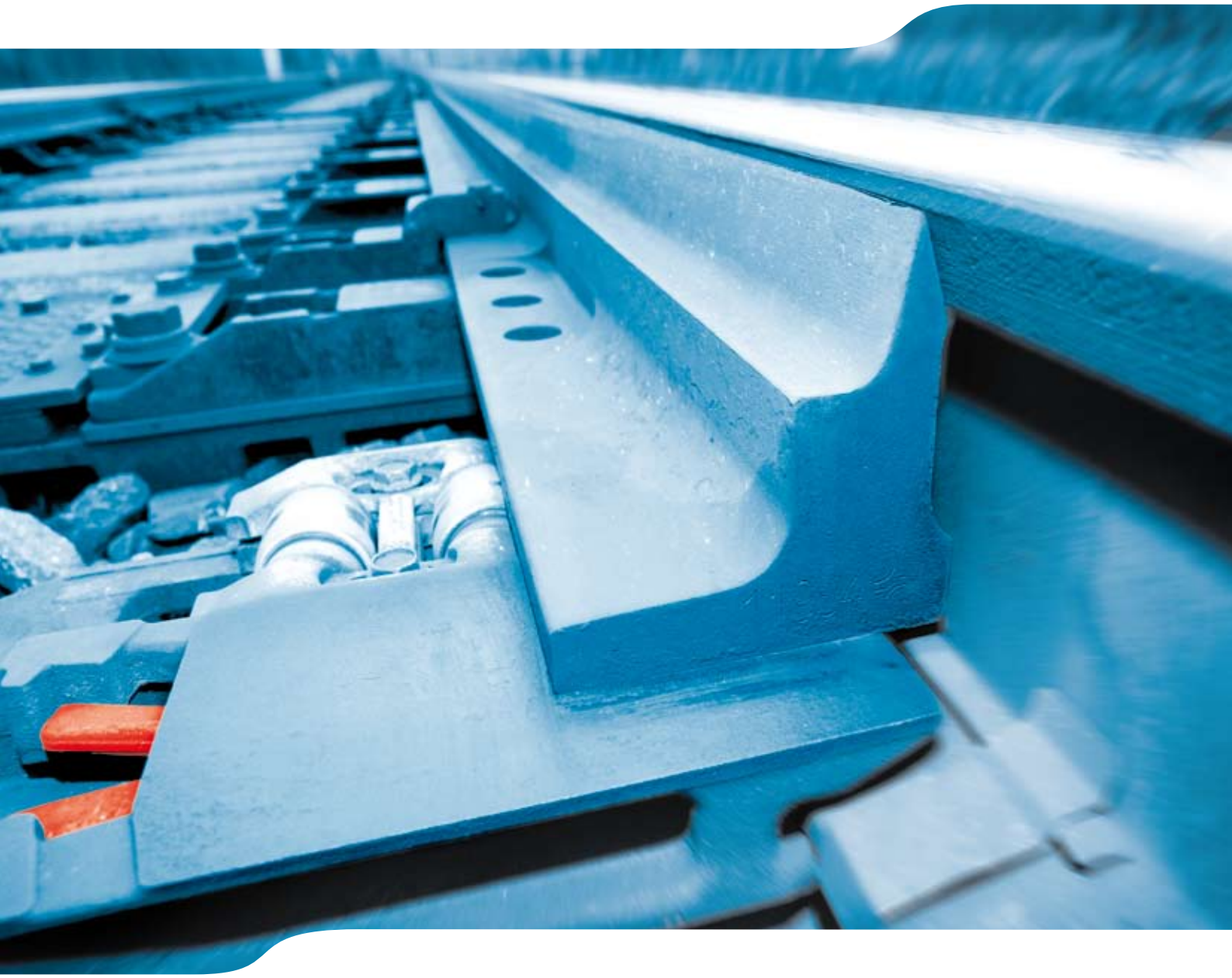
Schwihag

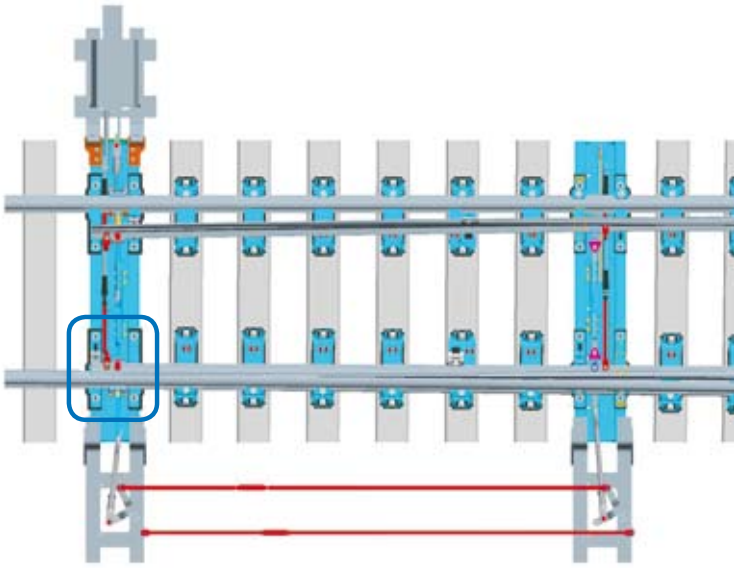


:::::::::::::::::::: INNOVATIVE TRACK AND SWITCH TECHNOLOGY :::::


DB Mobility Networks Logistics
DB
2008
DB supplier of the year
Certificate
Category: components
SCHWIHAG AG, Tägerwilen (Switzerland)
SCHWIHAG AG receives this award for innovative
track fastening systems and switch components.
The products excel in reliability, durability and quality.

SCHWIHAG IS THE GLOBAL MARKET LEADER IN FLEXIBLE FASTENING SYSTEMS FOR STOCK RAILS, RUN-NING RAILS AND COMPONENTS FOR LUBRICATION-FREE SWITCHES.

CONTENT



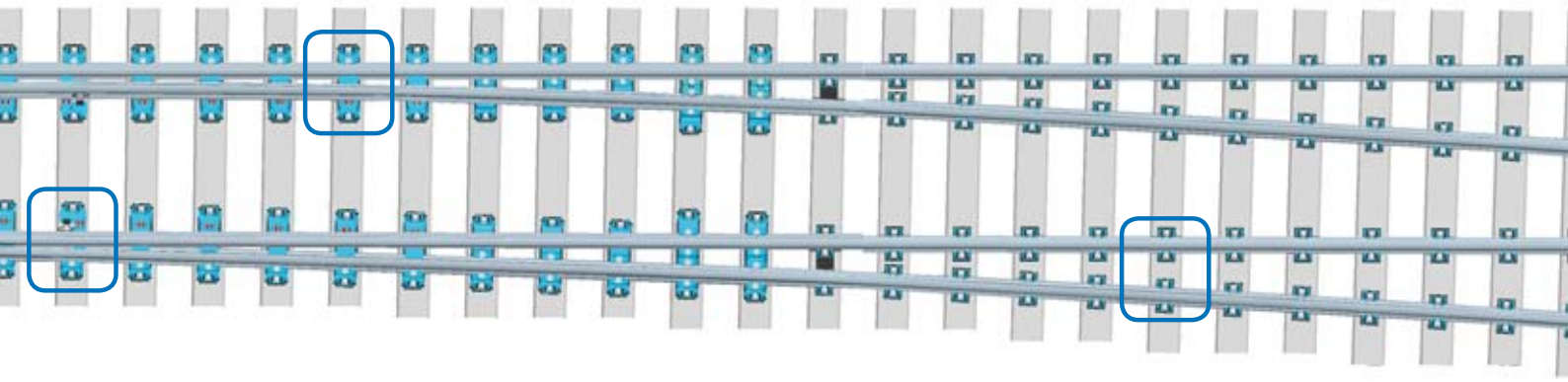
SCHWIHAG – Experts in permanent way technology since 1971

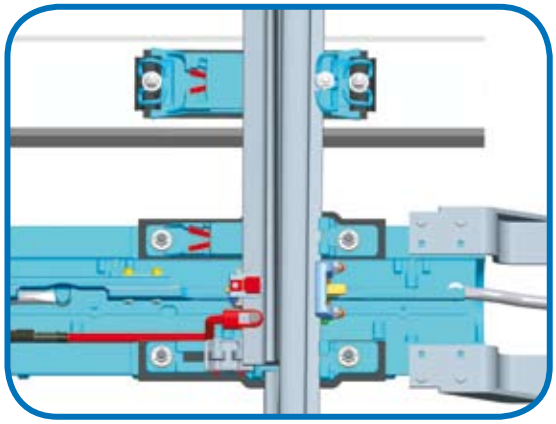
All over the world high-speed lines, heavy freight transport, tramway, underground and metro systems rely on our cutting-edge products to provide solutions to every challenge.

