

# Pipe and Profile EXTRUSION



**ADVANCES IN WOOD-PLASTIC COMPOSITES**

**UPDATE: PLASTIC PIPES IN INFRASTRUCTURE**

**WEAR PROTECTION ● MULTI-LAYER PIPE DIES**

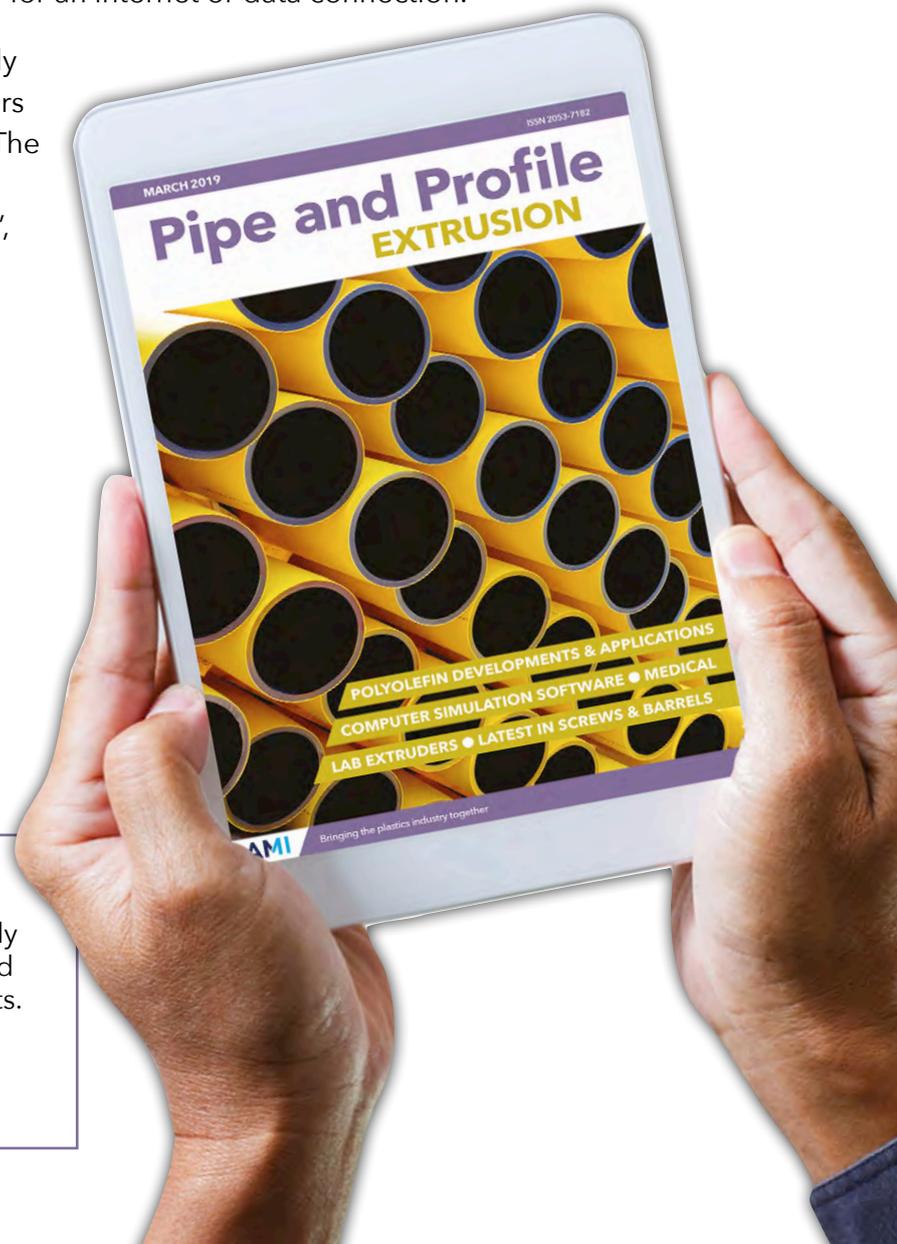
# GET THE APP...

## Pipe and Profile EXTRUSION

Pipe and Profile Extrusion magazine is available free-of-charge on iPads, iPhones and a huge range of Android-based tablets and smartphones.

Our dedicated Pipe and Profile Extrusion app is easy to use and provides completely free access to the latest edition of the magazine plus back issues - more than 15 in total. Once you have downloaded an issue, you can read it offline - there's no need for an internet or data connection.

The Pipe and Profile Extrusion app has already been downloaded by more than 5,400 readers in over 80 countries. Why not try it yourself? The app is available in Apple's App Store, iTunes and Google Play. Just search for 'AMI Plastics', or simply click on the relevant button below.



### Sponsor the app

Sponsoring the Pipe and Profile app is a highly effective and affordable way to put your brand before our audience of key industry specialists.

To find out more contact Levent Tounjer  
Sales and Commercial Manager  
E/ levent.tounjer@ami.international

# Pipe and Profile EXTRUSION

## 5 Industry news

### 13 Supply network: infrastructure pipe

Pipe to supply water and gas, and remove wastewater, is a vital part of any network – and can help to improve water resources and boost environmental performance

### 23 Wood effect: innovations in WPCs

The use of wood-plastic composite (WPC) materials is growing – with applications moving beyond decking into facades, furniture and more

### 33 Multiple choice: latest in multi-layer pipe

As well as withstanding tougher operating conditions, multi-layer pipes can help raise performance – such as by keeping drinking water free of environmental contaminants

### 37 Protection factor: extruder wear

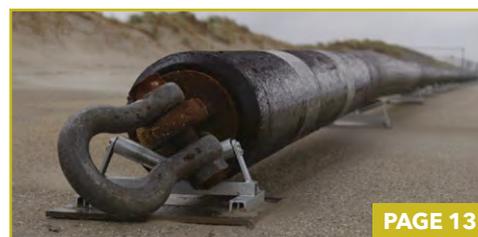
Extruder wear is a natural part of the process, but it can be resisted by ensuring that components such as screws are coated in the right way

### 39 Technology: Materials

### 41 Technology: Machinery

### 44 Extruder of the month: Palad HY Industries

### 46 Dates for your diary



PAGE 13



PAGE 23



PAGE 33



PAGE 37

PAGE 41



## COMING NEXT ISSUE

› ETPs & composites › Screenchangers/melt filtration › Control/instrumentation › Titanium dioxide

## CONTACT US

# AMI

Third Floor, One Brunswick Square,  
Bristol, BS2 8PE, United Kingdom

Tel: +44 (0)117 924 9442

Fax: +44 (0)117 311 1534

www.ami.international

www.twitter.com/plasticsworld

Registered in England No: 2140318

### EDITORIAL

**Editor-in-Chief:** Chris Smith  
chris.smith@ami.international

**Editor:** Lou Reade  
lou@pipeandprofile.com

**Events and magazines director:**  
Andy Beevers  
andy.beevers@ami.international

### ADVERTISING

**Advertisement manager:** Claire Bishop  
claire.bishop@ami.international +44 (0)1732 682948

**Sales & commercial manager:** Levent Tounjer  
levent.tounjer@ami.international +44 (0)117 924 9442

**Sales manager (China):** Jenny Zhou  
jenny.zhou@ami.international +86 13651 985526

**DOWNLOAD MEDIA DATA**

© Copyright Applied Market Information. No part may be reproduced without the prior written permission of the publisher.



# Profiles

Delivering extruded profiles through the expert integration of skill, materials, machinery and process technology

June 8-9, 2021

Philadelphia, PA, USA

# SECURE YOUR SEAT TODAY!

Join us to get your annual update on the entire profiles industry at our reputable Profiles US Conference. Rely on our 30+ years of bringing leading players together.

- Hear from The Vinyl Institute, The Azek Company, Veka, FGIA, and more
- Network with other professionals from across the profiles supply chain
- Discover the newest chemistry and additive developments
- Understand key market trends and drivers including sustainability

Book your place at  
[www.ami.ltd/attend-profile-USA](http://www.ami.ltd/attend-profile-USA)

**SAVE \$300**

when you book by  
March 12, 2021.

Use discount code  
EBC1154

## CONTACT US

Kelly DeFino  
Business Development Manager USA

T +1 610 478 0800  
E [kelly.defino@ami.international](mailto:kelly.defino@ami.international)

Media supporter:

**Pipe and Profile**  
EXTRUSION



Bringing the plastic industry together.

# Benzene in water 'not caused by HDPE pipes'

Polyethylene pipe did not cause benzene contamination in the water supply of California towns affected by forest fires in 2018, says a report from the Plastic Pipes Institute (PPI).

Instead, the contamination was due to debris being "sucked into the pipes, contaminating the water system regardless of the pipe material", said the organisation.

Fire-damaged areas, including towns such as Paradise, reported high levels of benzene contamination in the water supply in the aftermath of the fire. There had been claims that melting HDPE had led to the production of benzene, a known carcinogen.

"We wanted to ascertain that HDPE or any grade of polyethylene pipe was not the cause of the benzene being found in this specific area," said David Fink, president of PPI. "Our staff have conducted on-site



**Above: Forest fires destroyed many homes in California in 2018**

visits with Paradise Irrigation District officials. There has been no evidence found that plastic pipes of any material are responsible for the production of benzene or any other contaminant due to the heating of pipes during the fire."

PPI said that, before the fire, the district had 170 miles of underground water mains - typically buried 36-48in deep - made from materials including steel, cast iron, asbestos cement and PVC. Water service connections used mainly steel, polybutylene (PB),

copper, PVC and HDPE. Newer materials such as PEX and C-PVC were rarely found in older structures.

Contamination, including benzene, was found in all types of water main pipe - even those buried deep, and not exposed to the heat of the fire.

"There are many ways that different chemicals can find their way into the environment, especially in a fire where flame temperatures can hit 1,500F," said Fink.

The [full report](#) is available from PPI's website.

➤ [www.plasticpipe.org](http://www.plasticpipe.org)

## Extruder maker adds capacity

US Extruders says it has completed an expansion that nearly doubles its manufacturing space.

The company, which manufactures custom single-screw extruders, extrusion systems and screws, says it has grown by more than 25% over the last year. The expansion includes the installation of overhead cranes, which makes extruder assembly easier and more efficient, it says.

"We see our growth directly tied to our commitment to providing the best extruder technology and equipment backed by unmatched customer support," said Bill Kramer, president of US Extruders.

ProSystems, which supplies US Extruders with full extruder controls, shares the same facility. It has also expanded its production space - by around 40%.

➤ [www.us-extruders.com](http://www.us-extruders.com)

# Oyak brand merger creates \$500m PVC stabiliser giant

Oyak of Turkey says it has become the world's largest supplier of PVC stabilisers, with the merger of its Akdeniz Kimya and Chemson brands.

Together, the two brands account for US\$500 million of sales. The merged company, Akdeniz Chemson, will operate in five continents in 110 countries, said Oyak.

Akdeniz became part of Oyak in 2012, while Chemson joined one year later.

"This move will strengthen not only our production capacity, but also our sales and marketing operations," said Süleyman Savaş Erdem, general manager of Oyak. "Our aim is to create a volume of US\$750m through our production, sales and marketing activities."

➤ [www.akdenizchemson.com](http://www.akdenizchemson.com)



**Above: Oyak intends to grow Akdeniz Chemson sales to US\$750m**

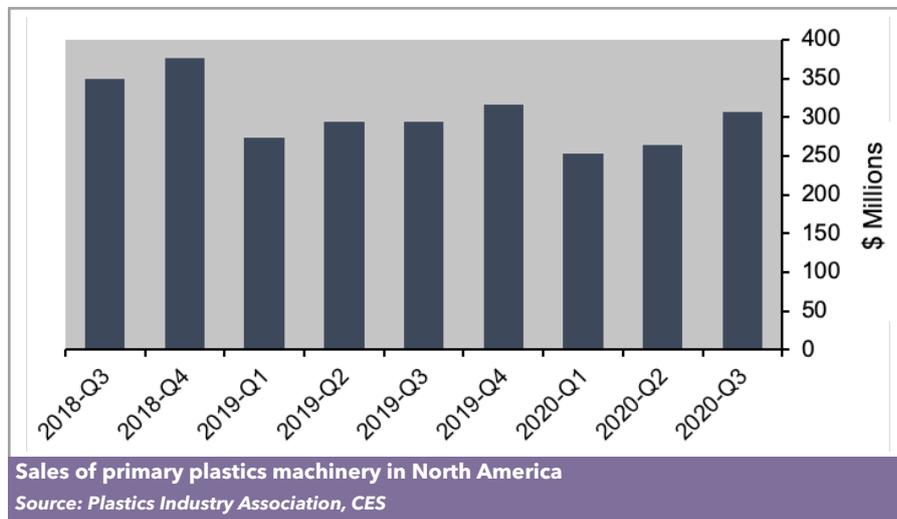
# North America primary plastics machinery sales increase in Q3

Sales of primary plastics machinery in North America increased by double-digits in the third quarter of the year, according to the Plastics Industry Association's Committee on Equipment Statistics (CES).

