PRODUCT CATALOGUE · EDITION 2026



HIGH-STRENGTH · FATIGUE-RESISTANT · ANTI-CORROSION

T-Bolts & Precision Fastening Systems

Ningbo Lingqi Hardware Industry Co., Ltd.

HEMUDU TOWN · YUYAO CITY · NINGBO · CHINA

T-BOLTS · FASTENERS · STAMPED PARTS
CUSTOM NON-STANDARD COMPONENTS
M5–M90 · 20–3000 mm · 12 MILLION+ SETS / YEAR

ISO 9001:2015 | ISO 14001 | ISO 45001 | IATF 16949

ENGINEERED IN YUYAO · DELIVERED WORLDWIDE

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PRODUCT GALLERY · FIVE PLATES · PAGES 17–21

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THIS EDITION

English translation of the Lingqi electronic catalogue. Text, tables and captions translated from the Chinese original; product photography is the manufacturer's own.

PRODUCTS

Pages 16–44 group fasteners by the application they serve. Pages 17–21 are the twelve-up gallery plates; each family that follows lists the sizes, property classes and finishes available as standard.

TECHNICAL DATA

Pages 46–53 give the standards matrix, material classes, specification method, tightening torque and channel-system data.

Page numbers refer to this English edition. Dimension sheets, drawings and samples are available on request.

SUPPLIER SNAPSHOT

One qualified source for critical fastening.

LQ · EST. 2005
YUYAO · NINGBO · CHINA

Ningbo Lingqi Hardware Industry Co., Ltd., located in Hemudu Town, Yuyao City, specializes in the production of high-strength, fatigue-resistant and highly corrosion-resistant T-bolts. The company also manufactures a wide range of fasteners, stamped parts and custom non-standard components — covering sizes from M5 to M90 and lengths from 20 mm to 3000 mm — with an annual output exceeding 12 million units.

Products are manufactured in compliance with DIN, EN, ISO, ANSI, BS, JIS and GB standards. The company holds ISO 9001, ISO 14001, ISO 45001 and IATF 16949 certification, and supplies railway, metro, construction, automotive, wind-energy and industrial-equipment customers in more than twenty countries.

HEAVY-DUTY ANTI-CORROSION
FATIGUE-RESISTANT
HIGH-STRENGTH T-BOLTS
STAMPED PARTS
PER-DRAWING CUSTOM PARTS







SUPPLIER	**Ningbo Lingqi Hardware Industry Co., Ltd.** — Hemudu Town, Yuyao City, Ningbo, Zhejiang, China
CORE PRODUCTS	Heavy-duty anti-corrosion, fatigue-resistant, high-strength T-bolts; fasteners; stamped parts and custom non-standard components
SIZE RANGE	M5 – M90 | length 20 mm – 3000 mm | property classes 4.6 – 12.9, A2-50/70, A4-50/80
STANDARDS	DIN · EN · ISO · ANSI · BS · JIS · GB
CERTIFICATES	ISO 9001:2015 | ISO 14001 | ISO 45001 | IATF 16949
CAPACITY	Over 12 million sets per year
SPECIALTY	Custom high-strength fatigue-resistant bolts (3 million cycles servo-hydraulic / 6 million cycles high-cycle); stamped hinges per drawing

01 · COMPANY PROFILE

Built for safety-critical fastening.

Ningbo Lingqi Hardware Industry Co., Ltd. is an R&D-driven manufacturer of special bolts and high-end components for nuclear power, high-speed rail and metro applications — sectors where safety class and fatigue performance are non-negotiable.

Through long-term cooperation with universities and research institutes, and more than a decade of in-house development, Lingqi has achieved a major breakthrough in fatigue resistance and anti-loosening performance, with fatigue life verified beyond **6 million cycles** — a domestic leading level. Our bolts reach **QA1 grade** and have entered the key component supply chains of nuclear power and high-speed train programmes, breaking the former monopoly of imported parts.

Founded in June 2005 on a 7,000 m² site in Hemudu Town, Yuyao City, the company produces T-bolts and non-standard bolts in sizes from **M5 to M90** and lengths from **20 mm to 3000 mm**, with annual output exceeding **12 million units**. Property classes 4.6, 4.8, 5.6, 6.8, 8.8, 10.9 and 12.9 are available as standard, together with A2-50, A4-50, A2-70 and A4-80 stainless grades.







2005	7,000 m²	12 M+	M5–M90	3000 mm
FOUNDED	MANUFACTURING SITE	UNITS PER YEAR	THREAD RANGE	MAXIMUM LENGTH

Core competence. High-strength T-bolts · fatigue-resistant connection bolts · heavy-duty anti-corrosion fasteners · anti-loosening nuts and washers · stamped parts and hinges · custom non-standard components to drawing.

02 · TECHNOLOGY, IP & PARTNERSHIPS

Engineering depth, not just capacity.

Lingqi invests continuously in technical accumulation, process innovation and intellectual-property management. The company holds a registered national trademark together with a portfolio of utility-model and invention patents covering bolt geometry, thread-root design, anti-loosening structures and heat-treatment processes.

As a member unit of SAC/TC 85 — the national technical committee for fasteners — Lingqi leads or participates in the drafting of industry and national standards, and has been recognised as a **National Science & Technology SME** and a **National High-Tech Enterprise**.







Long-term supply relationships

Würth (Germany) · Bufab (Sweden) · Pandrol (France)
China Railway Group (CREC) · China Railway Construction (CRCC)
CRRC · Gem-Year Group

QA1 GRADE

Safety-class bolting

Qualified for nuclear-power and high-speed-train programmes — the highest domestic performance class for safety-critical bolted joints.

SAC/TC 85

Standard drafting

Member unit of the national fasteners standardisation committee; co-author of industry and national standards.

IN-HOUSE R&D

Design to drawing

Reverse engineering, material selection, forming and heat-treatment development, fatigue validation and PPAP documentation.

03 · MANUFACTURING

From wire rod to validated joint.





01
Cold heading & hot forging
Multi-station cold formers and hot forging for T-heads, square heads and special geometries up to M90.

02
Thread rolling
Rolled threads (6g/6h) for superior fatigue strength compared with cut threads.

03
Heat treatment
Computer-controlled quenching and tempering to achieve 8.8, 10.9, 12.9 and QA1 property levels.

04
Surface finishing
Zinc plating, zinc flake, hot-dip galvanising, DACROMET-type coatings, stainless passivation.

05
Inspection & test
Dimensional, mechanical, hardness, torque and fatigue testing; third-party verification on request.

06
Sorting & packing
Optical sorting, counting, customer-specific packaging and labelling with full traceability.

WIRE ROD	FORMING	THREADING	HEAT TREATMENT	COATING	INSPECTION	PACKING

Equipment includes multi-station cold headers, thread rollers, continuous mesh-belt hardening and tempering lines, automatic plating and coating lines, optical sorting machines and a fully equipped mechanical and fatigue laboratory. Process parameters are locked per part number and audited internally each shift.

04 · WHY LINGQI

Six reasons customers qualify us.

01

High strength

Property classes from 4.6 to 12.9 and QA1-grade special bolting. Alloy-steel grades with controlled chemistry and heat treatment deliver consistent proof load and tensile strength.

02

Fatigue resistance

Custom high-strength fatigue-resistant bolts verified at 3 million cycles on servo-hydraulic test rigs and 6 million cycles in high-cycle resonance testing.

03

Heavy-duty anti-corrosion

Coating systems matched to ISO 12944-2 corrosivity categories C1 to CX: hot-dip galvanising, zinc flake, zinc plating and stainless A2/A4.

04

T-bolts M5–M90

T-head, double-rib, hammer-head, hook-head and multi-tooth geometries, 20–3000 mm long, for embedded channels, rail fastening and machine building.

05

Stamped parts & hinges

Progressive-die stamping, bending, riveting and assembly — stamped hinges and brackets manufactured to drawing, with tooling developed in-house.

06

Certified system

ISO 9001:2015, ISO 14001, ISO 45001 and IATF 16949 management systems, PPAP documentation and full batch traceability.



> "Heavy-duty anti-corrosion, fatigue-resistant, high-strength T-bolts — engineered, tested and documented as one system."

Over 12 million sets per year · M5–M90 · 20–3000 mm · DIN / EN / ISO / ANSI / BS / JIS / GB

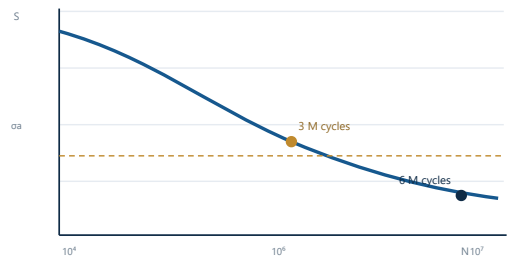
05 · FATIGUE ENGINEERING

Six million cycles, verified on production bolts.

Fatigue is the failure mode that decides whether a bolted joint survives a rail vehicle's service life. Lingqi treats it as a design parameter — not a final inspection item.

Thread geometry, thread-root radius, material cleanliness, forging flow lines and heat treatment are controlled together, then validated on two complementary test regimes: axial load cycling on **servo-hydraulic test rigs** for production qualification, and **high-cycle resonance testing** for development and grade approval.

SCHEMATIC S–N BEHAVIOUR · ROLLED THREAD



SERVO-HYDRAULIC

3,000,000

CYCLES · PRODUCTION QUALIFICATION

HIGH-CYCLE

6,000,000

CYCLES · DEVELOPMENT APPROVAL



Bolts are graded **QA1** for safety-critical joints in nuclear power and high-speed train applications. Test reports are retained per batch and can be issued with the shipment.

