

# Dynamic Tunneling Package

Why spending time making drill plans when the drill rig could do it by itself? Boomer Automation software.



# Dynamic Tunneling Package

Today all tunneling projects exist in a 3D CAD model. With the Dynamic Tunneling Package the drill rig can create its own drill plan directly at the face of the tunnel. You just download the contours of the tunnel or mine drifts to the drill rig together with a drill plan rule file and the drill rig will create drill plans tailored for the section it's currently navigated on.

## Main benefits

**More accurate drilling** since the drill plan is created directly on the drill rig

**Less traveling back and forth with drill plans**

**More time efficient** since less time is spent in the office adopting and modifying drill plans

Due to that the drill plan always will be generated at the actual section where it's navigated, the drill plan will always be a perfect match. There is no more need for free hand drilling to make the extension or use an old drill plan that "almost" fit. This will generate better blasting and better quality of the contours.

Today in large tunnel or mine projects it's a lot of time spent going up and down with new drill plans. Due to that Dynamic Tunneling Package creates the drill plans directly in the drill all that time is saved. With the Dynamic Tunneling Package you only have to download the contour of the tunnel and a set of rules. The rest is created by the drill rig.

If you use fix and predefined drill patterns there's always a risk that they will not fit to the actual section. In a ramp tunnel for example, your blasting have not reached the designed depth and due to that you have not advanced as much as planned. Instead of using the drill plan for a planned section ahead you have to go back to office to modify the drill plan. In projects with lot of size variations in cross sections, huge time could be spent on modify drill plans. On many projects the surveyor is responsible for the drill plans. If the surveyor is not present when the drill plan is needed there will be a lot of waiting. No more waiting for the surveyor because there is no drill plan that matches.





With the Dynamic Tunneling Package integrated drill plan generator the drill plans will be made directly on the rig.



When using the drill plan generator you will download the 3D model of the tunnel into the drill rig.



When generating the drill plan the exact location of the drill rig and the planned shape of the tunnel will be taken into consideration.





## Case story – Norway

# Why spending time when the drill rig co

Dynamic Tunneling Package is a new automation software for face drilling rigs. With the Dynamic Tunneling Package the drill rig can create its own drill plans directly at the face of the tunnel.

You just download the contours of the tunnel or mine drifts to the drill rig together with a drill rule file and the drill rig will create drill plans tailored for the section it is navigated within. No more going back and forth with drill plans. And improved accuracy of the excavation due to the fact that the drill plans will always be fitted for the current section.

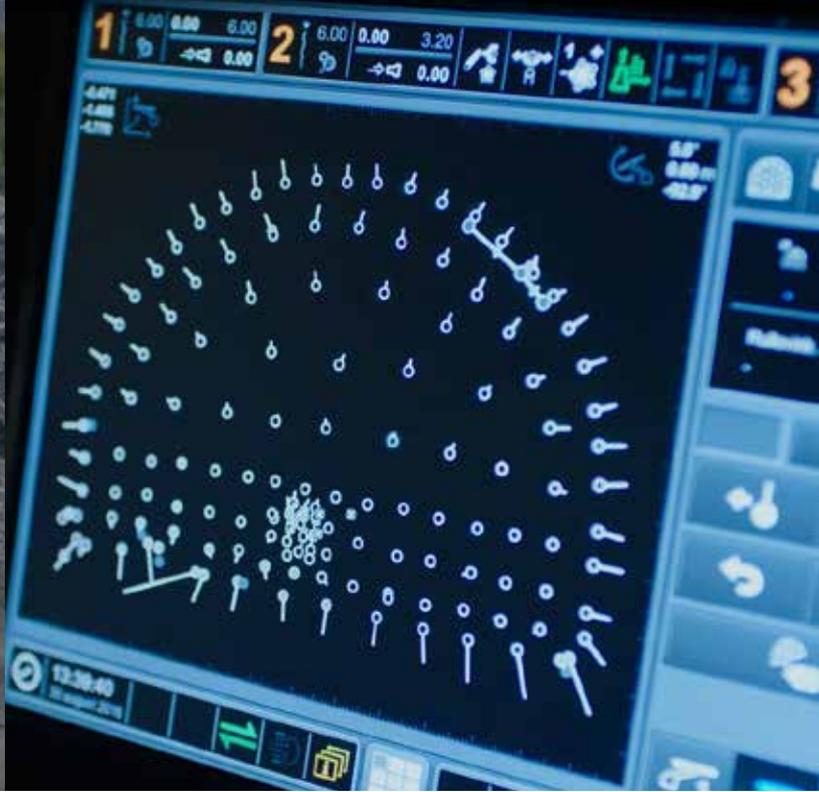
– Today, in tunneling projects, especially large ones in urban areas there are differences in the cross section. You go up and down with your drill plans. Dynamic Tunneling Package helps you. You don't have to go up and down. The drill plan is made on the drill rig at the face, says Johan Jonsson, Product Manager Boomer, Epiroc.

