 Vienna, May 2022

future track technology – NOW

Plasser & Theurer at the Internationalen Ausstellung Fahrwegtechnik (iaf)

**Right on time and in line with the slogan “future track technology – NOW”, the Austrian technology leader Plasser & Theurer presents several new solutions tailored to meet current market needs. Technologies which facilitate an even more efficient use of existing capacities are central to these solutions.**

# Highlights:

1. Unimat 09-8x4/4S BR Dynamic E³
2. Plasser FlashWelder
3. Plasser BallastMaster
4. End-to-End-Kommunikation
5. Retrofit
6. ModularCustomizing
7. Handover of our 17,000th machine

**The following machines will be presented at the iaf 2022:**

1. Unimat 09-8x4/4S BR Dynamic E3
2. Unimat 08-475/4S (Retrofit)
3. Plasser FlashWelder
4. Plasser BallastMaster 205
5. Plasser MaterialTransferUnit
6. MTW 100
7. 09-3X
8. EM120VT
9. DGS NG
10. Unimat 09-4x4/4S Dynamic
11. Duomatic 08-32 C
12. MFS 120
13. RM 85-750 N
14. BLS
15. Unimat 09-8x4/4S
16. 08-275 ZW (17.000)
17. UST 79 S
18. ATMO
19. SSP 110 SW (Retrofit, PRS)

#### More than eight innovations installed on one machine

**Plasser & Theurer proudly presents the Unimat 09-8x4/4S BR Dynamic E³, a cutting-edge combined machine for complete maintenance of tracks and turnouts. Existing ballast resources are used during the tamping process, which achieves a perfect result with just one machine.**

Designed for optimised worksite logistics, the Unimat 09-8x4/4S BR Dynamic E³ track and turnout tamping machine combines the functions of several machines: ballasting, tamping, profiling, stabilising, surveying, and post-measuring. It was conceptualised as a versatile tamping machine that uses innovative technology while driving technological innovation.

The machine combines the newest features available as part of ModularCustomizing with technologies that serve research and development purposes. For example, an entirely new approach to the operating concept is being tested in practice. However, the
Unimat 09-8x4/4S BR Dynamic E³ is not just a showpiece machine. In July of 2022, it is scheduled to start operation for Franz Plasser Vermietung von Bahnbaumaschinen, a
Plasser & Theurer subsidiary.

The Unimat 09-8x4/4S BR Dynamic E³:

goals, economic aspects, benefits

* Machine profile: a combination of a turnout tamping machine with increased tamping output thanks to an 8x4 tamping unit. It offers complete ballast management thanks to a profiling, ploughing and sweeping unit, hoppers, a ballasting unit, and an integrated dynamic track stabiliser.
* Main application scenario: periodic track maintenance – very flexible thanks to a complete ballast profiling section and front plough so that maintaining new layers remains possible.
* Typical conditions: shorter construction sections with short track possessions
* This combined machine has obvious advantages in terms of cost effectiveness and efficiency compared to individual machines: there is no need for a drive unit for additional machines; this translates into cost savings throughout the entire life cycle of the machine.
* Saves time and simplifies planning: the work sequences are carried out in a uniform, coordinated manner.
* Provides a solution to the increasing shortage of skilled staff: operation is possible with only five people.

#### Plasser FlashWelder

**Your innovative partner for continuous welded track**

Our time-tested technology in flash-butt welding enters a new era. The Plasser FlashWelder platform leads the way. The new welding head is more compact and lighter, its handling is easier, and the overall performance has been improved.

The crucial characteristics for the performance of our welding machines is the high quality of the welds, their robust design, and flexibility. Plasser & Theurer’s welding technology is very popular among users and has proven itself on numerous occasions. In 2011, the latest generation APT 1500 R was introduced. Since then, more than 20 welding machines have been equipped with this technology. Swietelsky AG purchased the first on-track machine of this series. Almost 20,000 welds have been performed to this day, many of them as closure welds.

We have continuously developed our technologies in the field of welding quality, which have proven their efficiency during many operations. Examples include trimming in line with applicable standards, integrated lifting, or even integrating closure welding.

All welding head components have been analysed and potential for optimising the product has been identified. We've received additional input from our customers and from the requirements of various operating conditions worldwide. The new Plasser FlashWelder represents yet another milestone for our welding technology: improved performance, easier handling, and compact design.

The new Plasser FlashWelder

* Design >> more compact, lighter, and simplified handling
* Modular design >> fully customisable with different options
* Reduced sensor system >> easier to service for greater availability
* Synchronous tensioning and adjustable limit stops >> easier handling

Added value for application

* Weld pre-positioned rails outside the track within the working mode gauge >> the adjacent track can remain in service
* Weld two pre-positioned rails in the middle of the track >> flexibility
* Weld of new and worn rails >> flexibility
* Closure welding is optional >> flexibility
* Readjustment of rail head stops/lateral limit stops >> change of running edge is possible under load

Your benefit for the complete package with vehicle

* Optimised weight of the welding unit >> reduced manipulator size
* Deposit rails crosswise in a 90 degree position is possible >> better view from the cab
* Reduced of axle loads >> more flexibility during transport

#### Plasser BallastMaster

#### Cost-effective and flexible ballast profile maintenance

The new ballast regulating machines in the Plasser BallastMaster series can be set up variably. With their wide performance range, they are compatible with a great number of track and turnout tamping machines. The only way to reduce the costs of modern track maintenance is through an optimum combination of tamping, stabilising, and profiling.

