OHSA
Health and Safety Consultants

Safety Products Africa

Height Safety

Fall Arrest Harnesses & Belts

Introduction

Falls from height are the single biggest cause of death and serious injuries in today's workplace. Fall protection is a major issue for all kinds of business whose workers need to operate effectively at height. That's why North's fall protection products are designed with the user in mind. Our goal is to provide high quality easy-to-use fall protection products so that your employees are encouraged to use them.

Our range covers the complete scope of fall protection. North is also dedicated to increasing compliance and worker safety through quality enhancement, manufacturing innovation and the overall promotion of safety in the workplace.

Hazard Identification

Before selecting a fall protection system, an assessment of the workplace hazards and conditions should be made. This is done via a risk analysis. This will help to determine the selected options to guard against any secondary hazards which may be present in the work place.

Official Advice Summary

- Avoid work at height where possible
- When working at height cannot be avoided, eliminated the risk and ensure that workers are not exposed unnecessarily
- Try to make the work place as safe as possible with warning signs, fences and safety areas etc.
- Where it cannot be avoided to eliminate the risks of falling, use a fall protection system

When Do You Need Fall Protection?

- Working height above 2 metres (differs from various countries)
- Risk of falling results from risk analysis (responsibility of the employer)

Fall Arrest System

A fall arrest system contains three parts. The anchorage point, a connecting device (lanyard or SRL with energy absorber) and a full body harness. The goal with a fall protection system is:

- Not to prevent falling; this is part of safe working procedure
- Arrest a fall
- Reduce the effect (impact) of a fall to minimum (Minimum=6kN=600kg) can only be achieved by shock absorption

3 TYPES OF FALL FACTORS

	FACTOR 0	FACTOR 1	FACTOR 2
Anchorage Point Situated	Above head level lanyard stretched above the person	To the back anchorage point of the harness, or slightly higher	Below the back anchorage point of the harness, or near the feet

Two main elements must be taken into consideration when determining the equipment required:

- The Fall Factor: Meaning the position of the anchorage point in relation to that of the operator.

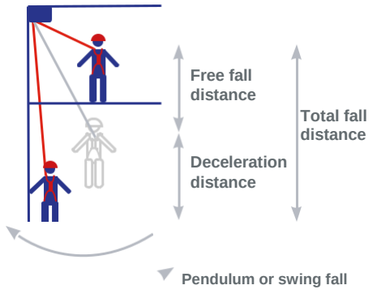
- The Fall Clearance: Meaning the necessary distance between the anchorage point and the ground (or first obstacle) to avoid crashing into the ground in case of a fall.

Consideration of these two elements enables the fall arrest system - and more particularly the attachment system that will save your life - to be defined.

The higher the fall factor, the greater the distance required to arrest the fall. Fall Clearance measurement is therefore indispensable. Fall Clearance varies according to the fall factor and which fall arrest system is used.

Work Positioning and Work Restraint

A fall protection system is often used together with work positioning or work restraint products. If a lifeline is not anchored vertically over the working place, the worker will can be faced with the danger of swinging. This can injure the worker by either hitting the ground or an obstacle beside him. Work position equipment helps eliminate this danger. Work restraint products make sure that a worker cannot get into a dangerous position. His equipment is restraining his freedom of movement.



Rescue

What is often forgotten when working at height is to plan for an accident. That is why a rescue and evacuation plan is mandatory to take into consideration. A rescue action should be completed within 15 minutes to avoid possible dangers. North Safety Products offers unique rescue products for various applications.

Training

Make sure that the user of fall protection products receive sufficient training for their work task. Training has a "best before date" and should be continuously updated.

Fall Arrest Blocks

2,2m

Product	HSL1 GSE1050
Description	A compact and safer alternative to a shock absorbing lanyard, comes complete with two equal 'D' karabiners for quick and easy attachment.
Physical Properties	Total extended carabiner to carabiner length 2.2m. High visibility yellow webbing. Sown in external shock absorber. Available to special order in alternative coloured webbing. Quick acting locking mechanism. Impact absorbing casing gives good protection with high durability. Weight complete with two karabiners 1.1kg.
Uses	The auto reel keeps the webbing lifeline taut against the user. This helps to eliminate the potential for slack webbing and so reducing free fall distance. This results in lower forces exerted on a user during a fall thus reducing the possibility of injury.
Standard	CE mark of approval. Fully tested to BS EN360.
Precautions	Safe working load 100kg