TEST BASIS

Fatigue testing to GB/T 13682 (ISO 3800) and GB/T 3075 (ISO 1099); transverse vibration to GB/T 10431 / DIN 65151.

JOINT DESIGN

Preload, thread engagement and bearing area are specified for each joint; we support customers with torque and clamp-load calculations.

DOCUMENTATION

Fatigue report, hardness traverse, decarburisation depth and S–N data retained per batch and issued with the inspection package.

06 · CORROSION PROTECTION

Specified by environment, not by habit.

Lingqi recommends the coating system from the corrosivity category of the installation site, following ISO 12944-2 and EN ISO 10025. Where a project specifies a different system, we manufacture to the customer's specification and document every process step.

Cat.	Corrosivity	Typical environment	Recommended Lingqi finish	Typical use
C1	Very low	Heated buildings, clean interiors; low-pollution rural areas	Zinc plating · light oil	Indoor, dry
C2	Low	Unheated buildings, rural and low-humidity atmospheres	Zinc plating (YZ) · zinc flake	Sheltered outdoor
C3	Medium	Urban and industrial atmospheres, moderate SO_2; production areas with high humidity	Zinc flake · DACROMET-type · HDG	Coastal-free outdoor
C4	High	Industrial areas, coastal areas with moderate salinity	HDG (ISO 1461) · zinc flake, multi-layer	Chemical, coastal
C5	Very high	Industrial areas with high humidity and aggressive atmosphere; coastal with high salinity	HDG + duplex coating · heavy zinc flake	Offshore, salt works
CX	Extreme	Offshore, tropical, extreme humidity and salinity	Duplex HDG · stainless A4 / 316L · HCR	Marine, offshore

Finish codes used in ordering

Code	Finish	Standard	Characteristics
ZP	Zinc plating	ISO 4042 / GB/T 5267.1	Bright, economical; indoor and light outdoor use
YZ	Zinc flake coating	ISO 10683 / GB/T 5267.2	Thin, hydrogen-embrittlement-free; automotive and rail
HDG	Hot-dip galvanising	ISO 1461 / GB/T 13912	Thick zinc-iron layer; 30–3000 mm parts, heavy-duty outdoor
DAC	DACROMET-type	ISO 10683	High corrosion resistance, no hydrogen embrittlement
A2 / A4	Stainless steel 304 / 316	ISO 3506	A2-50/70, A4-50/80; chemical, marine, food equipment

HCR (high corrosion resistance) stainless grades are supplied to EN ISO 10025 as agreed per project. Salt-spray and cyclic-corrosion testing to ISO 9227 / ISO 12944-6 can be witnessed or reported by accredited third-party laboratories.



HOT-DIP GALVANISED



ZINC FLAKE / DAC-TYPE



STAINLESS A2 / A4



ZINC PLATED

07 · CERTIFICATIONS

Audited systems, documented compliance.

ISO 9001:2015

Quality management

Design, manufacture and supply of fasteners and stamped components.

ISO 14001

Environment

Controlled plating, coating and heat-treatment emissions and waste.

ISO 45001

Occupational safety

Safe operation of forming, heat-treatment and finishing equipment.

IATF 16949

Automotive quality

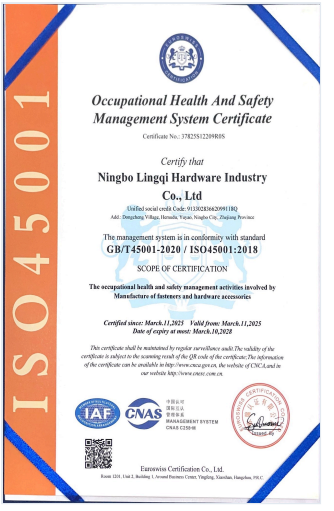
PPAP, APQP, MSA and traceability for automotive customers.



ISO 9001:2015



ISO 14001:2015



ISO 45001:2018



IATF 16949:2016

Additional approvals & recognition

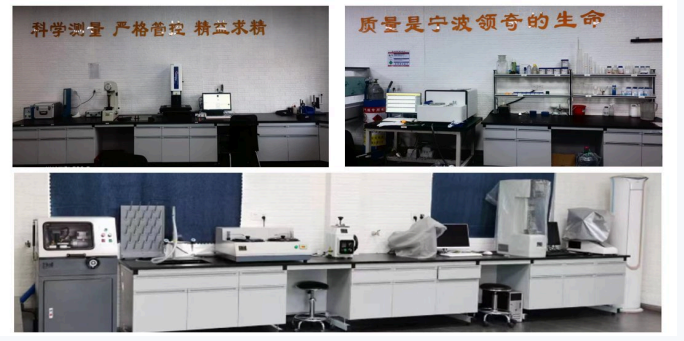
- National High-Tech Enterprise (国家级高新技术企业)
- National Science & Technology SME
- Member unit, SAC/TC 85 — National Technical Committee for Fasteners
- Co-drafting unit of industry and national fastener standards
- Registered national trademark, utility-model and invention patents





08 · LABORATORY & TESTING

Measured before it is shipped.





In-house test capability

· Servo-hydraulic fatigue testing (axial, 3 million cycles)

· High-cycle resonance fatigue testing (6 million cycles)

· Universal tensile and proof-load testing

· Hardness (Rockwell, Vickers, Brinell)

· Metallographic analysis and decarburisation depth

· Optical emission spectrometry (material verification)

· Torque–tension and tightening-torque testing

· Salt-spray and cyclic corrosion testing

· Thread gauging, profile projection, dimensional CMM

Third-party verification

Tensile, fatigue, hardness, metallurgy and coating tests are periodically confirmed by national accredited laboratories, with reports supplied to customers on request. Our records include mechanical-property reports, material certificates (EN 10204 3.1) and coating thickness reports.







3M / 6M	OES	ISO 9227	EN 10204 3.1
FATIGUE CYCLES	MATERIAL VERIFICATION	SALT SPRAY	CERTIFICATES

09 · QUALITY CONTROL

A closed loop, every batch.

1. **Incoming material**
   Wire rod and bar stock received, verified against mill certificates and chemistry.
2. **IQC**
   Incoming inspection — chemistry, dimensions, surface, hardness.
3. **Material issue**
   Batch released to the workshop with a quality-tracking card.
4. **QC plan**
   Control plan and inspection sheet issued per part number.
5. **First-article approval**
   First piece inspected and approved before the batch runs.
6. **Mass production**
   Operating parameters locked; SPC on critical dimensions.
7. **Self-inspection / IPQC patrol**
   Operator checks plus in-process patrol inspection.
8. **Pre-stock FQA**
   Final quality audit before goods enter the warehouse.
9. **OQC before shipment**
   Outgoing inspection, certificate of conformity issued.

Recorded for every batch

Material certificate (EN 10204 3.1) · dimensional and mechanical-property reports · hardness and decarburisation results · coating thickness · fatigue report where specified · certificate of conformity with the shipment.

Non-conforming product

Segregated at the point of detection and dispositioned by sorting / rework, scrap, or a formal quality-exception report with root-cause analysis and corrective action.

Traceability

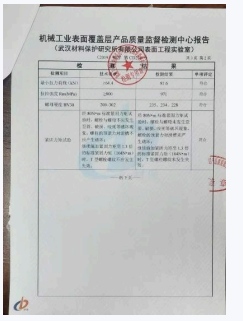
Heat number, production batch, operator, machine and inspection results are linked to the packing label, so any carton can be traced back to its material certificate and process record.

Automotive projects

IATF 16949 discipline applies: APQP planning, PFMEA, control plans, MSA, PPAP submission and IMDS data on request.

PROCEDURE REF. Q/LQ LCT03 · INTERNAL QUALITY CONTROL





10 · CAPACITY & RANGE

One supplier, the whole fastener scope.

Parameter	Range	Remarks
Thread size	M5 – M90 (M5 – M100 on request)	Metric coarse and fine; UNC / UNF / BSW on request
Length	20 mm – 3000 mm	Long parts produced on dedicated hot-forging and rolling lines
Property classes	4.6 · 4.8 · 5.6 · 6.8 · 8.8 · 10.9 · 12.9	QA1 grade for safety-critical joints
Stainless grades	A2-50 / A2-70 (304) · A4-50 / A4-80 (316)	Per ISO 3506
Head forms	T-head · double-rib T · multi-tooth T · hammer-head · hook-head · square · hex	Custom geometries to drawing
Materials	Carbon steel · alloy steel · 304 / 316 stainless · brass · aluminium	With EN 10204 3.1 certificates
Standards	DIN · EN · ISO · ANSI · BS · JIS · GB	Customer standards and drawings
Finishes	ZP · YZ · HDG · DAC · zinc flake · stainless passivation	Selected by corrosivity category
Annual capacity	Over 12 million sets	Multi-station forming, in-house heat treatment
Packing	Cartons, wooden cases, pallets, customer labels	Barcode and batch labelling available



Warehousing & dispatch. Finished goods are stored by part number and batch in a dedicated warehouse; packing lists, certificates of conformity and inspection reports are issued with every shipment, and container loading is photographed before sealing.

FORMING

Multi-station cold headers and hot forging, including heads up to M90 and lengths of 3000 mm.

HEAT TREATMENT

In-house quench-and-temper lines with controlled atmosphere and hardness verification per batch.

FINISHING

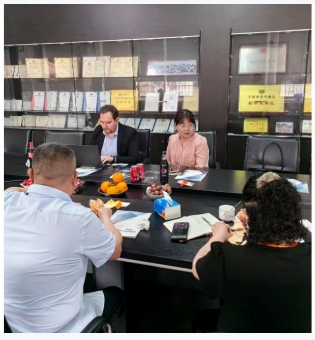
Zinc plating, zinc flake, hot-dip galvanising, DAC-type coatings and stainless passivation.

