

Incident Summary #II-802909-2019 (#10709) (FINAL)

SUPPORTING INFORMATION	Incident Date		January 21, 2019	
	Location		Penticton B.C.	
	Regulated industry sector		Electrical - Low voltage electrical system (30V to 750V)	
	Impact	Injury	Qty injuries	0
			Injury description	None
			Injury rating	None
		Damage	Damage description	The heater and element tube has been destroyed along with the branch circuit wiring and controlling thermostat. The resulting fire has caused damage to the structure and all materials stored within the warehouse area.
			Damage rating	Moderate
			Incident rating	
Incident overview		A Coloritech “OKB593C6” electric Infrared heater element tube produced an arc from the accumulation of moisture within which resulted in a fire that damaged the branch circuit wiring, the structure, and all materials stored within the warehouse.		
INVESTIGATION CONCLUSIONS	Site, system and components		The Caloritech electric infrared heater comes with a replaceable heater tube which consists of an element encapsulated by an insulating material and overall metal covering. If moisture penetrates the metal covering an arcing can occur between the element and metal covering. Externally provided GFCI protection for the heater should trip and cut power to the heater before further damage continues.	
	Failure scenario(s)		The Infrared heater was located in a warehouse/lunchroom area above tables where employees normally eat and dry their gear for the next day’s use. When the gear was drying it introduced additional moisture into the air and penetrated the outer metal covering of the heater tube. Once the interior insulating material of the heating tube was damp the internal heater element started arcing to the metal covering turning the cover to molten metal and metal dripped onto the tables below starting a fire.	
	Facts and evidence		<p>Infrared heater was installed above wooden tables to heat personnel and their gear. Workers gear is normally left in this area to dry for next day’s use. The heater location was less than the recommended 96” clearance suggested in the installation manual. Combustible items (paperwork) were also located on the tables.</p> <p>Obtained and reviewed Manufacturer installation instructions. Heater was not supplied with GFCI protection as per manufacturers instruction.</p> <p>Viewed heater assembly and molten metal residue. Fire damage to lunch tables was localized to where metal would have dripped from heater above.</p> <p>Disk of re-solidified metal was found under table on-site by local fire inspectors, indicative of molten metal dripping from the heater.</p>	
	Causes and contributing factors		It is probable that moisture in the air from the drying of equipment and environmental conditions penetrated the heater tube. This caused arcing between the heating element and the metal covering of the tube (as determined by the manufacturer). Without the external GFCI protection of the heater, as required per manufacturer installation instructions, the arcing would not trip a standard breaker as it is not a direct short to ground. This arcing will turn the metal covering of the heater element	

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into molten metal which dripped onto the wooden lunch table and paperwork below. The heat from the molten metal would have been enough to ignite the table and the paperwork on the table which in turn ignited surrounding items.



Photo#1: Branch circuit breaker



Photo #2: Heater element with dripping metal



Photo #3: Heater specifications



Photo #4: Warehouse area showing ceiling.



Photo #5: Warehouse area showing table locations.