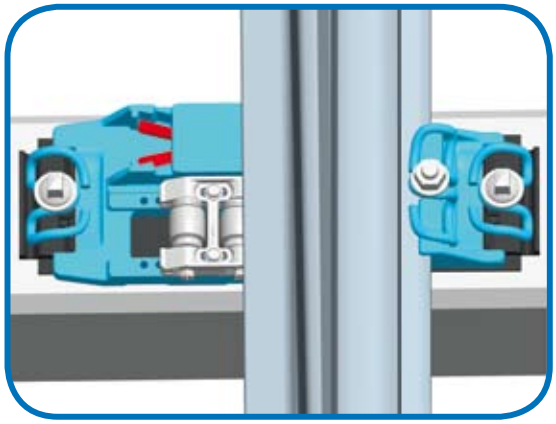
Renowned for their integrity, reliability and durability, SCHWIHAG products offer outstanding quality, allowing our customers to meet the increasingly complex demands of modern infrastructure systems in the most practical and cost effective manner. Our key components ensure a permanent reduction in maintenance costs, and at the same time can be relied on to increase the availability of the network.

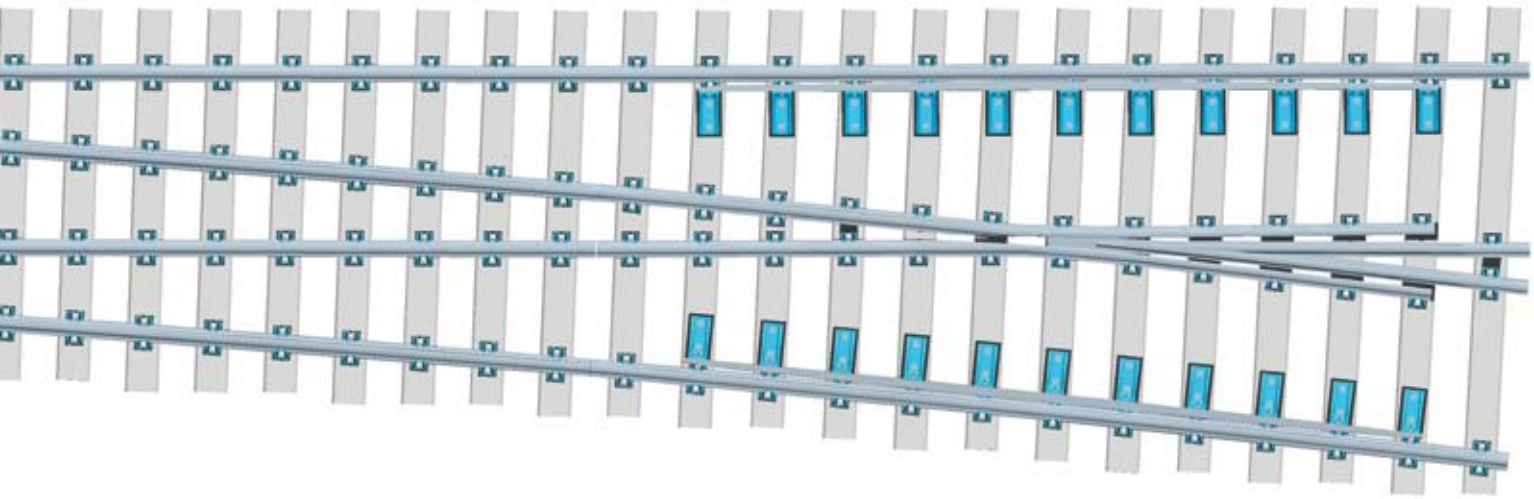
All SCWIHAG products are easy to install, easy to inspect, maintenance free and, thanks to our focus on sustainability, environmentally-friendly too.

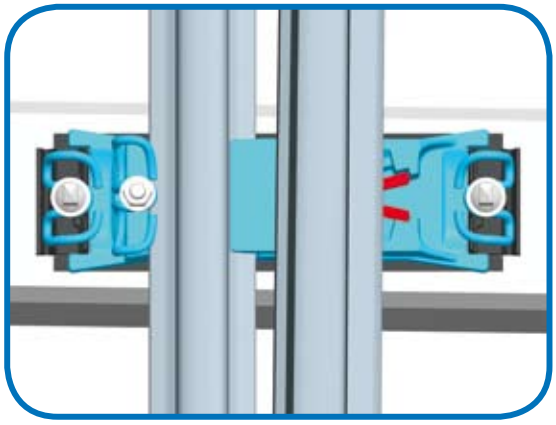
SCHWIHAG COMPONENTS FOR SWITCH ASSEMBLIES

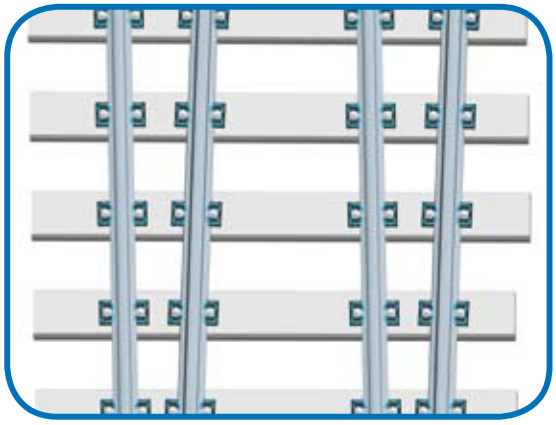




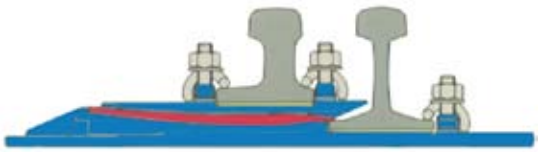




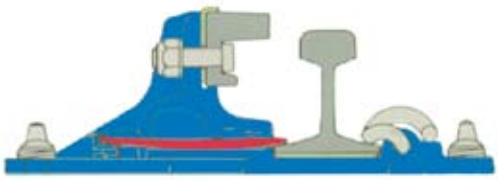




IBSR SLIDE BASEPLATES AND IBRR CHECK RAIL PLATES FOR



IBSR plate for non-moveable switch with spring clip SSb 4 and 6mm railpad.

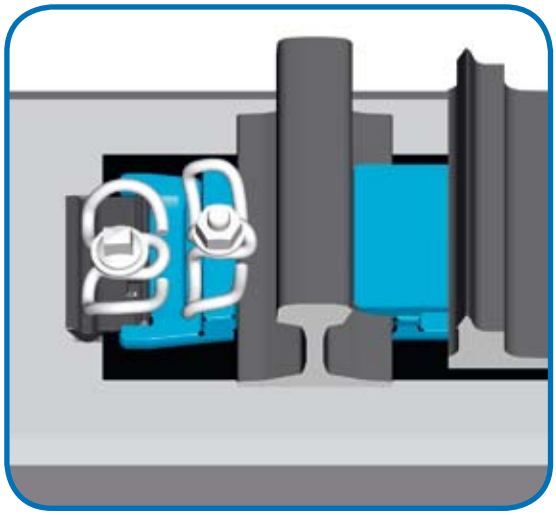


IBRR check rail plate MPL 50 for rails section SJ 50 with spring clip SSb 2 and 5mm railpad.

