RECYCLING

RECYCLING NEWSLETTER

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Bulking Up Recycling

In This Issue:

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SPE Council Meeting (Virtual)

Editor's Corner

Do I spy a light at the end of the tunnel? As the season changes from winter to spring, be on the lookout for a rash of "green shoots" metaphors to describe the economic recovery, business re-openings, and the arrival of some type of new normal. Personally speaking, I'm looking forward to the day when Zoom or Teams meetings are complementary to the real thing instead of a daily occurrence. Still, spending time in front of numerous computer screens on a relatively flexible schedule does allow one to be productive at odd hours of the day and night.

Webinars, of course, have been a constant fixture of information dissemination throughout the pandemic era. For our part, the SPE Sustainability Series continues to draw attendees from across the spectrum of members and non-members. Subjects include energy efficiency in plastic processing, recycling technologies, start-up experiences, and the impact of regulatory changes. To help with planning and scheduling these events, we've overhauled our division website to be cleaner and simpler. Visit https://recycling.4spe.org and let us know what you think.

It's not only our division that is sharing this knowledge and building our networks: our friends in many other chapters have developed quality programming that include elements of plastics and sustainability. From SPE Polyolefins to Lehigh Valley, there is no shortage of environmental-focused information in the ranks of SPE.

In this issue of our quarterly newsletter, we offer technical papers on bottle-to-bottle recycling and the role of chemistry in plastics recycling. For the latter, authors from the Fraunhofer Institute for Packaging IVV in Freising, Germany provide a concise comparison of physical vs. chemical recycling of plastics. Importantly, they state that "precise differentiation" of the various process is crucial to full understanding of the possibilities at scale.

ANTEC 2021 is coming in May with a full suite of papers including dedicated threads for bio-based materials and plastics recycling. The "ANTEC Classic" program is now online and we encourage you to start planning your calendar. We are also waiting for some final details to emerge on a segment that is sure to draw a crowd: "Plastics & The Environment: It's Not Just Bags, Bottles, and Straws." ANTEC organizers have also chosen a very cool new networking platform called SwapCard. This interface allows attendees and speakers to engage in real-time along with meeting/matchmaking software. It also features a lead retrieval system, opening up new avenues for sponsors and exhibitors (without asking people to turn their badge around so you can scan with it some device that costs a fortune and works intermittently). As a speaker and a user of SwapCard, I can attest to the sleek graphic user interface and the innovative features that keep attendees engaged. Be sure to sign up soon and start thinking about what you want to get from the year's biggest plastics conference!

Why Join?

It has never been more important to be a member of your professional society than now, in the current climate of change and global growth in the plastics industry. Now, more than ever, the information you access and the personal networks you create can and will directly impact your future and your career. Active membership in SPE – keeps you current, keeps you informed, and keeps you connected. Visit www.4spe.org for details. The question really isn't "why join" but ...

Why Not?

Member Spotlight: PADNOS

SPE Recycling Division members are actively involved in the business of recycling. Getting beyond the glitzy PR releases from corporate marketing departments can take a bit of effort, but like anything else, we find that we are rewarded when we dig deeper.

Division Treasurer, Kari Bliss, recently shared with us her company's installation of a densifying system that turns lightweight, low value materials into valuable commodities.

Sustainability City at PADNOS

"We designed Sustainability City to help our customers solve tough problems with lightweight low value materials or materials that currently do not have a viable market. Sustainability City is 18,000 sq ft of dedicated innovation space within our plastics recycling plant. This space allows us to really take our time evaluating a load and develop new creative solutions.

We have sorting tables, smaller balers, choppers, grinders, densifiers, and saws that allow us to calculate the ROI on various options. We have developed a shipping & receiving process to ensure continuous feedback on quality.

We love to have our customers visit so we can demonstrate the leading practice for recycling. Customers can see how their material is received and processed. They learn how easy it is to operate densification equipment and how it saves them time, space, and money. We help them tell the circular economy story by showcasing what their materials become in the next life cycle. By partnering and innovating together we will develop new markets, improve carbon footprint and increase the recycling rate.

Further, we are actively engaged in social justice with our partner Goodwill. Via the Ignite program we help train and certify 18-24 year old's with a barrier to work in life skills, and to identify/process material. These participants will be available to hire when they complete the program. Counseling will continue for 6 months after placement to ensure their ongoing success."

