



D-SCE CABLE IDENTIFICATION

A TE Connectivity briefing paper

D-SCE cable identification for diesel and temperature performance

ALTHOUGH IT WAS ORIGINALLY DEVELOPED FOR USE ON DIESEL LOCOMOTIVES IN THE RAIL INDUSTRY, TE CONNECTIVITY'S D-SCE CABLE IDENTIFICATION MARKER IS USED WIDELY IN APPLICATIONS WITH DIESEL ENGINES OR GENERATORS. THESE NEED HIGH PERFORMANCE PRODUCTS THAT CAN WITHSTAND FLUIDS LIKE DIESEL, OILS AND SOLVENTS, AS WELL AS HIGH TEMPERATURES.

TE Connectivity has a wide range of identification products that meet the varying priorities of customers across multiple industries. Its portfolio includes high performance heat-shrink products as well as pre-printed markers, printable labels and tags.

This briefing paper by Stephen Earley, TE's global product manager for identification systems will explain the advantages of D-SCE, an identification product (ident) that performs in tough environments in spite of extended exposure to heat and corrosive liquids.



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The value of D-SCE

Identification products (idents) cost only a few pence each but selecting the wrong product can lead to significant costs and headaches down the line.

The D-SCE product was developed in the 1980s for wiring assemblies in railway applications with diesel engines, where any products adopted need to meet exacting quality and safety standards. Since then, the marker has proven that it remains in place and readable even after long periods in service. It has also been adopted in other applications where diesel engines and gensets are common, such as marine, aerospace, defense and in industrial power supplies.

Safety, performance and cost control are top priorities in these sectors. Because D-SCE remains in place and readable it saves valuable time during the many refits, refurbishments and maintenance operations over the life of the equipment being identified. A diesel locomotive or a backup power generator may have hundreds of wires and cables so printed

markers able to survive this harsh environment is critical for maintenance operators as replacing markers is avoided.

So by saving a few seconds per cable during maintenance activities over many years, D-SCE can avoid cost and complexity of tracing individual cables.

Operating environment

The key benefit of D-SCE is that it has high resistance to organic fluids such as diesel, oil and lubricants, as well as solvents. This is combined with the ability to withstand high temperatures for long periods.

Initially developed for the rail industry, it has been adopted for applications in the aerospace, marine and construction industries. TE has achieved product approval for these industries through an extensive program of testing against standards such as the EN45545 and NF standards for rail, as well as UK fire protection standards and US automotive and military standards.

System approach of D-SCE

Like all of TE's printable idents, the D-SCE product is actually a system that includes the heat-shrink material of the label itself as well as the printer, ink, print settings and software. It has been developed and tested as a whole so that installers know that when they apply the product, it will do its job.

This system approach is needed because failure of an ident can arise from many sources over time as it is exposed to chemical, mechanical and thermal wear and tear. Any of these may cause the material to degrade or the mark to become illegible.

Any ident product only performs if it stays in place and readable in spite of the conditions in its operating environment – and that is why the system approach is important.

Specially formulated polymer

D-SCE takes the form of a tube made of a specially formulated cross-linked polymer that shrinks to cling on to the cable when heated.

TE pioneered heat-shrink polymers in the 1950s under the Raychem brand when its material scientists found that a radiation source could be used to make changes to polymers on a molecular level. By exposing polymers to radiation, the chain-like molecules form links, creating a mesh-like structure that give the materials the unique properties needed for a premium grade and printable heatshrink tube.

On its own, this cross linked polymer doesn't have special properties like resistance to high temperatures, harsh ultra-violet light or corrosion by chemical substances.

To achieve the combination of high resistance to organic fluids and elevated temperatures for D-SCE, TE blends the cross-linked polymer substrate with carefully selected additives. These lend the idents their ability to withstand the tough operating environment.

Making a lasting mark

The other part of the D-SCE system is the interaction between the heat-shrink polymer material and the ink that makes the mark. The ident is only guaranteed to stand the test of time when used with an approved printer, print ribbon, printer settings and printer software. This is proven through TE's extensive program of testing.

Ladder format

D-SCE is supplied in ladder format, which TE introduced, where individual labels are held in place between two polyester strips that guide the product through the printer. Installers can print labels in batches and peel labels off one by one when they're needed.

During installation, this means that installers can take the batch to site in the ladder format and find and apply individual labels quickly in just a few seconds.

Once the heat-shrink tubing labels are on the cables, they can be shrunk into place with a heat gun or left at their original size. When shrunk, they will reduce in size by a ratio of three to one.

A range of sizes fits wires between 0.8 and 33 mm (0.032 and 1.3 inches) in diameter.

Practicalities and printing

Because they can be printed on site, D-SCE is suited to large volume applications, such as railway locomotives, which might have thousands of individual markers on board.

It's possible to print both sides of the D-SCE tubes at once to maximize the printed area with sequential numbers, bar codes and letters from multiple languages and alphabets, as well as logos and symbols.

As standard the markers are sold as a single piece or semi-severed into two pieces (S1) and the choice depends on the quantity of printed data that is required. Non-standard options for scoring include S2, which slits the marker in two places, or S3 which slits the marker in 3 places.

Standard colours are white and yellow which gives excellent print contrast with black ink.

Guaranteed performance and end-to-end control

While there are many idents on the market, it's worth investing in products like D-SCE for consistent proven quality. TE exerts total control over sourcing, purchasing, production and testing of its ident systems.

Many variables can affect the performance of heat-shrink tubing products. Raw ingredients can vary in quality and mixing rates, temperatures and even the grain size of mineral additives can all affect quality of the end product.

Tight control over sourcing, production and quality throughout manufacture translates into consistent high quality product. This is complemented by rigorous laboratory testing that demonstrates that TE's products are up to scratch and every batch is good.

Choosing the right ident

At first glance, cable identification seems simple but because of the many standards that can be applied and wide variations in the operating environments, installers need to take care to select the right product.

Each industry and operating environment is bound by a set of standards, which can vary for different countries and regions of the world. Add to this that many organisations have their own standard specifications and many individuals have personal preferences.

TE is connecting with its customers to give them the tools and support they need to find the right product to balance all of these needs.

About the author

Stephen Earley is global product manager for TE's identification products. He has long experience in the identification field and the corresponding markets such as Aerospace, Defence, Marine, Rail, as well as Electrical since 1992. Today he is leading an initiative to reconnect TE's identification products around the world, including a new catalogue that has been designed around the needs of the customer.

About TE Connectivity

TE Connectivity is a technology leader that designs and manufactures the electronic connectors, components and systems inside the products that are changing the world – making them smarter, safer, greener and more connected.

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