Hamm | Ballast compaction in railway construction using the HD 10C VV compact roller

Construction machine shows its strengths during renovation works in Switzerland

HD CompactLine compact rollers can be used virtually anywhere in the fields of asphalt construction, earthworks, gardening and landscaping. What many people don't realise is that they also come into their own in railway construction. In Aarau in Switzerland, the Hamm HD 10C VV tandem roller was used in works to upgrade the points. In these works, compacting the ballast is an integral part of the pre-compaction process. If a ballast bed is not cleanly compacted and homogenised, this can lead to costly processes further down the line.

Compact tandem rollers can achieve optimum compacting results on ballast layers, frost protection layers and base courses, as well as water-bound road surfaces and asphalt layers. The articulated compact rollers of the HD CompactLine are ideally suited to railway construction – including the HD 10C VV tandem roller used for the project in Aarau.

The quality of the ballast bed is critical

The condition of the ballast bed upon which the rails are laid is one of the determining factors for the quality of the guideway. The ballast has a whole host of important jobs to fulfil, which require it to have very specific properties. The basic prerequisites: The ballast follows a clearly defined distribution of stone sizes and fulfils various geometric, physical and chemical requirements.

Ideally suited for railway construction – the “lightweight” HD 10C VV

"The weight of a roller is a major consideration in railway construction," explains Jürgen Franzen, foreman for the Rhomberg Sersa Rail Group who are completing the construction works. "Even from around three tonnes upwards, you can see clear differences in the tracks the roller leaves behind. However, the actual problem is hard to see with the naked eye – namely, the graining. This means there are certain fracture points in the ballast. However, the ballast stones need to have certain properties to stick together as required. Too much weight would impair this characteristic. Plus, the compact proportions of the HD 10C VV also make it particularly easy to load onto transport vehicles, so it's a great option for transporting around."

Major time savings during operating hours

The works to upgrade the points generally take place during normal operation of trains on the adjacent track. In Aarau, the reconstruction work was carried out on a three-shift rotation. Each work step intertwines with the next and they build on each other. This is important because the rail traffic generally resumes operations immediately after the points are installed, since closures are calculated to an absolute minimum.

Carefully coordinated processes for more efficiency and safety

The points were upgraded once the W+ excavation system had excavated, cleaned and reapplied the ballast. While the W+ was doing its thing, the HD 10C VV was compacting the ballast. The tandem roller with vibrating roller drums provides not only the initial compaction, but also a level surface on which to subsequently lay the sleepers flat. This initial compaction essentially gives a degree of compactness to the deposited material. The ballast here already has a certain sticking quality. The HD 10C VV compensates for this with compression and vibration. This way, the material fuses together better. Then the mechanical surfacing stage of the points construction began. After that, it was mechanically tamped to further homogenise the ballast.

“The HD 10C VV has everything I could possibly need to do my job properly. It's intuitive to operate. It has really impressive visibility and excellent driving and handling characteristics,” explains René Neujahr, operator for the Rhomberg Sersa Rail Group.

Jürgen Franzen, foreman of the company completing the construction works, adds: "If there's a raised section in the centre beneath a sleeper, caused by an oversight in the compacting stage, that sleeper could crack. That is relatively easily remedied if it is a track sleeper. But the way the points are here in Aarau means we can't implicate any other points. So everything would grind to a halt. You can tamp it, but you would still need to remove the sleeper afterwards and properly refurbish it. Our Hamm roller helps ensure this doesn't happen."

Photos:

   
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For railway construction works to upgrade the points in Aarau, Switzerland, the Hamm HD 10C VV tandem roller was deployed to complete the ballast works.

  
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Following the mechanical surfacing stage of the points construction, the HD 10 C VV compacted the ballast to homogenise it further.

  
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Once the ballast had been excavated, cleaned and put back down by the W+ system, the points were upgraded.

  
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Foreman Jürgen Franzen and operator René Neujahr from the Rhomberg Sersa Rail Group discuss the individual work steps.

Note: These photos only provide a preview. For printing in publications, please use photos with a resolution of 300 dpi, which are available to download via the link provided.

More information is available from:

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