

SANDVIK TOUGH

BENCH DRILLING MF-RODS



TAILORED METALLURGY

Consistent quality, long service life and high performance have been the hallmarks of Sandvik *MF-rods* ever since their market breakthrough some 20 years ago. With the new Sandvik *Tough MF-rods*, specially developed for surface bench drilling, our drill strings now have an extra competitive edge as a result of carefully selected metallurgy in the various parts of the rod. *The result:* A drill string with practically no weak points.

Constant upgrading procedures

With our unique in-house manufacturing facilities for producing the steel, machining it and tailoring it for its application, we have all the resources required to achieve the metallurgical customisation of crucial components. In Sandvik *Tough*, the various parts of the rod have been given specific material characteristics to optimise wear and fatigue resistance. And to maximise the operational balance between them Sandvik *Tough bench drilling MF-rods* are born to last. They boost drilling performance, make drilling operations considerably simpler and secure high productivity.

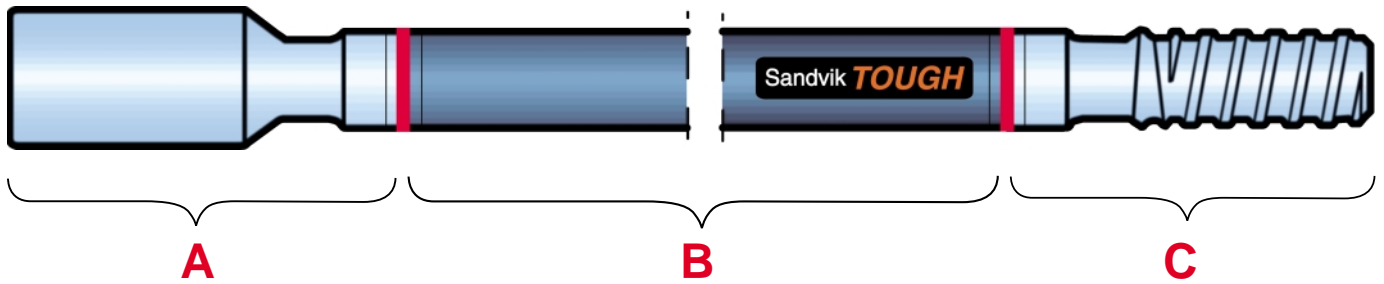
Sandvik Tough benefits

- Reduced risk of pittings on threads, thanks to upgraded material characteristics, which in turn mean extended service life
- Reduced risk of thread-end breakage and lost drill holes
- Better balanced thread wear between male and female threads provides more efficient rod utilisation
- Tighter manufacturing tolerances result in higher product quality and longer life



Sandvik Tough rods undergo stringent laboratory tests in which all critical drilling parameters are extended beyond the conceived material limits.

FEATURING STRONG POINTS ONLY



MF-design improves energy transfer and gives faster drilling

Since the coupling sleeve is integrated in an *MF-rod* it is possible to design the coupling with less mass. Consequently, energy loss in each joint is lower compared to drilling with separate coupling sleeves. Superior energy transfer through the drill string results in faster drilling.



MF-design means easier coupling and uncoupling

Coupling sleeves that come loose or stick to the wrong rod lead to time losses and interruptions in drilling operations. They may also damage the threads of the drill string when handled incorrectly. The *MF-rods* and their integrated couplings eliminate these problems leading to higher productivity and safety.

MF-design gives straighter bores

A drill string with *MF-rods* offers stiffer connections because the 50% reduction in thread play compared to a separate coupling sleeve. Drilling with a stiffer rod package results in improved hole straightness and more efficient and safe bench drilling.

MF-design is perfected for automatic rod handling systems

There are fewer parts to worry about when using *MF-rods* – you no longer need to keep track of coupling sleeves. This makes Sandvik *MF-rods* ideal for automatic rod handling systems. The integrated couplings considerably simplify rod handling procedures.

Sandvik Tough “Multi-Rod” technology

Drilling operations expose the different sections of a drill string to varying forces. Hence, the steel used in the various parts of a conventional rod must be a metallurgical compromise. The fact that the components making up a Sandvik rod are friction-welded to each other has given us unique potential to select the optimum steel grades and manufacturing techniques for each section of the Sandvik Tough *MF-rod*. The

Sandvik TOUGH

technique also allows for tighter manufacturing tolerances and high surface finish in terms of both machining and heat treatment and permits balanced wear and a minimised risk of breakages and fatigue. Sandvik Tough – *the premium MF-rod!*



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