



Innovation in the protection
of underground utilities



stokbord®

Stokbord® Cable Cover & Drum - meeting
The National Grid Standard TS 3.05.07,
ENA-TS 12-23 Class 1 and ENA-TS 12-23 Class 2
technical specifications - with new gains in
performance, capacity and sustainability.

Reassurance as standard

Confidence is hard won in the utilities sector.

For decades, Centriforce, home of the world-renowned Stokbord® Cable Cover, has been recognised across the industry for its time-proven and trusted method of keeping underground utilities safe.

Stokbord® Cable Cover is specified around the world for its ability to deliver heavy duty protection for buried utilities, including gas, water, electricity and telecoms.

It's formed a reputation built on trust. We've been the 'go to' partner in utilities for more than 40 years, standing out as pioneers in the sector, and seen as the experts in what we are doing.

Our policy of continuous improvement and innovation has brought a wealth of beneficial initiatives to the utilities sector.

That has included the recent launch of Stokbord® Drum, which offers the same level of protection and compliance, in an installation method that puts on-site health and safety and efficiency at the forefront.

In short, we've not rested on our laurels – and now we are setting out our latest advancement to the industry.



A new approach

Traditionally, it has been considered industry practice to refer to 14mm protection for The National Grid Standard TS 3.05.07 and ENA-TS 12-23 Class 1, and 12mm for ENA-TS 12-23 Class 2 technical specifications.

However, the purpose of this guide is to show how Centriforce's Stokbord® Cable Cover and Stokbord® Drum are capable of meeting technical specifications - delivering assured protection with the benefits of 12mm for The National Grid Standard TS 3.05.07 and ENA-TS 12-23 Class 1 - and 10mm for ENA-TS 12-23 Class 2.

Materials science has moved forward, and the strength and performance of Stokbord® now means that the utilities industry can draw on the company's research and development activity to achieve optimum safety, without compromise, with these proposed levels.

The advancement makes a strong economic case for our utilities clients – ensuring that the Stokbord® solution continues to be the optimum choice where safety and security count – with new tangible financial and sustainability benefits included as standard.

As you'd expect from Centriforce, there's a wealth of information explaining the science and engineering behind this latest development.

This document sets out some of that detail. It includes information on the history of the previous specification, the testing regimes implemented for Centriforce's updated 12mm and 10mm standards and information on our approach in the industry, to give an informed overview of this new advancement to cable protection standards.



An introduction to Stokbord®

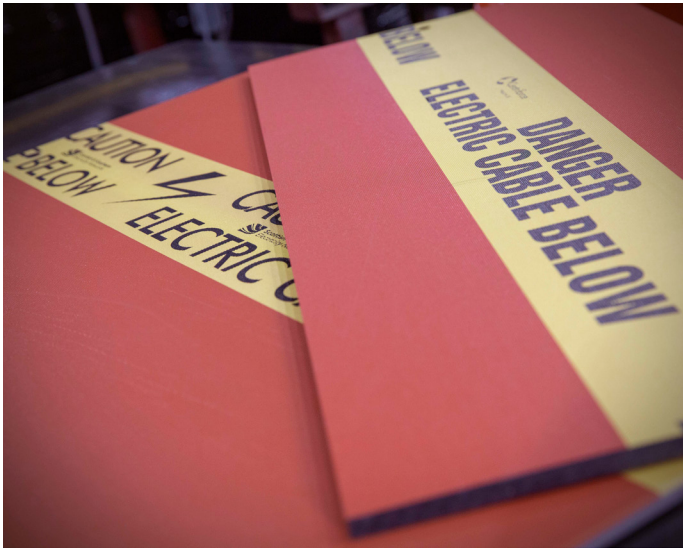
Stokbord® is a highly versatile impact resistant product which protects underground utilities from damage and at the same time provides a highly visual alert of what lies beneath. For the utilities sector, it is provided as a Cable Cover, which is a one metre tile, or in the new drum format.

The system can be used to protect underground utilities, particularly high voltage electricity cables, but can also be used for water pipes, gas pipes and fibre optic cables.

Of major significance is Stokbord®'s ability to help prevent damage to the electricity cable that is buried underground.

The idea behind the product is that if anyone is digging in the area at some point in the future where a cable is laid, they are going to hit the Stokbord® before they hit the cable.

This is invaluable as it helps prevent serious injury, as well as costly and disruptive outage in the electricity system.



Materials matter - the development of a game-changing specification

More than 13 years ago, a game-changing project set out a new benchmark for the protection of utilities underground.

In 2007, the Electricity Alliance Innovation Team approached Centriforce to drive forward a proposal to introduce plastic protection on the Kirkby to Lister Drive upgrade scheme.