A preliminary estimate puts the value at nearly US\$307 million, almost 16% higher than the previous quarter. Compared to the third quarter of last year, the figure was nearly 5% higher.

"Shipments of plastics machinery have increased for two consecutive quarters," said Perc Pineda, chief economist at the organisation. "The double-digit increases in the third quarter are in sync with the quicker-than-expected turnaround in other plastics end-markets. Most likely, shipments of machinery will also increase in the final quarter of 2020."

The value of single- and twin-screw extruders grew by more than 27% and 17%, respectively, in the third quarter. Injection moulding equipment was up 15% from the previous quarter and by



almost 8% compared to the third quarter in 2019.

In its quarterly survey of plastics machinery suppliers, CES found that three-quarters of respondents (76%) expect market conditions to improve or hold steady compared to one year ago. This is higher than the 36% who felt this way in the second quarter. For the next 12 months, almost 90% expect the

market to be steady-to-better - far above the 48% who said this previously.

"The pace of economic recovery is not without risks, and its path will depend on the containment of the coronavirus," said Pineda. "Nevertheless, the overall outlook for plastics machinery and the industry has turned more favourable in recent months."

> [www.plasticsindustry.org](http://www.plasticsindustry.org)

## Teel expands pipe extrusion operations

US-based Teel Plastics is to expand its pipe extrusion operations, by leasing an extra 180,000 sq ft of manufacturing and storage space.

The site will be Teel's fourth in its home city of Baraboo, Wisconsin. Investment in the facility will exceed US\$3 million and add 23 new jobs. This is in addition to an extra 50 positions, from a Department of Defense contract to produce Covid-19 swab sticks.

Work has already begun on the building and includes the installation of multiple

extrusion lines and supporting infrastructure - including a railroad unloading system for resin. The extrusion lines will produce all of Teel's conduit, microduct, multi-

duct and gas pipe products, moving Teel's industrial pipe operation from its headquarters at Teel Court.

"We are excited about the opportunity to reinvest

in Baraboo," said Christian Herrild, director of growth strategies at Teel. "We looked outside the area, but nothing could match the workforce, community and opportunity to grow where Teel was founded."

Earlier this year, Teel won two 'project of the year' awards from PPI. One was for making the first PA12 gas pipe installed under new PHMSA rules; the second was an HDPE conduit for a private fibre optic telecommunication network.

> [www.teel.com](http://www.teel.com)



For over **50 years** a landmark  
in the international  
market for the  
**manufacturing**  
**of complete**  
**mixing**  
**plants**

**PVC DRY BLEND**  
**POWDER COATINGS**  
**MASTERBATCH AND PIGMENTS**  
**THERMOPLASTIC RUBBER**  
**WOOD PLASTIC COMPOSITES**

**PLAS MEC S.R.L.**  
Via Europa, 79 - 21015 Lonate Pozzolo (VA) ITALY  
Tel: +39 0331 301648  
E-mail: [comm@plasmec.it](mailto:comm@plasmec.it)  
[www.plasmec.it](http://www.plasmec.it)



## Growing profits in profiles

Belgian profiles producer Deceuninck says it has enjoyed a strong third quarter, despite pressure from the Coronavirus pandemic.

Sales grew more than 7% to nearly €178 million (US\$208m) compared to the same period in 2019. The growth was driven mainly by recovery from the Coronavirus slowdown, market share gains in the US and economic recovery in Turkey, according to the company.

Year to date sales of €467m (US\$546m) is broadly in line with the €478m (US\$559m) for the first three quarters of 2019.

Adjusted EBITDA improved from around €18m (US\$21m) in Q3 2019 to €31m (US\$36m) in Q3 of this year. This strong profitability growth reflects higher volumes and a one-off positive impact of lower raw material prices.

In the year to date, the figure increased by 22% to exceed €59m (US\$69m).

➤ [www.deceuninck.com](http://www.deceuninck.com)

# ADS improves results in first half of fiscal year

US-based pipe extruder Advanced Drainage Systems (ADS) improved both sales and profits in the first half of this year.

The company reported sales of US\$1.1 billion – an increase of nearly 16% compared to the equivalent period last year. At the same time, net profits exceeded US\$151 million – compared to a net loss of US\$219m in the previous year.

For the second quarter alone, sales rose nearly 10% to US\$544m, while net profits increased tenfold, to nearly US\$81m.

“We had a strong second quarter as demand and business activity remained favourable,” said Scott Barbour, president and CEO of ADS. “We generated strong performance in key growth states, including the Carolinas and Florida.”

He said that the profitability growth in Q2 was driven by a number of factors including favourable material cost and taking proactive steps to control other costs.



**Above: ADS says increased demand helped to lift results in the first half of its fiscal year**

“We are optimistic as we look to the second half of our fiscal year,” he said. “Though uncertainties still exist, we are well positioned to capitalise on residential development and horizontal construction.”

ADS expects full-year sales in the region of US\$1.79bn-1.84bn. This is based on no further changes in economic conditions due to the Coronavirus pandemic.

Scott Cottrill, CFO of ADS, said: “We expect volume in the second half to be consistent with the prior year.”

■ ADS has received an award that recognises its use of recycled materials in drainage pipe.

The award was from Wisconsin’s Department of Natural Resources, which said ADS was recognised for its “superior performance with a recycling programme that exceeded expectations and provided a higher standard of service”.

ADS products are used in the stormwater and on-site septic wastewater industries, providing drainage solutions for construction, agriculture and road projects.

➤ [www.ads-pipe.com](http://www.ads-pipe.com)

## Polypipe gets back on track after dip

Polypipe of the UK says results are almost level with where they were last year.

In a trading update for the four months to 31 October 2020, the company said that sales of just over £156 million (US\$204m) were 1.5% lower than they were at the same point in 2019.

Operating margins have also

improved compared to the first six months of the year, as volumes continued to recover following the restrictions caused by the Coronavirus pandemic.

Although uncertainty remains around the possible effects of the second lockdown – which is due to end in early December – the company expects underlying operating profit for

the year to be at least £35m (US\$46m), compared to the current consensus range of £30m-35m (US\$39m-46m).

“Our end markets in the UK have continued to recover ahead of expectations, and I am pleased that our resilient performance in the last four months has reflected this,” said Martin Payne, CEO of Polypipe.

➤ [www.polypipe.com](http://www.polypipe.com)

# Precision Wall Thickness Measurement

## RAYEX S XT

- Easy and quick set up for new products
- Fast eccentricity and diameter measurement
- Added longevity due to high-quality xray source



Family owned since 1957, Zumbach is a global leader in the industry.  
Driven by innovation and experience.  
We are here for you and ready to build the future together.



# Plastic Pipes in Infrastructure

VIRTUAL SUMMIT

27-29 April 2021

Trends in the design, production, installation and exploitation of plastic pipes systems

**FIND  
OUT  
MORE**

## Save the date

For the first time this international event has gone virtual! Plastic Pipes in Infrastructure Virtual Summit will bring together expert speakers from across the industry.

- Network with senior decision-makers and influential stakeholders from pipe manufacturers, utility companies, installers, fitting suppliers and end users
- Plastic Pipes in Infrastructure virtual summit draws on AMI's many years of experience in serving this industry
- The summit provides a unique forum to debate the latest developments and market trends in the sector as well as to network with the global industry

Register your interest today:  
[www.ami.ltd/attend-pipes](http://www.ami.ltd/attend-pipes)

### Other ways to get involved:

**Become a speaker** and showcase your knowledge and your company's experience

**Promote your company** with your logo showcased throughout the event, on the website and in marketing communications.

[Contact us to find out more](#)

Media supporter:

**Pipe and Profile**  
EXTRUSION

# Mexico and Canada top export markets for US plastics industry

Mexico and Canada remain the largest export markets for the US plastics industry.

The annual Global Trends report from the US Plastics Industry Association, revealed 2019 exports of more than US\$15 billion to Mexico and \$12bn to Canada. The US had a trade surplus of almost US\$10bn with Mexico.

Though the report found that the industry's trade surplus decreased to US\$400 million in 2019 (down 25% compared to 2018), global plastics demand remains solid. The



US plastics industry had a trade deficit of nearly US\$14bn with China - which was also its third largest export market. At the same time, the US had a US\$2.5 bn trade surplus with China

for plastic resin.

The report also said that apparent consumption - effectively the difference between imports and exports of resin - grew by 2.5% in 2019.

In 2019, total US plastics industry exports fell by 2.9%, while imports were 2.8% lower.

"Although US resin producers continued to enjoy a cost advantage over most foreign producers, US resin exports decreased by 2% in dollar terms from 2018 to 2019," said Perc Pineda, chief economist at

the association. "Lower trade figures are expected this year - due mainly to the global economic slowdown - but the trade outlook for 2021 is positive."

He said that Canada and Mexico will continue to be the two largest export markets - and the top sources of US plastics imports. He added that the United States Mexico Canada Agreement (USMCA) - the trade pact that replaced NAFTA - should further enhance trade among the three countries.

➤ [www.plasticsindustry.org](http://www.plasticsindustry.org)

# EVOLVED

WPC TECHNOLOGY

## Start Ahead. Stay Ahead.

Struktol Company of America has been and continues to be the leader for additives and protective compounds in wood and natural fiber composites.

Our products, designed specifically for WPC applications, are key to enhancing product performance, processability and durability.

We keep our customers on the leading edge of technology in this constantly evolving market.

**struktol**®



Learn more at [struktol.com](http://struktol.com) or email [plastics@struktol.com](mailto:plastics@struktol.com)



# PLASTICS EXTRUSION WORLD EXPO EUROPE

PIPE, PROFILE AND TUBING EXTRUSION

## New dates

1-2 June 2021

**MESSE ESSEN, GERMANY**

## Source thousands of qualified leads

in a cost-effective and time-efficient way at AMI's focused  
exhibition for the pipe, profile and tubing extrusion industry

More than 200 exhibitors have already signed up for the Essen shows including:



**BOOK  
YOUR  
STAND**

To book your stand, contact:

[exhibition\\_sales@ami.international](mailto:exhibition_sales@ami.international)

+44 (0) 117 924 9442

[www.ami.international/exhibitions](http://www.ami.international/exhibitions)

Find out about the  
Plastics Extrusion  
World Expo,  
North America

Brought to you by:



Colocated with:



Proudly supported by:



*Pipe to supply water and gas, and remove wastewater, is a vital part of any network - and can help to improve water resources and boost environmental performance*

# Supply network: latest in infrastructure pipe

Infrastructure pipe is changing. While it still caters for traditional industries - such as water and gas - it also encompasses 'new' applications such as alternative energy.

**Egeplast** recently supplied protective pipes for high voltage cables in a wind farm project in Germany, for instance.

BorWin5 is a 230km grid connection connecting the EnBW He Dreiht wind farm - on an island north of Borkum - to a high voltage onshore grid, with a connection point at a converter station at Garrel.

The total length of underground cable is 120km. For the construction work, transmission system operator Tennet opted to install almost 7km of Ege-Com Macroduct High-T PE pipe, and almost 1km of Macroduct Mono PE. The pipe was installed using horizontal directional drilling (HDD).

Macroduct High-T is a protective pipe for high and extra high voltage cables of up to 525kV that provides enhanced thermal stability - enabling it to withstand the high thermal stresses involved. The combination of high flexibility and solidity provid-

ed the optimum properties required for performing these horizontal drilling operations, said Egeplast.

"Due to delivery via ferries - and limited storage capacities on the island - exactly timed delivery and direct and easy contact to egeplast, with short response times, are a critical success factor," said Thomas Schwindeler, project manager of project partner Strabag. "As a system provider, Egeplast supplies the entire range of accessories - with components including temperature-resistant electrofusion couplers in OD 450 as well as temperature resistant stub flanges."

## **Burstlining boost**

Separate to this, authorities in Esslingen in Germany recently rehabilitated an old cast iron pipe with Egeplast pipe - using trenchless installation and the burstlining approach.

The project used the company's SLM DCT pipe, with an outside diameter of 160mm. The installation method helped to reduce the burden of work and

**Main image:**  
Egeplast has supplied 7km of its Ege-Com Macroduct High-T PE pipe to protect high voltage cables in a wind farm project

expense compared to traditional methods, said Egeplast.

Burstlining involves inserting a plastic pipe into the pre-existing tube. During the process, the old pipe bursts, and the fragments pushed into the surrounding soil. The end result is a plastic pipe with the same - or larger - diameter than the original.