11 · CUSTOMERS & EXHIBITIONS

Present where the industry meets.







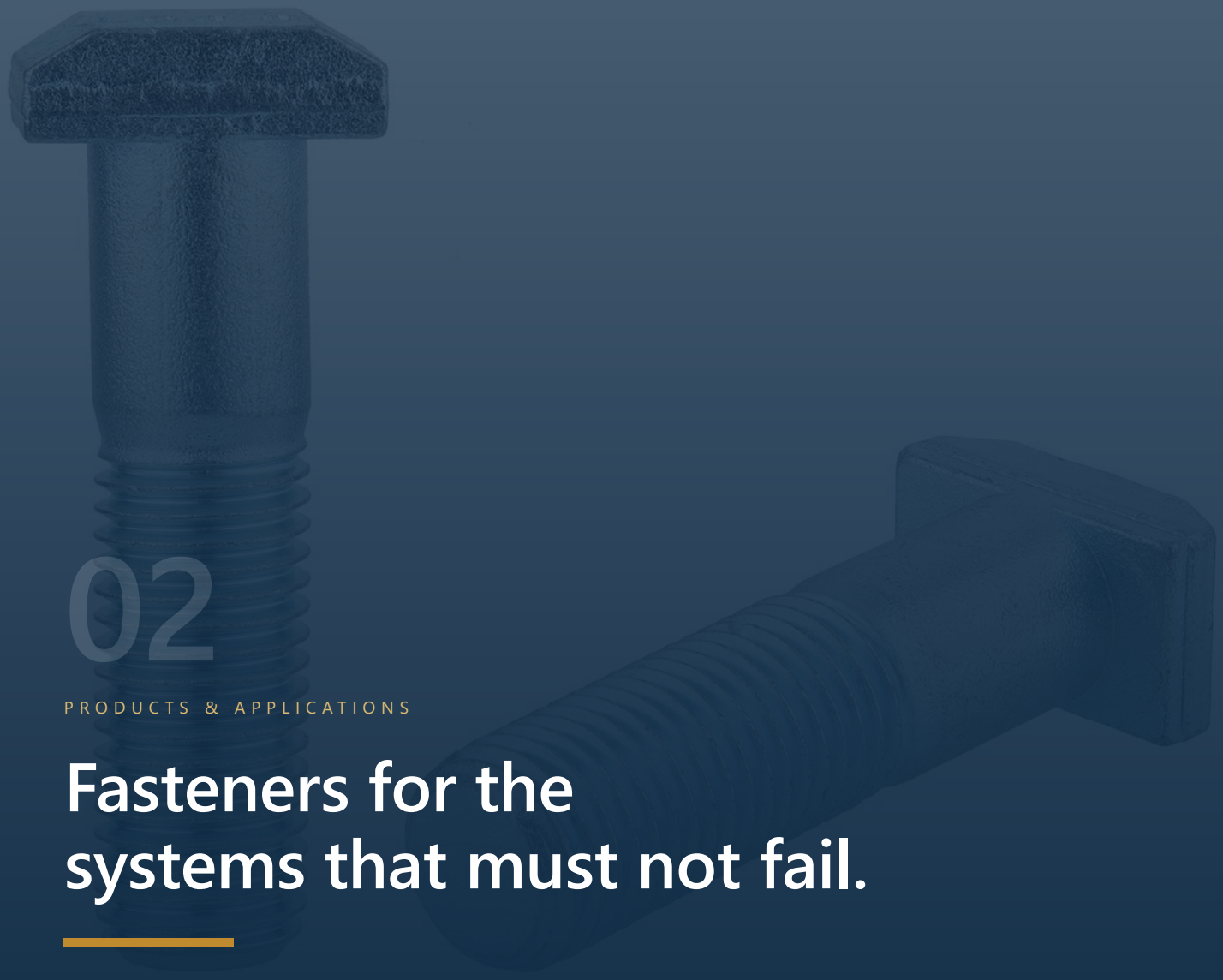
Lingqi exhibits at international fastener and railway technology exhibitions and receives customer audit teams at the Yuyao plant throughout the year. Supplier qualification typically covers a documentation review, a process audit of forming, heat treatment and finishing, and first-article approval against the drawing.

What customers rely on

- Consistent mechanical properties batch to batch
- Fatigue performance proven on production parts
- Coating systems matched to the installation environment
- Non-standard geometries without a second supplier
- Documentation ready for automotive and rail audits

Supplier snapshot

Ningbo Lingqi Hardware Industry Co., Ltd. · Hemudu Town, Yuyao City, Ningbo, Zhejiang, China · ISO 9001:2015 / ISO 14001 / ISO 45001 / IATF 16949 · over 12 million sets per year.



02

PRODUCTS & APPLICATIONS

Fasteners for the systems that must not fail.

T-bolts, special bolts, anti-loosening elements, stamped parts — organised by the application they serve, from high-speed rail to wind turbines.

RAILWAY | METRO & TUNNEL | CONSTRUCTION | AUTOMOTIVE | WIND POWER | INDUSTRY

12 · PRODUCT PORTFOLIO

The full scope in one catalogue.

Lingqi's catalogue is organised around the joint, not around the machine that makes it. Each family below shares the same material, heat-treatment and inspection discipline.

01 · T-bolts — standard, double-rib, multi-tooth, hammer-head, hook-head

02 · Special & non-standard bolts — to drawing, M5–M90

03 · Anti-loosening elements — nuts, washers, locking plates

04 · Track fastening — clip bolts, sleeper screws, embedded channel T-bolts

05 · Construction — anchors, foot pins, channel systems

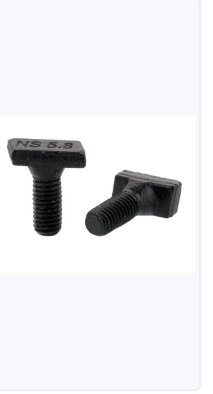
06 · Stamped parts & hinges — progressive-die stamping, assembly

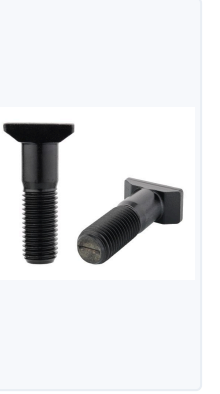
07 · Locks & hardware — skirt locks, cabinet and tool-box locks

08 · Wind & heavy equipment — blade bolts, tower and nacelle fasteners

Sizes M5–M90 · lengths 20–3000 mm · property classes 4.6–12.9 · A2/A4 stainless













T-BOLTS

Embedded channel, rail fastening, machine building — five head geometries.

FATIGUE

3 M servo-hydraulic / 6 M high-cycle validation for safety-critical joints.

CORROSION

HDG, zinc flake, DAC-type and stainless systems to C1–CX.

CUSTOM

Stamped hinges, brackets and assemblies manufactured to drawing.

13 · PRODUCT GALLERY

PLATE 01 / 05

Plain T-bolts, straight off the press.

Twelve head geometries taken from current production in the as-forged finish. Square, serrated, offset, hex-socket and asymmetric heads all share the same rolled-thread discipline — the head form is changed, the material and heat treatment are not.



HEAD FORMS

Square · serrated · offset · socket

THREAD

Rolled 6g / 6h, M5 – M90

CONDITION

As-forged or lightly phosphated

13 · PRODUCT GALLERY

PLATE 02 / 05

Colour that tells the crew which bolt it is.

Green and blue coating systems give site teams a visual check on bolt grade, work zone or trade, and lay a continuous barrier film over the zinc base coat at the same time. Colour is matched to the customer's own reference sample.














GREEN

Grade or zone identification

BLUE

System or trade identification

BUILD-UP

Powder coat over a zinc base

13 · PRODUCT GALLERY

PLATE 03 / 05

Zinc, yellow zinc and bronze tones.

Clear trivalent zinc for general fastening, yellow zinc where a heavier deposit is specified, and bronze-tone plating for visible architectural steelwork. The same finishes run on long-length bolts up to 3000 mm.



CLEAR ZINC
Cr(III) passivation, silver tone

YELLOW ZINC
Heavier deposit, warmer tone

BRONZE TONE
Architectural, exposed steel

13 · PRODUCT GALLERY

PLATE 04 / 05

The other half of the channel joint.

Spring-loaded channel nuts, serrated-head T-bolts for toothed profiles, and hammer-head bolts supplied pre-assembled with washer and nut so the installer handles one part instead of four.














CHANNEL NUTS

M6 – M30, plain or spring

SERRATED HEAD

Engages LXM toothed profiles

PRE-ASSEMBLED

Bolt + washer + nut, pre-set

13 · PRODUCT GALLERY

PLATE 05 / 05

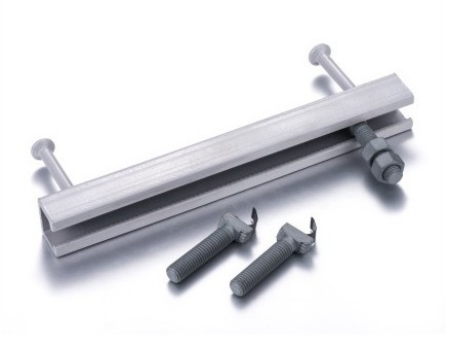
Headed shear studs and cast-in assemblies.

Headed shear studs for composite steel–concrete floors and bridge decks, welded T-head assemblies for precast segments, and cast-in channel sets supplied ready to embed in tunnel linings.

