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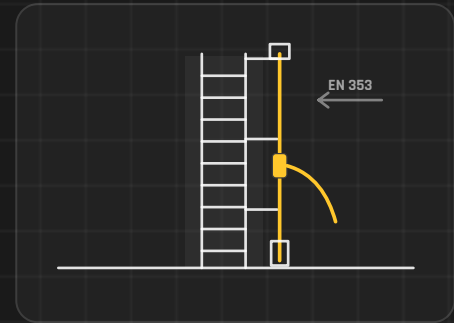
Tactical Safety for Access & Falls

Product datasheet

LIFELINE SYSTEMS

Vertical Lifeline System

A TsaF vertical lifeline keeps a climber attached to a guided fall arrester for the full height of a fixed ladder, so there is no need to disconnect and look for a new tie-off point. We design, manufacture and install rope- and rail-type systems for industrial structures across India.



9-10 m

Intermediate cable guide spacing
(rope type)

< 6 kN

Impact force limited by the shock absorber
(rope type)

Ø8 mm

SS-316 wire rope, 7×7
construction

EN 353-1:2014+A1:2017

EN 353-2:2002

Overview

Why fixed ladders need a vertical lifeline

Fixed ladders on industrial buildings, chimneys, storage tanks, telecom towers and wind turbines are some of the most-used access routes on a site, and often the least protected. A ladder cage on its own does not arrest a fall, and climbers who have to unhook and re-hook to pass obstructions are exposed at every transfer. Many ladder accidents are preventable when the climber stays connected to a guided fall arrester for the whole climb.

How the TsaF vertical lifeline system works

A TsaF vertical lifeline runs parallel to the ladder and carries a fall arrester that moves with the climber in normal use and locks if they fall. The worker connects the arrester to their full body harness and can move up and down the entire height of the line with a continuous anchor point, keeping both hands free for the ladder.

Rope type

The rope-type system uses an 8 mm SS-316 wire rope of 7×7 construction, held between a top mounting bracket and a bottom tensioner. SS-316 cable-guide brackets every 9 to 10 metres keep the rope aligned with the ladder, and a shock absorber limits the impact force to below 6 kN during a fall arrest. It suits tall ladders, towers and tanks where a light, low-profile installation is wanted.

Rail type

The rail-type system uses an aluminium (6063 T6) or hot-dip galvanised steel (S235) rail fixed to the ladder with rail-to-ladder connectors. A fall arrester trolley with an inbuilt shock absorber and a uni-directional lock runs in the rail, and end stoppers prevent it from running off. Rails suit frequently used ladders and routes where a rigid guide is preferred. TsaF also offers portable ladder solutions generally used at wind turbine sites, transmission and distribution poles and telecom towers.

Where it fits on your site

A vertical lifeline is usually one part of a wider access plan. On a building, the climb often uses a Flowlok ladder system or an aluminium cage ladder and leads onto a horizontal lifeline or an aluminium and FRP walkway, with a rooftop barricade at the exit point. Because the line connects to an existing cage ladder, it is also a practical retrofit for older structures.

Why choose Tsaf

Every Tsaf system starts with a survey of the actual ladder and structure and is engineered for that route rather than supplied as a generic kit. Components are manufactured at our 20,000 sq ft facility in Jewar, and the system is designed in accordance with EN 353-1 for rigid anchor lines and EN 353-2 for flexible anchor lines. Our certified technicians install the line and train your climbers to use it, and the Annual Maintenance Check function-tests the arrester, anchorages, guides and tension every year. To discuss a ladder, tank or tower on your site, request a site assessment.

System types

Rope type (SS-316 wire rope)

Ø8 mm SS-316 7×7 wire rope with a top mounting bracket, tensioner, shock absorber and cable-guide brackets every 9–10 m. Light and low-profile for tall ladders, towers and tanks.

Rail type, aluminium

6063 T6 aluminium rail fixed to the ladder with rail connectors and rail-to-ladder connectors. A fall arrester trolley with an inbuilt shock absorber runs inside the rail.

Rail type, galvanised steel

S235 steel rail with a hot-dip galvanised finish for routes where a steel rail is specified, using the same trolley, connectors and end stoppers as the aluminium rail.

Portable ladder solution

Portable ladder arrangements generally used at wind turbine sites, transmission and distribution poles and telecom towers, where a permanent installation is not practical.

Retrofit to an existing cage ladder

A rope or rail line added to a cage ladder that is already in service, after a survey of the ladder structure and its fixings.

