



PROJECT STEEL

*Engineering excellence in conveyors
and complete transport systems*



Conveyors / Pulleys



Website



LinkedIn



Office: Karola Miarki 34A,
41-400 Mysłowice, Poland
Phone: +48 534 441 392
Email: biuro@project-steel.com
VAT: 627-277-70-88



Conveyors

Project Steel provides end-to-end bulk-handling and steel-structure solutions: from concept and DEM/FEM analysis, through detailed design, EXC3 fabrication (ISO 3834-2), to erection, commissioning, and service.

We operate in C3–C5-M environments with ATEX 21/22 options across mining/aggregates, recycling, energy/biomass, ports, chemicals/fertilisers, food.

We ensure full CE compliance, deliverables STEP/DWG, ITP, FAT/SAT, DoP/EN 10204 3.1, and standardised components for low TCO and fast maintenance.

Product & execution scope – we deliver ALL variants

- Conveyors: belt (400–1600 mm, up to 800 t/h, 0.3–3.5 m/s), powered/gravity roller, screw, drag; VFD/soft-start, belt scales, metal detection, dust-tight enclosures.
- Steel structures: platforms/pipe-racks/skids/mezzanines/silos; EN 1090-2 EXC2/EXC3, C4-H/C5-M coatings, HDG/duplex, fire protection R30–R120.
- Dust control: ports, ducting, cartridge/bag filters, pressure switches, vacuum design.
- Materials & coatings: S355/S235/S460, Hardox 450/500 (impact zones), SS304/316; ISO 12944 C4-H/C5-M paint (DFT 240–320 μm), HDG EN ISO 1461, duplex, optional intumescent R30–R120.
- Safety & controls: ISO 14122 access, IP55/66, STO, interlocks, Siemens/Allen-Bradley PLCs, Profinet/EtherNet-IP/Modbus.



Fig. 1 AR-Project 1000 Belt Conveyor, length 150m, designed for hauling mined material.

Project Steel - Standards

We operate an advanced in-house manufacturing facility, enabling the delivery of even the most demanding projects.

During design, we strictly comply with applicable standards and prioritise rapid execution and adherence to the agreed budget.

Project Steel standards applied to every order:

- Finite Element (FEM) strength analyses and optimisations for efficiency and safety
- Prefabrication of steel structures in our own production facility
- 3D modelling and technical documentation in professional CAD environments
- CNC machining, bending, MIG/MAG/TIG welding, and plasma/oxy-fuel cutting
- Use of high-grade steels and protective coatings (hot-dip galvanising, powder coating)
- Production of series and one-off components in accordance with stringent standards
- Engineering support and continuous contact with a dedicated Project Manager at every project stage
- Transparent, detailed technical documentation and commercial proposals

What we have to solve - examples of the designing conveying systems

- Trajectory & energy control over large drops (1–20 m) and variable size distributions ($F_{max} \leq 200$ mm) — requires proper curve radii, rock-box, energy-absorbing shelves, and correct liner selection (AR/CCO/rubber/UHMW-PE).
- Dust & noise: maintaining negative pressure inside the chute, correct placement of DN160–DN250 extraction ports, balanced airflow, and acoustic reduction (elastomers, enclosures).
- Wear & serviceability: impact hotspots, need for wear-map, bolt-in panels, inspection every 2–3 m, minimized MTTR.
- Mech-elec-process integration: skirting, impact beds, belt scales/metal detectors, safety interlocks, ATEX 21/22 (earthing, ESD, sealing).
- Structural & environmental complexity: C5-M/HDG systems, EN 1090-2 EXC3, erection tolerances, transport/lifting constraints, 24/7 duty.