Product	HSL1 GSE107G
Description	G-Stop 7 is a retractable type fall arrester fitted with a 7m long, 5mm diameter steel cable. It is manufactured from precision machined components. Internal components are bronze, stainless steel and aluminium to ensure reliability in the harshest of environments, including offshore and mining applications.
Physical Properties	Compact, ergonomically designed & very durable. Lightweight durable aluminium housings. Lightweight 5.8kg. Reduced size. Carrying handle. Stopping distance: approx. 0,4m & 1,0m. Galvanised steel or stainless steel wire cables are available.
Uses	It offers full protection and complete mobility to the user in areas where there is a danger of falling. Should a fall occur, cable is pulled out of the block at an accelerating rate. When a cable speed of approximately 1.5 metres per second is reached, the braking mechanism is activated arresting the fall quickly and smoothly, exerting minimal forces on the body. When the load is released the cable retracts into the block.

7m

Uses continued	Use mounted vertically above the user or in roofing applications in conjunction with a roof anchor (carrying relative CE certification).
Precautions	Safe working load 136kg
Standard	CE mark of approval. Fully tested to BS EN 360.

7m, 14m, 20m, 34m

Product	HSL1 GSE507G
Description	G-Stop is a retractable type fall arrester fitted with 5mm diameter steel cable. Manufactured from precision machined components. Internal components are bronze, stainless steel and aluminium to ensure reliability in the harshest of environments, including offshore and mining applications.
Physical Properties	New durable aluminium housings. Proven fall arrest mechanism. Improved wear resistance, durability & rope life. Steel cable length: 7m; 14m; 20m; 34m. Stopping distance: between 0.6 & 1.0m. Unit weight: 9kg (approx.). Galvanised steel or stainless steel wire cables are available.
Uses	It offers full protection and complete mobility to the user in areas where there is a danger of falling. Should a fall occur, cable is pulled out of the block at an accelerating rate. When a cable speed of approximately 1.5 metres per second is reached, the braking mechanism is activated arresting the fall quickly and smoothly, exerting minimal forces on the body.

Uses continued	Use mounted vertically above the user or in roofing applications in conjunction with a roof anchor (carrying relative CE certification).
Precautions	Safe working load 136kg
Standard	CE mark of approval. Fully tested to BS EN 360.

Recovery Blocks

Product	HSL1 GSE407G
Description	The G-Saver II is a retractable fall arrest device with a combined rescue which to raise or lower a person to safety. The G-Saver II should be used in fall arrest mode, with the winch mechanism disengaged, to protect a person from the danger of a fall. Should a fall occur, cable is pulled out of the block at an accelerating rate. When a cable speed of approximately 1.5m/sec is reached the braking system is activated to quickly arrest the user and cushion the fall. The winch mechanism can then be engaged to raise or lower the person to safety, eliminating the need for additional equipment to retrieve the user and prevents the user from remaining suspended for extended periods of time, greatly simplifying the recovery process. With both the suspended load removed and the winch mechanism disengaged, the cable retracts automatically back into the unit, regaining its fall protection function.
Physical Properties	Lightweight durable aluminium housing. Cable length 7; 14m of 5mm diameter steel cable. Fall arrest stopping distance between 0.6 & 1.0m. Cable Retrieval Rate - approx. 3m per minute. Enclosed anti-run winch mechanism. Unit weight 12kg max. Galvanised Steel or Stainless Steel wire cables are available.

7m, 14m

ARROW™

Uses	It can be used for/to: 1. Fall arresting, with the reassurance that the user can quickly and easily be retrieved should a fall occur. 2. Mount vertically above a user. 3. Roofing and horizontal applications in conjunction with a suitable anchorage. 4. Confined space access when mounted on the G-Tripod or on a permanent anchorage device.
Precautions	Safe working load 136kg
Standard	CE mark of approval. Fully tested to BS EN 360 & EN 1496.