The SLM DCT pipe system features integrated quality inspection for trenchless installation. Integrated conductor strips make it possible to inspect the integrity of the pipe system right after installation.

**River resources**

PVC-A Bluforce pipe from **Fitt** has been used to manage water resources of the River Piave in Italy.

The project is part of the European National Rural Development Programme (NRDP) to support and develop the potential of rural areas throughout Italy. This includes making the use of water in



**Left: Palad HY of Israel will use a SolEx NG 75-40 from Battenfeld-Cincinnati to make large diameter infrastructure pipe**

agriculture more efficient through improved water storage capacity, managing water for irrigation and saving energy and water resources.

The Consorzio di Bonifica Piave project converts the surface gravity irrigation system (open air ducts) of 3,060 hectares of agricultural land in the Treviso area into a rain irrigation system using pressurised underground pipelines. It laid more than 270km of pipelines - of various diameters - to supply medium pressure water (3-4 atmospheres) to farms. This will reduce water withdrawal from the river by about 1,200 l/s, and improve the efficiency of the sprinkler system when compared with the



**REPORT**

**RIGID  
POLYOLEFIN  
RECYCLING  
IN EUROPE**

**Capacity, Technology  
and Recyclate Usage**

[Click here  
to find out more](#)

**Be market  
ready with  
the latest  
legislation,  
technology  
and recyclate  
usage data  
for Europe**



**OPTIMIZING YOUR  
PRODUCTIVITY  
& PROFITABILITY.**



**Visit [davis-standard.com](http://davis-standard.com) to learn more.**

## **THE SECRET TO EXTRUDER PERFORMANCE?**

### **Feedscrews and Barrels!**

Davis-Standard's award-winning DSB® feedscrews and bimetallic barrels are the industry benchmark for design excellence.

Our feedscrews are world renown for mixing performance, high output rates, product consistency and energy efficiency. Each screw is engineered for specific polymers or processes with customization options for every extrusion application.

Barrels are built to support all extrusion applications, including those with highly abrasive and corrosive properties. We manufacture every type of barrel including vented, groove-feed, nitrided, jacketed and re-sleeved.

And the best part? This technology is available as an upgrade for non-Davis-Standard brands.

**Right: MT Supertube conduit, from UK-based Marshall Tufflex, was recently installed at a children's hospital in London.**



current gravity system.

Around 188km of Bluforce pipe will be used in two separate projects. In the first, which involves three municipalities, the PVC-A water network pipes will be used to create an adduction system fed by an irrigation lifting system that takes water from a canal.

In the second project, involving four municipalities, the pipe will draw water at the origin of the Padernello canal, near its branching point from the terminal canal of Caerano.

The consortium has already used Bluforce pipes to extend a tertiary irrigation pipeline. Fitt says that its PVC-A polymeric alloy pipe was considered superior to PVC-U piping - which was originally indicated for the project - thanks to its better crack propagation resistance, higher flexibility and the safety of the socket-based jointing system with integrated gasket.

### Pipe record

**Ipex** says it has supplied "the largest PVC pipe in the world" - a 1,500mm diameter pipe - for a project to upgrade a wastewater treatment plant in Regina, Canada.

A key part of this was upgrading the sewer force main feeding the plant, which required a pipe that could handle high flow while offering maximum longevity and value. After a review, PVC was chosen over HDPE for several reasons: simple, press-fit joint connections allowed quick installation compared to fusion; and, a thinner wall profile gave a larger internal diameter - and higher flow capacity.

For the first phase of the project, Ipex supplied 354m of 1500mm SDR 41 Centurion PVC pipe. This was delivered on 15 truckloads. In the second phase, Ipex supplied 4,000m of similar pipe.

### Melt control

Palad HY Industries, a pipe extruder based in Israel, recently invested in a SolEx NG 75-40 from **Battenfeld-Cincinnati** - which it will use to make large diameter pipe for infrastructure applications.

"The main advantages of the new extruder are low melt temperature and high output," said Fuad Dweik, managing partner of Palad.

Palad, founded in 1997, is the first pipe manufacturer in Israel to opt for the new generation single screw SolEx extruder. It already runs several Battenfeld-Cincinnati lines within its facility. The company produces both HDPE and PVC pipe, in diameters up to 1200mm and 500mm, respectively. As well as serving the domestic market, it exports around 25% of its production to Eastern and Western Europe, South America and Africa.

Its range includes pipes for fresh water, sewage and natural gas distribution - as well as protective conduits for electricity and communication lines.

The new extruder, fitted earlier this year, replaces an old extruder on a PE100 pipe extrusion line.

"We are particularly impressed with the lower melt temperature compared to the previous extruder, combined with better melt homogeneity - and consequently better pipe quality," said Dweik.

The lower melt temperature helps Palad achieve a more even wall thickness distribution within narrow tolerances, and less undesirable sagging. Better pipe quality also reduces material consumption and produces less scrap.

"The material savings and the roughly 10% reduction in energy consumption - due to the lower heating rates - make this a cost-efficient alternative," added Dweik.

The machine's BCtouch UX control system has been modified so that the equipment can be operated in Hebrew.

### Carbon reduction

Infrastructure pipe that combines steel, plastic and sensing technology could help to 'decarbonise' the construction sector.

UK pipe manufacturer **Aquaspira** and the **University of Birmingham** have begun a nine-month research project to develop low-carbon 'smart' pipes for buried infrastructure projects.

The pipes have a wound steel core, encased in PE63 HDPE. Approximately half the steel is recycled, which helps to reduce carbon footprint. Sensor technology built into the pipes will detect and report changes in environmental conditions, enabling infrastructure problems to be rapidly identified and rectified.

# HM+KMH

## The solution of Excellence for every PVC mixing need.

Heating and  
Horizontal Cooling Mixer



MIXACO World leader, since 1965, in the conception and realization of customized plants for industrial mixing.

Our goal is to go beyond your expectations with systems designed to specific needs, able to optimize energy costs and production performance.

From small to large systems, MIXACO deploys its highly specialized team that will follow you step by step, from the first consultation through to installation and after-sales service.

With MIXACO you have the luxury of having no worries.

The **advantages** you will achieve:

- Minimizing Batch Times
- Automating your Processes
- Digitalization of Processes
- Increasing Output
- Optimizing Resources
- Increasing Quality of Final Products
- Maximizing Production Times and Profits

.....

**MIXACO**

Dr. Herfeld GmbH & Co. KG  
Niederheide 2 - 58809 Neuenrade - Germany  
Tel. +49 2392 9644-0 - Fax +49 2392 62013  
info@mixaco.de

**MIXACO USA LLC**

1784 Poplar Drive  
Greer, SC 29651 - USA  
Tel. +1 864 331 23 20 - Fax +1 864 331 23 21  
info@mixaco.com

**MIXACO.COM**





**Above:**  
**Egeplast's**  
**Macroduct**  
**High-T is a**  
**protective pipe**  
**for cables of up**  
**to 525kV and**  
**can withstand**  
**high thermal**  
**stress**

The partners will develop the sensing technology and the pipes will be tested at the university and National UKCRIC Buried Infrastructure Facility. The project is funded by a grant of £269,000 (US\$350,000) from Innovate UK.

“Not only will the research deliver low-carbon drainage solutions for the construction industry, but the new monitoring technologies will be vital for the long-term assessment of climate change impacts on our built environment,” said Nigel Cassidy, professor of geotechnical infrastructure engineering at the University of Birmingham.

Neil Wallace, managing director of Aquaspira, added: “The Government’s objective of carbon zero by 2050 cannot be achieved without a significant reduction in the use of concrete in construction. This provides an opportunity to enhance understanding of the alternatives and deliver an exemplar low-carbon solution.”

**Conduit installation**

UK-based **Marshall Tufflex** says that its MT Supertube conduit has been installed at a new research centre at a leading children’s hospital in London.

MT Supertube comprises polyethylene (PE) internal and external layers over a continuous aluminium tube, making it robust and heavy-duty conduit. Its high mechanical strength makes it a long-lasting solution, said the company. It also offers low smoke, zero halogen (LSOH) performance.

“For the new facility, the product was installed in the plantrooms, laboratories, super labs, tissue culture labs, treatment rooms, outpatient area, seminar rooms, validation suite and GMP area,” said Jeff Kerridge, national sales manager at Marshall Tufflex.

The cable management system offers security from data interference and high performance in electromagnetic interference (EMI) screening. The conduit in this application also needed to meet BS

EN 61386-1, which outlines the requirements and tests for conduit systems for the protection and management of cables in electrical or communication systems up to 1000 V AC or 1500 V DC.

**Gas delivery**

UK-based **GPS** has produced a bespoke solution as part of a £3 million (US\$3.6m) project to construct a new gas mains pipeline. The line, underneath the River Foyle in Ireland, is one of the largest directional drilling gas projects ever undertaken in the country, said the company.

The 660-metre pipeline uses GPS’ Excel PE100 grade.

The pipeline was needed in order to consolidate the supply of gas on the cityside of Derry - which was served by a single gas line.

The pipeline needed to be a high quality, robust solution that could withstand the rigours of horizontal directional drilling (HDD) installation. Once commissioned, it then needed to maintain its performance when at the bottom of the 50m deep river.

Due to the concerns of the long-term structural stability of the pipeline, a thicker pipe than is normally used for the transportation of fuel gas was needed - with 355mm SDR 7.4 Orange PE pipe specified. As a size not previously used in the gas industry, GPS says it was the only manufacturer that could manufacture and test this specific pipe.

McCormack, the drilling contractor, drilled a 660mm diameter hole under the river bed in preparation for the pipe. The pipe was laid out on nearby school grounds and joined using butt fusion welding. Using school grounds put a short timeframe on the installation: it was moved into position over a weekend and pulled through the hole under the river in a continuous 10-hour operation overnight.

The pipe was produced in lengths of 13.5m -- instead of the standard 12m - in order to reduce the number of deliveries needed, cut transport costs and reduce carbon emissions. It also reduced the number of butt fusion joints required, which speeded up installation.

**CLICK ON THE LINKS FOR MORE INFORMATION:**

- > [www.egeplast.de](http://www.egeplast.de)
- > [www.fitt.com](http://www.fitt.com)
- > [www.ipexna.com](http://www.ipexna.com)
- > [www.battenfeld-cincinnati.com](http://www.battenfeld-cincinnati.com)
- > [www.aquaspira.com](http://www.aquaspira.com)
- > [www.birmingham.ac.uk](http://www.birmingham.ac.uk)
- > [www.marshall-tufflex.com](http://www.marshall-tufflex.com)
- > [www.gpsuk.com](http://www.gpsuk.com)

# MORE THAN IDEAS.

UNITED, OUR EXPERTISE IS COMBINED TO PROVIDE SOLUTIONS FOR ALL OF YOUR PLASTICS PROCESSING NEEDS.

With our combined expertise in injection molding machinery, reaction process machinery, extrusion technology, digitalization, and automation, we are unique in the industry and offer you limitless possibilities for utilizing plastics. Find out more now: [kraussmaffei.com/newtechnologies](http://kraussmaffei.com/newtechnologies)



**KraussMaffei**  
*Pioneering Plastics*

**PLASTICS EXTRUSION**  
WORLD EXPO

**PLASTICS RECYCLING**  
WORLD EXPO

**POLYMER TESTING**  
WORLD EXPO

**COMPOUNDING**  
WORLD EXPO



**FIND OUT MORE**

1-2 June 2021, Essen, Germany

These are just some of the 250+ exhibitors who will be in Essen:



Brought to you by:



Proudly supported by:

**Compounding**  
WORLD

**Film and Sheet**  
EXTRUSION

**Pipe and Profile**  
EXTRUSION

**Plastics Recycling**  
WORLD



# 4 EXPOS 2 CONTINENTS

The international exhibitions for the plastics compounding, recycling, extrusion and testing industry

## BOOK YOUR STAND

**FIND OUT MORE**

November 3-4, 2021, Cleveland, Ohio

These are just some of the 250+ exhibitors who will be in Cleveland:





# Polymers for Oil and Gas

VIRTUAL SUMMIT

1-3 December 2020

13:00 GMT

The global summit for polymer materials in onshore and offshore oil and gas engineering

Headline sponsor

**TEIJIN**

**FREE  
VIRTUAL  
EVENT**

## AMI's Oil & Gas conferences have gone virtual for this year!

The free-to-attend global virtual summit will cover the latest technical developments and market trends in the Oil & Gas sector.

### Five reasons to attend:

1. Learn how advances in polymeric materials are being applied in oil & gas
2. Identify opportunities for composites in sub-sea environments
3. Explore new material developments for optimal performance
4. Debate new approaches for the industry including 3D-Printing and AI
5. Network with industry experts and build professional contacts

All from the safety of your home or office!