Padnos is based in Grand Rapids, MI. For more information, visit www.padnos.com |

Looking for past issues?
Check out the new SPE Recycling Division website at recycling.4spe.org

Bottle-To-Bottle Recyclability For Barrier Packaging Enabled By Surface Modified HDPE

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This paper was first presented at ANTEC 2020 - The Virtual Edition.

Abstract

Ellen McArthur Foundation's bold vision for The New Plastics Economy is one where plastic goods can be recycled and reused in a closed loop, a "Circular Economy". A key hurdle to enabling closed loop recycling is the deterioration of polymer properties due to raw material contamination in the recycle stream. Mixed polymer systems, i.e. co-extrusion/ multilayer packaging, use barrier materials such as EVOH or Nylon, creating significant issues during recycling. In contrast, having monolayer packaging enables the highest recyclability.

Fluorinated HDPE enables monolayer barrier packaging solutions. To further understand its impact on recyclability, Inhance Technologies investigated the inclusion of fluorinated HDPE in the regular HDPE stream. Fluorinated HDPE and regular HDPE were blended at different ratios, re-extruded and pelletized. Following pelletization, bottles were molded from the regrind blends and their properties were evaluated. At all blend ratios, thermal-mechanical properties, chemical fingerprint, and sortability match those of virgin HDPE. The results demonstrate that fluorinated HDPE can be recycled as regular HDPE within the existing recycling infrastructure.

1. Introduction

Sustainability is rapidly gaining momentum in the plastic industry and in main street. The word sustainability casts a wide net and its scope can vary by context. In most all contexts, recycling and recyclability is considered a central pillar of sustainability.

The need for packaging continues to grow in the 21st century and likely beyond as global population growth will fuel the need for packaging of all variety of goods1. Plastics have a strong sustainability advantage from a weight and energy cost perspective. Monolayer packaging also has well established recyclability streams.

But monolayer packaging alone cannot solve all packaging needs. For many chemicals, a barrier packaging is required. A predominant form of barrier packaging is multilayer coextruded packaging. A typical multi-layer package will have an inside and outside layer of HDPE for physical strength and moisture barrier. In between, a layer EVOH or nylon provides chemical barrier necessary to contain permeable organic chemicals. Two additional adhesive tie layers, sandwiched between HDPE and EVOH on both sides, are also necessary to maintain a cohesive whole. Multilayer is excellent for barrier packaging but has poor prospects for recyclability and thus sustainability. Separating the multiple layers is not currently viable and recycling the entire package leads to unacceptable physical properties of the regrind2.

One alternative to COEX packaging for barrier applications is fluorinated HDPE. Simply, in direct fluorination, fluorine gas is reacted with HDPE packages, either in-line as they are manufactured, or post manufacture, typically in a batch setting. The fluorine gas reacts with the HDPE surface and the surface becomes perfluorinated. Fluorination has been widely practiced for 50 years and multiple studies have been done to demonstrate its efficacy in providing barrier properties to otherwise permeable packaging3,4.

Direct fluorination only reacts with the outer most surface of polymers its treating. Typical thickness of fluorination are on the order of 1 micrometer and certainly less than 10 micrometers3,4. Thus, the bulk of a fluorinated HDPE remain virgin HDPE.

This work studies how fluorinated HDPE behaves compared to virgin HDPE in the context of recyclability . Regrind pellets are made from blends of f-HDPE and ordinary HDPE which in turn are blown into bottles. Recycled HDPE with no f-HDPE is used as a control for comparison of physical properties of both the pellets and bottles. Furthermore, the sortability of f-HDPE using current state-of-the-art Near Infrared Sorting Technology (NIR) that is used in materials recycling facilities (MRF) is tested.

2. Experimental

2.1 Recyclability Evaluation

In partnership with Plastics Forming Enterprise LLC (PFE), Amherst, NH, a recyclability evaluation was performed in accordance with the HDPE Critical Guidance Document (CGD) issued by the Association of Plastics Recyclers (APR)5. f-HDPE bottles were ground, mixed with ordinary HDPE regrind, pelletized and re-blown into bottles with the goal of evaluating whether blends of recycled f-HDPE and ordinary HDPE would perform the same as recycled ordinary HDPE only.