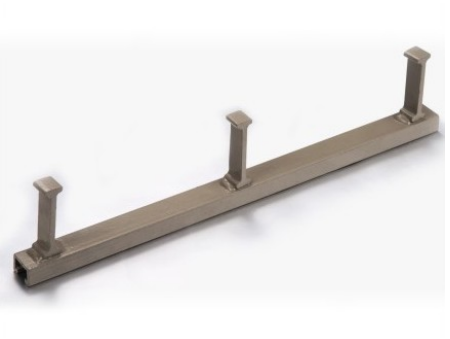
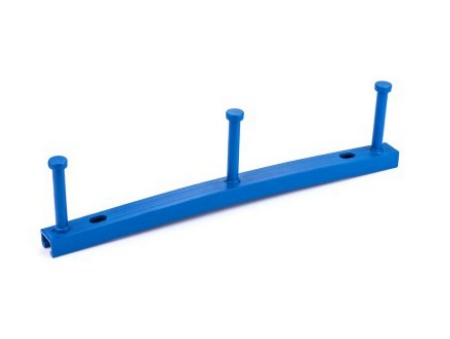










SHEAR STUDS
GB/T 10433 · EN ISO 13918

ASSEMBLIES
Stud bars welded to drawing

CHANNEL SETS
Channel + anchors + T-bolts

14 · RAILWAY

Rail & rolling stock

Components qualified for high-speed EMUs, intercity trains, metro vehicles and freight wagons.

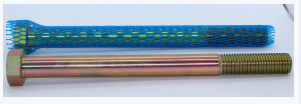
Railway bolting demands more than strength: joints in running gear, equipment cabins and skirt panels see sustained vibration, stone impact, brake dust and wash-down cycles. Lingqi supplies fatigue-resistant connection bolts, anti-loosening nuts, special T-bolts and hardware as one qualified family, with property levels and coatings selected per joint.

Parts are manufactured to CRRC drawings and to DIN, EN and GB standards, with first-article approval, batch traceability and fatigue test reports available for the safety-relevant items.

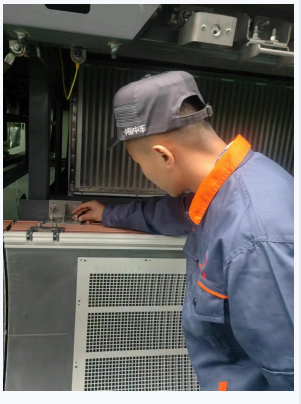
- Fatigue-resistant bolts for running gear and bogie frames
- Equipment-cabin and skirt-panel fastening sets
- Anti-loosening nuts, washers and locking plates
- Skirt locks, cabinet locks and tool-box locks

APPLICATIONS	EMU · metro · locomotive · freight wagon
PROPERTY CLASSES	8.8 · 10.9 · 12.9 · A2-70 · A4-80
FINISHES	Zinc flake · HDG · DAC-type · stainless
VALIDATION	3 M / 6 M cycle fatigue, salt spray





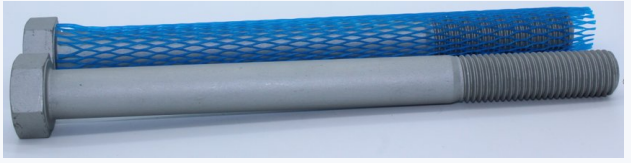




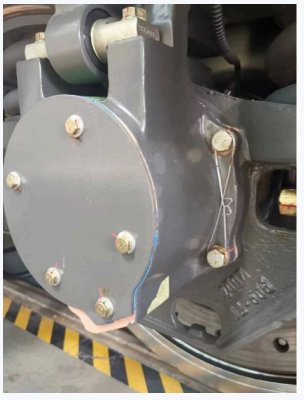


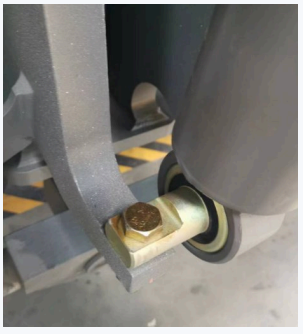
15 · RAILWAY

Bogie & running gear











Fatigue-resistant connection bolts where dynamic load and safety class meet.

Bogie frames, axle-box housings, brake calipers and suspension brackets are assembled with high-strength bolts whose failure mode is fatigue, not static overload. Lingqi controls thread-root geometry, forging flow lines and decarburisation depth, then verifies the finished part on servo-hydraulic rigs to **3 million cycles** and in high-cycle resonance testing to **6 million cycles**.

- Long bolts with rolled thread over the full shank
- Controlled decarburisation and surface integrity
- Property classes 10.9 and 12.9, QA1 grade on request
- Coating systems free of hydrogen embrittlement risk

THREAD	M8 – M30 (larger on request)
LENGTH	up to 3000 mm
FATIGUE	3 M / 6 M cycles
STANDARDS	DIN 931/933 · EN 14399 · CRRC drawings

16 · RAILWAY

Equipment cabin & skirt panels



Fastening and locking hardware for aerodynamic covers, equipment cabins and skirt panels.

Skirt panels and equipment cabins are removable bodywork: the fastener must hold under vibration and aerodynamic load, yet release quickly during maintenance. Lingqi supplies quarter-turn locks, captive fasteners, special T-bolts and spring-loaded components with anti-rattle geometry, in stainless and coated steel to resist wash-down and de-icing salt.

- Skirt locks, retaining catches and hinges
- Captive and quick-release fasteners
- Stainless A2/A4 for wash-down zones
- Tested for vibration loosening and salt spray

MATERIALS	Carbon steel · A2 · A4
FINISHES	Zinc flake · DAC-type · passivated
FUNCTION	Quick release, anti-rattle, lockable









17 · RAILWAY

Anti-loosening nuts & skirt locks

Thread-locking elements that keep a preloaded joint preloaded.

A bolt only performs if the joint keeps its clamp load. Lingqi's anti-loosening nuts use all-metal locking geometries — no nylon insert, no adhesive — so performance is unaffected by temperature, lubricant or service life. The same principle is applied to skirt locks and bodywork catches, where vibration plus repeated opening cycles normally destroys conventional hardware.

- All-metal prevailing-torque locknuts, reusable
- Flange nuts and serrated locknuts
- Skirt locks with defined opening force
- Property classes 8.8 – 12.9, A2/A4

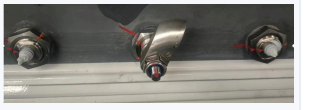
THREAD	M6 – M39
STANDARD	ISO 7042 · DIN 980 · DIN 6923
REUSE	Multiple assembly cycles
TEMPERATURE	Unaffected by −40 °C to +120 °C











18 · RAILWAY

Cabinet & tool-box locks









Locks and latches for control cabinets, tool boxes and access doors on locomotives.

Rolling stock carries dozens of access points: control cabinets, battery boxes, tool lockers and inspection doors. Lingqi manufactures the lock bodies, cams, keepers and mounting hardware as a matched set, with keyed or quarter-turn operation and vibration-proof latching.

- Quarter-turn and keyed variants
- Zinc-die-cast or stainless bodies
- Matched cams, keepers and gaskets
- Supplied as kits for line-side replacement

BODY	Zinc die-cast · stainless
ACTUATION	Quarter-turn · keyed · T-handle
CAM	Straight · offset · adjustable
SEALING	Optional IP-rated gasket
FINISH	Chrome · black powder · passivated

19 · RAILWAY

Non-standard T-bolts for locomotives

T-head geometry developed from the joint backwards.

When a standard T-bolt will not fit the channel, the head has to change: neck height, rib position, head width and thread run-out all affect clamp load and fatigue life. Lingqi develops non-standard T-bolts from the customer's channel section and load case, then proves the geometry on production parts.

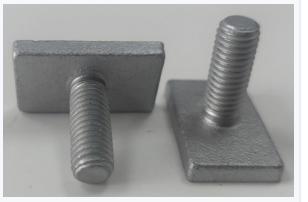
Custom high-strength fatigue-resistant bolts are validated at 3 million cycles on servo-hydraulic equipment and 6 million cycles in high-cycle resonance testing.

- Head geometries: double-rib, multi-tooth, hammer, hook
- Thread M6 – M30, length up to 3000 mm
- Property classes 8.8 / 10.9 / 12.9 and A4-80
- Forged head-to-shank transition for fatigue life

HEAD	T · double-rib · multi-tooth
THREAD	M6 – M30
LENGTH	25 – 3000 mm
GRADE	8.8 · 10.9 · 12.9 · A4-80











Custom high-strength fatigue-resistant bolts: 3 million cycles servo-hydraulic / 6 million cycles high-cycle.

20 · RAILWAY

Fatigue-resistant special bolts











Skirt-panel and bodywork bolts engineered against vibration.

Body-mounted components are the harshest location on a train: alternating aerodynamic load, stone impact and constant micro-vibration. These special bolts combine a forged, generously radiused head transition with a rolled thread and a defined preload, and are supplied with matched anti-loosening elements.

- Optimised shank-to-head radius
- Rolled thread, Class 6g
- Defined tightening torque and preload
- Zinc flake or stainless finish

THREAD	M8 – M24
GRADE	10.9 · 12.9
FATIGUE	3 M / 6 M cycles verified
COATING	Zinc flake · A4

21 · RAILWAY

Freight & diesel locomotive

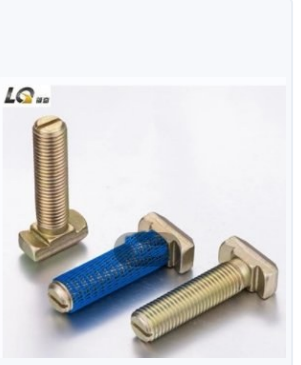
Heavy-duty bolting for freight wagons, couplers and diesel-electric locomotives.