How it works

- 01 Top anchorage** — An SS-316 mounting bracket at the top of the climb carries the line; on rope systems the bracket is fixed across two ladder rungs.
- 02 Anchor line** — Either a tensioned Ø8 mm SS-316 wire rope or a rigid aluminium or galvanised steel rail runs the full height of the ladder.
- 03 Guides and connectors** — Cable-guide brackets every 9–10 m keep the rope aligned with the ladder; rail systems use rail connectors and rail-to-ladder connectors.
- 04 Guided fall arrester** — The arrester or trolley travels with the climber and locks on the line if they fall. The rail trolley has a uni-directional lock.

- 05

Energy absorption — A shock absorber limits the impact force on the climber to below 6 kN on the rope system; the rail trolley has an inbuilt shock absorber.
- 06

End stoppers and tensioner — Rail end stoppers prevent the trolley running off, and the rope tensioner at the base keeps the line correctly set.

Benefits

Continuous connection
Climbers stay attached for the whole climb, with no need to disconnect and find a new tie-off point.

Hands-free climbing
The arrester follows the climber up and down the line, so both hands stay on the ladder.

Corrosion-resistant materials
SS-316 rope and brackets, 6063 T6 aluminium or hot-dip galvanised steel rail for long outdoor service.

Works with existing ladders
The system connects to an existing cage ladder, making it a practical upgrade for older structures.

Engineered per ladder
Each line is designed for the height, structure and use of the specific ladder after a site survey.

Installed and supported by TsaF
Trained TsaF technicians install the line, train your climbers and inspect it under the Annual Maintenance Check.

Components & specifications

SKU	Component	Key specifications
TSAF-200	Vertical Kit	Material: SS-316 · Finishing: Natural Finish · Breaking Strength: 35kN · Fixing: Through SS-304 Fasteners · Weight: 3.5 kg
TSAF-108	Stainless Steel Wire Rope Dia 8 mm	Material: SS-316 · Construction: 7×7 · Dia: 8 mm · Length: 1m · Weight: 0.25 kg/Mtr.
TSAF-201	Cable Guide Intermediate Bracket	Material: SS-316 · Finishing: Natural Finish · Range: 9-10 m · Weight: 0.77 kg · Fixing: Through SS-304 Fasteners
TSAF-204	Extension Arm	Material: SS-316 · Finishing: Natural Finish · Weight: 6.7 kg · Length: 1.75 m
TSAF-131	Karabiner	Material: Alloy Steel · Finishing: Natural Finish · Weight: 0.26 kg · Breaking Strength: 23 kN
TSAF-205	Aluminium Rail	Material: 6063 T6 · Finishing: Natural Finish · Min Breaking strength: 15kN · Fixing: Through SS-304, GI Fasteners · Weight: 2.425 kg/Mtr.
TSAF-705	Steel Rail	Material: S235 · Finishing: HDG · Min Breaking strength: 15kN · Fixing: Through SS-304, GI Fasteners · Weight: 1.5 kg/Mtr.
TSAF-703	Rail Connector	Material: SS-304 · Finishing: Natural Finish · Weight: 0.57 kg · Fixing: Through GI Fasteners

SKU	Component	Key specifications
TSAF-202	Fall Arrestor Trolley	Material: Aluminium Alloy & Steel · Finishing: Natural Finish · Min Breaking strength: 15kN · Weight: 1.05 kg
TSAF-706	Rail Stopper Bracket Type-1	Material: GI · Finishing: HDG · Weight: 0.28 kg · Fixing: Through GI Fasteners
TSAF-207	Rail Stopper Bracket Type-2	Material: SS-304 · Finishing: Natural Finish · Fixing: Through SS-304 Fasteners · Weight: 0.148 kg
TSAF-708	Rail to Ladder Connector	Material: GI · Finishing: HDG · Weight: 0.230 kg · Fixing: Through GI Fasteners

Applications

- Fixed access ladders to industrial and warehouse roofs
- Chimneys and stacks
- Oil and fuel storage tanks
- Telecom and communication towers
- Wind turbine towers
- Transmission and distribution poles (portable solution)

Standards & specifications. Designed in accordance with EN 353-1:2014+A1:2017, EN 353-2:2002. Specifications are indicative and may vary with configuration. Final layouts, loads and applicable standards are confirmed by TsaF engineering for each project. Subject to technical changes.

Plan your vertical lifeline system with TsaF

Site assessment · System design · In-house manufacturing
· Installation · Training · Annual Maintenance Check

We don't just install your safety system. We stand on the roof with you.

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