Raw Materials

Two sets of 32 oz wide mouth bottles were supplied by Inhance as base material. The first set is a control HDPE bottles blown from Marlex HHM 5502BN Polyethylene. The second set is the same base bottles as the control, but fluorinated by Inhance using post mold direct fluorination method. Figure 1. show images of the bottles used.

Reground Pellet Testing

PFE ground these bottles into flakes and blended to form 3 samples.

- Sample A: 100% control material
- Sample B: 75% control material, 25% fluorinated material
- Sample C: 50% control material, 50% fluorinated material

From these three sets of grinds, pellets were reformed and a battery of properties were tested.

Figure 2. show images of the regrind and the reformed pellets.

Extrusion Evaluation

The three samples were evaluated during pellet extrusion. Table 1. shows the extrusion temperature profile. Table 2 shows the Extrusion process parameters. The filterability of the mixed samples were compared with the control under identical conditions, representative of the actual production situation. Additionally, the heat stability of the extrusion process was evaluated qualitatively.

Melt Index Testing

Melt Index was performed following ASTM 1238. Extruded pellets were dried for 10 minutes at 160°F and then run through an extrusion plastometer to measure the melt flow over a 10-minute period. The resulting measurement were recorded in grams/10min.

Density Testing

Polymer density was measured following ASTM D792. Extruded pellets were tested for density in units of g/cm3 using a Mettler-Toledo density kit.

Contamination Measurements

The percent polypropylene contaminant in each sample is evaluated following ASTM D7399. A Thermo Scientific iS5 FTIR was used. ASTM D7399 focuses on detecting PP content at 1376 cm-1 wavenumber.

Additionally, volatile content of the samples are measured using an AZI Computrac moisture analyzer. 10 grams of air-dried flakes were exposed to 160oC for 10 minutes and the total percent volatiles recorded for comparison.

Pellet Colors L*, a*, b*

A color evaluation of all three samples was conducted using a Minolta 3600d. The results are reported in terms of L*, a*, and b* which represent brightness, green to red component and blue to yellow component respectively.

Environmental Stress Crack Testing

Following ASTM method d1693, 20 test strips were made from each sample material. The samples were bent 180 degrees, notched and placed in 50oC Igepal solution for 48 hours. Perpendicular failures were tracked at various intervals.

Blown Bottle Testing

Three sets of bottle-to-bottle blends were made and HDPE bottles were blown.

Sample D: 100% control material

Sample E: 50% sample A, 50% sample B (by mass, 87.5% control material, 12.5% fluorinated material)

Sample F: 50% sample A, 50% sample C (by mass, 75% control material, 25% fluorination material)

This blending was chosen to simulate the effect of mixing re-ground fluorinated HDPE with standard recycled HDPE. Figure 3. shows an image of the newly blown bottles.

From these three sets of bottles, a battery of properties were also measured or tested.

- Total bottle weight
- Bottle volumetric capacity
- Bottle thickness
- Bottle height
- Drop test from 12 feet
- Top load per ASTM D2659

Additionally, a qualitative inspection of the bottles was made to evaluate to determine any visual or tactile differences:

- General visual appearance, such as roughness
- Bottle Integrity
    - Blowouts
    - pinholes
    - parson curling
    - excessive die lines
    - excessive flashing
    - weak welds
    - bottle warping
    - incomplete pinch off

2.2 Bottle Sortability

In partnership with MSS Inc (MSS), A sorting evaluation was performed using the APR's Near Infrared Sorting Protocol (NIR)6. The test mimics the current state-of-the-art sorting process at a materials recycling facility (MRF) with the goal of evaulating whether the fluorinated HDPE containers would sort the same as "HDPE Natural" containers.

Raw Materials

Two sets of one quart "F-style" natural HDPE bottles were supplied by Inhance. The first is a control bottle, and the second set is the same base bottles as the control, but fluorinated by Inhance using post mold direct fluorination method. Figure 4. shows an image of the bottles used.

Testing procedure

Both the control and fluorinated HDPE bottles were flattened using APR's compression protocol. They were then mixed with a variety of other baseline materials:

- HDPE Natural
- HDPE Color
- Polypropylene
- PET
- Other plastics (PVC, PS, PET-G, Black, Cartons, UBC)
- Mixed Input Materials

Figure 5. show images of the various different baseline materials.