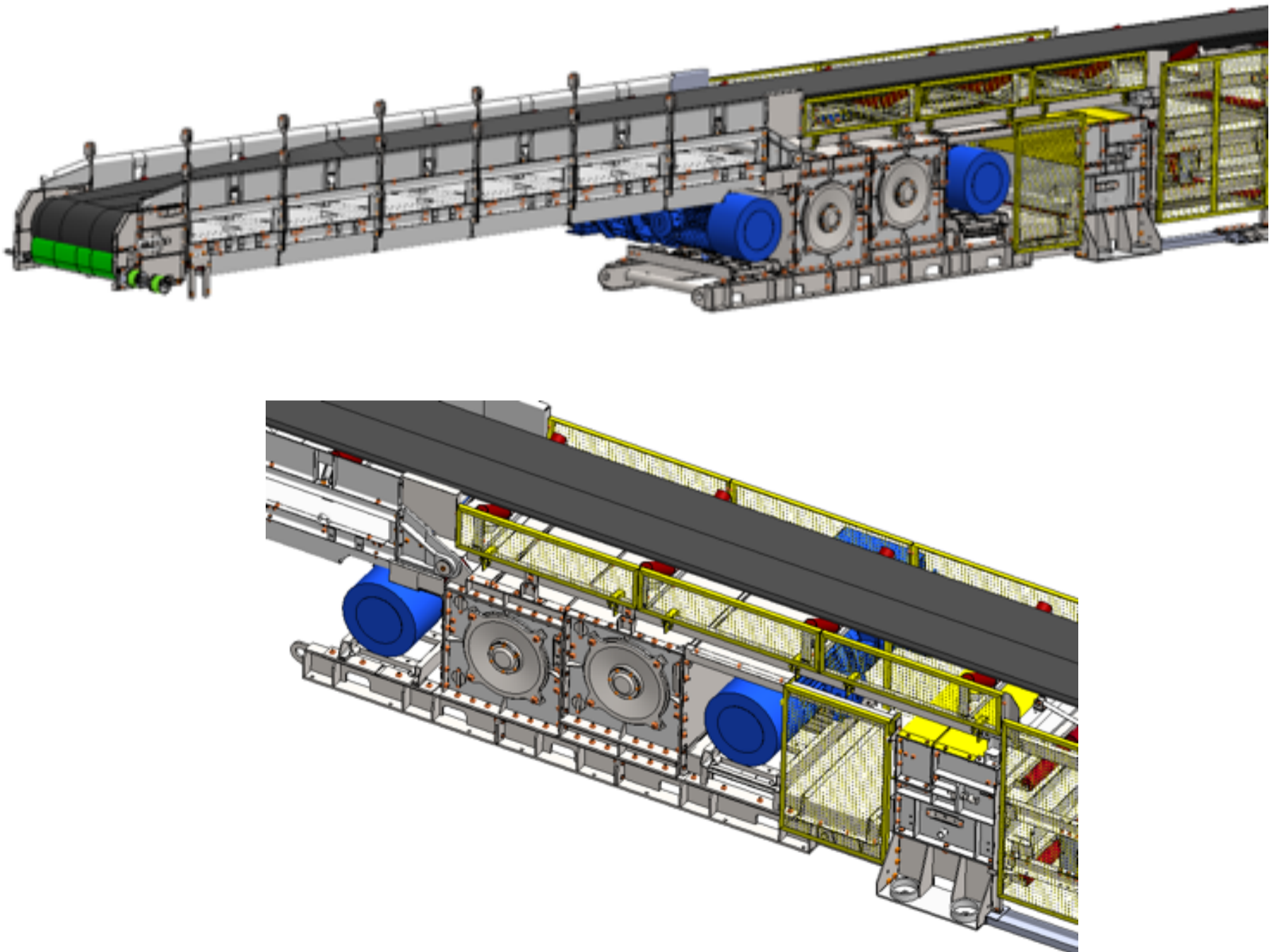


Fig. 2, 3. AR-Project 1000 belt conveyor — 150 m long, designed for mined material haulage — design environment (CAD).

Excellence

- DEM-ready engineering — validated trajectories and impact zones pre-fabrication for lower dust/wear and stable flow.
- End-to-end in-house — design, prefabrication, and erection under EXC3 / ISO 3834-2 with full EN 10204 3.1 traceability.
- Serviceability by design — flanged segments, bolt-in liners, doors/sight windows, spare-part readiness → reduced downtime.
- Fit-for-environment materials & coatings — C5-M / HDG / duplex, AR/CCO/UHMW-PE, ATEX variants.
- Controls & safety — Siemens/AB PLC, VFD/soft-start, interlocks, ISO 14122, IP55/66 → safe operation & low TCO.
- Clean, auditable documentation — GA/STEP/DWG, ITP, FAT/SAT, DoP/CE for frictionless acceptance and site integration.