IBSR slide baseplate PNC 60-35 with spring clip SSb 2 for use in UIC 60 RENFE switches with 6mm railpad.

SCHWIHAG slide baseplates are fitted with an inner bracing system for stock rails (IBSR). Depending on the position of the IBSR slide baseplate within the switching device, SCHWIHAG´S spring clips SSb 2, SSb 3 or SSb 4 can be used. For the outside of the stock rail, the client's preferred fastening system (e.g. SKL, Pandrol, Nabla) can be applied. The same inner bracing system for running rails (IBRR) can be fitted in the crossing-check rail area.

OUR IBSR AND IBRR SYSTEMS HAVE BEEN PROVEN OVER 20 YEARS IN THE OPERATION OF HIGH SPEED, HEAVY FREIGHT TRANSPORT AND STANDARD RAILWAYS IN MORE THAN 40 COUNTRIES WORLDWIDE.



All IBSR slide baseplates and slide plates can be finished with a wax sealed, non-corrosive, lubrication-free Molybdenum coating or equipped with a lubrication-free, friction-free sliding insert made of CuSn8 F66-bronze, with or without graphite discs.
These coatings or sliding inserts are in the heel of the switch in combination with the SCHWIHAG roller plate system. Here they reduce the break-off forces of the switch points and improve the durability of the sliding plates. The lubrication-free Molybdenum coatings or sliding inserts, together with the roller plate system, guarantee permanent low switch moving forces offering greater longevity.

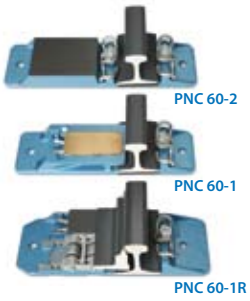
IBSR slide baseplates and IBRR check rail plates are made of ductile cast iron, ready for installation. For smaller projects and special installations, corresponding die-cast slide plates and abutments are available for the manufacture of welded plates to fit any track or blade profile.

SCHWIHAG PLATES FOR DIFFERENT RAILWAY

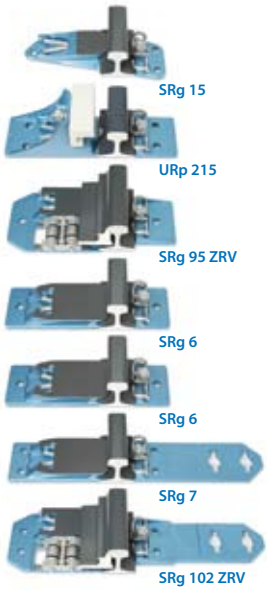
NETWORK RAIL, UK
IBSR slide baseplate
for SCHWIHAG
modular bearer with
switch securing block
with pad lock


SB7 Mk4

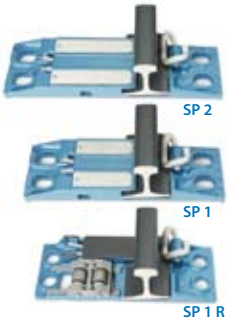
RENFE/ADIF, Spain,
slide block plate, IBSR
slide baseplate and
IBSR roller plate
for switch UIC 60


PNC 60-2
PNC 60-1
PNC 60-1R

DB, Germany,
switch S 54-KS with
DKW-IBSR narrow slide plate,
IBRR check rail plate
IBSR roller plate,
IBSR slide baseplate,
IBSR slide baseplate
with plate extension
IBSR roller plate
with plate extension


SRg 15
URp 215
SRg 95 ZRV
SRg 6
SRg 6
SRg 7
SRg 102 ZRV

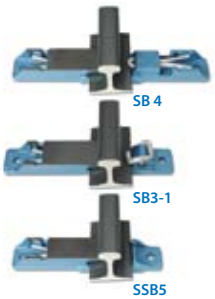
MRTC, Lantau Airport
Railway,
Hong Kong, China
IBSR slide baseplates
and IBSR roller plate


SP 2
SP 1
SP 1 R

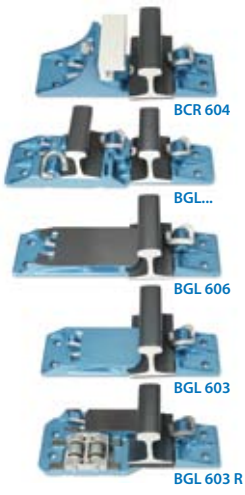
NETWORK RAIL, UK,
switch UIC 54 with
high switch points


BPV 4
BPV 3
BPV 2
SPVR
BPV 1
BPV 1
BPV 1
BVP
SPVR

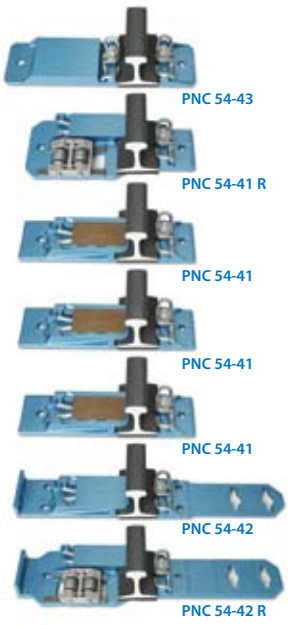
NETWORK RAIL, UK,
plates for SCHWIHAG
modular bearer


SB 4
SB3-1
SSB5

SNCB, Belgium, switch
UIC 60 with switch point
bracing plate, IBSR slide
baseplates and IBRR
roller plate

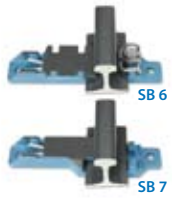

BCR 604
BGL...
BGL 606
BGL 603
BGL 603 R

IBSR plate range for switch
UIC 54, Madrid Metro and
RENFE/ADIF, Spain

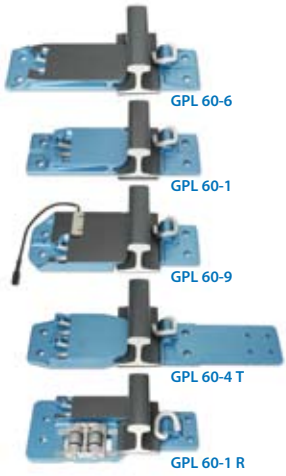

PNC 54-43
PNC 54-41 R
PNC 54-41
PNC 54-41
PNC 54-41
PNC 54-42
PNC 54-42 R

OPERATORS (EXAMPLES)

NETWORK RAIL, UK, IBSR slide baseplates for SCHWIHAG modular bearer in switch UIC 60

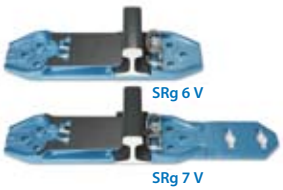


IBSR plate range for switch UIC 60, Banverket, Sweden

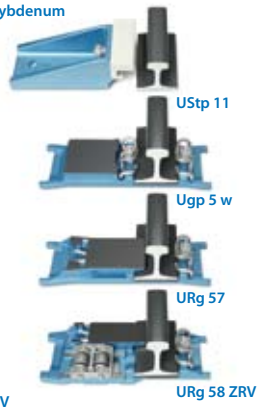


DB, Germany, switch UIC 60-KS with IBRR check rail plate, slide block plate, IBSR roller plate and IBSR slide baseplates

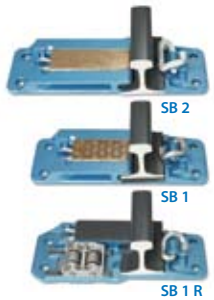
DB, Germany, switch S 54, reinforced IBSR slide baseplate with 6 holes for highly stressed switches on wooden sleepers



DB, Germany, fixing plate for switch UIC 60-W with check rail support block, slide block plate, IBSR slide baseplate and IBSR roller plate