Centriforce were approached as industry leaders to help develop a solution to replace reinforced concrete covers on site for the 275kV project.

We engineered a system, which we showed to National Grid who visited our premises to see the development.

A temporary permission was then granted, and the works successfully completed.

This project went onto play a key role in the EAW Report, which was launched in 2008 – and signalled a dynamic new approach for the industry.

The document discussed how advances in materials meant that the utilities sector could safely move away from traditional concrete methods and still achieve the necessary levels of impact resistance through plastics.

As leaders in the field, we were asked to contribute to the EAW Report as experts in the subject area, and with the benefit of experience gained on the Kirkby to Lister Road project.

Although not explicitly recommended, the report led to an assumed standard of 14mm protection for The National Grid Standard TS 3.05.07 specification.

This created a new benchmark for industry and we were proud to play a part in it.

However, time brings new developments and, just as we were able to play a part in the 2008 revision in materials, our expertise and industry knowledge means we are now well-placed to deliver protection at 12mm for The National Grid Standard TS 3.05.07, ENA-TS 12-23 Class 1 and 10mm for ENA-TS 12-23 Class 2 technical specifications.

That brings a variety of benefits to our clients, including the reduced product, labour and transportation costs all associated with the introduction of lighter materials.

It's time for a new approach.

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We are very proud of our Stokbord® product. We’ve been manufacturing it for more than 40 years in the UK and supply it to many different countries around the world.

Now, our expertise and industry knowledge means we are well-placed to deliver new levels of performance with 12mm and 10mm standards, for 2020 and beyond.

Simon Carroll, CEO of Centriforce, the manufacturers of Stokbord

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Our Quality Commitment

As a responsible manufacturer we test the suitability of raw materials for each blend and make further checks at various intervals during the manufacturing process. This is to ensure effective process control & conformance to specifications.

Our blend of materials is specially procured from empirical knowledge of what is needed to achieve compliance to National Grid TS 3.05.07 and ENA-TS 12-23 Class 1, and ENA-TS 12-23 Class 2 specifications. This is supported by data driven laboratory testing results, which includes melt flow index & tensile testing.

Along with regular dimensional checks, an impact test is performed at the start, middle and end of each production run. The impact test is key in assessing product conformance. The impact test consists of dropping a tup (striker) on to a sample from a predetermined height so that the tup strikes the sample with a minimum energy of 125J. The procedure is repeated on the same sample so that the tup strikes the sample in the same location as the first strike.

The Energy (E) required at impact is 125J.

Height (H) = 3.06m

Mass of tup (M) = 4.16kg

Gravity (g) = 9.8 m/s²

The formula for deriving the test conditions is as follows:

$H = E / (M \times g)$

$3.06 = 125 / (4.16 \times 9.8)$

Periodic independent testing of our cable covers and rolled cable covers is completed to demonstrate that our products and testing regimes satisfy the requirements of our customer specifications, for reference please see Appendix A Page 22.

Centriforce provides Certificate of Conformance and test reports when required by the customer.



A testing regime

A recent testing procedure, executed by independent experts at iPolytech (Appendix A), clearly demonstrates how Stokbord® Cable Cover and Stokbord® Drum offer exceptional protection at the reduced thickness grades.

From the test, our 12mm Stokbord® product demonstrated that it conforms to ENA-TS 12-23 Class 1 and also to National Grid TS 3.05.07 specification.

	ENA-TS 12-23 ISSUE 3	National Grid TS 3.05.07 ISSUE 10
Standard 12mm	Class 1 – Pass	Pass
Standard 14mm	Class 1 – Pass	Pass
Rolled 12mm	Class 1 – Pass	Pass
Rolled 14mm	Class 1 – Pass	Pass

Table 1 – Summary of Impact Results for 12mm and 14mm Stokbord® Cover (ref. Appendix A, iPolytech, Table 18)

In the same testing conditions, Stokbord® at 10mm was tested to show that it passes the requirements of ENA-TS 12-23 Class 2.

	ENA-TS 12-23 ISSUE 3
Standard 10mm	Class 2 – Pass
Rolled 10mm	Class 2 – Pass

Table 2 – Summary of Impact Results for 10mm Stokbord® Cover (ref. Appendix A, iPolytech, Table 18)

The impact test simulated the potential hit from equipment that is not power assisted, to demonstrate the cable cover’s resistance to an impact strike.

In the test environment, for ENA-TS 12-23 Class 1 and National Grid TS 3.05.07, the acceptance criteria is an indentation of no greater than 10mm, and on the second strike, a penetration no greater than 20mm.

For ENA-TS 12-23 Class 2, the acceptance criteria is a penetration no greater than 20mm, and on the second strike, no greater than 35mm.