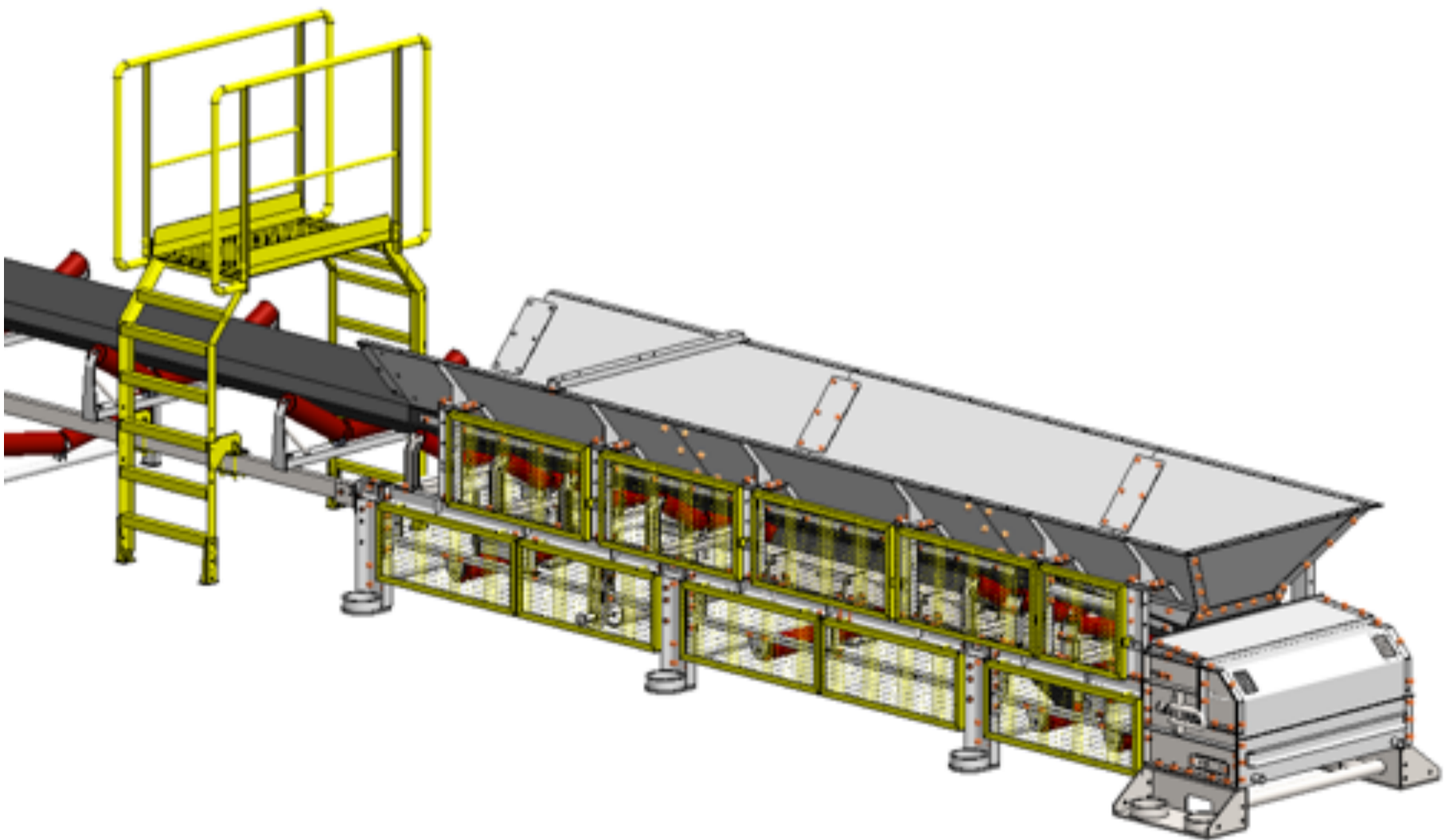


Fig. 4. AR-Project 1000 belt conveyor — 150 m long, designed for mined material haulage — design environment (CAD).

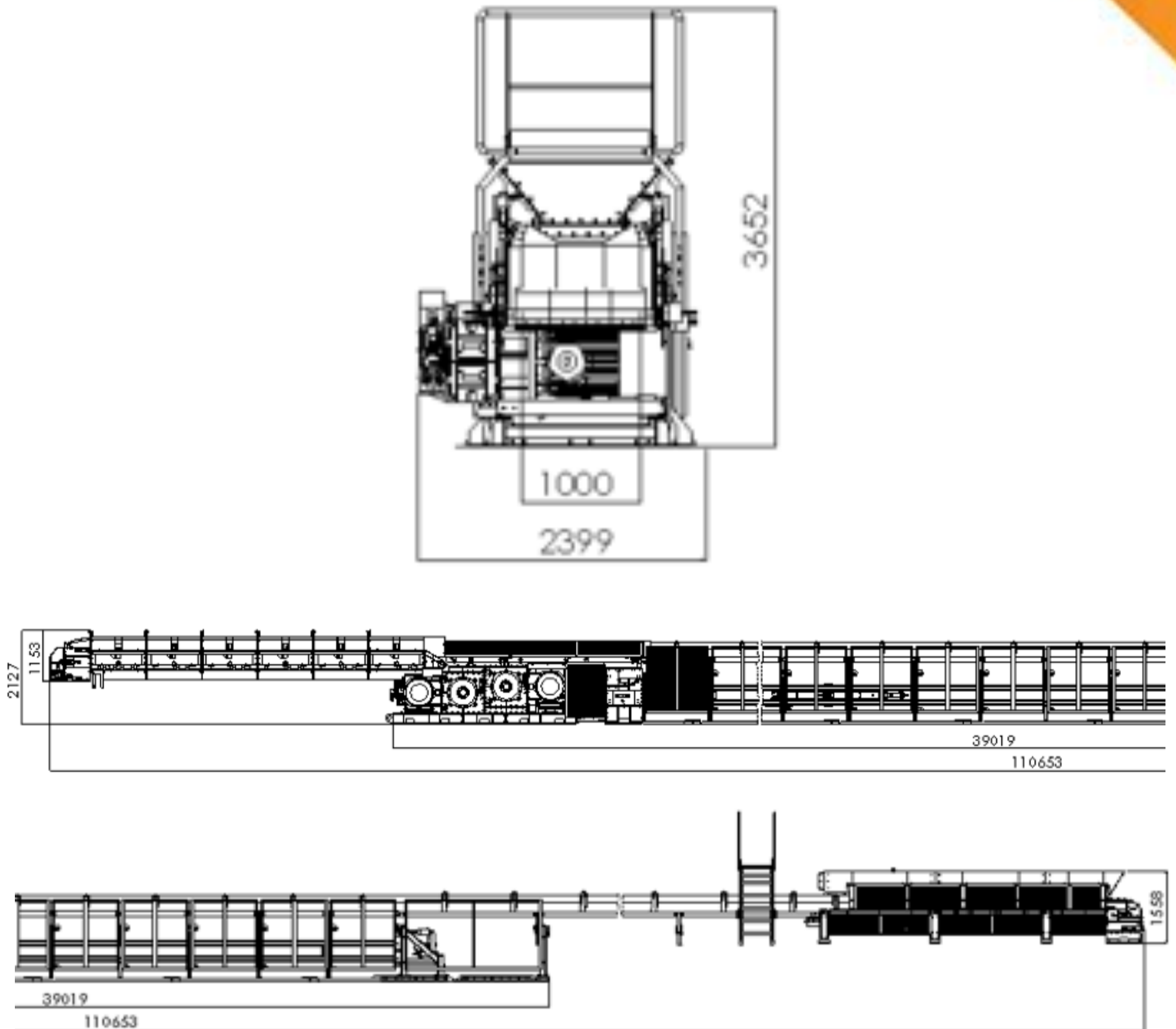


Fig. 5–7. AR-Project 1000 belt conveyor — 150 m long, designed for mined material haulage — technical assembly drawings.