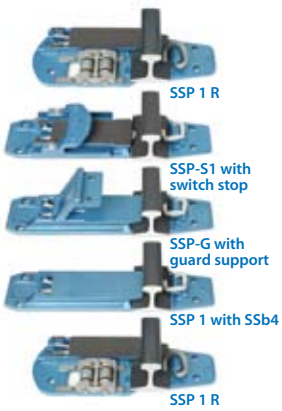


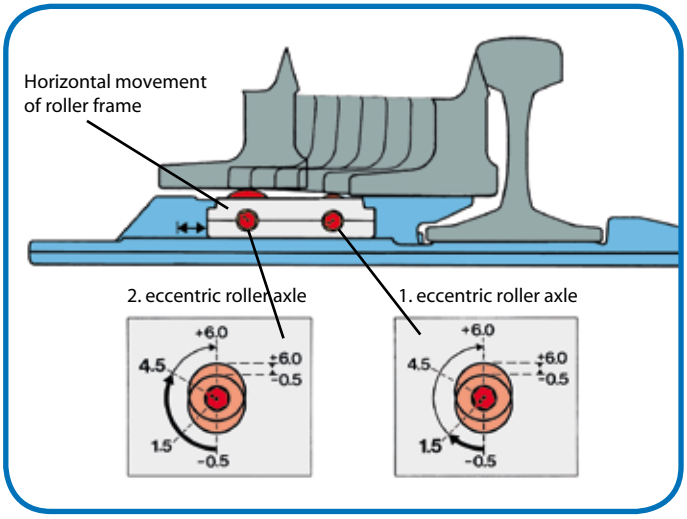
NETWORK RAIL, UK, IBSR slide baseplates and IBSR roller plate for switch UIC 60 with low switch points



NETWORK RAIL, UK, IBSR slide baseplates and IBSR roller plates for switch UIC 54 with low switch points

TTC, Canada, IBSR slide baseplates and IBSR roller plates





An eccentric axle allows vertical height adjustment of the rollers

:: Roller may be adjusted vertically from -0.5 to +6.0 mm ensuring the correct vertical clearance between switch rail and slide plate.
:: Vertical height adjustment of each roller ensures controlled lifting of the switch rail and a low switch moving force.
:: No special precautions are required to allow mechanical tamping of the switch assembly.
:: All slide baseplates have a Molybdenum coated slide surface.
:: Integrated roller slide baseplates are available for both full and shallow depth switch assemblies.
:: Available for a wide range of rail profiles.
:: Can also be used in switch diamonds and slips.

SCHWIHAG SWITCH BLADE ROLLING DEVICE SRD

Lubrication-free switch

:: SCHWIHAG switch blade rolling device SRD – the perfect solution

SCHWIHAG switch blade rolling device SRD

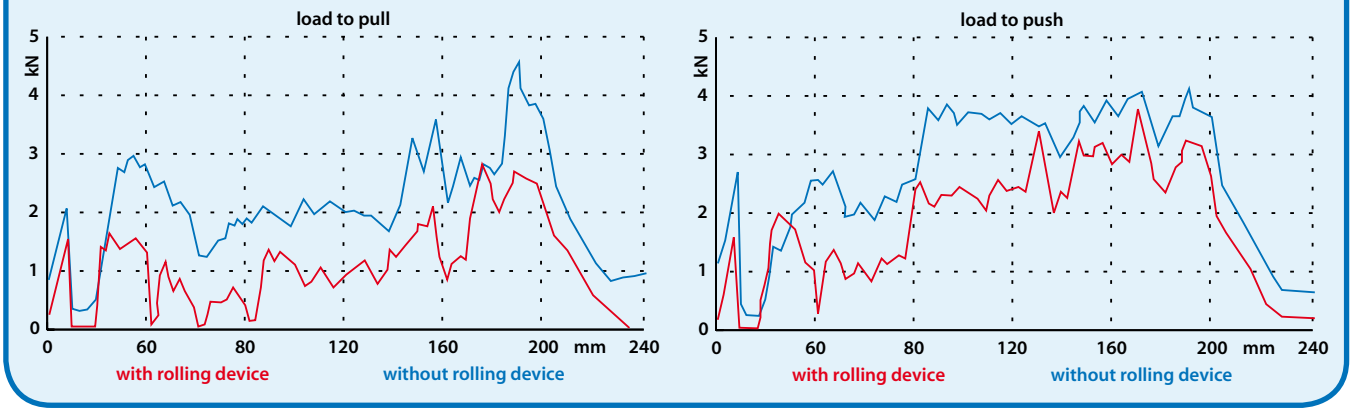
:: individual adjustment of rollers
:: easy to install
:: for new switches or existing switches in need of an upgrade

Advantages

:: mounted directly onto sleeper
:: integrated into slide baseplate
:: friction-free movement of switch blades
:: inspection-friendly and maintenance-free
:: lubrication-free, so environmentally-friendly and cost effective

SCHWIHAG switch blade rolling device SRD integrated into IBSR slide baseplate with protective cover before ballast is applied.

Switching force measurement in Geislingen an der Steige, Germany, **switch 112** with and without SCHWIHAG switch blade rolling device SRD.



MODULAR BEARER WITH INTEGRATED SWITCH POINT

Weight and size of the modular bearer correspond to conventional concrete switch point bearer.

Stretcher bar, back drive and rodding, and the switch motor, are totally integrated within the bearer. Ballast can therefore be applied over the entire switch-operating mechanism and mechanical tamping of the whole switch is possible.

Also, the displacement resistance of the modular bearer, made of ductile cast iron, is higher than that of conventional concrete bearers. The improved stability of the whole switch point ensures a substantial reduction in malfunctions resulting in a significant increase in network availability. If required, the modular bearer can be fitted with Molybdenum coated, lubrication-free IBSR slide baseplates and roller plates.

The weatherproof modular bearer is electrically heated and all moving parts are completely insulated. The cover can be easily removed and access to all parts is unrestricted. This makes the SCHWIHAG modular bearer particularly inspection-friendly. On request, our modular bearer is also available for your own preferred locking system.