20m, 34m

ARROW™

Product	HSL1 GSE420G
Description	The G-Saver II is a retractable fall arrest device with a combined rescue winch to raise or lower a person to safety. The G-Saver II should be used in fall arrest mode, with the winch mechanism disengaged, to protect a person from the danger of a fall. Should a fall occur, cable is pulled out of the block at an accelerating rate. When a cable speed of approximately 1.5m/sec is reached the braking system is activated. This quickly arrests the user and cushions the fall. The winch mechanism can then be engaged to raise or lower the person to safety. This eliminates the need for additional equipment to retrieve the user and prevents the user from remaining suspended for extended periods of time, greatly simplifying the recovery process. With both the suspended load removed and the winch mechanism disengaged, the cable retracts automatically back into the unit, regaining its fall protection function.
Physical Properties	Lightweight durable aluminium housing. Cable length 20 & 34m of 5mm diameter steel cable. Fall Arrest Stopping distance between 0.6 & 1.0m. Cable Retrieval Rate - approx. 3m per minute. Enclosed anti-run winch mechanism. Unit weight 17-23kg max. Galvanised steel or stainless steel wire cables are available.
Uses	It can be used for/to: 1. Fall arresting, with the reassurance that the user can quickly and easily be retrieved should a fall occur. 2. Mount vertically above a user. 3. Roofing and horizontal applications in conjunction with a suitable anchorage. 4. Confined space access when mounted on the G-Tripod or on a permanent anchorage device.
Precautions	Safe working load 136kg
Standard	CE mark of approval. Fully tested to BS EN 360 & EN 1496.

Tripod & Fittings

Product	HSL1 GSE210
Description	The G-Tripod OHP is a quality tripod which is durable and versatile, for confined space and down hole applications. Setup over the horizontal aperture, the G-Tripod can be used in conjunction with the G-Saver II and or G-Winch. Used with the G-Saver II to protect personnel descending into or leaving a confined space, and with the G-Winch for lowering and raising personnel.
Physical Properties	The tripod has been designed to give a secure and stable anchorage for the G-Range of safety products. There are two anchorage points allowing the use of a secondary back-up fall arrester, or other types of lifting/safety equipment. Accessories are available separately to facilitate this. Manufactured in tubular aluminium for lightness and long term durability. The legs are telescopic and adjustable to accommodate uneven surfaces, and ensure easy transport and storage. Rubber cup feet ensure stability in a wide variety of environments.
Uses	Used with the G-Saver II to protect personnel descending into or leaving a confined space, and with the G-Winch for lowering and raising personnel.

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	The G-Tripod can be supplied with brackets to suit the following equipment: 1. The G-Saver II or G-Stop. 2. The G-Winch
Precautions	Safe working load 136kg
Standard	CE mark of approval. Fully tested to BS EN 795.

150 kg - 20m, 30m, 40m, 50m
250 kg - 20m, 30m, 40m

Product	HSL1 GSE070
Description	The G-Winch is manually operated winch for routine raising or lowering of personnel
Physical Properties	Galvanised steel rope as standard, with stainless steel and synthetic ropes. An anti-run braking mechanism. Tough and durable gears, case hardened for a long, wear resistant life. Tough pressed steel body and casing. Rope lengths of up to 50m.
Uses	The G-Winch can be used for both rescue purposes, and for day to day personnel lifting. It is ideal for confined space entry, and can be quickly fitted to the G-Tripod, ready for use. Brackets are available to suit the G-Tripod plus a range of scaffold tube anchorages, with operational brackets for fitting to 50mm square anchorages.
Precautions	150kg maximum load with rope lengths of 20m, 30m, 40m, or 50m 250kg maximum load with rope lengths of 20m, 30m, or 40m
Standard	CE certified and conform to European Directive 2006/42/EC

Product	HSL1 G-GUARD 300
Description	G-Guard 300kg is a retractable tensioned safety line for protection of machinery, high value and sensitive loads
Physical Properties	Cable lengths: 7,10,12, 15, 18, 20, 24m. Maximum working load: 300kg. Stopping Distance (approx.): min: 0.3m; max: 1.0m. Fall protection brake can be activated by quickly extracting the safety line from within the arrester housing. This happens when a fall occurs. Brake includes a shock-absorbing element to minimise forces encountered when stopping a fall.
Uses	The G-Guard range of load fall arresters are suitable for protecting both static and moving loads in a wide variety of applications. Where directional movement, usually gravitational, above a speed must be protected against, the G-Guard range of load arresters offer an 'off the shelf' solution for stopping moving loads.
Precautions	Safe working load 300kg
Standard	CE 0353. 2006/42/EC