Parameter	Unit	Standard	Option
Throughput	[t/h]	150	Up to 800
Belt width	[mm]	800	400-1600
Speed	[m/s]	2.0	0.3-3.5 (VFD)
Icline	[°]	18	Do 22 (chevron)
Length	[m]	24	Do 120
Drive power	[kW]	11	4-90
Frame material	-	S355	SS304/SS316, ocynk
Coating	-	C4-H 240um	C5-M 320um
Belt type	-	EP 400/3	Olejoodporną, FDA, chevron
Noise	[dB(A)]	Do 78 @ 1 m	-
IP/ATEX	-	IP55	IP66, ATEX 21/22
Safety	-	Osłony, linka STOP	Kurtyny, blokady

Table 1. Custom belt conveyor specifications available on request

Key benefits

- Lower TCO (Total Cost of Ownership): VFD/soft-start and correct idler/enclosure selection directly reduce energy usage and extend belt life.
- Clean, low-dust operation: sealed skirting and DEM-ready transfer chutes (validated trajectory and critical wear zones).
- Excellent traction, zero belt slip: full belt tracking and tension control.
- Compliance & safety: CE, EN 1090-2 EXC2/EXC3, ISO 14122, IP55/66, optional ATEX Zone 21/22.

Drag chain conveyors

Our drag chain conveyors provide dust-tight, gentle handling of bulk materials on horizontal and mildly inclined routes, with multi-point inlets and discharges at low dust emission levels:

- Conveyed media (sealed enclosure): grains, feed, biomass, pellets, coal, coke, ore, clinker (≤ 150 °C), fertilizers, ash, fines.
- Routes & layout: horizontal and mild incline (typically up to 15°), multi-inlet / multi-discharge configurations (shut-off/diverter gates).
- Best fit where: containment (dust/ATEX), gentle handling (low degradation), compact footprint, and easy service are critical.

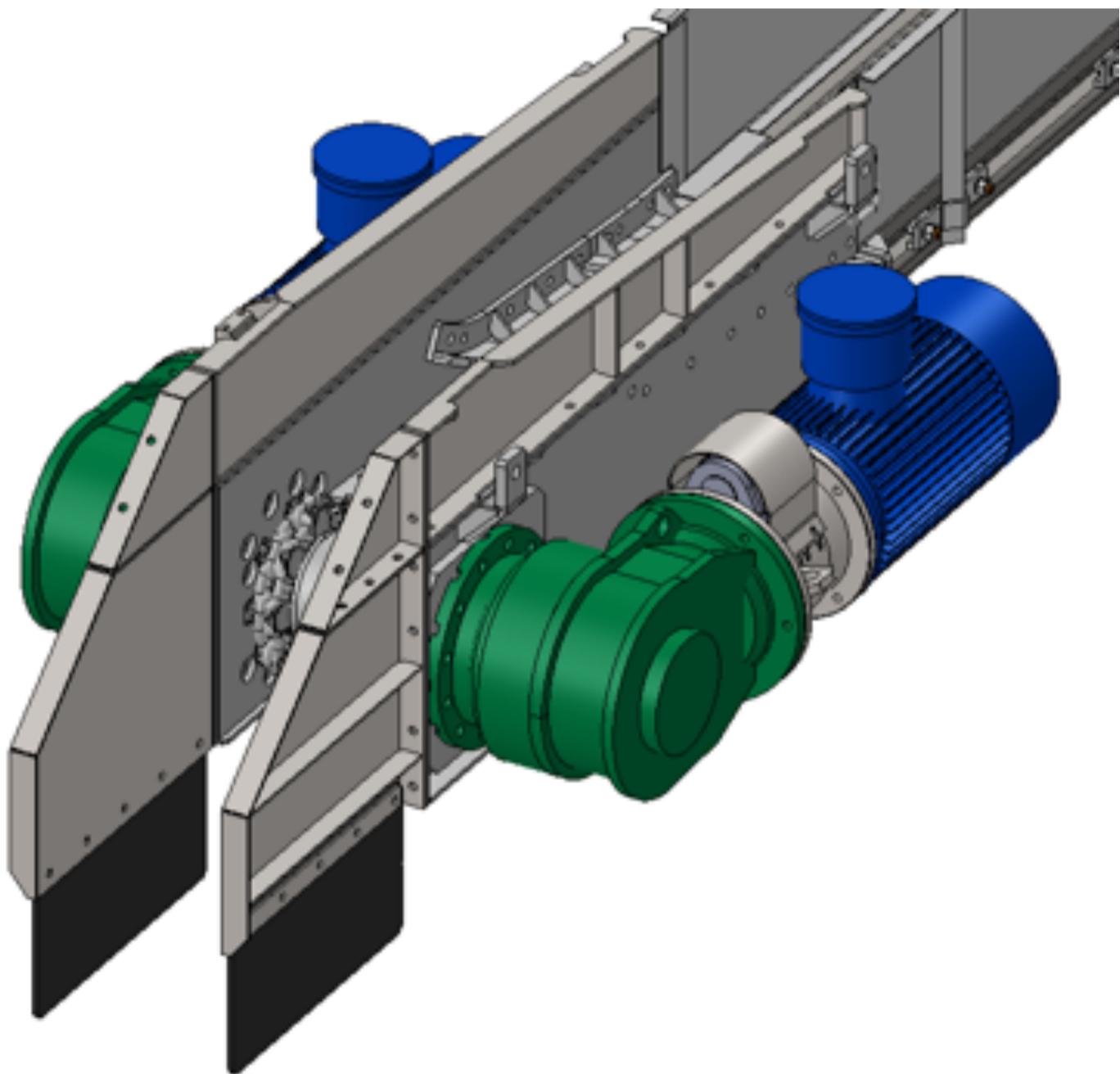


Fig. 8. One of our reference projects — Project-440/E180 drag chain conveyor, 2x30 kW.