**"The Dynamic Tunneling Package is very easy to use. It is two keystrokes and you are started"**

Kent Simensen  
Drill rig operator, Veidekke.

Epiroc's customer Veidekke and their RV80 project in Bodø, Norway was one of the pilot projects for Dynamic Tunneling Package.

– Veidekke is working on the State highway 80 project in Bodø. There's a tunnel that's two times 2.5 kilometers. We are going to excavate about 500 000 cubic meters of rock. The collaboration with Epiroc to develop the DTP went well. Epiroc were responsive to our feedback and made adjustments to the program. Today, the drill rig operators make niches manually. They can turn out way



# making drill plans could do it by itself?

too big or way too small. Dynamic Tunneling Package makes our drilling more precise. We can make changes to drill plans directly on the rig. We can move cuts or drill-holes. We are more flexible at the tunnel face compared to making all changes at the office. We use Dynamic Tunneling Package to make niches (areas of the tunnel with larger cross section). This makes the work more precise, says Jon-André Nilsen, Manager Surveying Technic Underground, Veidekke.

**"The Dynamic Tunneling Package has made my work in the tunnel a lot easier, says"**

Kent Simensen  
Drill rig operator, Veidekke.

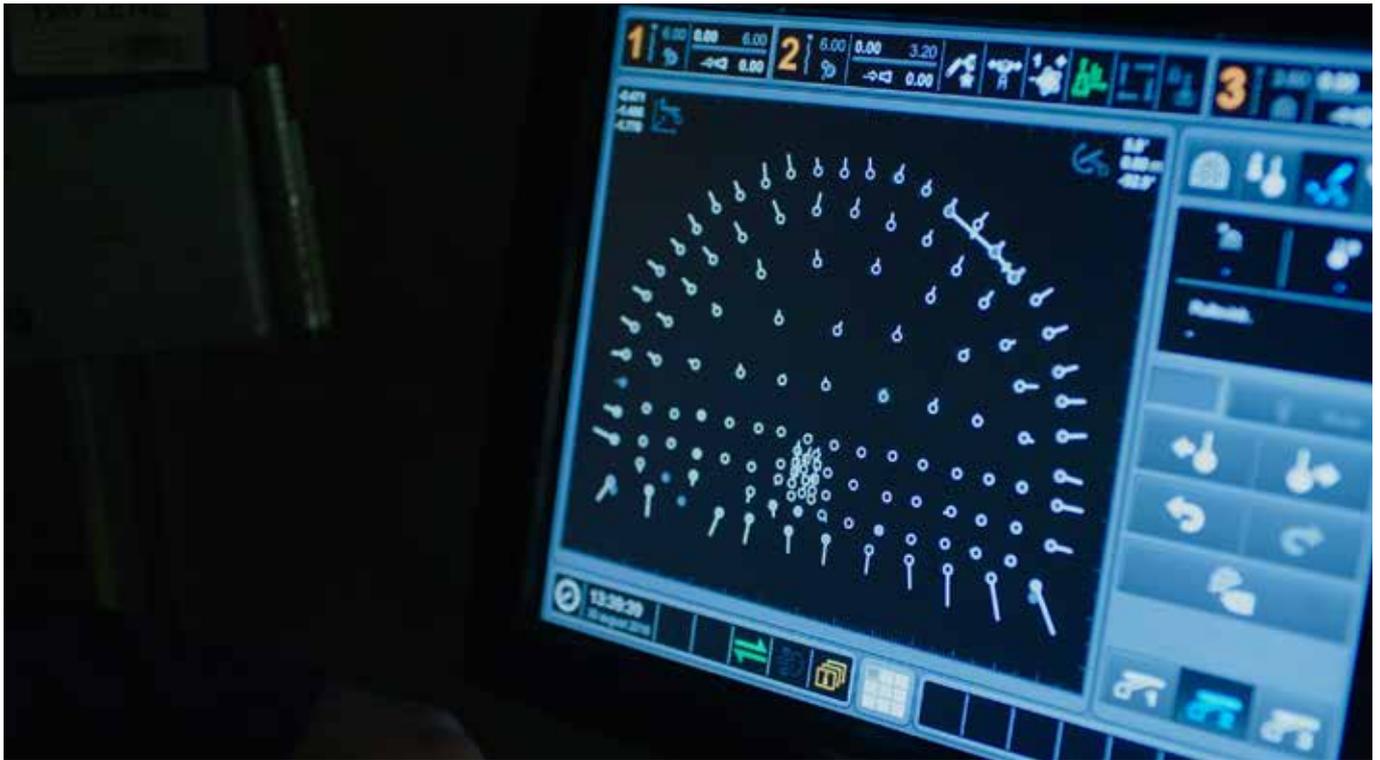
–The Dynamic Tunneling Package is very easy to use. It is two key-strokes and you are started. The contour turns out very accurate. The end result is identical to the drawing.

