Plant Hazard Analysis & Risk Assessment

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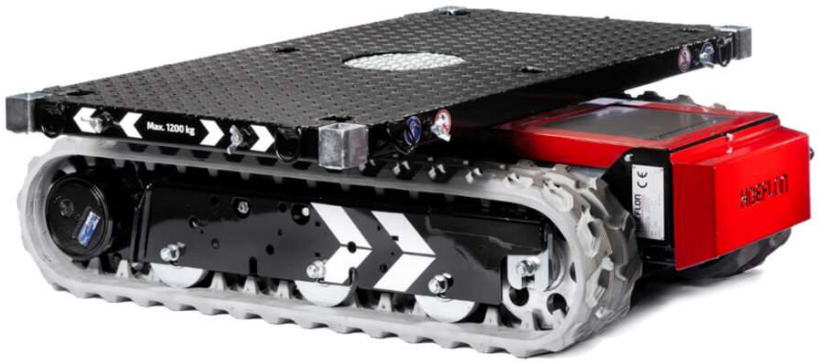
Model: Hoeflon TC1 Tracked Carrier

Date: 22/11/2023



Person conducting assessment:

This Hazard Identification and Risk Assessment document is Model specific. It is based on the knowledge that all new machines of this model were/are produced to the same specification and design. It assumes all examples of this exact model currently in service to be as per the original specification, and to have been and continue to be operated and maintained in accordance with the Manufacturers requirements, and with all applicable statutory and regulatory requirements of an original example of the Model for which it was prepared. This Assessment must be reviewed by all stakeholders as required:

- Having regard to the manufacturers approved options
- Having regard to the general arrangement of miscellaneous equipment or facilities that may be provided on the plant according to the end users requirements or specification
- According to the particular circumstances under which the plant is used and maintained
- As new Hazards are identified and/or as risks are reassessed
- As existing risk control measures are revised or new risk control measures are introduced and implemented
- As and when work procedures are altered or revised
- Having regard to any unauthorised alterations or modifications made to the design or operation of the equipment

Monitor, in conjunction with the design verification process delivered by Engineering Design Innovation have made every attempt to identify all reasonably foreseeable operating circumstances in preparing this Assessment, however no guarantee as to the completeness of this Assessment is provided or implied.

It is the responsibility of Owners, Employers and Operators to identify all hazards associated with the use of this equipment specifically applicable to the task to be carried out and to where the equipment is to be used or located. They must assess the risk potential for each of the identified hazards and ensure that all reasonably practicable steps are taken to ensure those risks are effectively controlled.

- All operators must be trained and competent in the safe use of this particular piece of equipment, and hold appropriate qualifications as required by applicable regulatory requirements
- Operators of the equipment to which this Plant Risk Assessment refers must read and understand the Instructions for Use and Warnings contained within the Operators Manual prior to use
- All Daily Pre-Start Checks, Routine and Periodic Inspections, Maintenance and Repairs to this equipment must be carried out in accordance with the requirements of AS2550.10-2006

ID	Description of Hazard Potential		Activity	Risk control measures already implemented	Risk	Supplementary risk control measures	Risk score
	Origin	Consequence					
1	Operator Competency						
1.1	Untrained operator, not following proper operating procedures. Distracted operator. Following a poor system of work. Operator working alone.	Crushing Impact Trauma	Set up Operation Maintenance	Operation instructions explained in operator's manual	C4 Extreme	Train operators on safe use of the plant. Operator training should include at least the following: • pre-operation inspections • safe operation of plant • regular maintenance tasks • understanding of plant operation • capabilities and limitations • emergency procedures Do not operate the plant unless proper training has been received. Ensure operator's manual is kept with the plant for reference. Do not operate the plant when distracted, ill, excessively fatigued, or under the influence of drugs or alcohol. Implement appropriate system of work based on manufacturer's recommendations (e.g. operating instructions shown in operator's manual).	B1 Low
1.2	Misuse Unauthorised use of plant	Crushing Impact Trauma	Operation	Operator's manual warns about not using the plant for other than its intended purpose.	C4 Extreme	Do not use the plant for any other purpose than its intended use as explained in the operator's manual. Do not operate the plant unless proper training has been received.	B1 Low