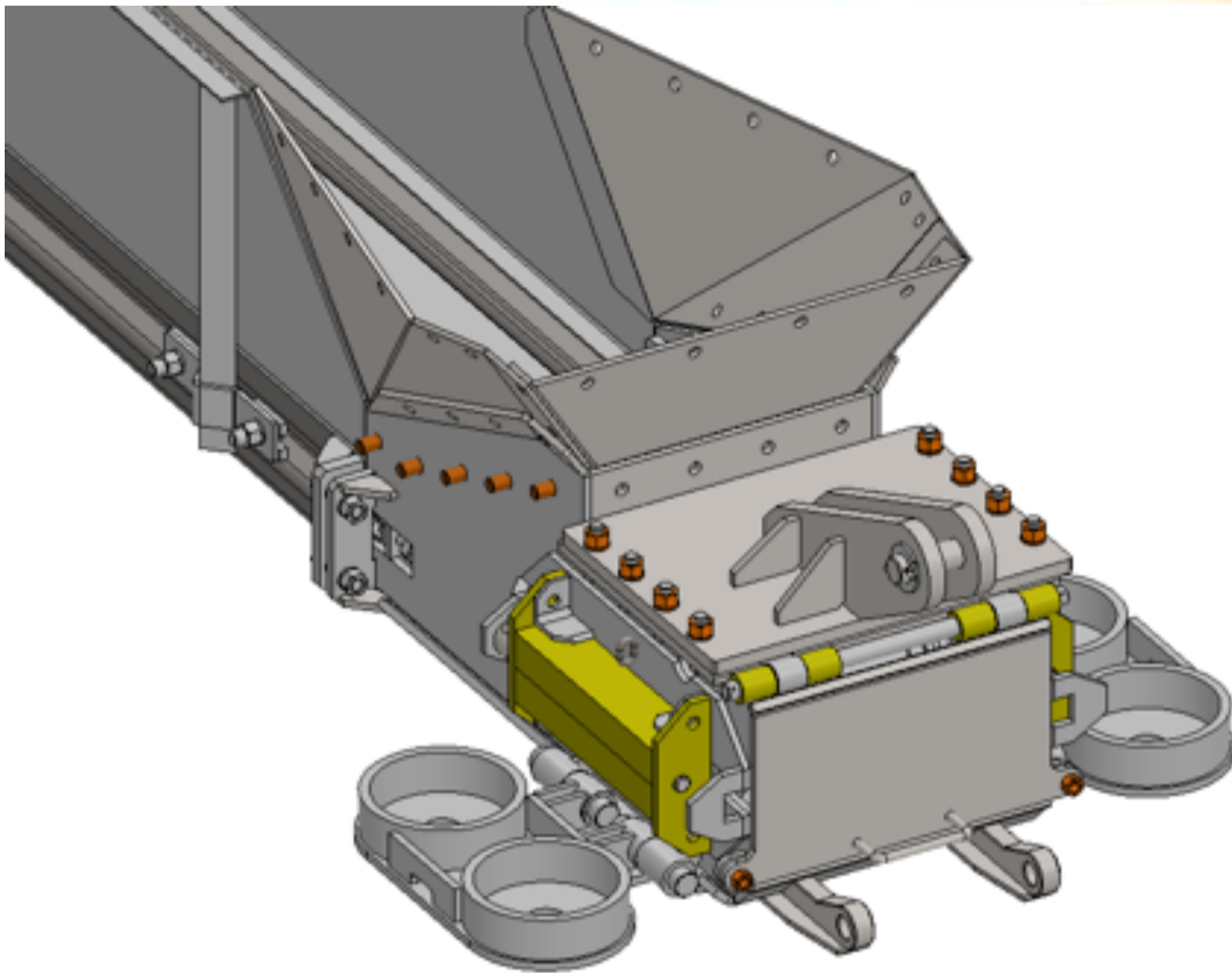


Fig. 9. One of our reference projects — Project-440/E180 drag chain conveyor, 2x30 kW.

