

HH-15.1. Occupational scenario for offloading borates from ships

Systematic title based on use descriptor	PROCs	
	8a	Transfer of substance or preparation from/to vessels/large containers at non-dedicated facilities.
	8b	Transfer of substance or preparation from/to vessels/large containers at dedicated facilities.

HH-15.2 Controlling worker exposure

Product characteristics	Granular or powder form.	
Amounts used	Shipments may be around 4 000 – 10 000 tonnes.	
Frequency and duration of use	Monthly shipments, takes 24 – 48h to offload.	
Human factors not influenced by risk management	None	
Other given operational conditions affecting workers exposure	Spillage from the crane grab, movement of the front end loader in the hold, movement of the borates in the warehouse by the front end loader can cause airborne dust.	
Technical conditions and measures at process level (source) to prevent release	None	
Technical conditions and measures to control dispersion from source towards the worker	Conveyors are enclosed. The hopper can be enclosed and fitted with local exhaust ventilation. The cabs of the small front end loader used in the hold can be air-conditioned.	
Organisational measures to prevent /limit releases, dispersion and exposure	Appropriate training. Regular testing and maintenance of plant and equipment.	
Conditions and measures related to personal protection, hygiene and health evaluation	Clothing	Standard work clothes.
	Gloves	Not required for normal industrial exposure.
	Eye protection	Required where good hygiene practice or substance classification demands it.
	RPE	P2 /P3 required where exposure is above the DNEL.

HH-15.3. Exposure estimation

		INHALATION						
		Activity	Source/ Parameters	RMM	Value 8h TWA ₃ mg B/m ³	RCR DNEL = 1.45 mg B/m ³		
Human Health Exposure Estimations	Measured	Crane drivers	90P of measured data (#dp = 20)	-	0.2	0.14		
		Trimming ships	90P of measured data	RPE not taken into account	0.68	0.47		
		Driving front end loaders in the ships' holds	90P of measured data	RPE not taken into account	1.35	0.93		
		Driving front end loaders in the warehouses	90P of measured data	Air conditioned cab or RPE P2	Air co. cab: 0.44 RPE P2: 0.72	0.30 or 0.50		
			DERMAL					
	Modelled (MEASE)	Crane drivers	Physical form	high dustiness	-	0.173	<0.001	
			Content	5 - 25% boron				
			PROC	8a				
			Duration	60 – 240 min				
			Use pattern	wide dispersive				
Handling			non-direct					
Trimming ships		Contact level	incidental	-	57.6	0.012		
		Duration	15 – 60 min					
		Handling	direct					
Driving front end loaders in the ships' holds		Contact level	extensive	Separation of workers, air conditioned cab	0.058	<0.001		
		Duration	60 – 240 min					
		Handling	non-direct					
Driving front end loaders in the warehouses	Contact level	incidental	Separation of workers, air conditioned cabs	Air co. cab:0.144 No air co. cab:0.144	Air co. cabs: <0.001 No air co. cabs: <0.001			
	Duration	> 240 min						
	Handling	non-direct						
	Contact level	Air co. cab No air co. cab						
			Incidental					
			Extensive					

HH-15.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

If the parameters used in the MEASE model outlined above do not reflect conditions at the DU facility, the DU can use MEASE and input the parameters that do reflect conditions at the DU facility to check whether the DU works inside the boundaries set by the ES. Detailed guidance for evaluation of ES can be acquired via your supplier or from the ECHA website (guidance R14, R16).