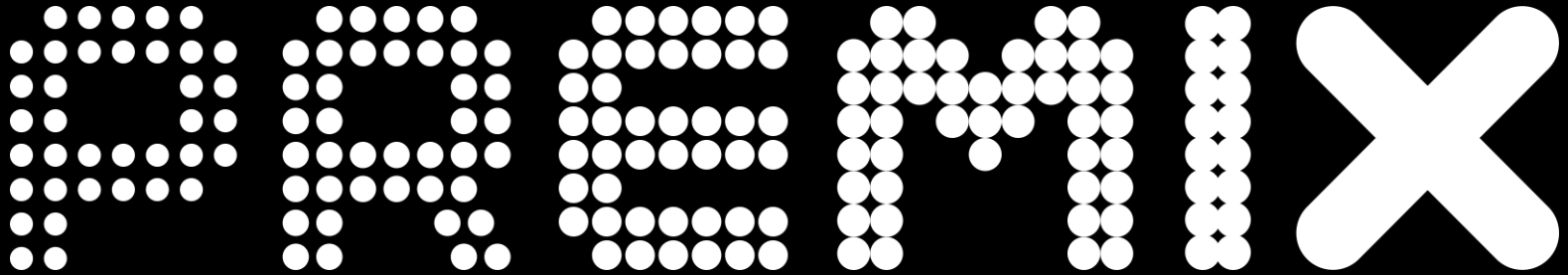


Conductive PRE-ELEC® Compounds for Sheet Applications


“Creating a safe society
with functional materials”

The high material requirements of the transport and packaging industry inspire us to continuously develop new sustainable and functional materials to meet the needs of our customers.

Trend 1 Material requirements and standards are getting tighter, especially when operating in ATEX and ESD environments.

Trend 2 Bigger need for packaging complex electronic components, e.g., in electric cars and automatization, to protect the sensitive parts from uncontrolled static electricity.

Trend 3 Replacing metal with plastics to reduce weight and cost, make assembly easy, and prevent corrosion and thus prolong the utilization time of the end-product.

Sheet solutions
For electronics

Sheet solutions for electronics

In electronics packaging, conductive plastics protect the sensitive components from uncontrolled static discharges.

Polypropylene corrugated boards can be cut and folded into different transportation boxes.

In EPA zones* conductive sheets can be used in furniture elements and accessories, such as table covers, mats, and edges.

* EPA zones = ESD Protected Areas

Polyethylene continuous foams, chemically crosslinked, can be CNC cut and used for electronics packaging.

This autumn, Premix will introduce new HDPE concentrate for sheet applications that can be thermoformed into trays.

PREMIX

Corrugated sheets for ESD packaging

Polypropylene corrugated boards can be cut and folded into different transportation boxes and containers for electronics.

It is an excellent replacement for corrugated carton. Polypropylene corrugated boards do not emit dust, do not absorb moisture, and have excellent impact resistance.

ESD mats & EPA furniture elements

In EPA zones* conductive sheets can be used in furniture elements and accessories, such as table covers, mats, and edges.

They create ESD protection for sensitive electronics that enables longer operation time for electronic devices.

Foams

Polyethylene continuous foams, chemically and physically crosslinked, can be CNC cut and used for heavy automotive and defense industry electronics packaging for transportation.

Additionally high-density EVA foam can be cut into gaskets and sealings.

ESD trays for electronics

This autumn, Premix will introduce new HDPE concentrate for sheet applications that can be thermoformed into trays.

It is a commercially competitive alternative for polystyrene based sheets.

Sheet solutions
For ATEX areas

ATEX directive

The ATEX **Directive 2014/34/EU** covers **equipment and protective systems** intended for use in **potentially explosive atmospheres**. The directive defines the essential health and safety requirements and conformity assessment procedures, to be applied before products are placed on the EU market.

It is aligned with the **new legislative framework** policy, and it is applicable from 20 April 2016, replacing the previous **Directive 94/9/EC**.