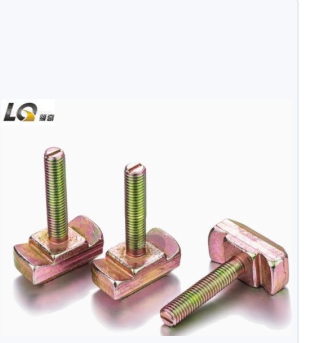
Freight service trades speed for load: couplings, brake rigging, wagon bodies and bogie components work at high static stress with shock loading. Lingqi supplies large-diameter special bolts, U-bolts, T-bolts and long connection bolts in 8.8 and 10.9, hot-dip galvanised or zinc-flake coated for decades of outdoor service.

- Large diameters up to M90
- Hot-dip galvanised to ISO 1461
- U-bolts, eye bolts and special shapes
- Long lengths up to 3000 mm

DIAMETER	M16 – M90
GRADE	8.8 · 10.9
FINISH	HDG · zinc flake · DAC-type
STANDARDS	GB · DIN · customer drawing





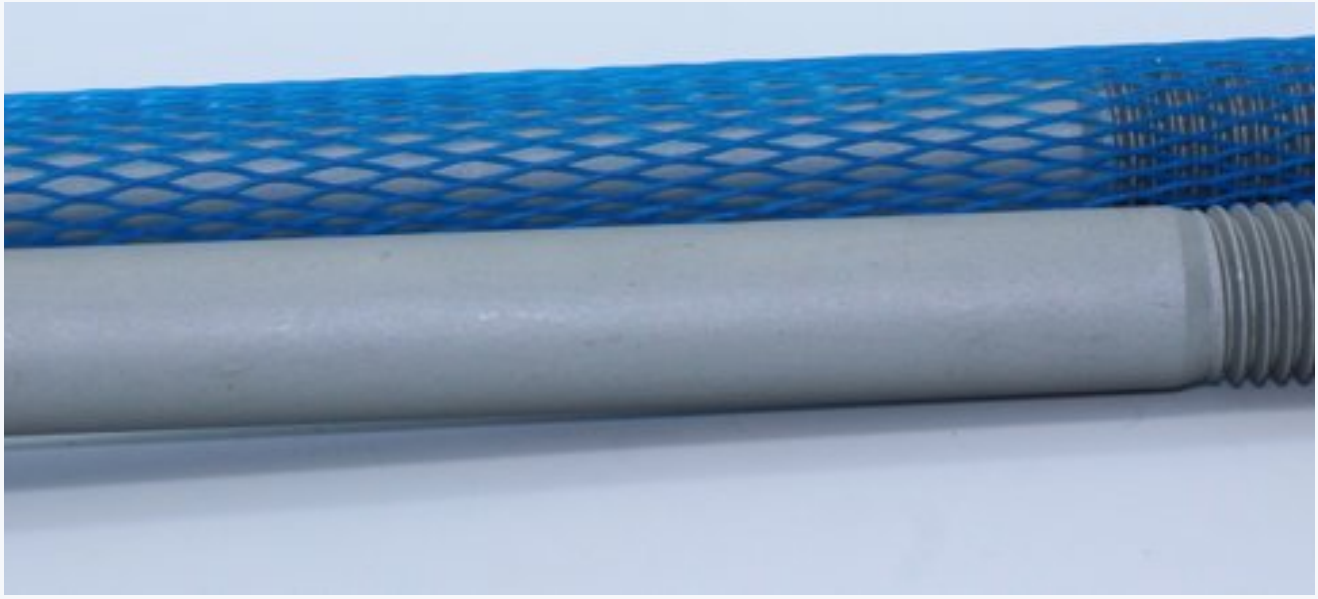






22 · RAILWAY

Extra-large & extra-long bolts



The parts other suppliers decline.

Long bolts are a forming problem before they are a threading problem. Lingqi hot-forges the head, rolls the thread and controls straightness over lengths up to **3000 mm**, then heat-treats in fixtures that limit distortion. The result is a straight, fully threaded part with consistent mechanical properties along its whole length.

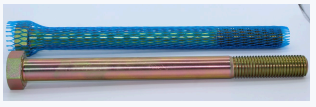
- Lengths up to 3000 mm, diameters to M90
- Hot-forged heads, rolled threads
- Straightness controlled through heat treatment
- Full-length mechanical property verification

LENGTH	up to 3000 mm
DIAMETER	M20 – M90
STRAIGHTNESS	controlled per drawing
GRADE	8.8 · 10.9 · 12.9









23 · T-BOLT SERIES

Standard T-bolt series











DIN 186, DIN 188, DIN 787 and GB/T 37 — held in tooling, ready to run.

Standard T-bolts are the working horses of embedded-channel and machine-bed fastening. Lingqi manufactures the full DIN 186 / DIN 188 / DIN 787 and GB/T 37 series, plus the LQ series with double-rib and multi-tooth heads for higher pull-out resistance in concrete anchors.

Dimensions and available lengths for the LQ series are given in the technical-data section (page 46 onwards); DIN and GB dimensions follow the published standards.

- DIN 186 · DIN 188 · DIN 787 · GB/T 37
- LQ double-rib (LQB) and multi-tooth (LQA) series
- Length 20 – 3000 mm, thread M6 – M30
- Zinc plating, zinc flake, HDG or stainless

STANDARDS	DIN 186/188/787 · GB/T 37
THREAD	M6 – M30
LENGTH	20 – 3000 mm
GRADE	4.6 – 12.9 · A2/A4

24 · INFRASTRUCTURE

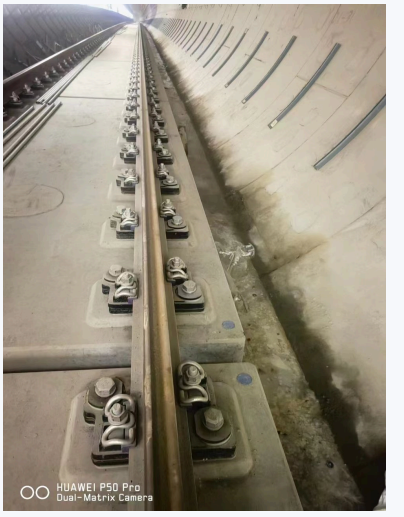
Track fastening systems

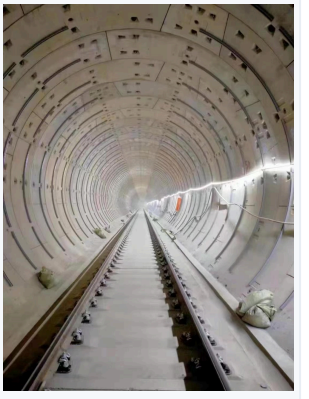
Fastening for slab track, ballasted track, embedded channels and pre-embedded anchors.

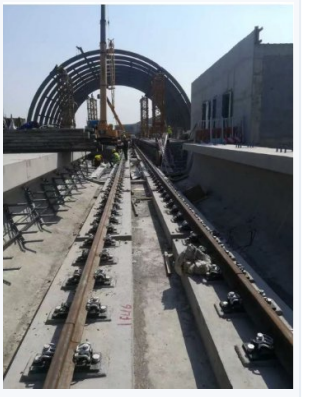
Track fastening transfers dynamic wheel load into the structure while maintaining gauge and electrical isolation. Lingqi supplies the bolted elements of the system: T-bolts for embedded channels, clip bolts, sleeper screws, shoulder bolts and the anti-loosening hardware that keeps them in place under millions of load cycles.

- Embedded-channel T-bolts (hammer-head, double-rib)
- Clip bolts and rail-pad fasteners
- Sleeper screws and dowels
- Anti-loosening washers and locknuts

THREAD	M8 – M24
GRADE	8.8 · A4-70/80
FINISH	HDG · zinc flake · stainless
STANDARDS	EN 13481 · GB/T · customer spec











25 · INFRASTRUCTURE

Rail clip bolts & sleeper screws











High-volume track hardware, produced on dedicated lines.

Rail clip bolts, sleeper screws, spike-type dowels and pad-retaining bolts are consumables in track construction — millions of pieces with no tolerance for variation. Lingqi runs these on dedicated high-speed lines with in-process SPC, and supplies them hot-dip galvanised or zinc-flake coated for coastal and tunnel environments.

- Clip bolts for elastic fastening systems
- Sleeper screws with rolled wood or concrete thread
- Spike and dowel variants
- HDG or zinc flake, salt-spray verified

THREAD	M8 – M24 · special wood thread
LENGTH	40 – 300 mm
GRADE	4.6 · 8.8 · A4
CAPACITY	high-volume dedicated lines

26 · INFRASTRUCTURE

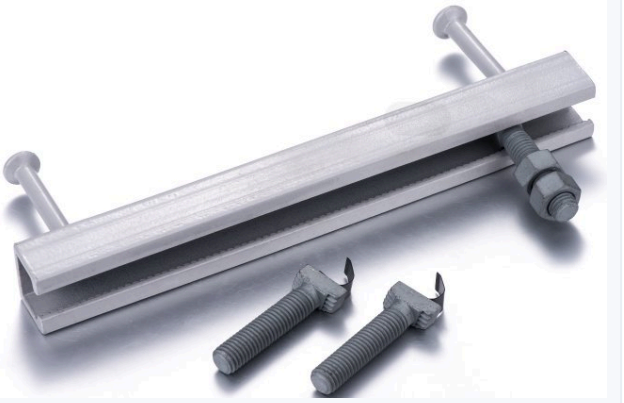
Metro & utility tunnels

Corrosion-resistant fastening for metro tunnels, utility tunnels and pipe galleries.