The fluorinated HDPE natural bottles were added to the Mixed Input Materials bin, which contained a combination of all the aforementioned plastics. This mixed bin was then passed through an MSS CIRRUS Plastimax Near-Infrared Optical Sorter to test whether the current state-of-the-art plastics recycling sorting technology would label f-HDPE natural the same as virgin HDPE natural.

3. Results

3.1 Recyclability Evaluation Results

Table 3. is a summary table combining results from regrind pellet testing. The evaluation criteria described in the second column is aligned with APR guidelines. For melt flow and density measurements, the results are the average of triplicate testing. For color data, L*, a* and b* values presented are the average of 5 measurements of each respectively. For extrusion evaluations and contamination measurements a single test per sample was taken.

For both samples B and C, the f-HDPE blended pellets both met the passing requirements for every test taken. They appeared identical to the control, sample A.

Table 4. is a summary table combining results for environmental stress crack testing as well as the battery of re-blown bottle testing. Similar to the pellets, the evaluation criteria described in the second column is aligned with APR guidelines. For environmental stress crack testing, the 20 samples of each part were evaluated over 48 hours at varying intervals, the breakdown of which is in Table 5. For drop testing, 20 bottles of each sample family were dropped to calculate mean failure height. All other measurements were a single measurement per sample.

For both samples E and F, the ESCR plaques and blown bottles made from f-HDPE blended regrind pellets met the passing requirement for every test taken. They appear identical to the control, sample D.

3.2 Bottle Sortability Results

Figure 6. shows an image of the pre-sorted Mixed Input Materials with the f-HDPE added. The f-HDPE bottles are highlighted with a circle. Figure 7. shows an image of the Mixed Input Materials after passing through the MSS CIRRUS Plastimax Near-Infrared Optical Sorter. The f-HDPE bottles are sorted alongside with other HDPE bottles in the left bin— again, highlighted with a circle. These are clearly separated from the other plastic types, that are now solely in the right bin.

Figure 8. shows an image of the optical sorter analysis of an f-HDPE bottle. The f-HDPE F-style quart is identified as "HDPE Natural". The same designation was given to the control, virgin HDPE, F-style bottle. No setting adjustments were necessary. Fluorination of HDPE for barrier packaging has no negative impact on sortability or plastics using NIR technology.

4. Discussion and Conclusions

Visual Properties

The fluorination process by itself makes no easily discernable color shift on the bottle, as can be seen in figures 1. and 4. Furthermore, regrind and re-extruded pellets show no visual differences to the naked eye as indicated in figure 2. Re-blown bottles are also visually inseparable (figure 3). Using optical analysis, the pellet colors are all confirmed in spec with APR guidelines (table 3.).

Equally important, the similarity in visual properties extend beyond the visible spectrum and into near-infrared. This allows sorting conducted using NIR technology to go unimpeded. Figures 6, 7 and 8 show that fluorinated HDPE is indistinguishable from control HDPE using current state-of-the-art sorting technology used in MRFs.

Physical Properties

Pellet testing results presented in table 2. and re-blown bottle testing presented in table 3. show that recycled f-HDPE blends performed identical to recycled ordinary HDPE on the entire test battery. The % mixture for both the pellet and re-blown bottle follow APR's guidelines5. For pellet sample C, the pellet had 50% f-HDPE recycled material. Importantly, this is a conservative scenario as the vast majority of HDPE is not barrier HDPE. Thus, even if 100% of the f-HDPE stream were recycled, the % f-HDPE mix with ordinary HDPE will be significantly lower. The same hold for bottle sample F, where sample C is mixed with 50% ordinary HDPE regrind and re-blown. Even at 25% f-HDPE regrind by mass, the percent f-HDPE is a conservative (i.e. higher than real-world scenarios).

The combined analysis of visual and physical properties, of sorting, regrinding, re-pelleting and re-molding demonstrate that at every stage of the recycle loop f-HDPE is indistinguishable from ordinary HDPE. Using fluorination, HDPE can be augmented to be an excellent barrier package while retaining its monolayer recyclability quality, enabling a bottle-to-bottle barrier technology.