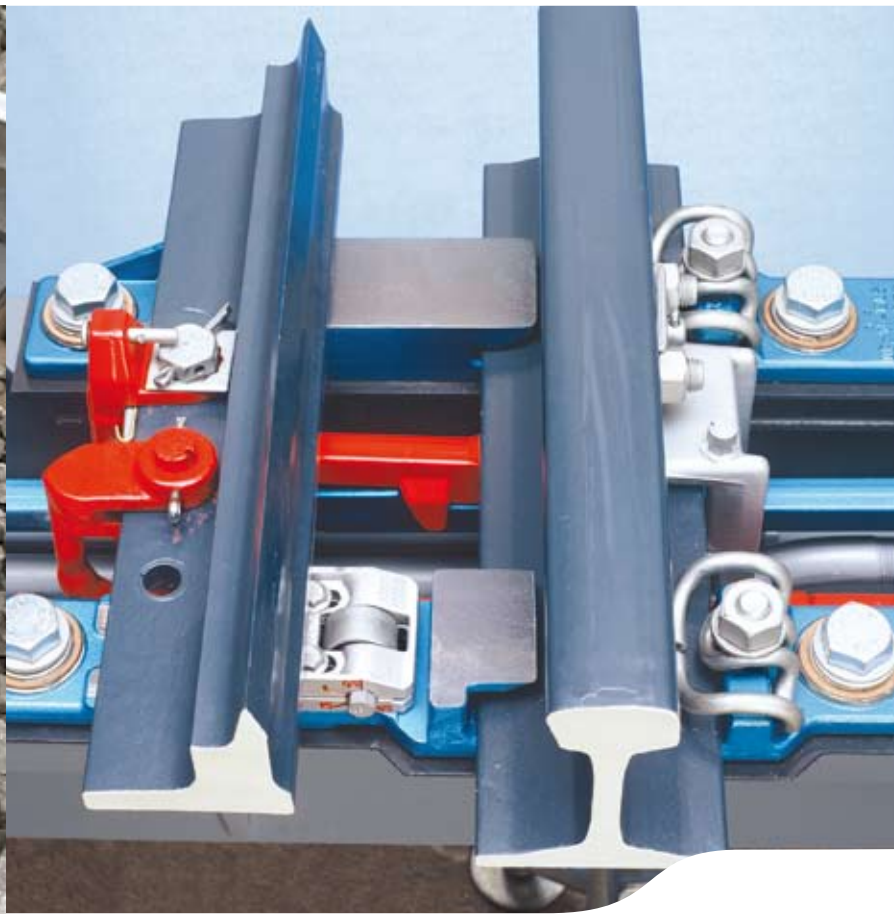
SCHWIHAG clamp lock system SKV

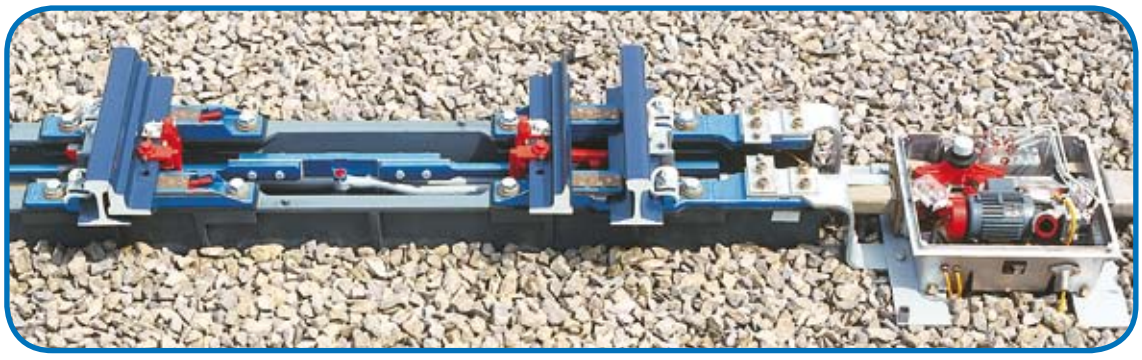
The SCHWIHAG clamp lock system, integrated into the SCHWIHAG modular bearer, can be applied to locking switch points as well as movable point frogs.

The lock allows for thermal longitudinal displacement of up to + – 30 mm. The clamp lock system SKV can also be supplied without the modular bearer.

IMPROVED STABILITY OF THE WHOLE SWITCH POINT ENSURES A SIGNIFICANT REDUCTION IN THE INCIDENCE OF MALFUNCTIONS AND INCREASED NETWORK AVAILABILITY.

OPERATING SYSTEM





Switch motor

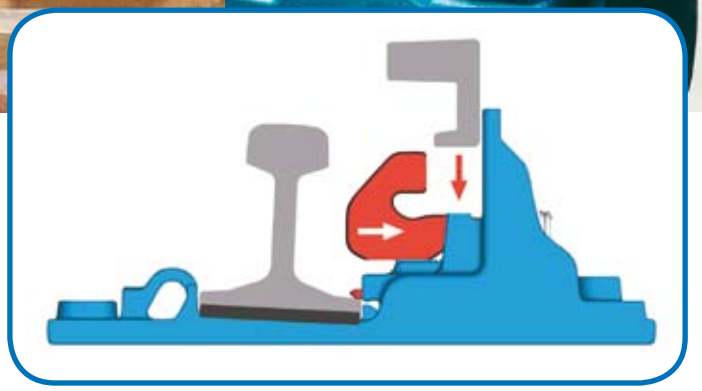
There is a choice of an electric-mechanic or electric-hydraulic, integrated switch motor.

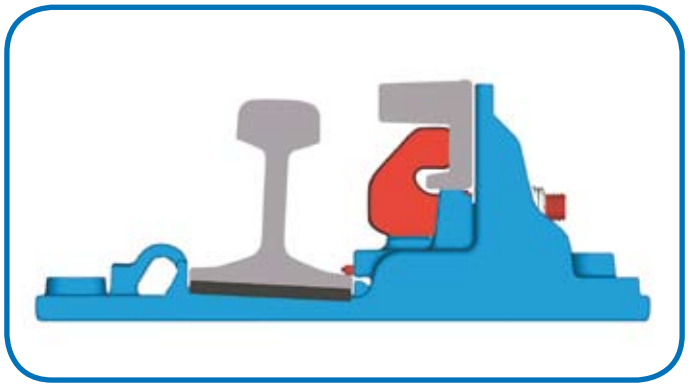
BOLTLESS CHECK RAIL PLATE BCR

INTRODUCING SCHWIHAG'S BOLTLESS CHECK RAIL PLATE, A SIMPLE AND EFFICIENT CLAMPING DEVICE, OFFERING SIGNIFCANT TIME-SAVING BENEFITS IN THE INSTALLATION OF RUNNING RAILS AND CHECK RAILS.

Boltless check rail plate (BCR)

:: no drilling of exact holes in the check rail required
:: tolerates longitudinal misalignment between check plate and check rail
:: installation time reduced thanks to easy handling
:: fast and safe removal of the check rail
:: no loose parts at installation site
:: ideal for continuous check curves and complex layouts
:: the SCHWHAG spring clip allows removal of the running line without dismantling the check rail
:: suitable for any rail fixing system and rail profile





RAIL FIXING SYSTEMS

RAIL FASTENINGS FROM SCHWIHAG ARE BASED ON SYSTEMS WHICH HAVE BEEN TRIED AND TESTED FOR DECADES. SCHWIHAG HAS OPTIMISED THESE SYSTEMS AND MADE THEM MORE EFFICIENT AND ECONOMICAL.

SCHWIHAG offers consultancy, development, construction, production, supply and service for rail fastening systems and the following applications:

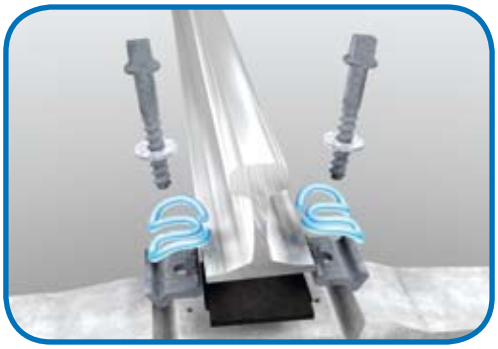
:: standard railway lines
(20.5 t axle load – 30 t axle load)
:: high-speed railway lines
(up to 20.5 t axle load)
:: heavy freight transport
(over 30 t and up to 50 t axle load)
:: underground systems
(12 t – 13 t axle load)
:: metro systems
(16 t axle load)
:: tramways
(6 t – 10 t axle load)
:: industrial railway lines
(22.5 t – 50 t axle load)

for the following track systems::

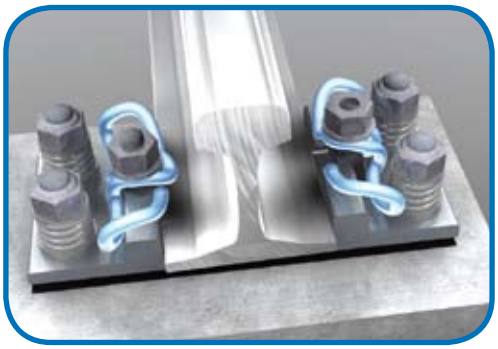
:: ballast permanent way with concrete sleepers
:: ballast permanent way with wooden sleepers
:: ballast permanent way with steel sleepers
:: paved concrete track
:: bridge beams (steel bridges)

independent of:

:: track profile and track gradient
:: sleeper geometry
:: routing (e.g. tight radius, high gradient))



Tension clamp Skl 1 on concrete bearer



Tension clamp Skl 12 on paved concrete track

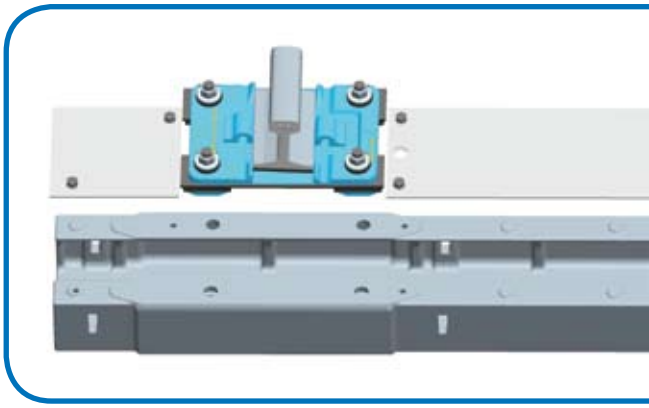
Tension clamp Skl12 on wooden sleeper

SCHWIHAG fastening systems SFS are:

:: proven standard systems
:: new developments customised to your specific requirements
:: adaptations using optimised components, e.g. new spring clips for existing sleepers
:: components made to specifications for complex installations
:: systems with special surface protection for SFS components in critical environmental conditions
:: systems with highly effective sound/vibration insulation
:: systems for transition areas, e.g. tunnels and bridges with a high level of relative motion between rail and sleeper
:: supplied unconnected

Rail clip Skl1 in pre-mounting position

Rail clip Skl1 final fixing position



Advantages

:: fabricated from one piece of ductile cast iron
:: the base of the hollow sleeper has sharp edges and indentation provides high stability in ballast bed
:: completely accessible from above and at both ends
:: comparable in size and weight to concrete sleeper
:: double insulation
:: suitable for any track profile and gauge

HOLLOW STEEL SLEEPER

THE SCHWIHAG HOLLOW STEEL SLEEPER IS MADE OF DUCTILE CAST IRON AND IS COMPARABLE IN SIZE AND WEIGHT TO A CONCRETE SLEEPER. THE BASE OF THE SLEEPER HAS SHARP EDGES DESIGNED FOR STABILITY IN THE BALLAST BED.

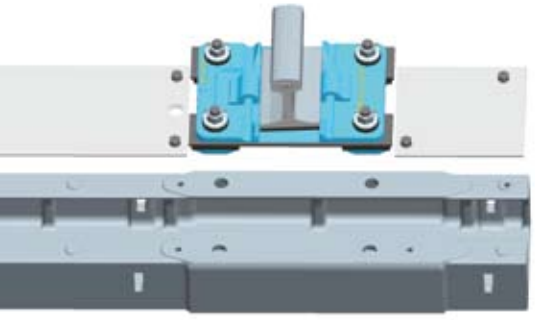
Hollow steel sleeper

The integrated cable pipes allow for safe, permanent crossing of cables in switch points and tracks, even when mechanical maintenance and adjustments are being carried out.

The cable pipes at the front are held firmly in place by vibration absorbent rubber pads. To ensure maximum safety, there is electric insulation between rail and baseplate as well as baseplate and sleeper. The fully machined top surface ensures the correct seating, alignment and level of the running rail.

The easily removable covers offer robust protection from debris and the effects of weather. Unrestricted access from above and at both ends make it exceptionally inspection-friendly. Thanks to ease of accessibility, existing cable crossings can be upgraded at any time.

The hollow steel sleeper can be easily installed in the ballast bed without complications and there is no need to disconnect existing cable crossings.



ENGINEERING

SCHWIHAG delivers reliable partnership to railway authorities and the railway industry for all aspects of track and switch technology.

Research and development

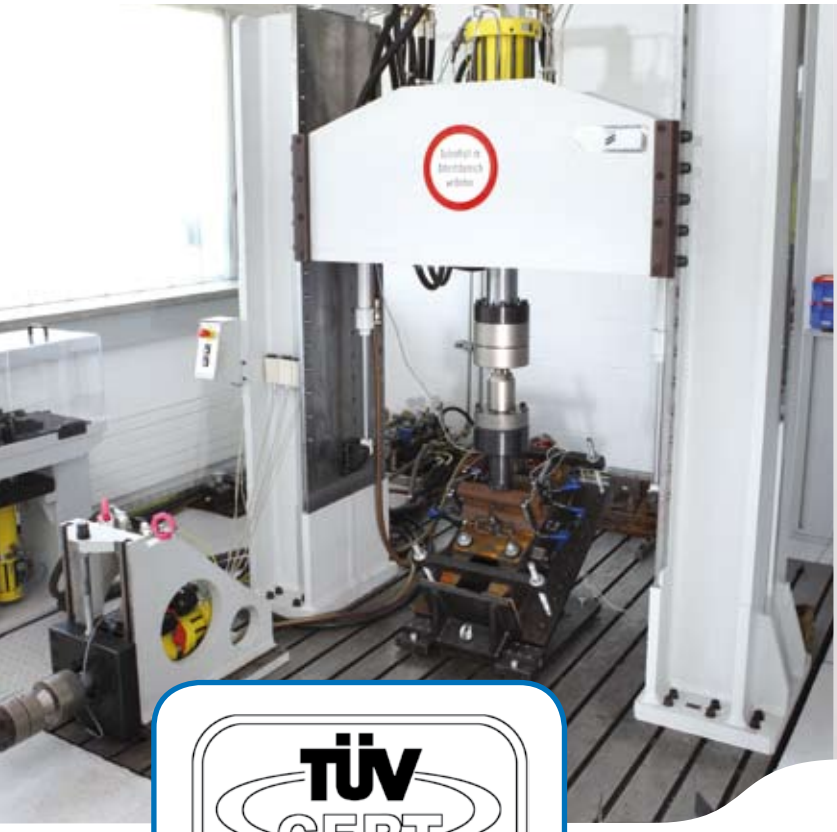
Through close collaboration and consultation with our engineering counterparts in operating companies, and ongoing research and development, we are able to identify the future needs of the rail and track industry worldwide.

The development of new products and the adaptation or optimisation of our proven product range is supported by the 3-D CAD System Pro/ENGINEER. FE analysis is conducted on the basis of CAD data.

Prototypes are rigorously tested for their technical properties and operational capabilities in our own laboratories. During this process we carry out constant load tests in compliance with international standards, or as specified by national railway authorities.

After successful completion within our own facilities, as part of the approval procedure, components and systems are tested by independent experts. SCHWIHAG has close working relationships with testing and research institutes such as the Technical University of Munich and the Technical University of Dresden.

TARGET FOCUSSED RESEARCH AND DEVELOPMENT ARE HIGH ON OUR AGENDA.



TÜV CERT
DIN EN ISO 9001:2000
Zertifikat: 01-379-047

SCHWIHAG HAS AN ISO 9001-2000 CERTIFIED QUALITY MANAGEMENT SYSTEM AND HAS BEEN A Q1 SUPPLIER FOR DEUTSCHE BAHN AG FOR MANY YEARS.