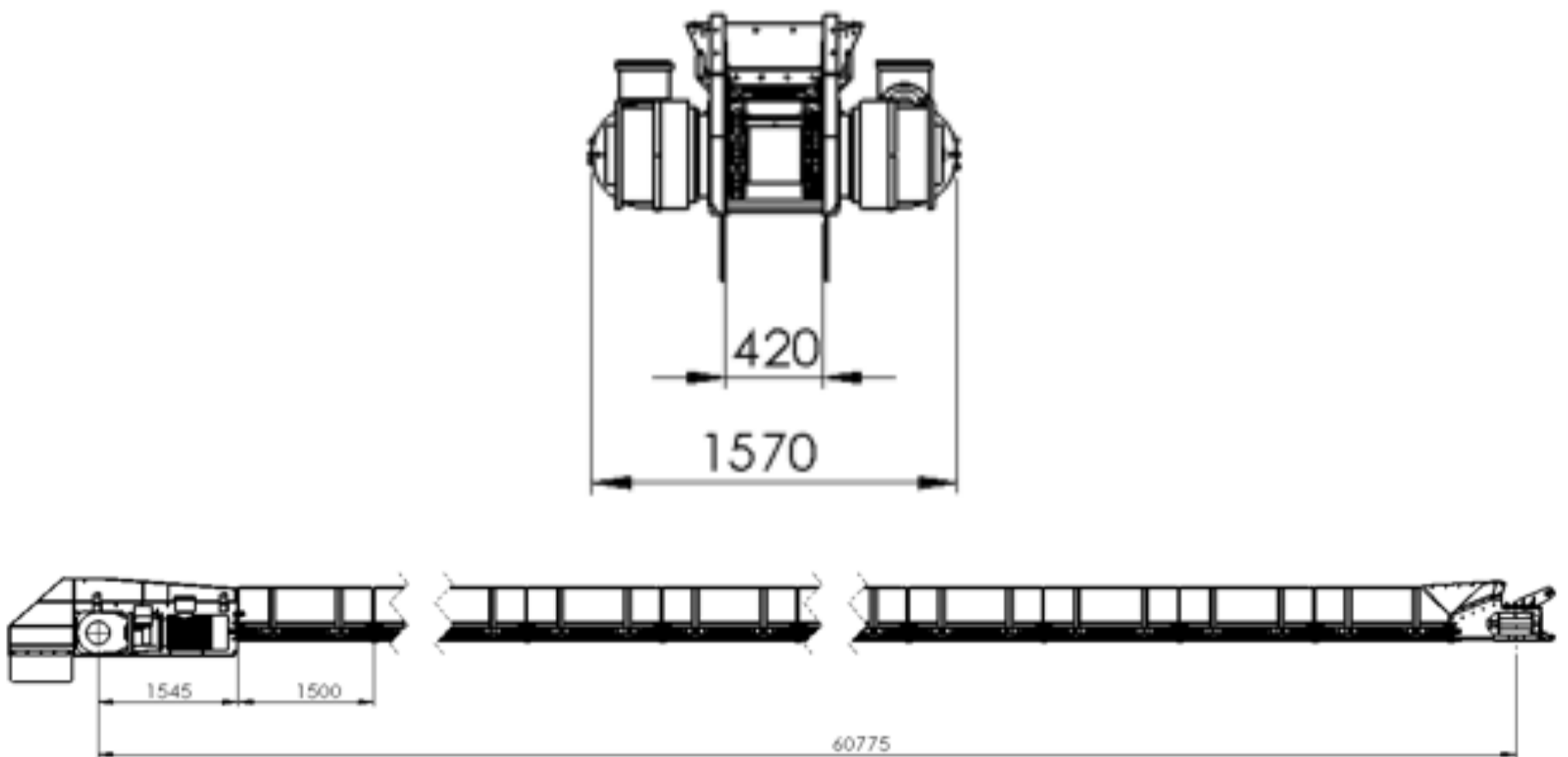


Fig. 10. Project-440/E180 drag chain conveyor, 2x30 kW — overall envelope (GA) drawing.

Parameter	Unit	Standard	Option
Throughput	[t/h]	120	20-400+
Długość	[m]	25	Do 80 sekcji
Icline	[°]	0-10	15
Through cross-section width	[mm]	400	300-800
Chain Speed	[m/s]	0.25	0.15-0.45 (VFD)
Drive	[kW]	11	4-45
Frame material	-	S355	SS304/316
Bottom	-	AR 8-10mm	Hardox 450/500, CCO 6+6
Drag chains	-	PE-1000 (UHMW-PE)	Stal/guma (aplikacyjnie)
Chain	-	2-str. Łuskowy	Heavy-duty, food-grade
Coating	-	C4-H 240um	C5-M 320um / HDG / duplex
ATEX	-	-	Zone 21/22
Noise	[dB(A)]	Do 78 @ 1 m	Do 75 (elastomer liners)

Table 2. Custom drag chain conveyor specifications available on request.

Key benefits

- Dust-tight conveying: low dust emissions; easy connection to central dust extraction.
- Gentle handling: low product degradation (grains, biomass, fertilisers).
- High durability and wear resistance.
- Service “on the fly”: quick-release covers, sight windows, accessible tensioners.
- Route flexibility: multi-inlet / multi-discharge layouts, modular sections and diverters.

Return, drive, snub / bend and take-up pulleys

Our pulleys are engineered to meet specific industrial requirements—load cases, resistance to external factors, and operating environment. We offer extensive manufacture and refurbishment capabilities thanks to a fully equipped machine shop.

Pulley types and their function:

- Drive pulley — generates belt motion by transmitting power from the motor to the belt.
- Return (tail) pulley — installed at the discharge end; redirects the belt on the return run.
- Take-up pulley — regulates belt tension, ensuring stability and correct operating tension.
- Snub/bend pulley — increases wrap and guides the belt on complex runs, improving tracking and direction.

Reference projects:



Fig. 11 Drive pulley (flange).



Fig. 12 Tail pulley.



Fig. 13 Directional / snub pulley - 244.5 x 1400 mm.