Load Arrest Blocks

7m, 10m, 12m, 15m, 18m, 20m, 24m

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7m, 10m, 15m, 18m, 20m, 24m

HSL1 G-GUARD 500-1
HSL1 G-GUARD 500-2

HSL1 G-GUARD 500-3

ARROW™

Product	HSL1 G-GUARD 500
Description	G-Guard 500kg is a retractable tensioned safety line for protection of machinery, high value and sensitive loads
Physical Properties	Cable lengths: 7,10, 15, 18, 20, & 24m. Maximum working load: 500kg. Stopping distance (approx.): min: 0.3m; max: 1.0m. Fall protection brake can be activated by quickly extracting the safety line from within the arrester housing. This happens when a fall occurs. Brake includes a shock-absorbing element to minimise forces encountered when stopping a fall.
Uses	The G-Guard range of load fall arresters are suitable for protecting both static and moving loads in a wide variety of applications. Where directional movement, usually gravitational, above a speed must be protected against, the G-Guard range of load arresters offer an 'off the shelf' solution for stopping moving loads.
Precautions	Maximum working load of 500kg
Standard	CE 0353. 2006/42/EC

Product	HSL1 G-GUARD 1000
Description	G-Guard 1000kg is a retractable tensioned safety line for protection of machinery, high value and sensitive loads
Physical Properties	Cable lengths: 7m, 9m, 10m. Maximum working load: 1000kg. Stopping Distance (approx.): min: 0.3m; max: 1.0m Fall protection brake can be activated by quickly extracting the safety line from within the arrester housing. This happens when a fall occurs. Brake includes a shock-absorbing element to minimise forces encountered when stopping a fall.
Uses	The G-Guard range of load fall arresters are suitable for protecting both static and moving loads in a wide variety of applications. Where directional movement, usually gravitational, above a speed must be protected against, the G-Guard range of load arresters offer an 'off the shelf' solution for stopping moving loads.
Precautions	Safe working load 1000kg
Standard	CE 0353. 2006/42/EC

7m, 9m, 10m

Lanyards

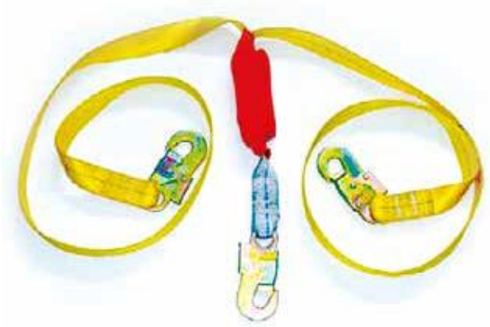
HSH1 DLW100-SC

Double Shock Absorbing Lanyard with strain indicator, a standard snaphook and 2 scaffolding hooks. **1m length for use above height of 2m with fall factor of 0.**

HSH1 DLW160-SC

Double Shock Absorbing Lanyard with strain indicator, a standard snaphook and scaffolding hooks. **1,6m length for use height of 5m with fall factor of 0 and 1.**

Product	HSH1 DLW100-SC & HSH1 DLW160-SC
Description	Double Shock Absorbing Lanyard
Physical Prop.	Polyester webbing
Uses	To be used as anchorage points or in restraint system. Shock absorber cushions fall. Fall indicator will show if force of 100kg is applied to the lanyard. When selecting a lanyard it is important to choose the right kind of snap hook or carabiner to fit around an anchorage.
Standard	SANS 50354:2003/EN 354:2003 Lanyards SANS 50355:2003/EN 355:2003 Energy Absorbers



Product	HSH1 A-DLW175
Description	Double Shock Absorbing Lanyard 1.8m with a standard carabiner and 2 snap hooks. Option with scaffold hooks (HSH1 A-DLW175-SC).
Physical Prop.	Polyester webbing
Uses	To be used as anchorage points or in restraint system. Shock absorber cushions fall. When selecting a lanyard it is important to choose the right kind of snap hook or carabiner to fit around anchorage.
Standard	SANS 50354:2003/EN 354:2003 Lanyards SANS 50355:2003/EN 355:2003 Energy Absorbers
Precautions	Ensure that the lanyard is in working condition before use

Product	HSH1 A-DLOOPW175
Description	Twin Tail Loop Tie Back Lanyard complete with snap hook on each leg, Carabiner for attachment to harness, fall indicator and shock absorber
Physical Properties	**Lanyard** Double lanyard with tie back loops attached to shock absorber. Two 25kN snap hooks. 2,5 ton breaking strain. All lanyard webbing UV stabilised. **Shock Absorber** 35mm polyester webbing, 2.5t MBL (Minimum Breaking Load). Safety back up strap. Will deploy after 2kN Fall Indicator.
Uses	A detachable double lanyard with tie back loops for ease of anchoring. To be used in conjunction with an Arrow branded harness.
Standard	SANS 50354:2003/EN 354:2003 Lanyards SANS 50355:2003/EN 355:2003 Energy Absorbers
Precautions	Always inspect lanyard for cuts and damage before use - see inspection sheet