**REGISTER FREE TODAY**

### Other ways to get involved:

- **Become a speaker** and showcase your knowledge and your company's experience
- **Promote your company** with your logo showcased throughout the event, on the website and in marketing communications

To find out more contact the conference [organiser](#).

Also sponsored by:



Progress beyond

Organised by:

**AMI**



*The use of wood-plastic composite (WPC) materials is growing - with applications moving beyond decking into facades, furniture and more*



# Wood effect: recent innovations in WPCs

While wood-plastic composites (WPCs) have found a niche in building applications such as fencing and decking, the material is finding its way into new areas all the time.

Delegates at the recent *Wood-Plastic Composites* virtual summit, organised by AMI, learnt how WPC formulations are being modified to take them into new areas.

Arne Schirp, of the **Fraunhofer Institute for Wood Research (WKI)** in Germany, says his organisation is studying how to improve the fire retardancy of WPCs for facades.

There are three main ways to achieve flame retardancy in WPC profiles, he said. The first is mass (or bulk) protection, which is achieved by adding flame retardants during compounding, or by pre-treating the wood particles. The second way is to add a coating to the finished, extruded profile.

The third is to use co-extrusion. Here, flame retardants are only added in a co-extruded outer

layer. This final method can save cost and allows recycled materials to be used in the core.

There are two main ways to pre-treat the wood: fibres can be treated using thermo-mechanical pulping (TMP) - a continuous process.

"You can add flame retardants via the blowline, then pelletise fibres mixed with polymer additives," he said. "You could also add fibres to a heating-cooling mixer cascade."

If using conventional wood flour or wood particles, the flame retardants can be added by spraying, followed by compounding or extrusion.

TMP converts wood chips - via a refiner process - into wood fibres. This method is usually used to make MDF, and WKI used it to apply flame retardants directly to fibres. WKI had the fibres pelletised by BAFA in Germany. Their composition was 66% fibres (with the flame retardant, ammonium polyphosphate - APP); 33% HDPE; and 1% lubricant. Two compounds were prepared, with flame

**Main image:**  
WPCs are widely used in decking, yet are finding their way into a host of other applications

**Right: The market for WPCs and natural fibre composites is growing, says Austrian research institute Wood KPlus**

retardant contents of 12 and 19%. Once profiles were extruded, single-burning item tests can easily be carried out. In the test, WKI had a relatively large exposed area (1.5 x 1.5m). A propane gas burner was placed at the corner of the sample and takes about 20 minutes.

These results can be incorporated into the relevant EU classification. "We hope to be between B and D," said Schirp. "We cannot reach A because we have flammable materials in the formulations."

Overall, he said that differences in filler - such as rice husks or wheat straw - or in shape (such as a solid or hollow profile) affected flame retardancy.

He added that, while small scale tests are good for screening, they do not really predict performance in the way that large scale tests do - those these are more costly and time consuming.

### Indian demand

Hardik Panchal, of Indian WPC products manufacturer **Hardy Smith**, said that India is a growing market for WPCs - and is crying out for more technology to help it grow further and faster. As well as traditional applications like decking, India is using WPCs for all kinds of products - such as furniture.

He said that India currently has a total installed capacity for WPC products of around 21,000 tonnes/year - with a yield of around 14,000 tonnes/year. Around 60% of this is in WPC sheet, which is produced on 70 lines across the country. The other 40% is in WPC profiles, for which there are around 110 lines across India - in both PE and PVC.

Right now, he says that around 95% of production is on Chinese-made lines.

"These machines are good, but do not have the capacity of machines made in Europe, for example," he said.

He says that these machines are one factor that bring down production yield. Others include an unreliable electricity system and raw materials supply.

Despite the relatively low numbers, he says that annual growth of WPC products is around 25%. So, while India has installed around 180 lines in the 10 years since it began making WPCs, he says there is demand for 500 new lines over the next 10 years.

"We are looking for larger capacity machines in particular," he said. "This is a good opportunity for other countries to supply technology, enter into joint ventures and make manufacturing investments."

■ The **AMI** virtual conference on wood-plastic composites was held in September. Forthcoming events - both traditional and online - can be found on AMI's website.



IMAGE: WOOD KPLUS, JURGEN LESSLHUMER

### Growing market

The market for WPCs and natural fibre composites (NFCs) is on the rise, according to Austrian research institute **Wood KPlus**.

"The main reasons for the increase include greater awareness of these materials and the use of more recycled materials, as well as numerous bio-economic strategies all around the world," said Andreas Haider, area manager for bio-based composites and processes at the organisation.

In new materials, he says the main driver is efficiency. More recycled materials are being used to meet the needs of the circular economy, such as durability and re-use. Coextrusion is one solution - using recyclate as a core material - but cannot yet be readily found on the market. Matrix polymers for WPCs are typically standard polymers, such as PE, PP and PVC. For NFCs, the use of biopolymers - industrial and home compostable - is growing, he said.

"The main drivers for new developments in processing machinery include the critical process parameters needed for good material performance and high extrusion output - principally screw design - which has to be optimised for many formulations as well as for effective degassing of materials," he said.

Haider says that where WPC and NFC production quality is high, so is product quality.

"We did a comprehensive benchmarking of commercial WPC available in the European market, which showed a broad range of material performance. This showed that the main issue for WPC is still production quality and resistance to water uptake."

Nevertheless, the weaknesses of WPC and NFC remain impact strength and water uptake, especially for outdoor applications.

"We try to overcome these by using different types of fibres or even employing hybrid formulations with more than one type of fibre in the compounds," said Haider.

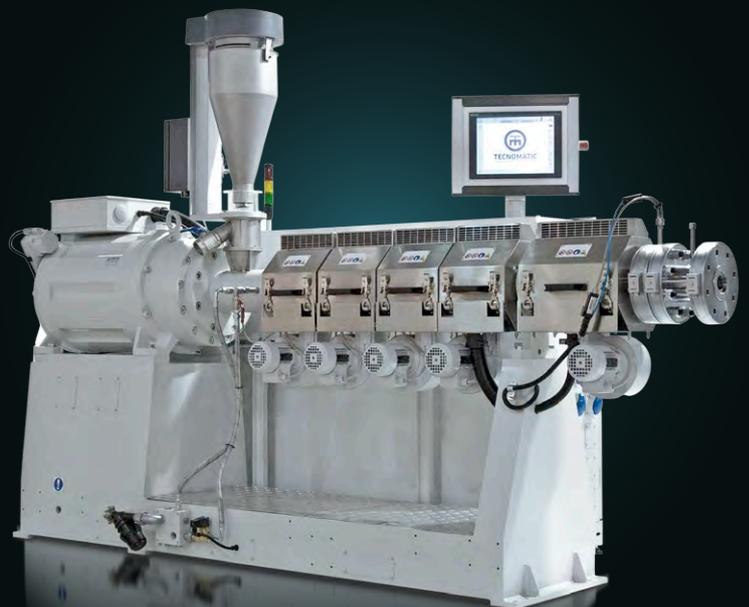




# THINK OUTSIDE THE BOX



Approaching problems in new and innovative ways; conceptualizing problems differently; and understanding a position in relation to any particular situation in a way never thought before are the basis of the companies that want to stay relevant and inventive. Starting from our customer's experience and working backwards to technology, Tecnomatic partnerships all the pipes companies, which are aiming at development and leadership, cultivating the ability to look at things differently from the common thinking.



**TECNOMATIC**

TECHNOLOGIES FOR PLASTIC PIPES PROCESSING

Tecnomatic Srl | Bergamo | Italy | tel. +39 035 310375 | [tecnomaticsrl.net](http://tecnomaticsrl.net)

**Additive options**

Additives that improve the performance and processing of WPCs are essential to their continued development - and many companies are active in developing new products.

**Struktol**, for instance, recently expanded its line of lubricants, and introduced a new coupling agent and additive to fortify capstock compounds for the WPC market.

The Struktol TPW 813 coupling agent is said to offer superior properties to traditional products. As well as providing good flexural properties, it is said to be especially effective in reducing water absorption, giving a more durable product that can withstand more wetting and freeze-thaw cycles. TPW 813 can be used with any type of lubricant and works ideally with Struktol TPW 617 lubricant/processing aid.

Struktol product line for WPC decking materials includes Struktol TPW 420, a full capstock compound that offers durability, scratch resistance, adhesion to substrate, processability and a low-gloss surface. The company is further developing its capstock line with new compounds that have a 'soft feel' surface. These compounds offer better anti-slip properties with increased coefficient of friction, the company says.

The focus for these compounds will be hand-rails, poolside decking, stairs, ramps and other applications that require a soft surface with improved grip and feel.

**Silicone platform**

**Dow** has developed Amplify Si Silicone Enhanced Polymer Systems (SEPS), a silicone-polyethylene hybrid technology that improves product performance. Dow says that the product, designed for WPC decking, is one of a series that it plans to launch under its new SEPS platform.

"It enables manufacturers to use more economical options - such as a variety of recycled plastic

and higher levels of fillers - in their wood composite manufacturing processes," said Mauro Gregorio, business president of Dow Consumer Solutions. "By incorporating this product into WPC boards, manufacturers can more easily bring new life to recycled plastic."

According to Dow, the product allows higher throughput, lower melt temperature and less thermal degradation. Manufacturers can also expect to see higher production rates, lower rejection rates and overall improvement in the tensile and flex strength of their WPC boards, it says.

Beyond decking, Amplify Si SEPS can be used with similar results in applications such as docks, railing, wall cladding, siding, fencing, window profiles and automotive.

**Dark matter**

**Americhem** recently collaborated with a WPC fencing manufacturer that was struggling to get good weathering performance in dark colour spaces due to degradation - which led to excessive colour fade. Americhem changed the customer's formulation from a blend to its eCap technology, which was colour matched to what they were currently selling. It used nGrain simulated woodgrain and eCap pre-colour capstock compounds, which are available in several finishes. The switch has helped the fencing producer to increase sales, integrate better weathering, and add more colours to its product line, said the company.

**Fire protection**

As well as mechanical properties and durability, WPCs frequently need effective fire protection for use indoors and in public buildings.

**BYK** says that its Scona modifiers for WPCs strengthen the physical bonding of the wood fibres in the thermoplastic matrix. The modifiers enable higher loading levels while maintaining good mechanical properties, says BYK - while giving the impact resistance needed for applications such as decking and outdoor panels.

Similarly, **Budenheim** recently developed a halogen-free flame retardant for WPCs, called Budit 620. The FR system was specifically designed for natural fibre-reinforced plastics and is said to meet high requirements in terms of fire behaviour.

**Waste wood**

Turkish researchers have used municipal waste - both wood and plastic - to make WPC compounds. The researchers, from the department of chemical engineering at **Izmir Institute of Technology**, said that using these materials cut waste, decreased

**Below: BYK's Scona modifiers strengthen the physical bonding of wood fibres in thermoplastics**



IMAGE: BYK

environmental effects and supported recycling.

Five different types of polypropylene (PP) or polyethylene (PE) based recycled plastics and wood, from urban household bulky wastes, were used to make recycled WPCs (rWPCs). The researchers also prepared WPCs from virgin resins - using wood flour and maleic anhydride grafted compatibiliser (MAPP or MAPE) - to evaluate the effect of recycled polymer type and compatibiliser on mechanical properties.

They found that the tensile strength of rWPCs made from recycled PP was higher than of those made from mixed polyolefins and recycled PE. Surface morphology of fractured surfaces - as well as tensile, flexural and density results of rWPC compounds - showed that MAPP enhanced interfacial adhesion in rWPCs.

Our results indicate the technical feasibility of using bulky waste as a potential raw material for WPCs, by considering physical and mechanical properties," according to the researchers, in a paper published in the journal *Waste and Biomass Valorization*.

### Weather effects

Researchers at the **Institute of Wood Science and Technology** in Bangalore, India, have studied how weathering changes the colour and mechanical properties of PP-based WPCs.

"The study focused on understanding the effect of coupling agent and particle size on weathering behaviour," said the researchers, in a paper in *Maderas - Ciencia y Tecnologia* (Wood Science & Technology).