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						Keys are not to remain in an unattended machine.	
2	Plant Limitations						
2.1	Plant overload causing - structural failure	Roll over Crushing	Driving Operation	Plant's maximum rated load and maximum applicable load on material support bars given in Operator's manual.	C4 Extreme	Learn and understand plant limitations. Do not exceed load capacity (1200kg). Regularly inspect the plant as per maintenance schedule to ensure integrity of structural members.	A2 Low
2.2	Excessive incline causing plant to overturn	Roll over	Driving Operation	Plant limitations given in Operator's Manual.	C3 High	Do not drive the plant over ground slopes which exceeds its limitations. Stand clear of the plant and payload being transported while the plant is in motion. Conduct site risk assessment to determine suitability of job site before starting any work.	B2 Low
2.3	Excessive wind force causing overturning.	Roll over	Operation		C3 High	Do not operate the plant under excessive wind conditions. Know and understand plant limitations. Constantly monitor wind speed when operating in wind sensitive areas.	B2 Low
2.4	Transporting tall, long, wide loads.	Crushing Impact Severing	Operation		C4 Extreme	Set load on platform in such a way that is stable, with its centre of gravity centred with the platform. Ensure all persons keep a safe distance away from the load.	A1 Low

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						Maintain visual contact with the plant and load during operation.	
3	Plant at worksite						
3.1	Collision with - site infrastructure - other plant and/or pedestrians	Crushing Impact Electrocution	Set up Operation Driving Transport		C3 High	Beware of any obstructions around the work area; survey the area before moving the plant. Beware of other plant and persons around the work area, in particular when travelling around corners or blind spots. Use spotter where required.	B2 Low
3.3	Plant positioned near or driven over large depressions / obstacles.	Roll over Collapse	Operation Driving		C4 Extreme	Always maintain a safe distance from ditches, trenches or pit walls while operating plant. Plan a route to safely bring the plant to the job site. Avoid driving over large obstacles or depressions. Assess the ground conditions before setting up the plant.	B2 Low
4	Operation						
4.1	Damaged control panel	Crushing Impact	Set up Operation		C5 Extreme	Regularly inspect control panel.	B1 Low
4.2	Driving on steep ground	Overturning Crushing	Driving Set up	Follow maximum inclination limits set by manufacturer. Found in plant manual. Remote control permits operator to stand at a safe distance away from the plant.	A5 High	Carry out job site risk assessment to determine suitability of the site before commencing any work. Avoid driving on steep ground; find alternative routes whenever possible.	A1 Low

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						Do not stand on the lower side of the plant while driving on steep ground. Never drive across steep ground, always drive with the tracks parallel to ground inclination.	
4.3	Operator control	Roll over Impact	Operation	Model comes with remote control.	C5 Extreme	Operate the drive control levers gently in order to avoid abrupt and jerky movements. When driving, pay special attention to stability and the dimensions, especially the length, of the machine.	B2 Low
4.4	Unintended operation of controls. Unintended direction of travel.	Crushing Impact	Set up Operation Maintenance Cleaning Troubleshoot	Plant movement stops when controls are released. Travel direction indicated by arrows on side of crawlers.	C3 High	Do not operate the plant unless trained to do so.	B2 Low
4.5	Inadvertent operation of controls	Crushing Impact	Set up Operation Maintenance Emergency	Operator's manual recommends activating emergency stop when plant is not being driven.	D3 High	Do not leave the remote-control unit unattended during plant operation. Always depress the emergency stop button and remove key from key switch whenever the plant is not being operated.	B2 Low
4.6	Load movement due to: Failure of tie-down / rigging gear; Load-holding posts / bars becoming loose; Inadvertent rotation of turntable.	Crushing Severing Shearing	Set up Operation		D3 High	Always secure the load before operating the carrier. Use gear in good condition and appropriate to secure the load. Ensure load-holding bars and turntable are securely fastened.	B2 Low