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Figures

1a. Image of control virgin HDPE bottle used for recyclability evaluation

1b. Image of fluorinated HDPE bottle used for recyclability evaluation

2a. Image of regrind of virgin HDPE bottle from figure 1a

2b. Image of regrind of fluorinated HDPE bottle from figure 1b

2c. Image of sample A (control) re-extruded pellets

2d. Image of sample B (25% f-HDPE) re-extruded pellets

2e. Image of sample C (50% f-HDPE) re-extruded pellets

3. Image of re-blown HDPE bottles made from sample A, sample B, and sample C, respectively

4. Image of f-style bottles used for sortability study; â€œAâ€ , in the foreground, is a control HDPE bottle, C is a f-HDPE bottle

5a. Image of baseline HDPE Natural for sortability test

5b. Image of baseline HDPE Color for sortability test

5c. Image of baseline Polypropylene for sortability test

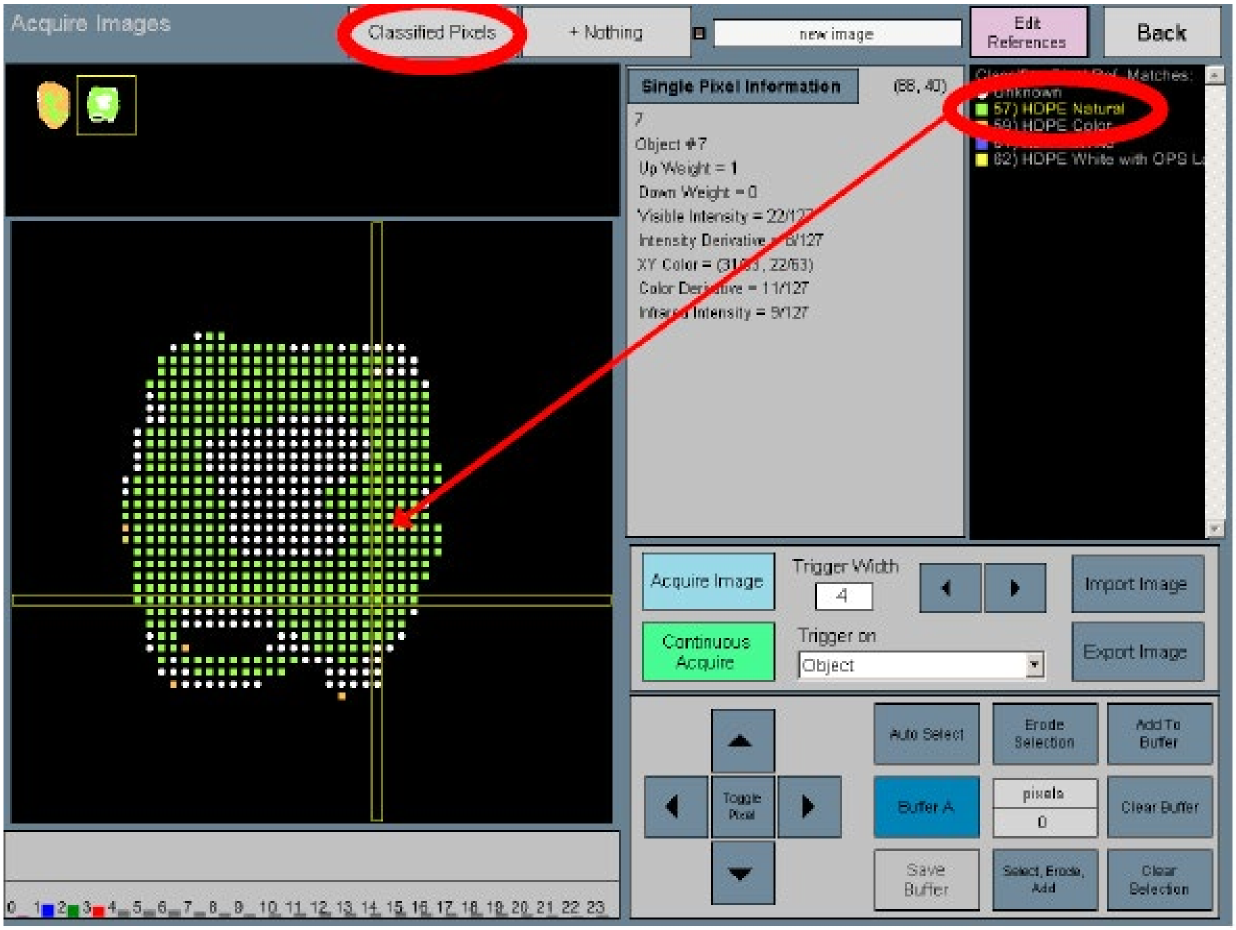
5d. Image of baseline PET for sortability test