Two coupling agents - maleic anhydride grafted



IMAGE: BUDENHEIM

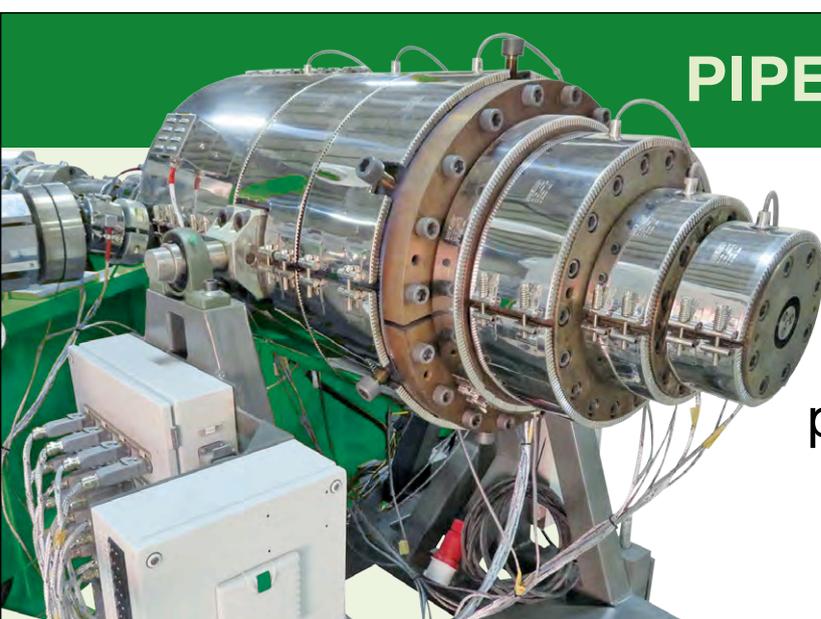
polypropylene (MAPP) and m-TMI grafted polypropylene - were used to prepare the WPCs. The WPCs were exposed to outdoor conditions for one year and changes in surface colour and mechanical properties were measured after 2, 4, 8 and 12 months of natural weathering.

During the first four months, considerable colour change was seen - especially in terms of lightness. Mechanical properties were largely unaffected in this period, then began to decline. Overall, tensile strength decreased by about 15% and flexural strength by about 8% after one year. Flexural modulus also fell by about 10%.

Wood particle size was found to affect the aesthetics and strength of the WPCs after natural weathering.

"Coupling agents had a positive impact on mechanical properties, but their influence on weathering degradation was not noticeable," said the researchers.

**Above:**  
**Budenheim**  
**says that its**  
**Budit 620**  
**halogen-free**  
**flame retardant**  
**is optimised**  
**for natural**  
**fibre-reinforced**  
**plastics**



## PIPEHEADS FOR OIL & GAS

**CONEXTRU** produces top quality multilayer heads for liners made of technical polymers like PA, PVDF, PPS and monolayer cross heads for cover pipes.



**NEW DATES:** 21-22 July 2021  
Bangkok, Thailand

Discover the latest  
global trends in  
PVC innovations  
to optimise and  
add value to your  
formulations

Join PVC chemists and other experts from around the world at this targeted conference.

### Reasons to attend:

- Understand global trends in the polymer industry, including mergers and acquisitions affecting PVC compound supply
- Network with key industry leaders that are driving the market forward
- Update your knowledge on additives, from new innovations to renewable sources, substitutions, selections and legacy additives
- Hear what construction, packaging, healthcare, and automotive manufacturers want from PVC suppliers

**Book your place**  
[www.ami.ltd/attend-PVC-Asia](http://www.ami.ltd/attend-PVC-Asia)

**Special rate for  
compounders and  
processors!**  
Just \$145

Founding sponsors:



Organised by:



Supported by:



### CONTACT US

Emily Nicholson  
Conference Organiser

T +44 (0) 117 314 8111

E [emily.nicholson@ami.international](mailto:emily.nicholson@ami.international)

## Cladding debut

Producers of WPC products are also developing innovations. **Trex**, a leader in WPC decking and railing, has expanded its offering with a cladding product.

Trex Cladding uses the company's square-edge Transcend deck boards, which can be applied horizontally or vertically. The open-joint façade system promotes airflow over the water-resistant barrier behind the cladding, providing an effective rainscreen assembly. It makes hardwood planks obsolete, says Trex.

The boards are made from 95% recycled plastic and reclaimed wood scrap, and are backed by a 25-year product and fade and stain warranties for both commercial and residential projects.

"Rainscreen is extremely popular across the building industry and is a natural extension for us," said Adam Zambanini, president of Trex Residential. "Our Transcend boards outperform wood in rainscreen applications."

Trex Cladding is available in three board lengths and 10 colour options - from earth tones to multi-tonal tropical hues. They feature a nine-element surface formulation that produces a natural, timber-like grain pattern. The material resists fading, and can be maintained by cleaning with soap and water.

## Scratch damage

US-based **MoistureShield** introduced its Diamond-Defense all-polymer cap for its Vision line last year. The company says DiamondDefense resists damage from scratches, stains and fading, resulting in the look of interior hardwoods with the strength that is needed in outdoor environments. The Vision line features a variegated appearance with a diverse pallet of colour options. Some are available with the option of CoolDeck technology, which minimises heat absorption by up to 35% compared to traditional capped composite boards.



IMAGE: NEOTIMBER

## Advanced capping

UK producer **NeoTimber** has added a capped hollow deck board to its line. Its Advanced range is described as a second-generation (capped) composite decking based on its Essential hollow product that wraps a composite core in a durable, four-sided polymer capping. The capping provides protection and weather resistance, but also means the board is reversible, with an authentic embossed woodgrain on one side and grooved channels on the other.

The Advanced board is said to differ from others on the market in its use of hollow-tube design and less extreme core reduction - 40% compared to up to 80% from other manufacturers, it says.

"We've had great success with our Essential range and were keen to replicate this design philosophy with our capped decking range," said Toby Allen, marketing director at NeoTimber. "We believe that by removing a small proportion of the material within the board - and doing so in circular increments - the board remains considerably stronger than others on the market."

## Recycled packaging

Packaging specialist **Berry Global** and building

**Above:**  
**NeoTimber**  
**Advanced**  
**composite**  
**decking is a**  
**performance**  
**optimised**  
**capped hollow**  
**core product**



## Add Value, Reduce Costs & Eliminate Risks with Xaloy® Barrel Solutions

As the pioneer in barrel technology, Nordson is the only manufacturer who produces bimetallic plasticizing barrels in the Americas, from start to finish! Profit from over 90 years of experience and optimize your process with Xaloy® Plasticizing Solutions.





[WWW.NORDSONPOLYMERPROCESSING.COM](http://WWW.NORDSONPOLYMERPROCESSING.COM)



# Polymer Foam

## VIRTUAL SUMMIT

19th January | 26th January  
2nd February 2021

Free-to-attend virtual forums exploring  
advances in polymer foam materials,  
processes and applications

**FREE  
VIRTUAL  
EVENT**

### Other ways to get involved:

**Become a speaker** and showcase your knowledge and your company's experience

**Promote your company** with your logo showcased throughout the event, on the website and in marketing communications.

**Contact us to find out more**

Organised by:

**AMI**

Media supporter:

**Compounding  
WORLD**

**This forum series, held over three consecutive Tuesdays, will give you the chance to:**

- Learn how market trends will influence the future direction of the foam industry
- Obtain valuable insights into new materials and processes in foam markets
- Discuss the role of sustainability and its impact on the industry
- Position your company in the marketplace
- Network with global foam professionals from across the supply chain and academia

**All from the safety of your own home or office!**

**Register your interest**

products manufacturer **Azek** have teamed up to recycle more than 13,000 tonnes of waste plastic into usable products - including composite decking.

Berry will provide a stream of mixed, post-industrial scrap - from its plants across North America - to Azek, which will use it to make wood-plastic composite (WPC) decking. Azek's portfolio includes a number of wood-replacement products.

"This expands our recycling initiatives and enables us to increase the overall sustainability of our manufacturing operations," said Jesse Singh, CEO of Azek.

The deal will help both companies lower the environmental impact of their operations.

### Decking in Saudi

Nusaned Investment has invested in Saudi company Suhul Alkhalej - which is to make a range of products including wood-plastic composite (WPC) profiles for decking and cladding, WPC sheets and doors, and PVC profiles.

The deal between Nusaned and Suhul Alkhalej will use raw materials from **SABIC**, which is the owner of Nusaned.

"The new venture fulfills our mandate of investing in industrial SMEs in [Saudi Arabia]," said Faisal Al-Bahair, CEO of Nusaned Investment. "It will use polymers as raw materials promoting sustainability and downstream initiatives. The products are a good fit for our portfolio."

#### CLICK ON THE LINKS FOR MORE INFORMATION:

- > [www.wki.fraunhofer.de](http://www.wki.fraunhofer.de)
- > [www.hardyplast.com](http://www.hardyplast.com)
- > [www.ami.international](http://www.ami.international)
- > [www.wood-kplus.at](http://www.wood-kplus.at)
- > [www.struktol.com](http://www.struktol.com)
- > [www.dow.com](http://www.dow.com)
- > [www.americhem.com](http://www.americhem.com)
- > [www.byk.com](http://www.byk.com)
- > [www.budenheim.com](http://www.budenheim.com)
- > [www.iyte.edu.tr](http://www.iyte.edu.tr)
- > [www.icfre.org](http://www.icfre.org)
- > [www.trex.com](http://www.trex.com)
- > [www.moistureshield.com](http://www.moistureshield.com)
- > [www.neotimber.com](http://www.neotimber.com)
- > [www.berryglobal.com](http://www.berryglobal.com)
- > [www.azekco.com](http://www.azekco.com)
- > [www.sabic.com](http://www.sabic.com)

NEW REPORT AVAILABLE NOW

# THE GLOBAL MECHANICAL PLASTICS RECYCLING INDUSTRY 2020

Get a clearer understanding of the competitive intensity, size and structure of each market within your industry.

Discover:

- The size of the market opportunity for rPE, rPP, rPET, rPVC and rPS
- In which end-use applications and geographies what growth will occur
- How various waste sources will drive recyclate output
- Where is new product and technology development, and investment leading the market
- How the Chinese National Sword policy has transformed the global recycling industry

Click here for more info

AMI

[www.ami.ltd/Global\\_Mechanical\\_Recycling](http://www.ami.ltd/Global_Mechanical_Recycling)



# PLASTICS EXTRUSION WORLD EXPO NORTH AMERICA

PIPE AND PROFILE EXTRUSION

## New dates

November 3-4, 2021

CLEVELAND, OHIO, USA



## Highlights from 2019

From across the co-located expos



Total number  
of exhibitors:

**261**



Total number  
of visitors:

**4,375**



Number of countries  
represented:

**42**



Combined budget  
of visitors:

**\$8.9BN+**

To book your booth, contact:  
[exhibition\\_sales@ami.international](mailto:exhibition_sales@ami.international)  
+1 610 478 0800

Find out about the  
Plastics Extrusion  
World Expo, Europe

**BOOK  
YOUR  
BOOTH**

Brought to you by:

**AMI**

Colocated with:

COMPOUNDING  
WORLD EXPO

PLASTICS RECYCLING  
WORLD EXPO

POLYMER TESTING  
WORLD EXPO

Proudly supported by:

Film and Sheet  
EXTRUSION

Pipe and Profile  
EXTRUSION

# Multiple choice: latest in multi-layer pipe dies

*As well as withstanding tougher operating conditions, multi-layer pipes can be used to raise performance – such as by keeping drinking water free of environmental contaminants*

The main reason for using multiple material layer – in a product such as a film or pipe – is to take advantage of the physical attributes of each layer. This could be in terms of physical performance such as strength, or other mechanical properties such as barrier performance.

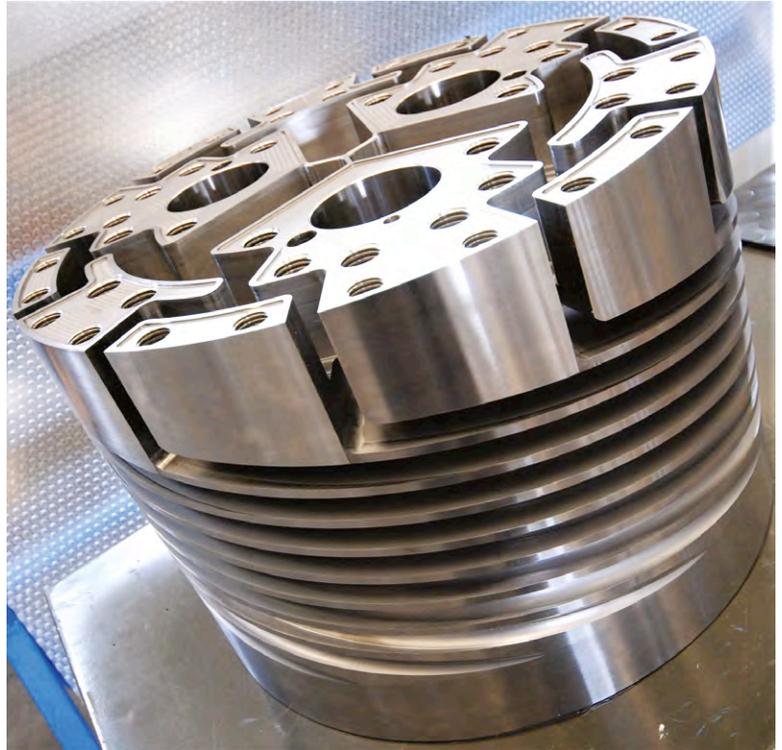
**Tecnomatic** recently delivered an extrusion line to Authentic Production in Myanmar, to make multi-layer pipes up to 630mm in diameter.