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						Support heavy and unbalanced loads with other machinery while securing it to the platform. Do not release the turntable lock when the plant is on inclined ground.	
4.7	Use carrier in tandem with other plant for assisted carriage of load.	Crushing	Operation		C4 Extreme	Keep a safe distance from the load and plants involved. Develop safe work method statement when performing tandem operations.	B1 Low
4.8	Out of control plant due to: Slippery ground (Ice, water, oil). Excessive ground inclination.	Crushing Impact	Operation	Driving operation from remote control permits operator to stay safe distance away from carrier.	D4 Extreme	Stand a safe distance away from the moving plant and check no person is around it before driving. Assess ground conditions prior to operating plant; pay attention to surface condition and gradient.	A2 Low
4.9	Faulty/out of order, or poorly maintained plant	Crushing Impact Trauma	Operation Emergency Maintenance	Operator's manual outlines plant maintenance schedule. Current maintenance inspections up to date as per manufacturers recommendation.	B4 High	Always perform pre-operation inspection before operating the plant. Implement 'tag out' procedure to isolate faulty/out of order plants. Do not use an 'out of order' plant. Record all faults in logbook. Perform plant maintenance as per manufacturer's maintenance schedule.Keep maintenance records / plant logbook up to date.	B1 Low
4.10	Plant modifications after completion of risk assessment.	Crushing Overturning	Operation Set up		C5 Extreme	Ensure modifications made to the plant are inspected, assessed, and approved by a competent person. Review hazard analysis and risk	B1 Low

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						assessment after plant modifications.	
5	Transport						
5.1	Loading and unloading – driving on	Roll over Crushing	Transport	Use remote controls always as they provide a safe operating distance for loading / unloading. Use low speed / low engine RPM on slopes / ramps.	C4 Extreme	Follow appropriate loading procedures including using weight rated ramps, have ramps at a low inclination, all person clear from the loading zone and placing the heavy end towards the front of the tray or tow hitch on a trailer. Ensure that there is no load on the Tracked Carrier.	B2 Low
5.2	Loading and unloading – lifting on	Crush Impact	Transport Lifting	Lifting procedure included in Operator's Manual.	C5 Extreme	Follow appropriate lifting procedure. Ensure that there is no load on the Tracked Carrier.	B2 Low
5.3	Failure of lifting slings / chains used for lifting or tying down / tie down straps	Roll over Crushing	Transport Lifting	Plant is fitted with designated lifting and tied down points.	C5 Extreme	Use tie-down points provided on the plant to secure it for transportation. Ensure lifting slings and tie down straps are in good condition. Ensure lifting slings have a SWL suited to the load.	B2 Low
5.4	Unmarked lifting and tiedown points	Crushing	Transport Lifting	Lifting and tie-down points are provided.	B5 Extreme	Mark lifting and tie-down points on plant for correct identification.	B2 Low
6	Plant Failure						
6.1	Plant failure including: - malfunction of control devices	Crushing Impact	Storage Operation Setup	Follow routine maintenance inspections by qualified person as per manufacturers recommendation.	B5 Extreme	Carry out pre-operational function tests of safety related functions at the start of every shift. Beware of risks associated with inadvertent operation of the	B2 Low

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	Origin	Consequence					
	- structural failure of machine components			Prestart inspection as per manufacturers recommendation.		machine, avoid compromising machine positions. Familiarise with location of emergency stop buttons. Regularly inspect the plant as per maintenance schedule to ensure integrity of structural members.	
6.2	Inadequate maintenance procedures	Crushing Impact	Maintenance	Maintenance procedures included in Operator's Manual.	B4 High	Allow only qualified service personnel to perform maintenance tasks.	B1 Low
7	Electrical						
7.1	Damaged power cables, components.	Electrocution Shock Fire	Set up Operation Maintenance Troubleshoot Emergency	RCD fitted to 240V circuit. Fuse protection on electrical circuits	C1 Low	Ensure plant and extension cord are electrically tested and tagged as per AS 3760. Do not operate/use equipment with an expired test tag. Visually inspect the plant and extension lead before using.	B1 Low
7.2	Earthing fault	Electrocution Shock Fire	Set up Operation Maintenance	Plant fitted with thermal fuse and residual current device (RCD).	C4 Extreme	Use appropriate means to supply power to the plant. That is, use extension leads with neutral, live and earth wire and pin. Ensure the plant's appliance inlet is regularly tested and tagged as per AS 3760. Do not operate a plant with an expired electrical safety tag. Visually inspect the plant and extension lead before turning the power ON.	A2 Low
7.3	Incorrect power supply.	Electrocution Shock	Set up Operation		C4 Extreme	Use appropriate means to supply power to the plant. That is, only	A3 Medium