Innovations for greater efficiency and cost effectiveness

The two-part shoulder ploughs can be adapted to any ballast shoulder without infringing the clearance gauge of an adjacent track - even when setting up the machine. The ballast collected by the shoulder ploughs is picked up and distributed in the area of the ballast crown. >Neue Kehrbürste für alle Schwellentypen

>A new sweeper brush for all types of sleepers

The newly developed adjustable brush shaft enables maintenance of all sleeper types. Until now, the entire brush shafts had to be changed depending on the application scenario, which was a labour-intensive and time-consuming process. With the new sweeper brush, this is no longer necessary, and there is no need to carry a replacement brush. The brush shaft adjusts continuously.

>Sweeping unit with flexible ballast distribution

With the new generation, it is possible to select flexible distribution ratios: one third of the ballast into the hopper and two thirds onto the shoulders or vice versa. Of course, it is still possible to transfer the entire ballast into the hopper.

>Steep conveyor belt with higher output and less dust

>Ballast hopper increases savings potential and cost efficiency

>Optimised ergonomic design for cabs and servicing

Choosing the ideal design

The right technology is crucial to achieving the best technical and commercial results:

* high working speed – adapted to the output of the tamping machines or other high-capacity machines used
* high sweeping output with perfect results

#### Machine communication – putting the puzzle together

The end-to-end process of digitalised track maintenance is like a jigsaw puzzle with many pieces that have to fit together perfectly. We will be demonstrating several such technological components and how they work together at iaf 2022 in Münster.

The first fully automated machine-to-machine communication

What typically happens is that a track inspection vehicle, such as an EM120VT, provides an exact measurement of the track geometry and sends the measuring data to a track maintenance machine via the cloud. Thanks to its integrated measuring systems, the
Unimat 09-4x4/4S E³ can also take care of the measurement itself. This means the operator no longer has to feed surveying data into the tamping machine.

The tamping machine’s automatic guiding computer takes the measuring data from the cloud and guides the tamping of the track section or the turnout. The subsequent tamping report is then generated fully automatically and in conformity with the applicable standards. In addition, the results of pre- and post-measuring can be entered directly into the infrastructure manager’s database.

Digitalisation boosts efficiency

These individual pieces are coming together for the first time to form a complete picture: the automated end-to-end process. Time-consuming manual work is no longer necessary, making the process less error-prone and less stressful for operators. The live demonstration at iaf is an impressive display of how digitalisation and networking are key to optimising efficiency in track maintenance.

#### Retrofit of track renewal machine SUM Q-3

Plasser & Theurer retrofits are becoming increasingly popular. This comes as no surprise: we as the manufacturer have the perfect prerequisites for performing excellent work. That was also the reason why the SUM-Q3, operated by DB Bahnbau Gruppe, travelled to Linz on 22 December 2021 for a revision that included a retrofit.

The SUM-Q3, dubbed the “Buffalo”, is a track renewal machine that uses the assembly-­line method. This machine series was developed in the 1980s, and its predecessors have been built since the 1960s. Thanks to integrated ballast management including optional storage of ballast in MFS units (material conveyor and hopper units), the machine concept is still state of the art. That’s what the DB Bahnbau Gruppe operating company and its crew appreciate in the SUM-Q3, even though it’s been in operation for twelve years. The machine has renewed 1,350 km of track to date, primarily on main lines but also on secondary lines. In the past year alone, its output was around 120 km.

**Plasser & Theurer: an obvious choice**

In 2021, the time for a comprehensive machine revision had come. There were no doubts about carrying it out. Experience has shown that the service life of this machine type is between 20 and 30 years. For the customer, there were three arguments in favour of the revision and the retrofit. First, staff is already perfectly familiar with the machine. Once the work has been completed, the machine can go straight back into operation. Second, the costs are significantly lower than the purchase price of a new machine. Third, the machine will return to operation more quickly.

In late July 2021, Plasser & Theurer was tasked with the revision. The reasons were equally convincing and included, above all, manufacturer know-how. In Linz, Plasser & Theurer has access to all design documents. Using them for reference, the work can be performed in line with the machine’s original form. The infrastructure available in Linz is just as essential. The 114 m long SUM-Q3 was built in exactly the same factory hall where it is now being reconditioned. As an added bonus, some members of staff had participated in manufacturing the machine and therefore were perfectly familiar with it. For speedy project completion, it is also ideal if repair parts are produced directly on-site.