Today all tunneling models exist in a 3D model. Previously you have to import the model into Underground manager and then do all the drill plans manually in Underground Manager. With Dynamic Tunneling Package you still import the 3D model but you only need to set up a set of rules (a rules file) in Underground manager. The set of rules and the 3D model is then brought to the drill rig by USB or WiFi-connection. The drill rig will then make its own drill plans based on where in the tunnel it navigated and according to the tunnel model. Due to this the drill plans will always be precise made for the section and size that should be excavated right now.



## Customized automation solutions

The Atlas Copco Automation Team will partner and evaluate your automation possibilities and find profitable solutions. We offer a range of partner services from audits to network support and project management. Together, we can develop strategies to meet and exceed your goals for production, profit, safety and sustainability. With a strategic digitalization plan in place, we can help you reach your goals by implementing our automation solutions where you need them most. Automating your equipment will help you find ways to improve production while lowering cost. Get in touch with us today so we can start collaborating.



## Dynamic Tunneling Package

Underground Manager with possibilities to make drill plan rules	A new extended version of Underground Manager that enables you to use the new functions of the RCS system. This include both the function to generate drill plan rules but also same drill plan generator in the PC software as on the rig.
Time and quality measurements	You can easy verify the drill plan rule files in the office using Underground Manager before you send them down to the drill rig.
Drill plan generator	The RCS system on the rig will generate a drill plan directly on the rig optimized for the cross section where the drill rig is navigated.
Extra contour lines on rig	When drilling the face both start and end contour will be visualised so the operator easy can se the preferd shape of the end contour.
3D view over tunnel on rig	The tunnel will be visualized in a 3D view and can be shown from all angels in the rig.
Possibility to move cut on rig	When doing a drill plan you can move the cut and generate a new drill plan based on the new position of the cut.
Possibility to add/remove and change holes on rig (Edit Drill Plan)	A drill plan can be edited and holes can be added and removed based on customer preference.
Systematic bolting support	The drill rig is able to generate new bolt row of systematic bolting. The bolt plan is also improved to simplify visualisation and understanding.
Input needed	To use the drill plan generator a rule file, tunnel line and contour is needed. This could either be created in the included PC software Underground Manager or imported into Underground manager in IREDES (xml), DWG or XLS format.



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