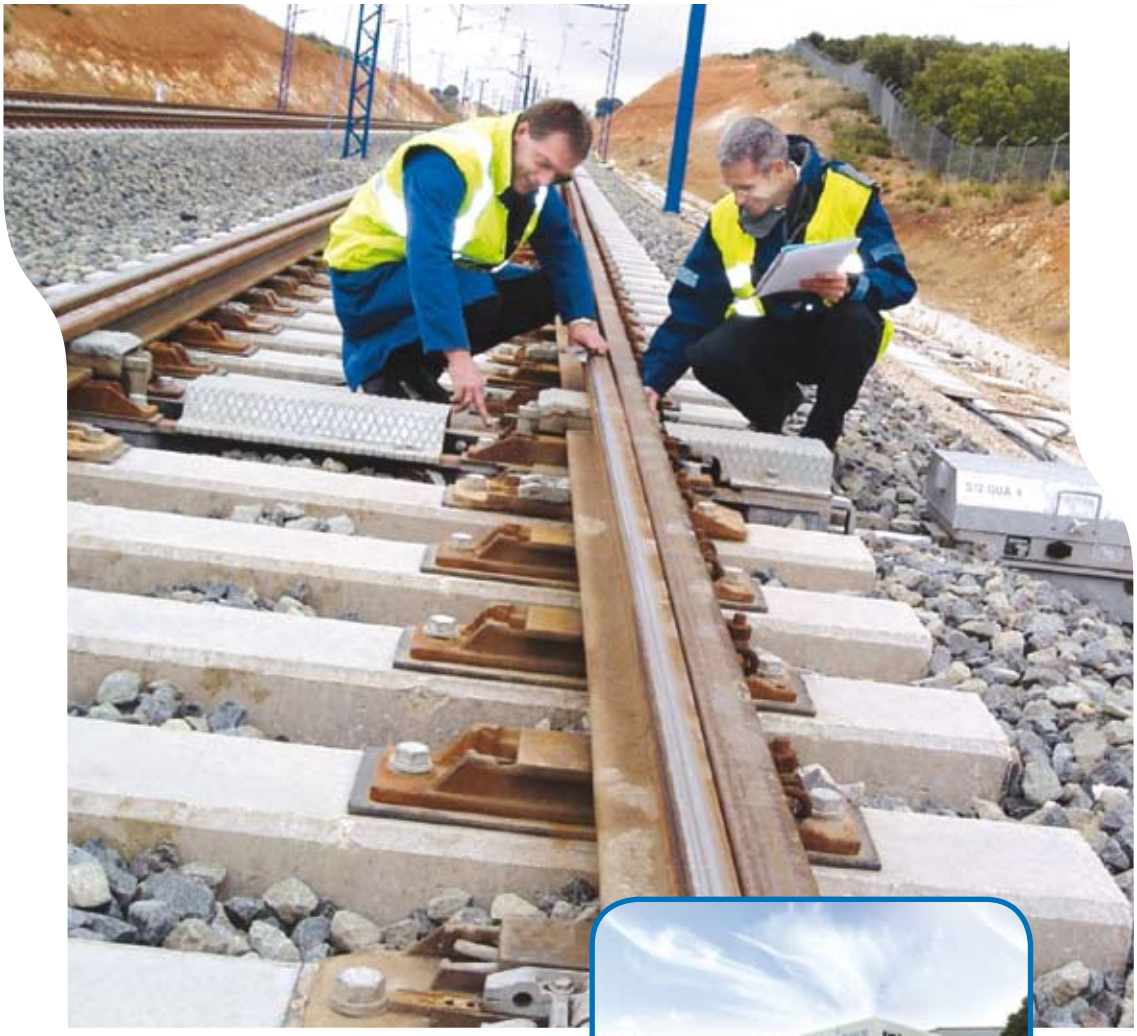
Production, quality and logistics

Our clients are guaranteed high quality products conforming to the following criteria:

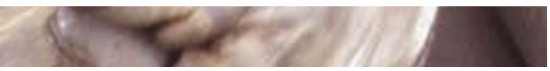
:: careful selection of appropriate, highly durable materials
:: optimised production process in relation to quality, flexibility and use of resources (manpower, material, energy efficiency)
:: permanent supervision of the production process and product data in compliance with international standards or as specified by our clients

SCHWIHAG has an ISO 9001-2000 certified quality management system and has been a Q1 supplier for Deutsch Bahn AG for many years.

SCHWIHAG'S production know-how and logistic processes ensure that your needs can be quickly met, even at short notice, and that standard and customised products are delivered on time wherever you are.



OUR CLIENTS BENEFIT FROM OUR EXTENSIVE KNOWLEDGE OF LOW MAINTENANCE COMPONENTS AND SYSTEMS FOR TRACK AND SWITCH ASSEMBLIES.



SERVICE AND CONSULTING

In relation to:
:: quality
:: strength, durability and
:: reliability

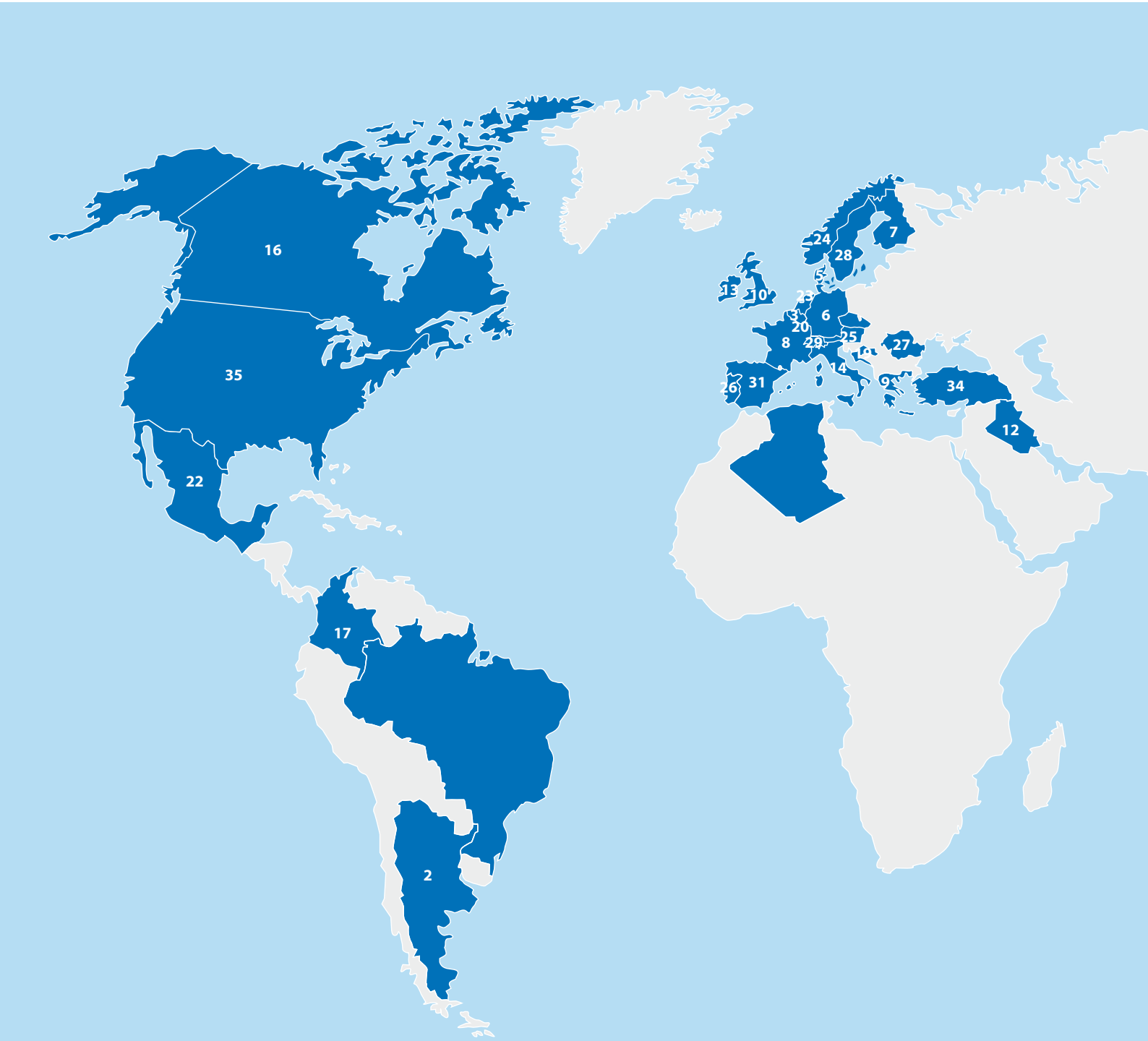
our competitive product range guarantees to meet the growing demands of railway traffic:
:: faster speeds
:: higher axle loads
:: increased travel comfort
:: improved environmental sustainability, for example better sound/vibration insulation

Our clients benefit from our extensive knowledge of low maintenance components and systems for track and switch assemblies with:
:: short and long distance railway lines
:: high-speed lines
:: heavy freight transport
:: industrial railways
:: metro systems above and below ground
:: tramways

In addition to a comprehensive consultancy service when the products are introduced, we also guarantee exceptional after-sales support. We offer:
:: training for installation and inspection
:: technical support for modifications
:: solutions for individual technical problems
:: information about new products or adaptations

SCHWIHAG'S experts attend all major railway exhibitions on a regular basis where we are delighted to offer our clients detailed technical advice (Innotrans, iaf, Rail-Tech, sifer, Nordic Rail, Expo Ferroviaria, Rail Forum, Infrarail, Railtex, Rail Solution Asia and others).