Product	[illegible]
Description	Single Shock Absorbing Lanyard 1.8m with a standard carabiner and 2 snap hooks
Physical Prop.	Polyester webbing
Uses	To be used as anchorage points or in restraint system. Shock absorber cushions fall. When selecting a lanyard it is important to choose the right kind of snap hook or carabiner to fit around anchorage.
Standard	SANS 50354:2003/EN 354:2003 Lanyards SANS 50355:2003/EN 355:2003 Energy Absorbers
Precautions	Ensure that the lanyard is in working condition before use

Harnesses

Product	[illegible]
Description	Basic Harness with Double Shock Absorbing Lanyard. Option with Scaffold hooks - HSH1 A-NH1BDL-SC.
Physical Properties	**Harness** 45mm polyester webbing 2.8 ton MBL UV stabilised leg straps with adjustable slotted buckles. All fittings silver colour, chromated. **Lanyard** Double lanyard attached to shock absorber (Twin Tail). Two 25kN snap hooks - (Scaffold hooks option). 2.5 ton breaking strain. All lanyard webbing UV stabilised. **Shock Absorber** 35mm polyester webbing, 2.5t MBL. Safety back up strap. Will deploy after 2kN.
Uses	A body support for fall arrest purposes. The full body harness suitably arranged and assembled to support the whole body of a person and to restrain the wearer during and after the fall.
Standard	SANS 50361 / EN 361:2003 Full Body Harness SANS 50355 / EN 355:2003 Energy Absorbers SANS 50354 / EN 354:2003 Lanyards
Precautions	Always inspect harness for cuts and damage before use - see inspection sheet

Product	HSH1 A-NH1BSL
Description	Basic Harness with Single Shock Absorbing Lanyard
Physical Properties	**Harness** 45mm polyester webbing 2.8 ton MBL (Minimum Breaking Load) UV stabilised leg straps with adjustable slotted buckles. All fittings silver colour, chromated. **Lanyard** Single lanyard attached to shock absorber. One 25kN snap hooks. 2.5 ton breaking strain. All lanyard webbing UV stabilised. **Shock Absorber** 35mm polyester webbing, 2.5t MBL. Safety back up strap. Will deploy after 2kN. Fall indicator.
Uses	A body support for fall arrest purposes. The full body harness suitably arranged and assembled to support the whole body of a person and to restrain the wearer during and after the fall.
Standard	SANS 50361 / EN 361:2003 - Full Body Harness SANS 50355 / EN 355:2003 - Energy Absorbers SANS 50354 / EN 354:2003 - Lanyards
Precautions	Always inspect harness for cuts and damage before use - see inspection sheet

Product	HSH1 NH2RITE-ON
Description	Rite-On MK2 Harness with Integrated removable back and shoulder pad harness with waist belt, additional front “D” ring and standing trapeze
Physical Properties	**Harness** Breathable removable comfort pad. Single dorsal plus sternal “D” ring, 45mm chest strap. 45mm polyester webbing, UV stabilised. Adjustable shoulder straps. 45mm Waist belt. Leg straps with adjustable slotted buckles on shoulders. North branded label. Bayonet style connector. **Trapeze** 35mm polyester webbing with length adjuster and bayonet style connector.
Uses	A Body support for fall arrest purposes. The full body harness suitably arranged and assembled to support the whole body of a person and to restrain the wearer during the fall. **Trapeze** is a strap attached to the waist belt of the harness that when deployed, will provide a loop for the person that has fallen, to step into and alleviate the extreme discomfort associated with harness suspension.
Standard	SANS 50361/EN361:2003 - Full Body Harness
Precautions	Always inspect Harness for cuts and damage before use - See inspection sheet. This harness is supplied without a lanyard. Please ensure correct North Safety Products lanyard is used in conjunction with the harness.

