dimension	3,75 x 3 x 1 metres
Pit material	Concrete
Resultat	The fire extinguished in about 6 seconds

Tested acc. to Svenska KraftNät
'Guidelines for external mechanic transformer and reactor safety'

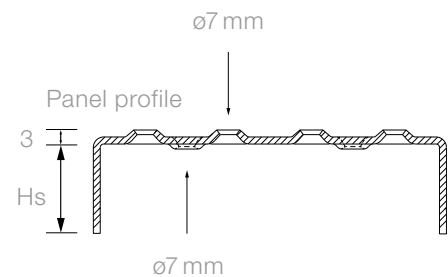
SP Borås' conclusion to LHD® 2015 tests

The tests were performed in order to investigate how well the PcP.s fire protection grating Type LHD is able to extinguish an oil fire under a specific fire scenario. The scenario modeled correlates to a sudden accidental release and ignition of large oil quantities from a transformer. The fire protection gratings Type LHD managed to successfully extinguish the fire during the performed tests. Complete flameout above the fire protection gratings occurred within 6 seconds under the conditions tested. Shortly after, the temperature and oxygen concentration measurements indicate that the fire was extinguished in the entire pit, also under the fire protection gratings. The rapid quenching of the fire is partly due to the reduced oxygen concentration and it is therefore important that the fire grid protection is covering the complete pit.



Extract from the reference list

Country	Client	Trafo		m ²
Iceland	GA Smidajarn	Smidajarn Trafo	LHD-171x44 mm	90
Finland	Eltel Networks Oy	Norrböle Trafo	LHD-153x44 mm	52
Germany	E.ON - Hanse AG	Trafo 5,90x10,0	LHD-171x35 mm	25
Germany	RWE Energie AG	UA Kevelaer - Trafo 11 & 12	LHD-153x35 mm	103
Denmark	Vestjyske Net Service	St. Skodbjerg	LHD-114x35 mm	22
Denmark	Energi Midt	Gedsted	LHD-153x53 mm	29
Norway	BKK Nett AS	Evanger Trafo T5	LHD-225x53 mm	89
Norway	Siemens	Martin Linge Kollsnes Substation SR1	LHD-250x72 mm	82
Netherlands	Staabouw Smid Hoogkerk	Offshore Wind Farm Gemini Trafo	LHD-250x45 mm	1067
Poland	Alcor Sp. Z.o.o	GPZ Lomianki	LHD-135x35 mm	21
Sweden	Veidekke	Stureholm	LHD-225x53 mm	73
Sweden	Vattenfall AB	Garpenberg - Trafo-fundament	LHD-135x53 mm	105
UK	Polimex-Mostosal SA	Uskmouth - Power Station	LHD-153x35 mm	282
Singapore	Sumitomo Mitsui Construction Co. Ltd.	Lanxess Project Flame Retardant Coverings	LHD-135x35 mm	28



Standard panel dimensions - Steel 240

Panel width (Pw)	63	81	99	117	135	153	171	189	207	225	250
Shoulder height (Hs)	32	32	32	32	32	32	32	32	32	32	42
Material thickness	3	3	3	3	3	3	3	3	3	3	2
Shoulder height (Hs)	41	41	41	41	41	41	41	41	41	41	55
Material thickness	3	3	3	3	3	3	3	3	3	3	2
Shoulder height (Hs)	50	50	50	50	50	50	50	50	50	50	66
Material thickness	3	3	3	3	3	3	3	3	3	3	2

mål i mm