Authentic has previously used Tecnomatic lines to make pipe up to 1200mm diameter. The latest product uses BorSafe HE3494-LS-H PE100 high stress crack resistant (HSCR) material in the outer layer to withstand point loads and surface damage that may occur during installation.

The pipe made by Authentic has two layers, equal to 10% and 90% of the total thickness. The outer layer is made from HSCR PE100 material, the core from standard PE100. This requires two separate extruders: a Zephyr extruder in L/D 40 for the outer layer; and an Atlas extruder in L/D 30 for the inner layer. Both are synchronised using gravimetric feed to maintain a continuous raw material feed and to record variations in mass throughput, which controls the weight per metre and wall thickness distribution.

The material is extruded through a Venus Multi pipe head. Its spiral geometry is optimised for the latest generation of PE and PP raw materials and has been designed to have a smaller overall length, volume and operating pressure.

Extra features can be added to the pipe, such as a peelable outer skin. This peelable layer, often made from modified polypropylene, protects the



pipe surface against potential notches and cracks during installation. It is typically 0.6-0.7mm thick and is added by a crosshead positioned before the final cooling bath.

## **PB and PEX**

In addition, Tecnomatic has supplied a multi-layer line – to make five-layer polybutylene and PEX pipe – to a European producer of heating and plumbing pipe.

The key part of the line is a version of its Athena die-head which has been optimised to allow more flexibility and accuracy in the distribution – which is important in shaping the EVOH and adhesive into very thin, uniform layers, it says.

The radial distributors have no dead zones or edges, which eases the jobs of cleaning and assembly/disassembly. Radial spirals allow low pressure losses and high flexibility in terms of layers structure (thick or thin layers) and number of layers, while short flow paths reduce residence time and allow rapid material and colour changes.

The line, which has a working range of 8-32mm, runs at up to 50 m/min for PEX or PE-RT pipe, and up to 40 m/min for most polybutene pipe diameters. ➤

**Main image:** Myanmar-based Authentic Production has begun making multi-layer pipes on a Tecnomatic line, which includes a Venus 630 die-head



**Above:**  
**Tecnomatic**  
**recently**  
**supplied a line**  
**that makes**  
**five-layer**  
**polybutylene**  
**and PEX pipe**

The line uses a gearless Atlas 60.30 as the main extruder - which reduces maintenance and optimises energy consumption - and Mizar and Atlas 30 co-extruders for adhesive, EVOH and external layers.

A double ultrasonic wall thickness station and eccentricity scanners - with central symmetrically adjustment - continuously control all the pipe parameters during production.

**Sustainable pipe**

Albert Vaartjes, global sales manager for RBleu PVC-O at **Rollepaal** in the Netherlands, told delegates at a recent seminar that multi-layer pipe can help to boost sustainable performance in sewer systems.

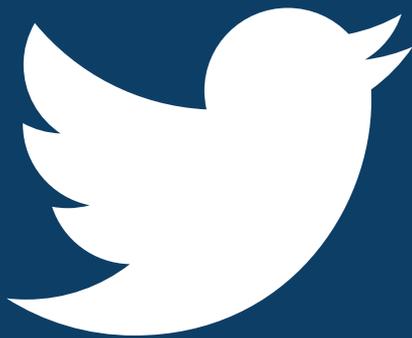
“Multi-layer PVC pipe systems allow us to re-use post-consumer and in-house recycled material in specific applications,” he told delegates at a workshop organised by the Southern African Plastic Pipe Manufacturers Association (SAPPMA).

As well as having a lower environmental impact, multi-layer PVC sewer pipes also have the required properties to design life, he says.

Vaartjes said that Rollepaal focuses on both non-pressure systems (multi-layer pipe) and pressure systems (PVC-O pipe). Its R&D team uses low volume die-heads, automatic thermal centring, inline production systems and continuous process improvements to reduce carbon footprint.

“Years of experience in PVC pipe has allowed us to develop more effective pressure and non-pressure pipe joints and pipe components to deliver reliable piping systems,” he said. “These have proven to be the preferred pipe system choice and

# Follow us on...



**Be the first to know when we  
publish a new edition, plus  
updates on our conferences  
and useful links.**

**Compounding**  
WORLD

**Film and Sheet**  
EXTRUSION

**Pipe and Profile**  
EXTRUSION

**Injection**  
WORLD

**Plastics Recycling**  
WORLD

[www.twitter.com/plasticsworld](http://www.twitter.com/plasticsworld)

offer all the added benefits of PVC that end users are familiar with."

### Water protection

**Wavin** was recently granted a US patent for a multi-layer barrier pipe aimed at drinking water applications.

Drinking water pipes often need to be laid in contaminated ground and need to prevent ingress of contaminants such as hydrocarbons, said Wavin. The patented idea incorporates layers that are impermeable to hydrocarbons and gases, which ensures that the drinking water inside remains uncontaminated.

The structure incorporates polyolefin inner and outer layers, as well as a barrier layer, protective layers and a 'peelable' layer.

Rather than relying on EVA or polyamide for the barrier layer - which Wavin says are too hydrophilic - it proposes using materials such as PET, PBT, PEN or PEF. These, it says, have good enough barrier properties at 20°C to repel substances such as hydrocarbons.

Wavin has proposed several structures of pipe that vary the order or thickness of the different layers. Importantly, the whole pipe can be produced by co-extrusion - and there is no need to extrude a core pipe and then add other layers to it.

"This saves space - for the footprint of all the equipment - as well as logistics, and storage space," according to the patent document.

At the same time, making the pipe in this way reduces production time.

The 'peelable' layer - between the barrier layer and polyolefin inner layer - provides for a discontinuation of the diffusion path - if available - for any hydrocarbon molecules that have penetrated the outer barrier layer.

"By lack of material continuation, the hydrocarbon molecule may not diffuse further inwardly through the pipe wall," according to the patent. "The molecule may 'get stuck' at the discontinuity - and not reach the drinking water."

### Flexible die

**Conextru** has developed a multi-layer pipe head, which it says is flexible enough to make a wide range of pipe structures.

"One of the important requirements for flexibility is that the position of each extruder must be the same for all pipe structures," said Josef Dobrowsky, managing director of Conextru. "Only a short longitudinal movement of a few centimetres is allowed - for mounting to the head."

This has been achieved with a new adapter

block, which sits between the multi-spiral channel head and the extruder. The adapter block brings the melt from each extruder to the correct distributor of the head.

The multi-layer head has four different spiral distributors. They are designed for best melt distribution of low-viscosity polymers such as PVDF, PA, EVOH or adhesive, and for high-viscosity materials such as PE 100 RC or high modulus PP.

Not all multi-layer pipes can be made with same die design so it is sometime necessary to have a specific die design depending on the pipe product.

However, the system works with a master die set which is placed in the centring unit. 'Add on' die sets can be mounted onto this master die set. The horizontal die set change - combined with segmented mandrels - makes the system more flexible and user friendly.

If colour stripes are needed, the best option is to apply them via a CSR colour stripe ring mounted at die end.

Dobrowsky adds that the extruders themselves must be flexible enough to process different polymers without changing screw. So, instead of being optimised for high output, the extruders are optimised for a wide processing range. This can be achieved if the extruder have a corrosion resistant screw and barrel - to process corrosive polymers - as well as barrier screw design and temperate grooved intake, which can be operated at high temperature if needed. A gravimetric system for output control is also necessary, for co-extrusion at different output levels.

### CLICK ON THE LINKS FOR MORE INFORMATION:

- > [www.tecnomaticsrl.net](http://www.tecnomaticsrl.net)
- > [www.rollepaal.com](http://www.rollepaal.com)
- > [www.sappma.co.za](http://www.sappma.co.za)
- > [www.wavin.com](http://www.wavin.com)
- > [www.conextru.eu](http://www.conextru.eu)

**Below:**  
**Conextru says its multi-layer pipe head is flexible enough to make a wide range of different pipe structures**





# Polymer Sourcing & Distribution

17-19 May 2021

Hotel Grand Elysee

Hamburg, Germany

Disruptive forces, challenges  
and opportunities in global  
polymer sourcing & distribution



“AMI’s Polymer Sourcing is a must go conference. Good networking and learn latest trends on Europe polymers distribution”

Chief representative- CHEMORBIS

Organised by:

**AMI**

Media supporter:

**Compounding  
WORLD**

## 5 REASONS WHY YOU SHOULD ATTEND:

- Take a deep dive into the trends affecting polymer markets and their future prospects
- Deepen your understanding of the polymer supply chain and sourcing challenges
- Learn about the recycled polymer market and the impact of circular economy on supply chain dynamics
- Find out about the impact of Coronavirus on the plastics industry, and what the recovery may look like
- Meet and network with senior personnel from every part of within the polymer supply chain

**Book your place**

# Protection factor: extruder wear technology

*Extruder wear is a natural part of the process, but it can be resisted by ensuring that components such as screws are coated in the right way*

Protecting the surface of screws (and barrels) is a critical factor that can seriously lengthen the life and efficiency of extrusion machinery.

US-based **Extreme Coatings** says it has improved its CarbideX coating technology to replace nitriding and chrome plating in applications including conical feedscrews.

The move was prompted by environmental concerns with chrome plating and the need for better protection against wear and corrosion. According to the company, equipment operators can achieve up to five times longer equipment life with CarbideX formulations (C1000, C2000, and C9000-nano) of tungsten and chromium carbide encapsulation.

Wear resistance capabilities can be improved on a variety of components, including single and twin extrusion screws.

The company says its Chrome Plating Replacement (CPR) is virtually non-porous, so corrosive

gases from PVC cannot attack the base of the screw. However, unlike nitriding, it says CPR also increases resistance to corrosion and wear. CPR is also said to be more environmentally friendly than chrome plating.

Extreme Coatings says the chromium (VI) compounds used in chrome plating are known carcinogens but the chromium (III) carbide compounds used in its CPR C4000 system are not known to be carcinogenic or toxic.

In some applications where abrasive fillers cause premature wear, the company says its C1000 or C9000 nano formulations of tungsten carbide encapsulation provide superior wear resistance and a high level of corrosion resistance.

The company says its approach is to analyse specific wear or corrosion problems then create a customised solution to maximise component life.

"Advances in polymer technology demand parallel advancements in feed screw and process-

**Main image:**  
Because steel is susceptible to corrosion, parts such as extrusion screws should include surface protection

**Right: Surface treatment is critical in protecting screws from the corrosive effects of plastics processing**

ing technology,” said Curt Kadau, president of Extreme Coatings.

“We have kept pace with these advances and will continue to develop new products to meet the demands of our customers.”

**Corrosive effect**

**Nordson** has custom-designed a series of Xaloy screw and barrel packages to withstand the corrosive effects of fluoropolymers.

Fluoropolymers are among the most corrosive materials for processing in standard extrusion systems. Nordson says that its screw and barrel packages offer highly corrosion-resistant materials for all components, along with custom-designed screws to meet the differing processing temperatures of fluorinated ethylene-propylene (FEP) and polyvinylidene fluoride (PVDF).

The corrosion-resistant materials specified for FEP screws include Inconel nickel-chromium alloys for the base metal and Colmonoy nickel-based alloys for the hard-surfacing that is welded onto the wear surfaces of the screw flights. For PVDF screws, the recommended base metal is chrome-plated 4140 HT alloy steel or stainless steel.

For both screws, Nordson recommends that the barrel is lined with Xaloy X-800, a corrosion- and abrasion-resistant nickel-based alloy with tungsten carbide. For discharge flanges and feed ports, the material is Inconel.

An important difference between the two fluoropolymers is melt temperature: 230-290°C for PVDF, versus 360-380°C for FEP. This determines screw design for applications that require mixing of the polymer with additives, modifiers and colorants. For FEP, Nordson recommends a screw with the Xaloy Stratablend II mixer, which provides distributive and dispersive mixing with relatively low shear.

This is also recommended for mixing PVDF, but in addition Nordson specifies the Xaloy Efficient barrier screw. Its design separates the already melting resin from solid material that has yet to melt, preventing over-shearing of the already melted PVDF and keeping the melt temperature of the overall extrudate low.