SCHWIHAG PRODUCTS WORLDWIDE



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Railcorp, New South Wales
Fortescue Metals Group Ltd., Perth
Thomson, Kelly & Lewis Pty. Ltd.
ERICO Products Australia Pty. Ltd

2 Argentina
Metrovias S.A., Buenos Aires

3 Belgium
Belgium State Railways, S N C B

4 China
Mass Transit Railway Corporation, MTRC, Hong Kong
KCRC, Hong Kong
Light Rail, Hong Kong
China Railway Shanhaiguan Bridge Group
China Railway Turnout & Bridge Inc. – Baoji
China Railway Track Systems Group – Zhuzhou

5 Denmark
Danish State Railways, D S B (Banestyrelsen)
Metro Kopenhagen
Sportek/Kontek – Horsens

6 Germany
Deutsche Bahn AG, DB AG
Deutsche Bahn (DB) – Berlin
Berliner Verkehrs-Betriebe (BVG)
Häfen und Güterverkehr Köln AG
Kölner Verkehrsbetriebe – KVB
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Dresdner Verkehrsbetriebe AG (DVB)
Duisburger Hafen AG
Duisburger Verkehrsgesselschaft AG (DVG)
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Rail.One GmbH, Coswig
Rail.One GmbH, Brandenburg
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Voestalpine BWG GmbH & Co KG, Brandenburg
Voestalpine BWG GmbH & Co KG, Butzbach
Voestalpine BWG GmbH & Co KG, Gotha
Künstler Bergbautechnik GmbH, Holzwickede
Thyssen Krupp Weichenbau GmbH, Bochum
Thyssen Krupp Weichenbau GmbH, Essen
Thyssen Krupp Weichenbau GmbH, Rosslau
Weichenbau Laeis GmbH, Trier
Schreck-Mieves GmbH, Dortmund
Schreck-Mieves GmbH, Braunschweig

7 Finland
Finnish State Railways, V R
Metro Helsinki
Vossloh Cogifer Finland Oy – Teijo

8 France
French State Railways, S N C F
Vossloh Cogifer SA – Reichshoffen, Paris

9 Greece
Athens Metro
Hellenic Railways Organisation (OSE)
Artemi – Kiakidis, Thessaloniki

10 United Kingdom
Network Rail (previously British Railways BR)
London Underground, London
Metronet Rail BCV Limited – London
Tube Lines Ltd – London
Tramway Croydon, Croydon
Jarvis Rail – York
Amey Colas – London
Amey Rail Ltd., Surrey
Amey Railways Ltd., Wiltshire
Babcock Rail (Previously First Engineering Limited) – Blantyre
Balfour Beatty Rail Track Systems Ltd., BBRS, Sandiacre, Nottingham
Balfour Beatty Rail Track Systems Ltd., BBRS, Beeston, Nottingham
Balfour Beatty Rail Infrastructure Services – London
VAE Baileyfield, Edinburgh
Corus Cogifer, Scunthorpe

11 Indonesia
Indonesian Railway Public Corporation (Permuka)

12 Iraq
Iraqi Republic Railways

13 Ireland
Irish State Railways, I R, Dublin

14 Italy
Italian State Railways, FS, Rom

15 Japan
EJR
Tekki

16 Canada
Canadian National – CN
Calgary Transit
Metro Vancouver
Safetran Canada Inc. – Winnipeg MB
The city of Edmonton
TTC, Toronto Transit Commission

17 Columbia
Metro de Medellín

18 Korea
Korea High Speed Rail Construction (KHRC)
Teagu Subway Agency
Kangwon Railtech Co. Ltd., Seoul

19 Croatia
Proreg Proizvodnja – Regeneracija d.o.o. – Zagreb

20 Luxembourg
Luxembourg State Railways, C F L
KIHN, S.A. – Rumelange
ARBED, Differdange
Soluxtrafer, Rodange

21 Malaysia
Express Rail Link – Kuala Lumpur

22 Mexico
Ferrocarril Mexicano

23 Netherlands
Amsterdam Public Transport Company, GVB
Dutch State Railways, N S
Kloos Kinderdijk, Kinderdijk
Wissel Bouw Bedrijf B.V.

24 Norway
Norwegian State Railways, N S B
Oslo Sporveier, Oslo

25 Austria
VAE AG, Zeltweg
Linz AG, Linz

26 Portugal
Portuguese State Railways, C P, Lisbon
Metro Lisbon, ML
Futrifer SA, Abrantes

27 Romania
Romanian State Railways, SNCFR, Bucharest

28 Sweden
Bankverket (Schwedische Staatsbahn, S J)
Stockholm Commuter Rail, SL
Vossloh Nordic Switch Systems AB – Ystad
Vossloh Nordic Switch Systems AB, Örebro

29 Switzerland
Appenzeller Bahnen
Basler Verkehrsbetriebe
Berner Oberlandbahnen, Interlaken
B L S – Bern
Chemin de Fer LEB, Echallens
Rhätische Bahn AG, Chur
Schweizerische Bundesbahn – SBB Bern
Städtische Verkehrsbetriebe Bern

30 Singapore
Metro Singapore, SMRT

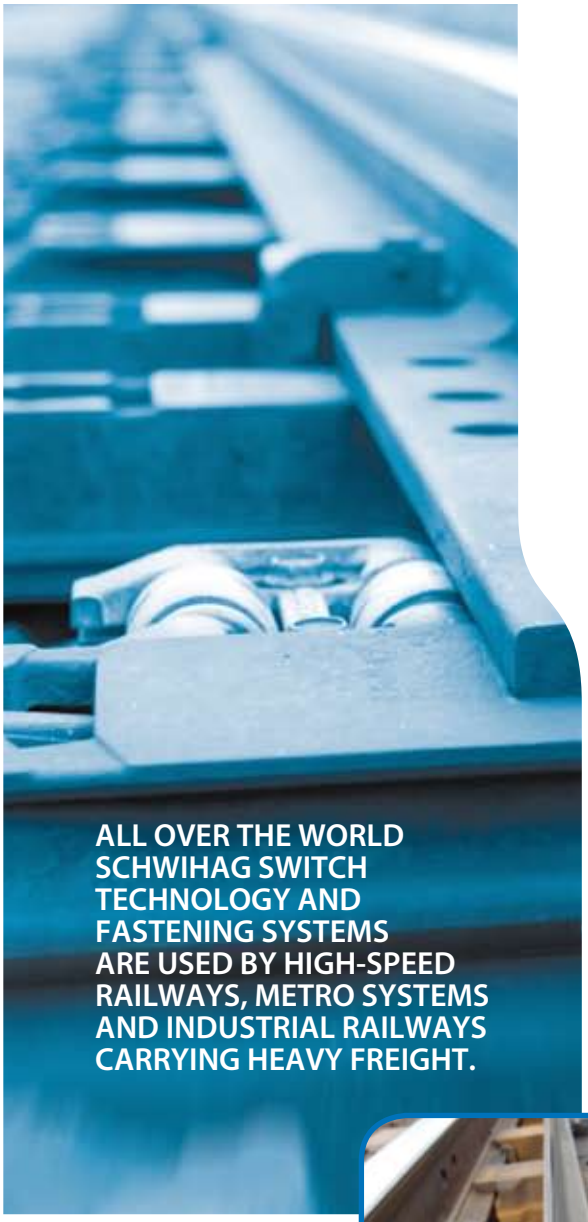
31 Spain
ADIF Administrador de Infraestructuras Ferroviarias – Madrid
Spanish State Railways, RENFE
Metro Madrid

32 Taiwan
Taipei Rapid Transit Corporation TRTC

33 Thailand
China Railway Construction Co. Ltd., CRCC, Bangkok

34 Turkey
Metro Istanbul
TCDD, Türkiye Cumhuriyeti Devlet Demiryollari

35 USA
Metro Baltimore
Metro Los Angeles LA
Metro North. New York
New Jersey Transit
Port Authority Trans-Hudson Corporation, PATH
Union Pacific Railroad, Omaha
Burlington Northern BNSF, Texas
Amtrack
Sacramento Regional Transit
Progress Rail Services
VAE-Nortrack



ALL OVER THE WORLD SCHWIHAG SWITCH TECHNOLOGY AND FASTENING SYSTEMS ARE USED BY HIGH-SPEED RAILWAYS, METRO SYSTEMS AND INDUSTRIAL RAILWAYS CARRYING HEAVY FREIGHT.

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