Tunnels are permanently damp and often chemically aggressive — the classic C4/C5 environment. Lingqi supplies hot-dip galvanised and stainless T-bolts, bracket bolts and channel systems for cable trays, pipes, ventilation and signage, with coating systems chosen for the measured corrosivity of the tunnel.

- HDG and A4 stainless as standard options
- Channel T-bolts for adjustable supports
- Bracket and hanger assemblies
- Coating selected per ISO 12944-2

THREAD	M8 – M20
FINISH	HDG · A4-70/80 · zinc flake
ENVIRONMENT	C4 – C5 (ISO 12944-2)
ACCESSORIES	channels, brackets, locking plates











27 · CONSTRUCTION

Precast construction & anchors



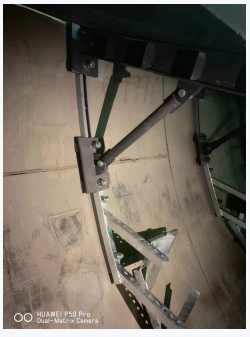
Anchors, foot pins and connection bolts for precast and modular construction.

Precast elements are connected on site, in the rain, with limited access — so the fastener must be forgiving and verifiable. Lingqi manufactures anchor bolts, foot pins, lifting-point hardware and connection bolts for precast columns, beams and façade panels, with hot-dip galvanising or zinc flake for external exposure.

- Anchor bolts and cast-in studs
- Foot pins and spherical-head anchors
- Lifting and handling hardware
- HDG to ISO 1461 for external elements

DIAMETER	M8 – M36
GRADE	4.6 · 8.8 · 10.9
FINISH	HDG · zinc flake
STANDARD	EN 1992-4 / customer drawing









28 · CONSTRUCTION

Embedded channel T-bolts

Hammer-head and hook-head bolts for cast-in and surface-mounted channels.

Embedded channels allow services to be fixed after the concrete has cured. The bolt must enter the channel, rotate 90° and lock — reliably, every time, with a defined pull-out resistance. Lingqi supplies the LQ series in five head geometries, matched to the channel profile and to the required load class.

- Hammer-head (LQE), hook-head (LQD), double-rib (LQB), multi-tooth (LQA)
- Length 15 – 400 mm for channel systems
- Hot-dip galvanised, zinc flake or A4
- Matched locking plates and channel nuts

THREAD	M6 – M30
LENGTH	15 – 400 mm
FINISH	HDG · zinc flake · A4
LOAD DATA	see technical section











Channel compatibility: 40/22 · 50/30 · 52/34 · 53/34 · 55/42 · 72/48 profiles, plus Halfen-compatible sections and customer-specific channels. Head width and hook thickness are matched to the channel drawing before tooling is released.

29 · CONSTRUCTION

Locking plates & special nuts











Channel locking plates, hammer-head nuts and anti-turn elements.

A channel system is only as good as its locking detail. Lingqi produces hook-type locking plates, hammer-head nuts, channel nuts with springs and serrated locking plates that prevent rotation under vibration — including Halfen-compatible geometries.

- Hook-type and serrated locking plates
- Hammer-head channel nuts
- Spring-loaded and anti-turn variants
- Halfen-compatible and custom geometries

THREAD	M6 – M20
MATERIAL	ZP steel · A4 stainless
FUNCTION	anti-rotation · anti-loosening
COMPATIBILITY	Halfen · LQ channels

30 · APPLICATIONS

T-bolt application scenes



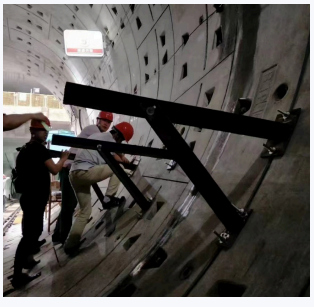
Where Lingqi T-bolts are working today.

The same T-bolt family serves tunnel linings, curtain walls, machine beds, crane rails and solar mounting structures. Because the head geometry is developed from the channel and the load case, one part number can replace a fabricated bracket — and installation becomes a single quarter-turn.

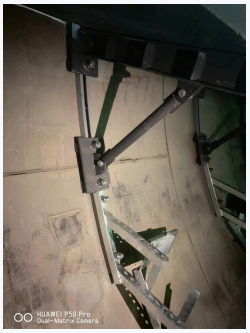
- Curtain wall and façade brackets
- Tunnel lining and segment connections
- Machine beds and crane rails
- Solar and mounting structures

TYPICAL JOINTS	channel-to-structure, bracket-to-concrete
LOAD DIRECTION	tension, shear, combined
INSTALLATION	quarter-turn, adjustable along channel









31 · AUTOMOTIVE

Truck & commercial vehicle

T-bolts and special fasteners for truck bodies, trailers and chassis.

Truck body builders need adjustable, reusable connections along a rail: T-bolts running in aluminium or steel profiles hold side panels, tarpaulin frames, tool boxes and refrigeration units. Lingqi supplies zinc-flake coated T-bolts in 8.8 and 10.9, with head widths matched to the profile and lengths from 25 to 300 mm.

- T-bolts for body-builder profiles
- Zinc flake coating for painted assemblies
- Property classes 8.8 and 10.9
- IATF 16949 documentation on request

THREAD	M8 – M16
LENGTH	25 – 300 mm
GRADE	8.8 · 10.9
FINISH	Zinc flake · ZP





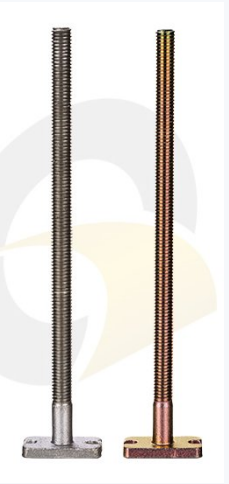






32 · AUTOMOTIVE

Automotive non-standard parts











Cold-formed and machined components for automotive assemblies.

Under IATF 16949, Lingqi produces non-standard bolts, studs, sleeves, nuts and small assemblies for automotive and off-highway applications — with APQP planning, PFMEA, control plans, MSA studies and PPAP submissions aligned to the customer's programme timing.

- Cold-formed specials and machined parts
- Assemblies with captive washers or seals
- PPAP level 3 documentation
- Zinc flake, geomet-free and painted finishes

PROCESS	cold forming · machining · assembly
MATERIAL	carbon · alloy · stainless
QUALITY	IATF 16949 · PPAP · MSA
VOLUME	serial production

33 · INDUSTRY

Agricultural machinery & smart parking



Wear-resistant hardware for farm equipment and automated parking systems.

Agricultural implements and automated parking systems share a requirement: parts that survive outdoor conditions and constant cycling with minimal maintenance. Lingqi supplies plough bolts, shares, linkage pins, chain components and drive hardware in heat-treated alloy steel, plus galvanised structural fasteners for parking-system frames.

- Plough bolts and implement hardware
- Linkage pins and bushings
- Galvanised structural fasteners
- Heat-treated wear parts

MATERIAL	heat-treated alloy steel
FINISH	HDG · zinc flake · bare oiled
APPLICATIONS	tillage · linkage · parking frames









34 · ENERGY

Wind power

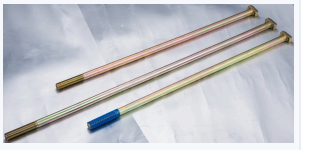
Blade, tower and nacelle fastening for onshore and offshore turbines.

Wind fastening is dominated by two failure modes: fatigue and corrosion. Blade-root bolts see hundreds of millions of load cycles over a 25-year design life, and tower bolts face C5-M marine atmosphere offshore. Lingqi supplies large-diameter blade bolts, tower connection bolts, T-bolts for internal components and matched nuts, with HDG or zinc-flake systems and full mechanical-property documentation.

- Blade-root and tower connection bolts
- Large diameters, long lengths
- HDG and zinc-flake systems for C5-M
- Impact-tested at low temperature on request

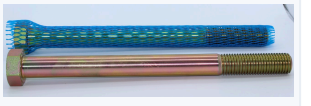
DIAMETER	M20 – M64 (M90 on request)
LENGTH	up to 3000 mm
GRADE	10.9 · 12.9
CORROSION	HDG · zinc flake · C5-M











35 · CAPABILITY

Stamped parts & hinges, per drawing.

Not every fastening problem is a bolt. Lingqi operates progressive-die presses, bending and riveting equipment to produce stamped brackets, clips, retainers and **hinges manufactured to drawing** — including hinge leaves, knuckles and pins supplied as assembled units.

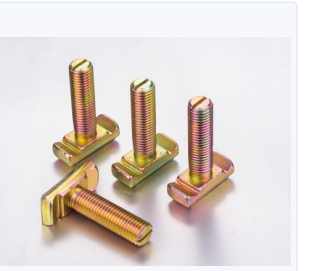
Tooling is developed in-house from the customer's 2D/3D data, with sample parts produced for fit-and-function approval before serial release. Parts can be supplied plain, zinc-plated, zinc-flake coated or stainless, and packed as kits with the mating fasteners.

- Progressive-die stamping, blanking, bending and forming
- Stamped hinges: leaves, knuckles, pins, assembled and tested
- Brackets, clips, retainers and mounting plates
- Riveting, spot welding and sub-assembly
- Material thickness 0.5 – 6 mm, carbon steel, stainless, aluminium

Why it matters

One supplier for the bolt, the bracket and the hinge means one tolerance chain, one inspection report and one shipment — instead of three suppliers blaming each other for a fit problem.