Conductivity requirements by ATEX

The requirements related to avoidance of electrostatic charges of non-metallic materials are listed in chapter 7.4 of IEC EN 60079-0 Standard "Electrostatic charges on external non-metallic materials"

- The surface resistance levels must stay below 1 GΩ at (50 ± 5) % relative humidity
  or below 100 GΩ at (30 ± 5) % relative humidity.

More information:
https://www.premixgroup.com/faq/faq-atex/

ATEX

Examples of industries

Factories and companies with ATEX areas:

Handling of small particles or dusts:

Cement, wood-processing, metal processing, grain mills, processing plastic granules, mines, and flour mills

Handling of combustible gases and chemicals:

Chemicals handling/drumming, tanks storage depots, refineries plants, port installations, coal/uranium mining, fixed offshore platforms, petrochemical plants

Examples of sheet solutions for ATEX

Polyethylene sheets are used as elements of internal floating roofs for combustible chemicals **evaporation control in tanks.**

Polyethylene sheets thermoformed and used as drum spill trays **to prevent leakage** of the chemicals.

Flame retardant **polyethylene**/polypropylene sheets for **controlling static discharge inside closed spaces**, like mines, cement plants, or any plants handling products with fine particles or gases.

Postprocessing of sheets

Thermoforming sheets:

- Thermoforming is a process where a sheet is heated and formed in a mold to a desired shape. /PE, Styrenics (PS, ABS) normally used for thermoforming. Surface resistance of the end product depends on the sheet thickness, mold design (e.g. 90 degree sharp corners to be avoided). Conductivity decreases when the sheet is being thermoformed and stretched.
- Thermoforming is a convenient process of making 3D-shaped sheets.
- ESD trays for electronics

Cutting sheets (corrugated board) :

- Corrugated sheets are cut and sliced into different shapes to be foldable into boxes.
- The right ratio of Impact strength and stiffness to enable quality cutting & slicing.
- ESD transportation collapsible containers.

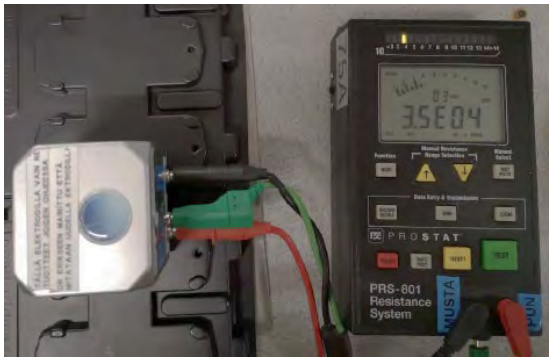
Foaming sheets:

- PRE-ELEC concentrates are used in block or continuous foam production. Both type of foaming can have physical or chemical cross-linking process.
- The density down to 33 gr/m2 can be achieved. Easy to CNC cut.
- ESD packaging, different sealings & gaskets.