	1st Drop		2nd Drop	
	Penetration	Indentation Depth (mm)	Penetration	Indentation / Penetration Depth (mm)
Standard 12mm	No	4.49	No	9.77
Standard 14mm	No	3.48	No	6.28
Standard 10mm	No	8.51	Yes	23.15
Rolled 12mm	No	5.69	Yes	12.15
Rolled 14mm	No	3.92	No	8.42
Rolled 10mm	No	10.21	Yes	26.25

Table 3 – Penetration Test Results (ref. Appendix A, iPolytech, Table 17)

The 12mm system comfortably passed both ENA-TS 12-23 and also National Grid TS 3.05.07, while the 10mm cable cover gained the same result in meeting the requirements of ENA-TS 12-23 Class 2.



The testing procedure can be viewed in a video, available to view at:
www.youtube.com/CentriforceProducts



James Gallagher, Centriforce's Quality & Process Improvement Manager

“The results of the testing demonstrated that Stokbord® Cover and Stokbord® Drum are incredibly durable – and that ultimately the material and product integrity conforms to ENA-TS and National Grid.”

Innovation - on a roll

Last year, the industry's ability to achieve compliance and take a giant stride in terms of installation capacity took a significant step forward with the launch of Stokbord® Drum.

Launched to acclaim in the industry in 2019, it provides a faster and safer solution to installation.

Developed in tune with our policy of continuous improvement, this new approach to the Stokbord® system offers significant improvements in health and safety, and speed of application.

Under the initiative, Stokbord® can now be supplied on a reel, enabling the product to be rolled across a large area with minimal intervention.

“Working collaboratively with our customers, we recognised that the amount of time spent in the trench was a rising concern.

As a result, the new Stokbord® Drum system has been created to deliver a mechanical rather than manual installation, keeping operatives safer and at the same time significantly speeding up the process.

It reduces the manual labour involved and creates a lower risk environment as operatives spend less time in the trench.

Stokbord® Drum is a genuinely game-changing innovation for the industry, and one that has been well-received by our clients who recognise the fact that the system can have a significant impact on their operations.

It means they now, along with the Stokbord® Cable Cover, have the benefit of choice to meet their exact project needs.”

Jonathan Pearce, Head of Sales at Centriforce



Your trusted partner in utilities

You might be surprised to know that all Stokbord® products are manufactured from recycled polyethylene waste.

That means Stokbord® Cable Cover and Stokbord® Drum not only offer first-class safety standards, but also offer key sustainability benefits too, which are unique in the industry.

And it's not a new development. Stokbord® has always been produced from recycled plastics throughout its entire 40-year history.

We reprocess products normally destined for landfill at our modern site in Liverpool, taking UK waste, and giving it a new lease of life. It's not a novel approach, but something that is at the core of the business.

Such environmental benefits come at no cost to durability. Stokbord® Cable Covers are extremely tough, impervious to water, rot proof and suitable for use in both acid and alkaline soil types.

Confidence is further assured with the product tested against a vigorous in-house programme, to ensure Stokbord® Cable Covers and Stokbord® Drum comply and conform to internationally recognised standards.

Furthermore, manufacturing is carried out in accordance with our ISO 14001, ISO 9001 and ISO 18001 accreditations.



“Centriforce, was established over 40 years ago in Liverpool and is at the forefront of manufacturing high quality products from recycled plastics.

We are a UK company using UK waste and proud to deliver damage protection from recycled plastic.

As well as Stokbord® Cable Cover and Stokbord® Drum, Centriforce designs and manufactures damage prevention products and services to help protect, locate and detect assets.

This portfolio of products means we offer the complete solution for the utilities industry.”

Simon Carroll, CEO

References

The EAW 2008 report referenced in this guide can be provided on request.

Energy Networks Association Technical Specification 12-23

National Grid Technical Specification: Installation Requirements for HV Power Cable systems – TS 3.05.07

Appendix A - iPolytech Report 14484 Rev C - Testing of Cable Protection Covers

Stokbord Cover Type A Technical Data Sheet – TDS 351 – Issue D1

Stokbord Cover Type B Technical Data Sheet – TDS 352 – Issue D1

You can also read more on how Stokbord® Drum helped Murphy break installation records at Triton Knoll
www.murphygroup.com/news/triton-knoll-team-breaks-records

Key contacts

Our team is on hand to offer all the information you need to reach an informed decision on the application of cable protection measures across the UK and overseas.

Simon Carroll, CEO

Jonathan Pearce, Head of Sales

James Gallagher, Quality & Process Improvement Manager

Amanda Welsh, Sales Executive

Clive Turner, Sales Executive



Contact us at:
0151 207 8100

14-16 Derby Road, Liverpool,
Merseyside, L20 8EE, UK

www.centriforce.com