The story of how one Malaysian Cable Manufacturer saved 2% of their Copper and Aluminium by switching to Nano-Dies®

Energy cables are manufactured all over the world, but Malaysia is a particularly important power cable manufacturing centre, combining advanced manufacturing knowhow with key geographic location.in the heart of South East Asia.

Riduan is a Malaysian R&D Engineer, based in Melaka at the production plant of one of the country's main cable manufacturers. Riduan is a very good engineer – he doesn't believe anything that he is told by suppliers – he just runs his own tests and draws his own conclusions. So, when we told Riduan about the benefits in cable manufacture of the very low friction and long life of Nano-Dies, he smiled politely and ordered one Nano-Die, exactly the same bore diameter as a PCD die he was already using. Then he ran a beautifully simple test.

1. He used an infrared thermometer on the cable at output from the final compacting die.
   Result: Final PCD die Ø18.83mm 46˚ C
2. He then replaced the final compacting die with a Nano-Die, leaving everything else the same.
   Result: Final Nano-Die Ø18.83mm 40˚ C
3. Riduan realized immediately that lower temperature means lower friction and lower friction means a less stressful process and that in turn means lower electrical resistance. Hence there was now an obvious opportunity to save a lot of conductor raw material.
4. He made a couple of confirming resistance measurements. Then he lightened the conductors by 2 percent and ordered a full set of Nano-Dies, in slightly smaller sizes than before.
   Result: Final Nano-Die Ø18.50mm 45.6˚ C

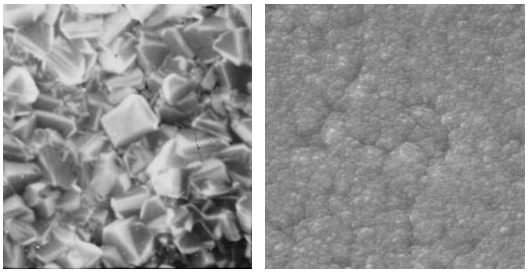
The resulting finished cable is fully compliant in all respects, but it uses 2 percent less of the most costly raw materials. If your plant uses $10M worth of Copper and Aluminium per month, that is $200,000 per month that you just saved. If you use more material than this, your savings are proportionally larger. Every little bit helps, as they say.

But the good news does not end there. Because the conductors of Riduan's cable are now enclosed within a smaller diameter of Ø18.50mm, he is able to save more money on all the materials outside the conductors. Riduan estimates that he saves roughly 0.5% on insulation, 2% on metallic screening, 0.5% at inner sheath (bedding), armour wires 1.25%, 0.5% on outer sheaths. He can order a smaller reel size, saving a further 0.75% and, because the overall product is less heavy, he saves around 0.5% on transportation costs.

A Nano-Die derives its enormous hardness and its remarkably low friction coefficient from the quality of its working surface, comprising millions of nanocrystalline diamond particles of the same size, locked together.

Any cable manufacturer can enjoy these benefits. A Nano-Die costs 3 to 6 times less than the equivalent PCD die. Nano-Dies hold +0 tolerance for 500-800 kilometres of cable compacted. The product range currently runs from Ø1.2mm to Ø60.0mm, far exceeding the maximum possible PCD diameter.

The photographs below contrast the difference between the surface of a Fine Grain PCD die (left) and a Nano-Die (right)



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