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	Origin	Consequence					
		Fire	Maintenance Troubleshoot Emergency			use extension leads rated to plant requirements. Ensure the plant's appliance inlet is regularly tested and tagged as per AS 3760. Do not operate a plant with an expired electrical safety tag. When recharging the batteries: • Place plant in a well-ventilated area • Keep away from ignition sources • Do not smoke.	
7.4	Recharging: Damaged extension cord. Extension cord overheating.	Electrocution Shock Fire Explosion	Maintenance		C5 Extreme	Ensure extension cords are electrically tested and tagged as per AS 3760.	A2 Low
7.5	Driving with extension cord connected to the machine.	Electrocution	Operation		D5 Extreme	Do not operate the plant with mains power connected.	A1 Low
7.6	Lightning	Electrocution Shock	Set up Operation		A5 High	Do not use the plant during a thunderstorm.	A1 Low

RISK MATRIX							ACTION	HEIRACHY OF CONTROLS
		CONSEQUENCE					**EXTREME –** Do not proceed, until further control measures are implemented to lower the risk. Senior management attention required. **HIGH –** Review and introduce additional controls to lower level of risk. Needs senior management attention. **MEDIUM –** Monitor and maintain supervision and controls. Specify management responsibility. **LOW –** Monitor and manage by routine procedures and monitoring.	1. Elimination – controlling the hazard at the source 2. Substitution – e.g. replacing one substance or activity with a less hazardous one 3. Isolation – e.g. use of barriers to shield or isolate the hazard, enclosures for noisy machinery, installing guards on machinery 4. Engineering – e.g. design and install equipment to counteract the hazard 5. Administration – policies and procedures for safe work practices 6. Personal Protective Equipment – e.g. respirators, ear plugs, face masks, safety glasses, safety shoes
		1. Insignificant	2. Minor	3. Moderate	4. Major	5. Catastrophic		
LIKELIHOOD	**E. Almost Certain** Is expected to occur immediately or within a short timeframe	HIGH	HIGH	EXTREME	EXTREME	EXTREME		
	D. Likely Will probably occur in most circumstances	MEDIUM	HIGH	HIGH	EXTREME	EXTREME		
	C. Possible Could happen and has occurred here or elsewhere	LOW	MEDIUM	HIGH	EXTREME	EXTREME		
	B. Unlikely Unlikely to occur	LOW	LOW	MEDIUM	HIGH	EXTREME		
	A. Rare Not expected to occur	LOW	LOW	MEDIUM	HIGH	HIGH		

CONSEQUENCE DESCRIPTORS			
SEVERITY	**SAFETY**	**ENVIRONMENT**	**BUSINESS**
5. Catastrophic	Potential for incident resulting in serious damage and/or fatality	The aspect is legally or contract regulated and has the potential for a disastrous long term impact resulting in prosecution.	Loss > $1M
4. Major	Potential for incident resulting in serious damage and/or permanent disabling illness or injury	The aspect is legally or contract regulated and has the potential for a serious long term impact resulting in prosecution.	Loss of service provision
3. Moderate	Potential for incident resulting in significant damage and/or temporary disabling illness or injury	Significant environmental aspect with short term impact resulting in improvement notice.	Loss $100K - $1M
2. Minor	Potential for incident resulting in moderate damage and/or requiring medical treatment.	The aspect is legally or contract regulated and has the potential for a moderate reversible short term impact resulting in an improvement notice.	Prolonged reduction in service provision or productivity
1. Insignificant	Potential for incident resulting in minor damage and/or injury requiring first aid treatment	The aspect is not legally or contract regulated and has the potential for a minor negligible impact.	Loss $10K - $100K