



Vignole Turnouts

Vignole turnout systems

Efficient turnouts for standard- and non standard-gauge railways and metros



**Progress guaranteed:
Meeting tomorrow's
requirements today**



The increasing need for mobility is a dynamically growing trend worldwide, making huge demands on public infrastructure. Pressure to increase the carrying capacities of rail based passenger and freight transport systems whilst remaining safe, comfortable, environmentally friendly and economical, has increased at least as much. In order to meet these requirements, innovative and intelligent product, system and service solutions are needed. voestalpine VAE develops and produces Vignole turnouts, crossovers, diamond crossings, slips, rail expansion joints and

complete layouts (halts, switch groups, yards and depots) according to international standards and individual customer requirements. Our systems can be provided in any virtually any rail profile, geometry or track gauge. The use of innovative technology and integrated, modern diagnostic systems provides trendsetting concepts in the maintenance arena. The result is a clear optimisation of asset service life, efficiency, availability, reliability and maintenance-friendliness.



Innovative systems and services



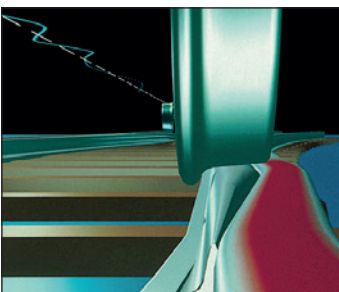
Intelligent system solutions from a single source

In-house designed, developed and manufactured locking, drive and monitoring systems, individually or combined into a single integrated system, can be integrated into voestalpine VAE turnouts. voestalpine VAE's proximity to our world-renown rail manufacturing sister company and the casting knowhow of voestalpine VAE's own producers of high grade cast manganese steel turnout crossings provides our customers with system solutions "from a single source".



LCC – Life Cycle Cost

Life cycle costs are of enormous significance in the infrastructure area. In the RAMS (reliability, availability, maintainability, safety) management concept, product-specific hazards are identified and investigated in a targeted manner and reliability, maintainability and safety analyses undertaken.



Made to measure turnout geometry and kinematic optimisation

A system of kinematic gauge optimisation in the transition area of switches, which voestalpine VAE has named KGO, is a proven design which sustainably achieves improved ride comfort, improved wear behavior and extended service life. KGO's turnout geometries, including circular arcs, higher-order curves and combined curves, or our TOZ designs (carrying capacity-optimised tongue geometry) result in individually tailored systems.



Elasticity and sleeper pads

Optimal elasticity of the turnout running track is one key for the reduction of the forces on both track and wheels, simultaneously resulting in reduced structure- and air-borne noise. The proper use of special elastic rail bearing systems makes it possible to reduce wear and rolling contact fatigue. In addition, sleepers with elastic pads, which aid in the achievement of desired deflection values and reduce the wear on sleepers and ballast, are also available.



Plug & Play – just in time (JIT)

Innovative, modularly structured turnout systems represent a new era – system intelligence. The entire modular turnout system is pre-assembled, fully functional, at one of the voestalpine VAE plants so that it can be installed in track in the least possible time. This means short track down-time, high "initial positional quality", a verifiably positive influence on function, wear and maintenance and, thus, on track availability and asset life cycle cost.

Innovative products for the most demanding requirements

Switches

Switches are available in different designs which can always be adjusted to individual requirements. High strength rail steel, state of the art manufacturing technologies and operating optimised design options like KGO and TOZ are used. To ensure the best stability at the highest speeds, the rail cant of the entire turnout area matches that of the adjacent running track (e.g. 1:40 or 1:20).



Elastic plate systems

Rail fastening in turnouts is usually determined by the rail fastening system used in the adjacent track voestalpine VAE turnouts utilise any common fastening. The plate systems vary according to the sleepers used (concrete or wood) or to the track foundation (ballasted or ballastless). This all results in optimised load distribution throughout the turnout and in the required vibration and noise attenuation. Further, there is not only a demonstrative increase in tamping cycles, but also reduced rail-wheel contact stresses. The stiffness of the system can be varied during design in order to eliminate the negative effects of abrupt rigidity changes.



SIGNALING

The range of products includes hydraulic drives, locking and monitoring systems, electronic safety systems as well as hazard alert systems for rolling stock. All systems are low-maintenance, installation-friendly, and are especially noted for their low life cycle cost. Our new monitoring systems for fixed infrastructure assets like turnouts, level crossings, etc. allow for early detection of impending failures well before one occurs.



Rail expansion joints

Depending on the required operating parameters, rail expansion joints are designed with movable switches, movable stock rails or as butt joints. Fixed switches and movable stock rails are used for expansion lengths from 300mm, while expansion lengths up to 1200mm (+/- 600mm) will use a standard fixed stock rails design. Special expansion lengths are also available, with voestalpine VAE solutions for expansion lengths of 2200mm (+/- 1100mm) having a history of excellent performance.



Concrete turnout bearers

Main line turnouts are usually placed on mono-block concrete bearers. These bearers guarantee optimal positional stability of the turnout in ballasted track. In terms of efficiency, the advantages of concrete bearers cannot be denied. They have a long service life without losing quality and are unaffected by environmental factors such as frost, heat or water. They can also be recycled readily.





Highest
efficiency.
Strongest
performance.
For the sake
of the
environment.

Built-up crossings

Bolted built-up crossings come in a multiplicity of designs and are especially suitable for the smaller, 'one-off' type application. While a wide variety of materials may be used in the turnout, the rail most commonly used is head hardened (perlite or bainite structure) with a high resistance to rolling contact fatigue and wear. The switch points may also be manufactured using heat-treated steel and composite materials with even higher hardness.

Crossings of cast manganese steel

In the high-performance area, welded mono-block crossings made from high-manganese cast steel with a 12%–14% manganese content have been proven to provide the optimal life cycle cost. These cast manganese steel crossings guarantee excellent resistance to wear and are particularly low-maintenance. Refurbishment following long periods of use in the track can be easily performed as the manganese is able to be welded without pre-heating and can thus be re-profiled. voestalpine VAE has developed a method for pre-hardening (explosive hardening) of the running surfaces of cast manganese steel crossings which further prolongs the service life of the crossing.

Moveable point crossing

Operating in the same fashion as switch devices, a movable point in a turnout crossing ensures a smooth transition through the crossing area. A check-rail is no longer required and there are no "interference points" during transition. Depending on the customer's requirements, different designs and materials are used, including for example, flexible movable points of rail (standard and special profiles), wing rails of cast manganese or high strength rail steel.

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