Other design specifications for screws to process these fluoropolymers involve the length of the feed and transition sections of the screw and the compression ratio.

“While there is growing demand for fluoropolymers in wire and cable because of their extreme heat and chemical resistance, these materials require plasticating systems that resist corrosion,” said Walter Smith, senior extrusion application engineer.



IMAGE: MESSE DÜSSELDORF, CONSTANZE TILLMANN

“We have designed package systems for FEP and PVDF that meet this requirement as well as addressing the special processing characteristics of each polymer.”

**Hot technology**

**Nanjing KY Chemical Machinery** of China says it has developed new Hot Isotactic Pressing (HIP) materials to improve the service life of screw elements.

According to the company, its HIP coatings can be directly powder-formed and treated materials can achieve 100% densification, which improves overall mechanical properties. KY Chemical says its PMHIP coating offers a number of favourable characteristics including high alloy content, uniform carbide formation by heat treatment and long service life.

Compared with domestic Chinese high-speed tool steel, service life is increased up to tenfold, says the company.

Other claimed benefits for its PMHIP steel include the ability to meet individual requirements for wear or corrosion resistance and more consistent product processing.

The company says the coating meets the requirements of machinery with torque ratings of up to 18Nm/cm<sup>3</sup> as the screw elements can adopt a soft core structure, which provides improved toughness.

**CLICK ON THE LINKS FOR MORE INFORMATION:**

- > [www.extremecoatings.net](http://www.extremecoatings.net)
- > [www.nordson.com](http://www.nordson.com)
- > [www.keyatwinscrew.com](http://www.keyatwinscrew.com)

## RECYCLING

# Compatibiliser allows mixing of PE and PP

Imerys has developed a compatibiliser that allows mixed polyethylene (PE) and polypropylene (PP) waste streams to be blended together and used to make new products.

"The current challenge for recycled plastics is to maintain the mechanical properties of these materials – which tend to deteriorate during the recycling process," said Cyril Coppel, marketing manager at Imerys.

The new mineral-based additive, called Imerlink,

enables "true compatibilisation" by creating a chemical bond with PE and PP. This results in improved mechanical properties with an optimum stiffness/toughness, while the solution is also cost effective, according to Imerys.

"Using ImerLink, recycled polyolefins materials that would otherwise not be compatible can now be processed at up to 100% and used in higher value applications that meet key performance requirements," said the company.

In extrusion, recycled HDPE is typically used for twin-wall pipes in this market, says Imerys.

"Recycled HDPE is readily available from a variety of post-industrial (old pipes) and post-consumer sources (bottles). Problems occur when PP contamination rates in the rHDPE are above 3-5%. Using ImerLink allows recyclers/compounders to use post-consumer wastes that have not been heavily sorted," according to the company.

➤ [www.imerys.com](http://www.imerys.com)

## ADDITIVES



## Biocide's viricidal activity

Tolsa says that its Adins range of biocidal additives also show viricidal activity.

It says that Adins Protection S10 has shown to be active against all enveloped viruses, including Coronavirus type, Norovirus, Rotavirus, and Adenovirus, according to the EN 14476 standard.

The tests, conducted by an external laboratory, have confirmed that it reduces viral load by up to 99.99% in both short and long periods. In addition to viricidal activity, Adins Protection also shows bactericide, fungicide and algicide activity.

Tolsa says that the active silver-based biocide offers high antimicrobial activity at lower dosages. In addition, the products allow an optimal dispersion into the matrix in which they are incorporated.

Adins Protection is supplied as a powder that can be used in a range of different formulations, from paints and coatings to plastic and rubber products.

➤ [www.tolsa.com](http://www.tolsa.com)

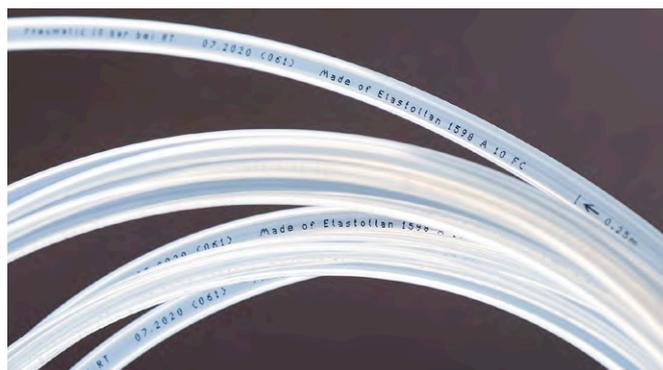
## POLYURETHANES

# Thermoplastic polyurethane has ether and ester benefits

BASF has developed a thermoplastic polyurethane (TPU), which it says combines the advantages of ether and ester TPU in a single material. It is aimed primarily at pneumatic hose applications.

Elastollan 1598 A 10 FC, approved for food use, has the hydrolysis and microbial resistance of ether-based TPUs and mechanical properties of ester TPU.

"Due to the better burst pressure behaviour in relation to temperature, it can be used to achieve a higher operating temperature of pneumatic hoses compared to conventional ether TPUs," said Mark



Ottens, segment manager of extrusion TPU at BASF.

The material exhibits reduced creep behaviour and increased bursting pressure. This means a longer product life and an expansion of the field of application – such as by allowing a higher requirement classification. Other

characteristics include its crystallisation properties and high dimensional stability, making it highly processable via extrusion.

"Customers benefit from efficient processing, such as faster line speed or less scrap at startup," according to Ottens.

➤ [www.basf.com](http://www.basf.com)

## Stay up to date: watch these free industry webinars

Click on a webinar to **watch in your own time.**

**Driving Processing Efficiencies in Optical Fiber Cable Manufacture**  
Pascal Amigouet  
Senior Technology Manager  
Ko Arts  
Marketing and Sales Manager






**Forecasting the impact of coronavirus on economies and plastics markets**  
David Buckby  
Principal Global  
Resin Analyst





**Hidden inside - Performance outside! A short story of functional fillers used in Masterbatch for foil applications**  
Péter Sebő, Head of Marketing & Market Development




*Hidden inside - Performance outside!*



A DIVISION OF QUADROWORKS GROUP

**SLENTEX - The space saving, non-combustible insulation**  
Dr Wibke Lölsberg,  
Manager Global Marketing





We create chemistry

**Drill, Punch, Skive - The Hole Truth**  
Speakers:  
Bryan Mathias, Director of Business Development  
Kerri McGillicuddy,  
Office Administrator






precision tooling & automation solutions

**Plastics and the Pandemic Virtual Forum Series**  
Analysing the impact of Covid-19 on the global plastics industry



Plastics and the Pandemic




**Flexible Compounding With Kneading-block-free Screws**  
Klaus Hojer, Business Development, Feddem





**Applications and solutions of plastics in the medical sector**  
Ing. Raquel Llorens-Chiralt,  
Senior Researcher - Health Group, Aimplas





PLASTICS TECHNOLOGY CENTRE

**Access the free Webinar Library Today**

Register once to view all AMI library webinars

## TESTING

# Cooling device allows dynamic testing without thermal chamber

The Fraunhofer Institute for Structural Durability and System Reliability (LBF) has developed a new cooling device for its high-speed testing dynamic plastics machine - allowing it to perform low-temperature testing without a thermal chamber.

It will allow the LBF team to investigate plastic properties at temperatures as low as -40°C. In addition, it measures strain

optically with Digital Image Correlation/Greyscale Correlation (DIC/GSC) - to determine a 2D strain field on the specimen.

Low temperatures are generated with compressed air cooled by liquid nitrogen, with the sample standing in the flow of this air. A thermal camera monitors temperature over a large area, and measurements begin once the correct temperature has

been reached.

The advantage of mixing compressed air and nitrogen is that the compressed air is dry and only a few ice crystals form on the sample surface. The gas mixture from the cold reservoir also ensures a more constant temperature of the air flow than when nitrogen is applied directly.

The cooling unit - developed at Fraunhofer LBF - consists of a controller and

switching element, a cold reservoir, a nitrogen tank and a supply line to the sample. The lack of a thermal chamber means there is no pane between the camera and the sample, which could tarnish or freeze or form air vortices when the pane is heated. This improves DIC and allows flexible testing of different component sizes and different load types.

➤ [www.lbf.fraunhofer.de](http://www.lbf.fraunhofer.de)

## HDPE PIPE

# Modularity makes for mobile extrusion

Tubi USA has developed a mobile modular extrusion system that reduces logistics, installation and handling costs for making and installing HDPE pipe in industries including mining, oil and gas and wastewater.

The modular production units operate at Tubi's sites - or a client's site - to reduce the cost of pipe transportation and ensure supply at each plant. The mobile extrusion plants can be packed onto flatbed trucks and taken to project sites in 72 hours to manufacture HDPE pipe for a range of infrastructure projects.

In the pandemic, Tubi can move its modular plants where needed and operate at 100% capacity compared to traditional pipe manufacturers in permanent facilities - which may face capacity limitations.

"Our modular technologies address the needs of an ever-increasing and far-spanning global community," said



Marcello Russo, CEO of Tubi. "With our geographies widening, there is a real demand to use more efficient, flexible and sustainable methods of operation."

The technology eliminates the risk of handling large pipe lengths while delivering sustainability advantages by reducing truck traffic. The mobile factories can be moved to strategic locations, providing increased flexibility compared to conventional brick-and-mortar plants, he added.

Tubi's plant can extrude 4in to 26in

pipe - with capability up to 48in, in lengths of 500 feet or more. Each modular extrusion factory has 20 million lbs of annual capacity, says Tubi.

Tubi has established a mobile manufacturing site in Bartow, Florida with two plants. The company won a large project, then leased space from its customer, Mosaic - a major fertiliser producer. Mosaic is using Tubi pipe to process wastewater from phosphate mining. Tubi is producing the pipe in 500ft lengths.

"No one has done that on land before and Tubi also successfully produced 1,000ft lengths of 16in pipe," according to Wes Long, COO of Tubi.

Tubi also operates a mobile extrusion plant in Odessa, Texas with plans to move a fourth new mobile extrusion plant to Tucson, Arizona to serve the Southwest mining industry.

➤ [www.tubigroup.com](http://www.tubigroup.com)

EXTRUDERS

# Single-screw extruders for polyolefin pipe production

Bausano says that its E-Go range of single-screw extruders is aimed at the production of polyolefin pipes.

The company says that the range allows the production of a wide range of pipes. These include smooth, corrugated, multi-layer, single-layer, rigid and flexible. It can also produce pipes from small to large diameter, using a range of materials.

Pipes made in this way are aimed at a number of sectors including construction, infrastructure, water and gas, agriculture, medical, mining and automotive.

E-Go extruders have a screw geometry that was redesigned according to customer requirements. These changes help it to boost output and process polyolefins without excessive mechanical stress, says Bausano. In addition, the design of the screw and cylinder - along with low-input asynchronous motors - help to raise energy efficiency.

The extruder features a multi-stage gearbox with ground helical gears, a cylinder heating system with ceramic heating elements and a cooling system with radial fans. Digital extruder control monitors energy



consumption and controls the extruder and entire line through a single user interface, says the company. For special processes such as co-extrusion, the extruder can be coupled to a twin-screw solution.

"Polyolefin pipes are required to have high

resistance to abrasion, corrosion, chemical agents and impact - as well as internal pressure and heat - which we guarantee by customising the core elements of the E-Go line," said Clemente Bausano, vice president of Bausano.

> [www.bausano.com](http://www.bausano.com)

RECYCLING

# Intelligent cameras to separate waste

Danish researchers are developing a camera-based system that can separate plastic waste according to type.

With a €3 million grant from Innovation Fund Denmark, Aarhus University has teamed up with recycling companies Vestforbrænding, Dansk Affaldsminimering and Plastix to develop technology that could increase the purity of recycled plastic materials. When implemented at plastic recyclers, it could help to increase the use of recycled plastics.

The project, called Re-Plast, aims to recycle plastic to a purity of at least 96% by polymer type - as well as sorting according to unwanted colours and filler materials.

"Different polymers are virtually impossible to mix," said Mogens Hinge,

assistant professor at the department of engineering at Aarhus University, who is heading the project. "For this reason, we want to develop equipment that can separate different plastics according to their specific properties - using three different types of cameras."

This will make it possible to categorise plastic waste according to its exact properties, and then divide it into fractions that are actually usable, she says.

The separation, controlled by artificial intelligence, uses CMOS, hyperspectral and terahertz cameras - which together photograph the properties of the plastic material as it travels along a conveyor-belt system.

A CMOS camera is an ordinary digital camera, as used in smart-

phones. The hyperspectral camera registers more wavelengths than the human eye, so can read the unique spectral signatures of different plastic types. The terahertz camera registers the refractive index of materials.