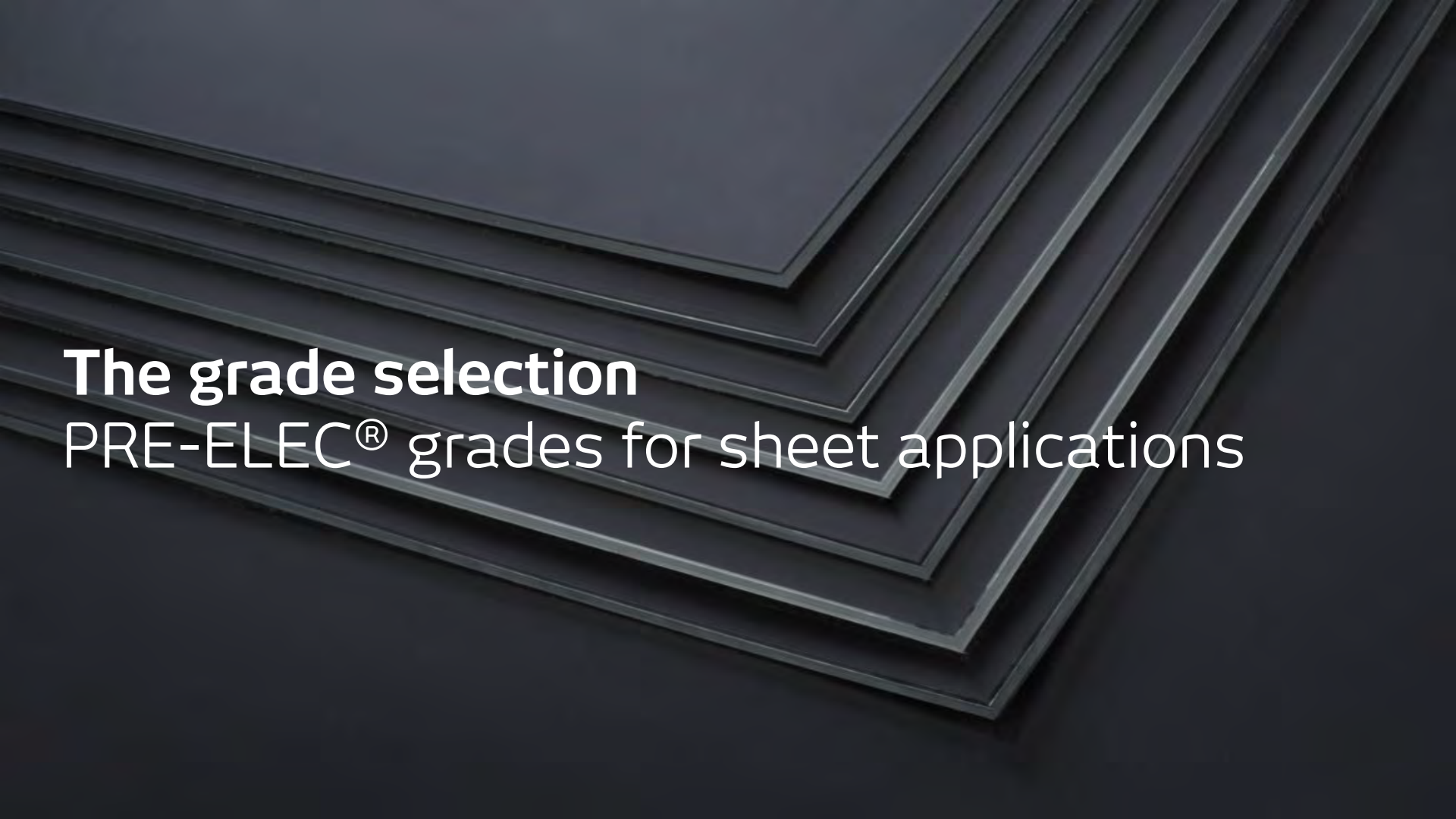
Welding sheets into pipes and other items:

- Carbon black is making welding challenging. Weld strength is normally reduced. The higher amount of carbon black, the weaker is the welding property.
- Welding makes joining of sheets and pipes possible
- ATEX air ducts