**Customer staff members participate actively on-site**

The contract includes all work that is defined in all standards as part of a 10-year revision. This includes the inspection and reconditioning of bogies, braking technology, hydraulics, electrics, and engines, which makes up around 95 % of all work to be performed. Further, individual upgrades were planned. They mostly included design modifications to extend the service life of certain wear parts.

Back on track in June of 2022

In May 2022, the Buffalo has already left Linz, and its first renewal work is planned for June. The operating company emphasises that its service life will be extended by 12 years, possibly even more.

##### **Eco-retrofits The future of tamping**

The latest experiences with electrically powered tamping units prove that the future of tamping is electrifying. The economic and environmental benefits of electrification speak for themselves. Plasser & Theurer now offers the eco-retrofit kit, an upgrade from hydraulic work units to electric work units. This way, existing machines can benefit from its advantages.

Advantages of the electrically powered tamping unit

**-Less fuel consumption** thanks to reduced rotational speed of the drive engine during working mode and reduced power consumption while increasing total efficiency

- **Higher efficiency** thanks to improved response time of the electric motors

- **Lower noise emissions** thanks to lower idling speed

- **Reduced wear** thanks to higher rotational speed during penetration

- **Heat development reduction** of the entire system thanks to reduced hydraulics

- **New opportunity for powering other components electrically** (e.g. AC unit, heating system, ventilation unit, and measuring systems such as the Levelling and Alignment Laser/Curve Alignment Laser)

####  Reduced costs and delivery times thanks to modularisation

To meet our customers' demands for shorter delivery times, better availability of spare parts, and reduced costs, we are fundamentally rethinking one of our most important product segments: compact tamping machines. A key technology worldwide, they are being completely re-engineered and combined into modular assemblies. This will enable us to meet customer requirements even better in the future.

ModularCustomizing: full variety, less complexity

The engineering effort needed for highly complex machines is enormous. For this reason, Plasser & Theurer is completely rethinking the concept of compact tamping machines. In the future, the Plasser CompactTamper will be based on a modular system. Various standardised components and assemblies can thus be individually assembled into a machine according to requirements. This saves time and costs without sacrificing flexibility.

Through ModularCustomizing, our customers will benefit directly from shorter delivery times, proven modules that are used worldwide, and better availability of spare parts. Fewer costs and less effort in replacing standardised modules throughout the entire product service life will further improve life cycle costs.

Thomas Ringer Director of Product Management, Plasser & Theurer

Standardised interfaces will enable easier upgrades or retrofits in the future. Modularisation offers many advantages with the usual amount of flexibility. A wide range of products can be offered to meet individual customer requirements. At the same time, an ecosystem of products and services is gradually emerging. They are designed to complement one another and to help our customers to organise their activities efficiently and cost-effectively.

Plasser CompactTamper: grand technology meets compact design

Based on the basic principle of modularisation, the company's entire product portfolio is being successively restructured and redesigned. Due to the great number of tamping machines in use worldwide and their important contribution to the availability of track infrastructure, this is a product segment we prioritise. In this way, our customers benefit from the advantages of ModularCustomizing as soon as possible.

Compact tamping machines by Plasser & Theurer maintain tracks on all continents under the most diverse environmental conditions. The machines stand for great flexibility, the use of the world's leading P&T tamping technology, and a compact and therefore cost-efficient design.  At the iaf in Münster, the machine designed according to the modular concept will be presented to the public for the first time. It will also be ceremoniously handed over to a delegation of Sitarail (Bolloré Transport & Logistics).

#### 17,000th machine by Plasser & Theurer

In the 70-year history of our company, we have been able to offer a variety of services to our customers worldwide. Our 17,000th machine, a Plassermatic 08-275 ZW, will be handed over to the Polish company Gór-Tor at iaf in Münster.

The Plassermatic 08-275 ZW has already been built in several different versions for customers in a number of European countries in recent years. With its tamping unit in split-head design, it is suitable both for plain track maintenance and for use in turnouts. Despite all the standardisation for the mostly similar application profiles and global focus, there are also differences in design. The machine intended for use in Poland, for example, adheres to a slightly lower weight specification. This allows it to be transported within the country without a special permit. The operator will be the Polish company Gór-Tor Sp.z o.o. based in Olszewo-Boki. This purchase, which offers a competitive advantage, is a response to the rapidly increasing demand for the maintenance of urban networks in Poland.

**About Plasser & Theurer**

**Machine, Fleet and Infrastructure**

The Austrian family business Plasser & Theurer stands for cost-efficiency and innovation in track construction and maintenance. Employing around 2,000 members of staff, the company has supplied around 17,000 machines to 110 countries since 1953. Most of the machines are manufactured in the main factory in Linz. The machine offer covers almost all works to be performed when maintaining, laying and renewing railway tracks, ranging from simple tamping machines to 200 m long high-capacity machines. As a full-range supplier collaborating with 19 partner companies around the world, Plasser & Theurer offers comprehensive customer services, covering training, spare parts supply and technical service. With the introduction of the first fully electric tamping machine, Plasser & Theurer has proven its position as the technology leader in the global market for track maintenance machines.

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