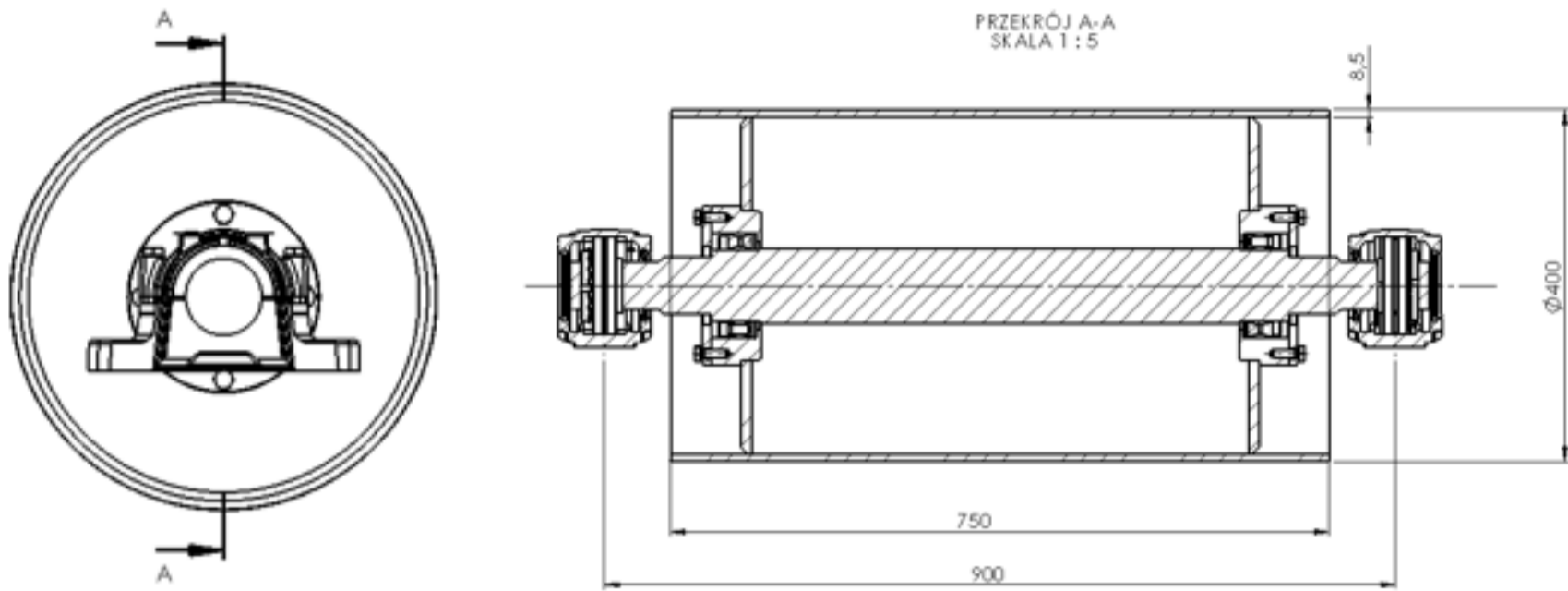


Fig. 14. Example installation — return (tail) pulley — technical assembly drawing.

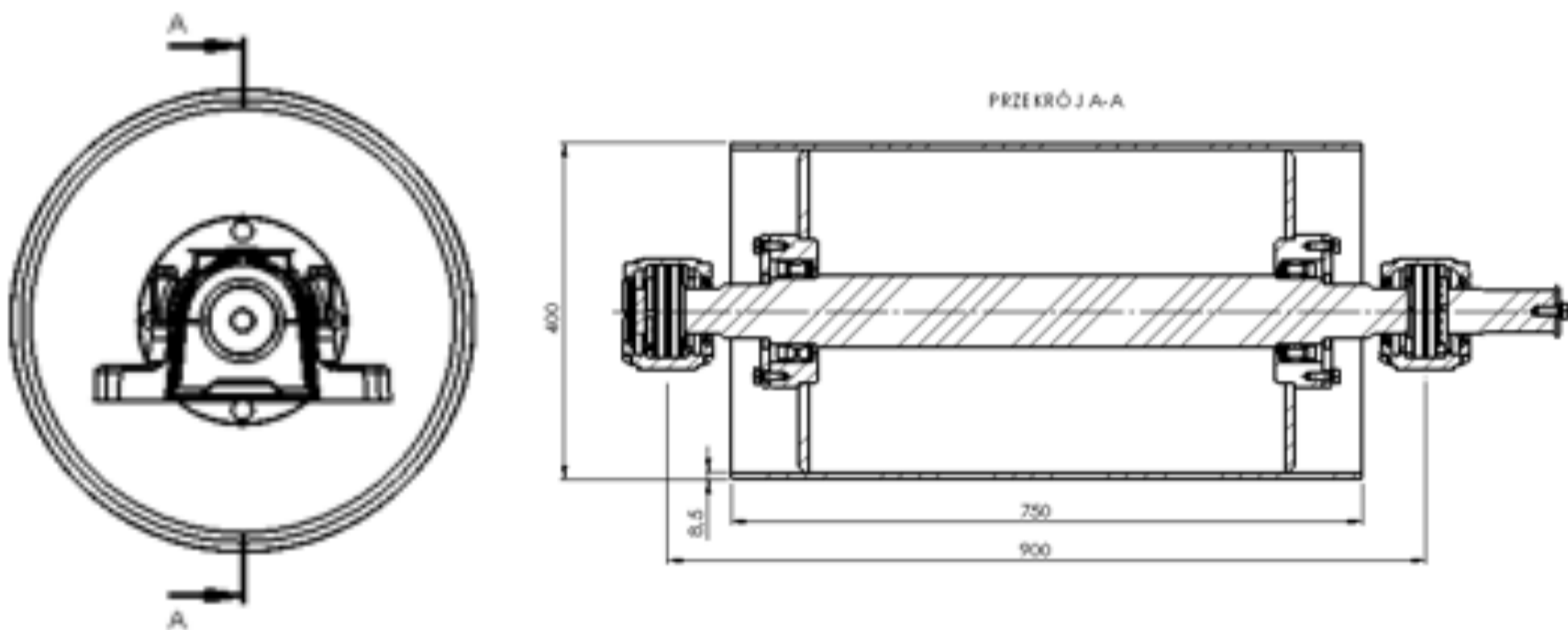


Fig. 15. Example installation — drive pulley — technical assembly drawing.