Vacuum formed sample from the middle, less strain -> lower resistance



Vacuum formed sample from the bottom, more strain -> higher resistance



The grade selection
PRE-ELEC® grades for sheet applications

PC/ABS – ABS – PE - CP

Product	Base polymer	Typical properties	Typical applications	Commercially available (TDS)
PRE-ELEC® PC/ABS 1420	PC/ABS compound	High stiffness	Thermoformed trays	•
PRE-ELEC® ABS 1415	ABS compound	Better chemical, impact resistance	Co-ex sheets with TPU for better grip	•
PRE-ELEC® PE 18800	PE-HD concentrate	Partial replacement to PE 1296	Sheets for chemical handling installations (ATEX zones), welded chemical tanks out of sheets	•
PRE-ELEC® PE 1296	PE-HD concentrate	Excellent mechanical strength	Sheets for chemical handling installations (ATEX zones), welded chemical tanks out of sheets	•
PRE-ELEC® PE 18594	PE-HD concentrate	Economical grade with good dispersion	Sheets for electronics packaging, canisters	•
PRE-ELEC® PE 1250	PE-HD concentrate	Impact modified economical grade	Sheets for electronics packaging, canisters	•
PRE-ELEC® PE 1292	PE-HD compound	Excellent mechanical strength	Sheets for electronics packaging, canisters	•
PRE-ELEC® PE 17840	PE-LLD concentrate	Dilution with ABS (+SBS), PP, PE	EPA area furniture elements	•
PRE-ELEC® PE 17800	PE-LD concentrate	Continuous foam with chemical cross linking/foaming	Packaging for electronics	•
PRE-ELEC® CP 1316	EVA concentrate	Flexible, foamable	Flex mats for EPA area with less anti-slip surface	•

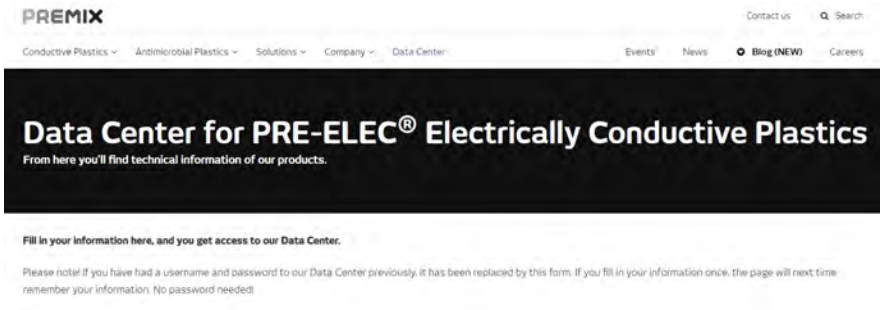
PP – TPU

Product	Base polymer	Typical properties	Typical applications	Commercially available (TDS)	Under development
PRE-ELEC® PP 18900	PP concentrate	Partial replacement to PP 1393	Corrugated boards	•	
PRE-ELEC® PP 1393	PP concentrate	Easy processability	Corrugated boards	•	
PRE-ELEC® PP 15392	PP concentrate	Challenging to homogenize, but more affordable	Corrugated boards	•	
PRE-ELEC® PP 1397	PP compound	Easy processing, excellent dispersion	Corrugated boards	•	
PRE-ELEC® PP 18787	PP compound	Economical version of PP 1397	Corrugated boards		•
PRE-ELEC® TP 14815	PP compound	Flame retarded (V0)	Ventilations pipes, ATEX sheets	•	
PRE-ELEC® TPU 1512	TPU-Es compound	Co-ex with ABS	EPA area	•	
PRE-ELEC® TPU 18025	TPU-Et compound	High conductivity, suitable for sensors	Cast film, flexible sheets	•	
PRE-ELEC® TPU 18435	TPU-Es compound	Fits for calendaring	Conveyer belt for EPA area	•	

Premix Data Center
Technical datasheets

In our Data Center, we have collected **technical information** about our products for you, including **processing instructions** for PRE-ELEC® conductive compounds and concentrates.

https://premixgroup.com/data-center




Premix Oy
Pioneering since 1980’s

Premix Oy – Your reliable material supplier

European market leader and global forerunner in **Electrically Conductive Plastics**.

Strong focus on developing future material solutions.

Long-term expertise in polymer compounding; product development and material processing know-how in sheet applications. Tailored solutions also available.

Technical sales and R&D support available for trial runs.

Wide distributor network, local representative in various countries.

Responsible Care
Our commitment to sustainability

QUALITY SYSTEM CERTIFICATION
DNV·GL
ISO 9001:2015

PREMIX

PREMIX

Family owned, independent company

Established 1980

110 employees

Sales revenue 46 M€ (2020)

Production capacity 70 kt/a

LET'S MAKE
A GOOD MIX

www.premixgroup.com