Terahertz technology provides a detailed image of the properties of a given plastic, allowing it to characterise material properties very accurately, said the researchers.

"By coupling the spectroscopic signals with chemical composition, we can achieve pure plastic fractions, which can then be recycled," said Hinge. "Re-Plast aims to develop this technology, make it work, then implement it."

> [www.international.au.dk](http://www.international.au.dk)

> [www.plastixglobal.com](http://www.plastixglobal.com)

# Download these new product brochures

Simply click on the brochure cover or link to download a PDF to your PC or smartphone

## STRUKTOL: WPC



This brochure from Struktol details its products for wood-plastics composites including engineered lubricants and performance additives for PP flow promotion, homogenisation, odour elimination and water absorption inhibition.

[CLICK HERE TO DOWNLOAD](#)

## SICA: PIPE PROCESSING



This brochure from Sica covers the company's full range of performance pipe finishing equipment including its novel TRS-W cutting and chamfering, Unibell electric bellling and robotised packaging machines.

[CLICK HERE TO DOWNLOAD](#)

## UNICOR: PIPE CORRUGATION



This brand new 48-page brochure from Unicor provides detailed insight into the design, production, applications and advantages of corrugated pipes. It includes specification data on the company's wide range of pipe corrugation equipment.

[CLICK HERE TO DOWNLOAD](#)

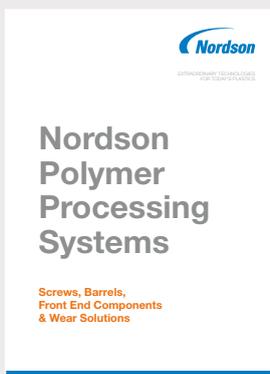
## DAVIS-STANDARD: PIPE & PROFILE



Davis-Standard supplies a wide range of extruders and extrusion systems for pipe, profile and tubing applications, including medical tubing. This brochure details the range of equipment available and key performance benefits.

[CLICK HERE TO DOWNLOAD](#)

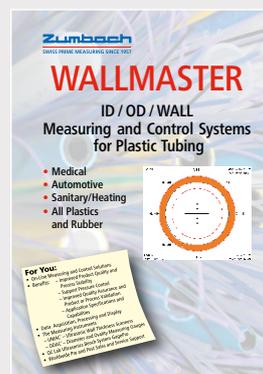
## NORDSON: SCREWS AND BARRELS



Xaloy plasticising system components produced by Nordson Polymer Processing for extrusion applications include a range of bimetallic barrels and a variety of barrier and mixing screws. Learn more in this brochure.

[CLICK HERE TO DOWNLOAD](#)

## ZUMBACH: MEASUREMENT CONTROL



This eight-page brochure details the main features of Zumbach's Wallmaster measurement and control system for improving product quality, process stability and data capture in plastic tube and pipe extrusion applications.

[CLICK HERE TO DOWNLOAD](#)

If you would like your brochure to be included on this page, please contact Claire Bishop [claire.bishop@ami.international](mailto:claire.bishop@ami.international). Tel: +44 (0)1732 682948

## Palad HY Industries

**Head office:** Migdal HaEmek, Israel

**General manager:** Fuad Dweik

**Founded:** 1997

**Ownership:** Private

**Profile:** Palad HY Industries, founded in 1997 by Fuad Dweik, is a leading manufacturer of HDPE and PVC infrastructure pipes. Based in northern Israel, its products are used widely in water supply, sewage structures, natural gas distribution systems, electrical and communication applications. As well as supplying the local market, it exports around 25% of its production to several regions, including Europe, Eastern Europe, South America and Africa.

**Product lines:** The company supplies a number of product variants for various industries. Its pressure pipe includes Ronit PVC-U and Roniflex PE100. In sewerage and drainage, its offerings include Roniviv PVC-U as well as numerous PE100 grades. Its Ronigas grades - also in PE100 - are used to transport gas and comply with the requirements of European Standard EN 1555-1. The pipes are designed with high creep rupture strength, stress crack resistance and resistance to rapid growth propagation, as well as being lightweight, easy to install and flexible. The company also supplies electrical conduit pipe, and pipe for industrial and agricultural applications.

**Factory location:** The company makes all its product at a single facility in Migdal HaEmek in northern Israel, which has an annual capacity of around 20,000 tonnes. Here, it makes PE pipe up to 1200mm diameter, and PVC pipe up to 500mm diameter. Palad recently invested in a new single-screw extruder from Battenfeld-Cincinnati, to make PE100 pipe. The company is certified to ISO 9001:2008.

To be considered for 'Extruder of the Month', contact the editor on [lou@pipeandprofile.com](mailto:lou@pipeandprofile.com)

## Pipe and Profile FORTHCOMING FEATURES EXTRUSION

The next issues of Pipe and Profile Extrusion magazine will have special reports on the following topics:

### January/February 2021

Engineering plastics & composites  
Screenchangers & melt filtration  
Titanium dioxide  
Control & instrumentation

### March 2021

Screws & barrels  
Polyolefin developments  
Computer modelling software  
Laboratory extruders

Editorial submissions should be sent to Lou Reade: [lou@pipeandprofile.com](mailto:lou@pipeandprofile.com)

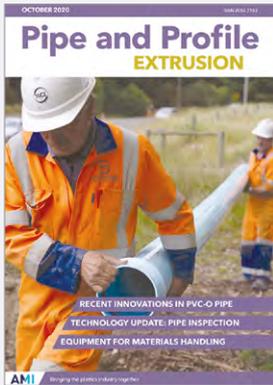
For information on advertising in these issues, please contact:

**Claire Bishop:** [claire.bishop@ami.international](mailto:claire.bishop@ami.international) Tel: +44 (0)1732 682948

**Levent Tounjer:** [levent.tounjer@ami.international](mailto:levent.tounjer@ami.international) Tel: +44 (0)117 314 8183

# Keep informed: read our latest editions

AMI publishes five process-specific FREE plastics industry magazines. Simply click on the cover below to read each magazine. Or download the issue in the relevant Apple or Android app



## Pipe and Profile October 2020

The October 2020 edition of Pipe and Profile Extrusion magazine explores the latest developments in oriented PVC pipes (PVC-O). It also takes a look at some new applications of pipe inspection technology and materials handling equipment.

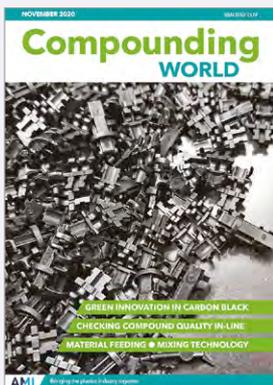
[> CLICK HERE TO VIEW](#)



## Pipe and Profile September 2020

The September issue of Pipe and Profile Extrusion looks at how growth in sizes is affecting developments in large diameter pipes. Another feature covers new materials playing a role in improving performance of window profiles. Plus downstream extrusion equipment.

[> CLICK HERE TO VIEW](#)



## Compounding World November 2020

The November issue of Compounding World looks at how innovations are providing sustainability solutions in carbon black. Other features focus on checking compound quality in-line, developments in material feeding and the latest in mixing technology.

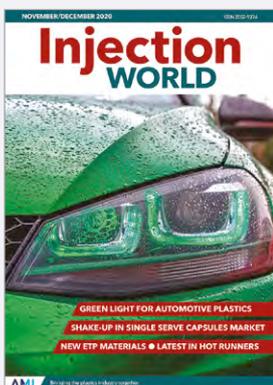
[> CLICK HERE TO VIEW](#)



## Plastics Recycling World September/October 2020

The September/October 2020 issue of Plastics Recycling World magazine explores how better processing and smarter design is improving rigid plastics recycling, plus a review of the latest innovations in sorting technology and extruders for re-compounding.

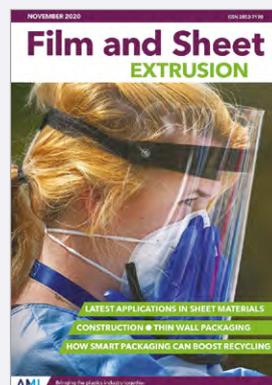
[> CLICK HERE TO VIEW](#)



## Injection World November/December 2020

Injection World's November-December edition has features on materials for automotive interiors and exteriors, new ETBs, the latest in hot runners, plus an article by AMI Consulting on a shake-up in single-serve capsules.

[> CLICK HERE TO VIEW](#)



## Film and Sheet November 2020

The November issue of Film and Sheet Extrusion contains in-depth features covering sheet materials, thin wall packaging, construction applications and how smart packaging can help improve recycling. Plus news from around the global industry and regular features.

[> CLICK HERE TO VIEW](#)

Take out your own FREE subscriptions to any of the magazines. Click on the logos below to simply register on-line.

**Compounding**  
WORLD

**Film and Sheet**  
EXTRUSION

**Pipe and Profile**  
EXTRUSION

**Injection**  
WORLD

**Plastics Recycling**  
WORLD

## GLOBAL EXHIBITION GUIDE

Year	Date	Event Name	Location	Website	
2020	2-4 December	Plastics Expo	Tokyo, Japan	<a href="http://www.plas.jp/en-gb.html">www.plas.jp/en-gb.html</a>	
	5-8 December	Plasteurasia	Istanbul, Turkey <b>POSTPONED</b>	<a href="http://www.plasteurasia.com/en">www.plasteurasia.com/en</a>	
	2021	9-11 March	Plastimagen	Mexico City, Mexico <b>NEW DATE</b>	<a href="http://www.plastimagen.com.mx">www.plastimagen.com.mx</a>
		9-11 March	JEC World	Paris, France <b>POSTPONED</b>	<a href="http://www.jec-world.events">www.jec-world.events</a>
		1-4 April	Plastics, Printing & Packaging	Dar-es-Salaam, Tanzania	<a href="http://www.expogr.com/tanzania/pppexpo">www.expogr.com/tanzania/pppexpo</a>
13-16 April		Chinaplas	Shenzhen, China	<a href="http://www.chinaplasonline.com">www.chinaplasonline.com</a>	
4-7 May	Plast 2021	Milan, Italy	<a href="http://www.plastonline.org/en">www.plastonline.org/en</a>		
17-21 May	NPE 2021	Orlando, USA	<a href="http://www.npe.org">www.npe.org</a>		
1-2 June	Plastics Extrusion World Expo Europe	Essen, Germany	<a href="https://eu.extrusion-expo.com">https://eu.extrusion-expo.com</a>		
15-18 June	FIP	Lyon, France	<a href="http://www.f-i-p.com">www.f-i-p.com</a>		
22-25 June	Colombiaplast	Bogota, Colombia	<a href="http://www.colombiaplast.org">www.colombiaplast.org</a>		
29 June - 1 July	Interplas	Birmingham, UK	<a href="http://www.interplasuk.com">www.interplasuk.com</a>		
10-12 August	Feiplar Composites	São Paulo, Brazil	<a href="http://www.feiplar.com.br">www.feiplar.com.br</a>		
14-18 September	Equiplast	Barcelona, Spain	<a href="http://www.equiplast.com">www.equiplast.com</a>		
12-16 October	Fakuma	Friedrichshafen, Germany	<a href="http://www.fakuma-messe.de">www.fakuma-messe.de</a>		
3-4 November	Plastics Extrusion World Expo North America	Cleveland, USA	<a href="https://na.extrusion-expo.com">https://na.extrusion-expo.com</a>		
15-18 November	Arabplast	Dubai, UAE	<a href="http://www.arabplast.info">www.arabplast.info</a>		
1-3 December	Plast Print Pack West Africa	Accra, Ghana	<a href="http://www.ppp-westafrica.com">www.ppp-westafrica.com</a>		

## AMI CONFERENCES

1-3 December 2020	Polymers for Oil & Gas <b>VIRTUAL SUMMIT</b>
2-3 February 2021	Polymers in Cables USA, Charlotte, NC, USA
3-4 March 2021	Medical Tubing & Catheters, San Diego, CA, USA
20-21 April 2021	Plastics Recycling Technology, Vienna, Austria
20-21 April 2021	PVC Formulation North America, Cleveland, Ohio
27-29 April 2021	Plastics Pipes in Infrastructure <b>VIRTUAL SUMMIT</b>

For information on all these events and other conferences on film, sheet, pipe and packaging applications, see [www.ami.international](http://www.ami.international)

**PLASTICS RECYCLING**  
WORLD EXPO

**POLYMER TESTING**  
WORLD EXPO

1 - 2 June, 2021  
**ESSEN, GERMANY**

**PLASTICS EXTRUSION**  
WORLD EXPO

**COMPOUNDING**  
WORLD EXPO

3 - 4 November, 2021  
**CLEVELAND, OHIO**

[www.ami.international/exhibitions](http://www.ami.international/exhibitions)