Parameter	Unit	Standard	Option
Pulley type	-	Drive	Reversible, tensioning, deflecting, cleaning
Diameter	[mm]	400-630	250-1000+
Face width	[mm]	800-1400	400-2000
Shell	[mm]	10-16	8-25 (dependent on loads)
Shell material	-	S355	S460, Hardox 450, SS304/316
Shaft	-	C45E	42CrMo4, SS316
Shaft diameter in bearing	[mm]	90-120	60-180
Sheathing	-	Rubber 10-12mm	Rubber 8-20, ceramics 12-15, PU 8-12, spiral grooved
Hardness	[Shore A]	55-65	50-70
Profile	[mm/m]	1-2	Barrel/flat, custom taper
Bearings	-	Spherical, SNH	Plummer DT housings, taconite seals
Sealings	-	Labirynth + V-ring	Taconite, contact sealing
Balancing	-	ISO 1940 G 16	G 6.3 (drive), G 2.5 (high rpm)
Radial / axial run-out	[mm]	Up to 0.5 / up to 0.8	Up to 0.3 / up to 0.5
Peripheral speed	[m/s]	0.3-3.5	Up to 5.0
Moment	[kNm]	-	Accordingly (kW, rpm)
Anti-corrosion coating	-	C4-H 240um	C5-M 320um, HDG, duplex
ATEX (dust)	-	-	Zone 21/22 (grounding, ESD)
Operating temperature	[°C]	-20...+60	-30...+120 (project's accordingly)
Norms	-	EN 1090-2 EXC2	EXC3, ISO 1940, ISO 281, CE
NDT off welds	-	VT/MT	UT/RT (on demand)
Documentation	-	GA + STEP/DWG 3.1	ITP, FAT/SAT, DoP

Table 3. Custom conveyor pulley specifications available on request.

Key benefits of our pulleys:

Drive pulleys

- Maximum traction: optimised lagging (ceramic/diamond/grooved) + correct crowning - zero slip.
- Stable operation: dynamic balancing per ISO 1940 (G 6.3 or better) reduces vibration and bearing wear.
- Long MTBF: S355/S460/Hardox shells, C45E/42CrMo4 shafts, taconite sealing for heavy-duty service.
- Environmental resistance: C5-M/HDG/duplex finishes, IP-ready housings, ATEX 21/22 (earthing/ESD).
- Drive integration: correct geometry (face width, crowning, traction) for VFD/soft-start and STO safety.

Return / tail pulleys

- Belt tracking stability: proper diameter and radial runout ≤ 0.5 mm minimise belt wandering.
- Lower wear: bare steel or light lagging options reduce abrasion on the return side.
- Serviceable bearing sets: SNH/DT housings, easy replacement, optional centralised lubrication.
- Contamination resistance: labyrinth + V-ring seals; taconite available for dust/impact duty.
- Extended belt life: correct wrap/offset and peripheral ratios support a smooth, even return run.

Take-up pulleys

- Consistent traction: correct operating tension → no slip and even belt wear.
- Shock damping: gravity/screw take-up mechanisms stabilise VFD start/stop cycles.
- Longer drivetrain life: reduced dynamic loads on the drive pulley and bearings.
- Fast adjustment: clear position indicators and service access without removing guards.
- Safety & monitoring: end-position sensors; PLC integration for tension alarms.

Snub / bend pulleys

- Larger wrap angle (belt-on-pulley contact): improves traction on the drive pulley without step-changing the lagging.
- Compact layout: shorter transfer nodes and better belt guidance where space is limited.
- Lower loads: correct diameter and position reduce side forces and idler wear.
- Quiet operation: proper balancing and sealing reduce noise.
- Flexible configuration: easy geometry tuning of the belt path (retrofit without changing the drive).

Cleaning self-cleaning pulleys

- Decisive belt cleanliness improvement: spiral/grooved lagging evacuates carryback; fewer build-ups.
- Fewer stoppages: less sticking → less frequent manual cleaning.
- Lower damage risk: less carryback = fewer chances of node damage and spillage.
- Stable traction: sustained contact with the drive pulley thanks to reduced contamination.
- Hygiene/chemicals: PU lagging and SS316 components available for corrosive or food-grade environments.

Implementation examples

Grain port — low-dust drag chain conveyor

Scope: trough 500 mm, L = 28 m, 120 t/h; 3× DN200 ports; SS304 covers, C5-M 320 µm.

Challenge: PM10 limits and grain degradation with multi-discharge layout.

Solution: chain speed 0.25 m/s (VFD), UHMW-PE flights, AR 10 mm bottom, Δp pressure switch, quick-release covers.

Result: dust –50%, grain damage –35%, MTTR –40%.

Standards: EN 1090-2 EXC3, ISO 3834-2, ATEX 22.

Recycling / steel mill — heavy-duty drag conveyor

Scope: L = 35 m, 200 t/h; trough 650 mm; Hardox 450 12 mm bottom + CCO 6+6 in impact zones; 22 kW VFD.

Challenge: abrasion and impacts from fine scrap; frequent service stoppages.

Solution: wear-map with bolt-in segments, sight windows, gravity take-up, taconite housings on terminal shafts.

Result: bottom life ×2, MTTR –30%.

Standards: EN 1090-2 EXC3, 3.1, ITP + FAT.

Mining / aggregates — 800 t/h belt conveyor (with pulley package)

Scope: BT 1400, L = 150 m, 800 t/h; drive pulley Ø800×1400 (rubber grooved 12 mm), snub Ø500, tail Ø500; balancing ISO 1940 G 6.3 (drive), G 16 (tail).

Challenge: high loads and dust at the transfer node; slip in wet conditions.

Solution: pulley set with crowning, sealed skirting, impact bed, DEM-ready curved chute (R = 2.5–3.0 m), 3× DN200 ports.

Result: dust –50% (24 h), slip eliminated, idler service –25%, energy –10%.

Standards: CE, EN 1090-2 EXC3, ISO 14122, ATEX 22 inside the chute body.