Stamped hinges per drawing — developed from customer 2D/3D data, sampled for fit and function, then released to serial production with dimensional reports.

36 · CUSTOM ENGINEERING

From drawing to serial supply.

1. **Requirement review**
   Drawing, standard reference or sample; load case, environment and annual volume.
2. **Design & feasibility**
   Material and property class, head geometry, thread, coating, tolerance chain.
3. **Tooling & sampling**
   Dies, forging or stamping tooling, first samples with dimensional report.
4. **Validation**
   Mechanical properties, hardness, torque, fatigue and corrosion testing as specified.
5. **Approval**
   First-article inspection, PPAP where required, packaging and labelling agreed.
6. **Serial production**
   Locked process parameters, SPC, batch traceability, scheduled deliveries.







Send a drawing, a sample or a standard reference — we will confirm material, property class, coating and the closest existing tooling before quoting.

WHAT WE NEED

Drawing (2D/3D) or sample · standard reference · property class · coating · annual volume · delivery point.

WHAT YOU GET

Feasibility review · material and process proposal · quotation with tooling cost · sample parts and first-article report.

SERIAL SUPPLY

Locked process parameters · SPC on critical dimensions · batch traceability · scheduled deliveries.

03

TECHNICAL DATA

The numbers behind the catalogue.

Standards and equivalent specifications · materials and property classes · specification and ordering · tightening torque · anchor-channel system data.

37 · STANDARDS

Executed to standard — and its international equivalent.

#	Product execution standard / referenced standard	Chinese national / industry standard	Equivalent
1	Mechanical properties — bolts, screws and studs	GB/T 3098.1-2010	ISO 898-1:1999
2	Mechanical properties — nuts, coarse thread	GB/T 3098.2-2010	ISO 898-2:1988
3	Mechanical properties — stainless bolts, screws and studs	GB/T 3098.6-2014	ISO 3506-1:1997
4	Mechanical properties — prevailing-torque hexagon locknuts	GB/T 3098.9-2002	ISO 2320:1997
5	Mechanical properties — nut proof-load / widening test	GB/T 3098.14-2000	ISO 10484:1997
6	Mechanical properties — stainless steel nuts	GB/T 3098.15-2000	ISO 3506-2:1997
7	Hydrogen embrittlement — preload test, parallel bearing	GB/T 3098.17-2000	ISO 15330:1999
8	Thread run-out, shoulder distance, undercut, chamfer	GB/T 3-1997	—
9	Metric thread — basic dimensions	GB/T 196-2003	ISO 724:1993
10	Metric thread — tolerances and fits	GB/T 197-2003	ISO 965-1:1998
11	General tolerances — linear and angular dimensions	GB/T 1804-2000	ISO 2768-1:1989
12	Geometrical tolerances — untoleranced	GB/T 1184-2008	ISO 2768-2:1989
13	Fasteners — ends of externally threaded parts	GB/T 2-2001	ISO 4753:1999
14	Fastener tolerances — bolts, screws, nuts	GB/T 3103.1-2002	ISO 4759-1:2000
15	Fastener tolerances — heat-resisting threaded connections	GB/T 3103.4-2014	DIN 267-13 / DIN 2510-2
16	Fasteners — electroplated coatings	GB/T 5267.1-2002	ISO 4042:1999
17	Fasteners — non-electrolytic zinc flake coatings	GB/T 5267.2-2002	ISO 10683:2000
18	Fasteners — hot-dip galvanised coatings	GB/T 5267.3-2008	ISO 10684:2004
19	Fasteners — passivation of corrosion-resistant stainless	GB/T 5267.4-2009	ISO 16048:2003
20	Surface discontinuities — bolts, screws, studs: general	GB/T 5779.1-2000	ISO 6157-1:1988
21	Surface discontinuities — nuts	GB/T 5779.2-2000	ISO 6157-1:1995
22	Surface discontinuities — bolts, screws, studs: special	GB/T 5779.3-2000	ISO 6157-3:1988
23	Acceptance inspection	GB/T 90.1-2002	ISO 3269:2000
24	Marking and packaging	GB/T 90.2-2002	—
25	Packaging and storage — China aerospace industry standard	QJ 326A-2004 FL 5300	—
26	Thermal-sprayed zinc and zinc-alloy coatings — test methods	GB/T 9793-2012	ISO 2063:2005
27	Designation of metallic and chemical coatings	GB/T 13911-2008	—
28	Hot-dip zinc coatings on iron and steel — requirements	GB/T 13912-2002	ISO 1461
29	Corrosion tests in artificial atmospheres — salt spray	GB/T 10125-2012	ISO 9227:2006
30	Fasteners — transverse vibration test	GB/T 10431-2008	DIN 65151:2002
31	Threaded fasteners — axial load fatigue test	GB/T 13682-1992	ISO 3800:1977
32	Metallic materials — fatigue testing, axial force control	GB/T 3075-2008	ISO 1099:2006
33	Threaded fasteners — stress area and bearing area	GB/T 16823.1-1997	JIS B 1082-1987

When a drawing or purchase order cites DIN, EN, ISO, ANSI, BS, JIS or GB, the corresponding Lingqi control plan is issued against that standard. Deviations are documented in the first-article report.

38 · MATERIALS

Property classes and the steel behind them.

Class	Tensile Rm (N/mm², min.)	Yield / proof (N/mm², min.)	Material	Typical grades	Condition
4.6	400	240	Low-carbon steel	Q235 · SAE 1008–1015	As-formed, stress relieved
4.8	400	320	Low-carbon steel	Q235 · SAE 1015	As-formed, stress relieved
5.6	500	400	Medium-carbon steel	C35 · SAE 1035	As-formed
6.8	600	480	Medium-carbon steel	C35 · SAE 1035	Quenched and tempered
8.8	800	640	Medium-carbon / boron steel	35K · 10B21 · SAE 1035	Quenched and tempered
10.9	1040	940	Alloy steel	40Cr · 35CrMo · SCM435	Quenched and tempered
12.9	1220	1100	Alloy steel	42CrMo · SCM440	Quenched and tempered
A2-50	500	210	Austenitic stainless 304	1.4301 / 1.4541	Solution annealed
A2-70	700	450	Austenitic stainless 304	1.4301 / 1.4541	Cold worked
A4-50	500	210	Austenitic stainless 316	1.4401 / 1.4571	Solution annealed
A4-70	700	450	Austenitic stainless 316	1.4401 / 1.4571	Cold worked
A4-80	800	600	Austenitic stainless 316	1.4401 / 1.4571	Cold worked, high strength

Material verification

Every heat is verified by optical emission spectrometry before release to production, and mill certificates to EN 10204 3.1 are retained with the batch record. Where a customer specifies a restricted grade, the chemistry is locked in the control plan.

Hydrogen embrittlement

For property classes 10.9 and 12.9, zinc-flake and DAC-type coatings are preferred over electroplating; where electroplating is required, parts are baked and tested to ISO 15330 (preload test) before shipment.

Temperature

Quenched-and-tempered classes are suitable for service from −40 °C to +150 °C, with impact testing at low temperature available on request. A2/A4 stainless is used where temperature or chemistry rules out coated carbon steel.

4.6–12.9
PROPERTY CLASSES

A2 / A4
STAINLESS GRADES

EN 10204 3.1
MILL CERTIFICATES

ISO 15330
EMBRITTLEMENT TEST

39 · SPECIFICATION

How to specify a T-bolt length.

The required bolt length is calculated from the clamping length plus the channel-hook thickness and the nut, washer and thread run-out allowance:

$$\text{req. } l = l_k + f + (m + s + u)$$

l_k clamping length of the connected parts · f channel-hook thickness
m nut height (EN ISO 4032) · s washer thickness (EN ISO 7093-1) · u thread run-out (EN ISO 4753)

Worked example

Channel 53/34, f = 8 mm, clamping length l_k = 65 mm, thread M16:
req. l = 65 + 8 + 21.8 = 94.8 mm → select **LQD52/34 M16 × 100 HDG**.

Ordering code

Series + thread + length + finish + property class

`LQD52/34  M16  100  HDG  8.8`

Allowance (m + s + u)

Thread	m+s+u (mm)	Thread	m+s+u (mm)
M6	8.8	M20	27.0
M8	11.3	M24	32.5
M10	13.9	M27	35.8
M12	17.3	M30	38.6
M16	21.8		

Finish codes

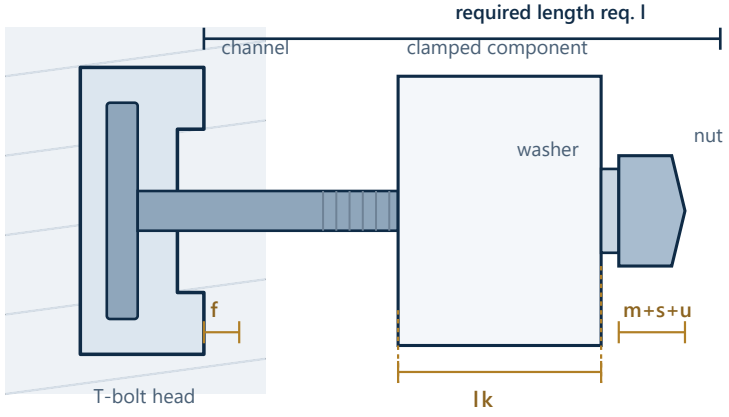
ZP zinc plated · **YZ** zinc-flake / coloured zinc
HDG hot-dip galvanised · **DAC** DACROMET-type
A2 stainless 304 · **A4** stainless 316

Property class

4.6 · 4.8 · 6.8 · 8.8 · 10.9 · 12.9

For bolts longer than 250 mm the tightening torque is limited by the shank capacity; consult the technical annex or our engineering department for the joint-specific value.