Product	HSH2 ARC/SBE
Description	Arc Rated Easy-Fit Full Body Harness
Physical Properties	Nomex/Kevlar inherently flame retardant webbing with 3.3 ton breaking strength & aluminium fittings
Colours	Blue, Red and Black
Uses	Arc flash, welding and high heat applications where the use of fall arrest equipment is needed
Sizes	S, M, L, XL
Standards	SANS 50361:2003 & ASTM-F 887-13 (40 cal/cm$_2$ rating)

Product	HSH2 ARC/DEL
Description	Arc Rated Full Body Harness
Physical Properties	Nomex/Kevlar inherently flame retardant webbing with 3.3 ton breaking strength & aluminium dorsal, sternal & lateral D rings, padded waist belt with leather protection on all exposed fittings
Colours	Red/Black/Blue
Uses	Arc flash, welding and high heat applications where the use of fall arrest equipment is needed
Sizes	S, M, L, XL
Standards	SANS 50361:2003 & ASTM-F 887-13 (40 Cal/cm2 rating)

Product	HSB1 SBA3 or HSB1 SBA6
Description	Restraint Belt
Physical Properties	1.8m chain or 1.8m nylon rope. 75mm polyamide webbing. 4 ton breaking strain. Blue colour. Weight: 0.49kg.
Uses	For the prevention of falls only, to be used as a fall restraint device only
Standard	SANS 50809
Precautions	Not to be used as a fall arrest device. Fall restraint systems fall factor must be zero.

Product	HSB1 LS5412
Description	Kidney Belt
Physical Properties	Elasticated kidney belt. Available in medium, large, X-large and XX-large. Made from elasticated nylon with flexible support ribbing. Available in black.
Uses	To be used when lifting heavy objects. To be used when driving motorised vehicles, such as LHD’s, forklifts and heavy earth moving machinery. To be used when driving standard motorised vehicles as a lumbar support.
Standard	None
Precautions	Ensure the kidney belt is in a good working condition before use. Ensure the kidney belt is of the correct size to maintain a secure fit while in use.

Product	HSB1 CB11
Description	Cap Lamp Belt and Lanyard
Physical Properties	50mm heavy cotton webbing belt, with 2 steel hooks and forged metal buckles, lanyard and snap hook
Uses	To be used as a belt to carry a cap lamp when working underground, or when the use of a cap attached lamp is required
Standard	None
Precautions	Not to be used as a fall arrest device. Not to be used as a restraint device.

Product	HSB1 CB
Description	Cap Lamp Webbing Belt
Physical Properties	Polypropylene webbing belt with Cap Lamp and Self Rescue Pack or First Aid pouch straps. CB8 to fit sizes S,M, & L. CB9 to fit sizes XL & XXL.
Uses	Product used to carry cap lamp and self rescue pack or first aid pouch when going underground
Standard	None
Precautions	Ensure that cap lamp belt is not damaged before use. Ensure that straps secured tightly. Not to be used as a fall arrest device. Not to be used as a restraint device.

Product	HSA2 N10 CARABINER
Description	Oval Carabiner with Nut
Physical Properties	Diameter: 10mm. Throat opening: 17mm. Material: Alloy steel. Minimum breaking load: 2200kg. Finish: Zinc plated.
Uses	For joining fall arrest ropes
Standard	SANS 50362

Product	HSA2 SH18 SNAP HOOK
Description	Safety Snap Hook
Physical Properties	Throat opening: 18mm. Material: Steel. Minimum breaking load: 2500kg. Finish: Galvanised/powder coated.
Uses	For joining fall arrest ropes
Standard	SANS 50362

Product	HSA2 SH64 SCAFFOLD HOOK
Description	Scaffold Hook
Physical Properties	Drop forged. Throat opening: 64mm. Material: Aluminium alloy. Minimum breaking load: 2272kg. Finish: Polished.
Uses	For joining fall arrest ropes.
Standard	SANS 50362

Product	HSA2 SN21 CARABINER
Description	Carabiner with Screw Nut
Physical Properties	Drop forged. Throat opening: 21mm. Material: Aluminium alloy. Minimum breaking load: 2272kg. Finish: Self coloured.
Uses	For joining fall arrest ropes
Standard	SANS 50362

Product	HSA2 TL11 CARABINER
Description	Carabiner with Twistlock
Physical Properties	Diameter: 11mm. Throat opening: 22mm. Material: Aluminium alloy. Minimum breaking load: 2800kg. Finish: Self coloured/anodized coloured.
Uses	For joining fall arrest ropes
Standard	SANS 50362

Product	HSA2 SG11 CARABINER
Description	Carabiner with Screw Gate
Physical Properties	Diameter: 11mm. Throat opening: 22mm. Material: Aluminium alloy. Minimum breaking load: 2800kg. Finish: Self coloured/anodized coloured.
Uses	For joining fall arrest ropes
Standard	SANS 50362