SECTION THROUGH A CAST-IN CHANNEL JOINT



40 · T-BOLT SERIES

Five head geometries, one channel system.

Series	Head form	Thread	Length (mm)	Channel profiles	Application note
LQB	Double-rib T-head	M10 – M24	25 – 400	40/22 · 50/30 · 52/34 · 72/48	Higher pull-out resistance; two ribs engage the channel lips
LQA	Multi-tooth T-head	M10 – M24	15 – 300	38/23 · 53/34 · 41/22 · 64/44	Serrated head for maximum resistance in thin-wall channels
LQD	Hook-head (hammer)	M10 – M30	20 – 1200	40/22 · 52/34 · 72/48	Inserted and rotated 90°; the standard channel bolt
LQE	Hammer-head, compact	M6 – M16	15 – 200	21/12 · 28/15 · 38/17	Small channels, light loads, cable-tray supports
LQM	Locking plates / channel nuts	M4 – M20	—	21/12 – 72/48	Anti-rotation and locking elements for the same channels



LQE HAMMER-HEAD



LQB DOUBLE-RIB



LQD HOOK-HEAD



LOCKING PLATE



CHANNEL NUT



HAMMER-HEAD NUT



HOOK-HEAD, LONG



SPECIAL T-HEAD

Full length-availability matrices for each series (thread × length) are available as a separate dimension sheet. Lengths outside the table above are produced to order — the maximum single-piece length is 3000 mm.

41 · TIGHTENING TORQUE

Recommended tightening torque T_{inst}

Channel & bolt series	Bolt	General connection 4.6 · 8.8 · A4-50 · A4-70	Steel-to-steel 4.6 · A4-50	Steel-to-steel 8.8 · A4-70
K28/15 · LQE28/15	M6	—	3	—
	M8	8	8	20
	M10	13	15	40
	M12	15	25	70
K38/17 · LQE38/17	M10	15	15	40
	M12	25	25	70
	M16	40	65	180
W40/22 · K40/25 · LQD40/22	M10	15	15	40
	M12	25	25	70
	M16	45	65	180
W50/30 · K50/30 · LQD52/34	M10	15	15	40
	M12	25	25	70
	M16	60	65	180
	M20	75	130	360
W53/34 · K53/34 · LQD53/34	M10	15	15	40
	M12	25	25	70
	M16	60	65	180
	M20	120	130	360
W55/42 · LQD53/34	M10	15	15	40
	M12	25	25	70
	M16	60	65	180
	M20	120	130	360
	M24	200	230	620
W72/48 · K72/48 · LQD72/48	M20	120	130	360
	M24	200	230	620
	M27	300	340	900
	M30	380	460	1200

Values in N·m. For steel-to-steel connections, a suitable washer must be used between the component and the channel. Property classes 8.8, A4-70 and F4-70 bolts may use the higher steel-to-steel values.



General connection

Component fixed directly to concrete or to the anchor channel; the tabulated torque applies with the standard washer and nut combination.

Steel-to-steel connection

Component clamped through a steel bracket onto the channel; the higher torque compensates for the additional bearing surface and is only permitted with the specified washer.

42 · ANCHOR CHANNEL SYSTEM

The channel is part of the joint.

Lingqi supplies hot-rolled assembly channels and the T-bolts that run in them as a matched system — so the head width, rib position and hook thickness are guaranteed to fit. LM profiles are plain hot-rolled channels; LXM profiles are toothed, for higher longitudinal load transfer.

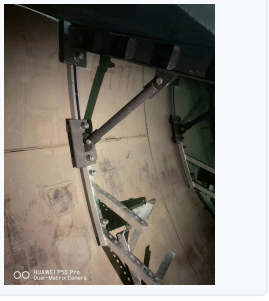
Profile	Section (mm)	Weight (kg/m)	Bolt range	Matching T-bolt / plate
LM 72/48	72 × 48	8.85	M20 – M30	LQD72/48 · LQMA · LQMB
LM 55/42	55 × 42	6.75	M16 – M24	LQD52/34 · LQMB M16-16
LM 53/34	53 × 34	5.00	M10 – M20	LQD52/34 · LQMB M16-16
LM 50/30	50 × 30	3.25	M10 – M20	LQD52/34 · LQMB M16-16
LM 40/22	40 × 22	2.10	M10 – M16	LQD40/22 · LQMC M16
LXM 64/44	64 × 44	7.19	M20 – M24	LQA64/40
LXM 53/34	53 × 34	4.65	M16 – M20	LQA53/34
LXM 38/23	38 × 23	2.42	M12 – M16	LQA38/23 · LQE38/17
LXM 29/20	29 × 20	1.55	M10 – M12	LQA29/20 · LQE28/15

Material: wb plain · HDG hot-dip galvanised · SV Sendzimir galvanised · A2 stainless 1.4301/1.4541 · A4 stainless 1.4401/1.4404/1.4571. Channels are supplied with foam filler on request.





Toothed LXM profile: the serrated inner face engages the multi-tooth head, raising longitudinal load capacity.



CAST-IN CHANNEL



CHANNEL WITH T-BOLT



CHANNEL NUT



LOCKING PLATE

43 · ANTI-LOOSENING SYSTEM

Gulock double-stack washers & locknuts.

The Gulock system uses two stacked, cam-profiled washers whose ramps are steeper than the thread pitch. Vibration cannot unwind the joint; the pair locks mechanically and remains releasable with a standard wrench.

- Highest safety class — mechanical lock, no adhesives
- Prevents loosening from vibration and dynamic load
- Easy to install and to release
- Locking effect unaffected by lubrication
- No preload limitation; same temperature behaviour as the bolt



Locknut design

All-metal construction: a convex nut with an eccentric locking ring, plus the matching concave nut. Reusable, semi-permanent locking with no nylon insert to age or creep.

Gulock washers are available for M3 – M80 in carbon steel (zinc plated), stainless and zinc-flake coated; “ss” denotes stainless, “sp” a large outside diameter.

Recommended installation torque (N·m)

Thread	8.8	10.9	12.9	A2/A4-70	A4-80
M6	8.6	12.3	12.5	6.9	9.2
M8	21	30	32	17	22
M10	42	58	64	33	43
M12	72	99	109	56	75
M16	174	240	263	136	181
M20	340	470	515	267	356

Suitability by industry

Locking element	Metro	Rail	Bridge	Wind	Airport	Nuclear	Port	Heavy plant	Mining	Metallurgy	Mobile mach.	Medical
Plain washer	A	A	A	A	A	A	A	A	A	A	A	A
Spring washer	B	A	A	A	A	A	A	B	A	A	A	A
Prevailing-torque nut	A	B	B	A	A	B	B	B	A	B	A	A
Gulock washer pair	C	B	A	C	B	A	C	B	A	C	B	A

A = adequate · B = improved security · C = recommended for the highest vibration and safety class.

44 · INSTALLATION & DELIVERY

Simple, safe, documented installation.

1. **Position the channel**
   Mark the channel position before pouring concrete and fix it to the formwork. Fill the channel with foam so that no concrete enters; remove the foam after stripping.

2. **Insert the bolt**
   Place the T-bolt into the channel with the head aligned along the channel axis.

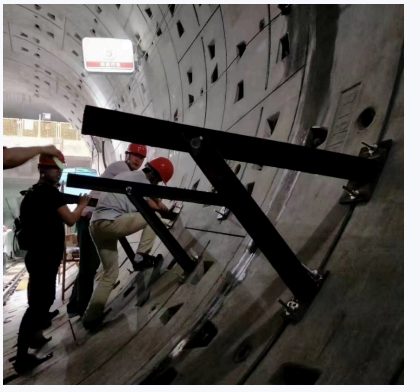
3. **Rotate 90°**
   Turn the bolt so that the head engages behind the channel lips — the correct position is perpendicular to the channel length.

4. **Position along the channel**
   Slide the bolt to the required position. Do not install it at the very end, outside the anchor zone.

5. **Tighten**
   Tighten the nut with a torque wrench to the specified installation torque (see page 50).

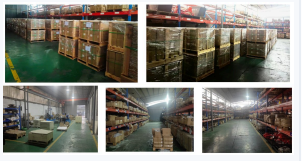
Why cast-in channels

No drilling, no anchors, no dust or noise on site. Position adjustment along the channel absorbs construction tolerances, and the connection is made with a single bolt — no welding, no special tools.



Packaging & logistics

- Cartons, wooden cases and pallets, customer-labelled
- Batch label with part number, heat, quantity, date
- Certificate of conformity and inspection report per shipment
- Container loading photographed before sealing
- Barcode / QR traceability on request





TORQUE

Tighten to the tabulated installation torque with a calibrated wrench; record the value on the installation sheet.

CHECK

Verify bolt position, head engagement and washer seating before final tightening; re-check after the first load cycle.

TRAINING

Installation instructions and torque tables are supplied with each channel order, in the project language.



GET IN TOUCH

Ningbo Lingqi Hardware Industry Co., Ltd.

Hemudu Town, Yuyao City, Ningbo, Zhejiang, China

Export sales +86 18067533926 (Emily)

WhatsApp：+86 18067533926

T-BOLTS M5–M90 · FATIGUE 3 M / 6 M CYCLES · HDG · ZINC FLAKE · A4 · STAMPED HINGES

ISO 9001 · 14001 · 45001 · IATF 16949

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