5e. *Image of baseline other plastics (PVC, PS, PET-G, Black, Cartons, UBC) for sortability test*

5f. *Image of baseline mixed input materials for sortability test*

6. *Image of the pre-sorted Mixed Input Materials with the f-HDPE added (in circle)*

7. *Image of sorted Mixed Input Materials with f-HDPE added; all HDPE, including f-HDPE (in circle) sorted to the left bin*



8. Near Infrared Identification of f-HDPE; f-HDPE sorted as HDPE Natural

Tables

Zone	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Clamp	Die
Temperature (F)	350	375	400	415	420	420	425

Table 1. Extrusion temperature profile for pelletization of regrind

Property	Sample A control (0% f-HDPE)	Sample B (25% f-HDPE)	Sample C (50% f-HDPE)
Melt Temperature (F)	350	375	400
Pressure (psi)	1455	1447	1496

Table 2. Extrusion process parameters for pelletization of regrind

Property	Evaluation Criteria	Sample A control (0% f-HDPE)	Sample B (25% f-HDPE)	Sample C (50% f-HDPE)
Extrusion evaluation--Screen Pack Pressure	<10% pressure increase from control sample to test sample	N/A	-0.49%	2.88%
Extrusion evaluation-- Heat Stability	No sticking, fumes, or odors should be noticed when compared to control sample. In addition, no additional thermal degradation, in form of black specs or other inclusions should be noticed	N/A	none	none
Melt Index	ASTM:1238; 0.2 to 0.7 g/ 10 minutes	0.326	0.358	0.360
Density	ASTM: D792; + or - 0.010 from control	0.944	0.945	0.940
Contamination--% Polypropylene in pellets	ASTM: D7399; <2% difference in PP compared to control test samples, Not to exceed 4% PP overall	<1%	<1%	<1%
Contamination--% volatiles in pellets	<0.1% absolute difference between control sample and test sample	0.37	0.38	0.36
Pellet Color L*	For Natural HDPE, > 63 ; No requirement for co-polymer	81.41	80.46	80.20
Pellet Color a*	For Natural HDPE, > -4.5 ; No requirement for co-polymer	-1.23	-1.24	-0.96
Pellet Color b*	For Natural HDPE, < 13 ; No requirement for co-polymer	1.87	3.79	5.64

Table 3. Physical property comparison between regrind ordinary HDPE pellets and regrind blended f-HDPE and ordinary HDPE pellets

Property	Evaluation Criteria	Sample D control (0% f-HDPE)	Sample E (12.5% f-HDPE)	Sample F (25% f-HDPE)
Environmental stress crack	ASTM: D1693; % failure delta to the control no more than 2 failures	17	15	19
Total bottle weight	Not to exceed + or - 5% of Control	63.510	63.508	64.000
Bottle volumetric capacity	Not to exceed + or - 5% of Control	959.6	955.0	954.5
Bottle thickness	Shoulder thickness > 0.012 inches	0.026	0.027	0.025
	Side wall thickness > 0.012 inches	0.042	0.043	0.042
	Base wall thickness > 0.012 inches	0.039	0.034	0.033
Bottle height	Not to exceed + or - 5% of Control	216.478	216.441	216.425
Drop testing	Number of failures at 12'; maximum no less than 95% mean failure height vs. control	11.33	11.80	12.00
Top load	ASTM D2659; No more than 5% decrease from Control	100.12	97.02	97.56
Visual Appearance	No visual defects including roughness	None	None	None
Bottle Integrity	No blowouts, pinholes, parson curling, excessive die lines, excessive flashing, weak welds, bottle warping, or incomplete pinch off	None	None	None

Table 4. Physical property comparison of ESCR plaques and re-blown HDPE bottles made from two resin types: ordinary recycled HDPE and blended recycled f-HDPE and ordinary HDPE

Time of measurement (hours)

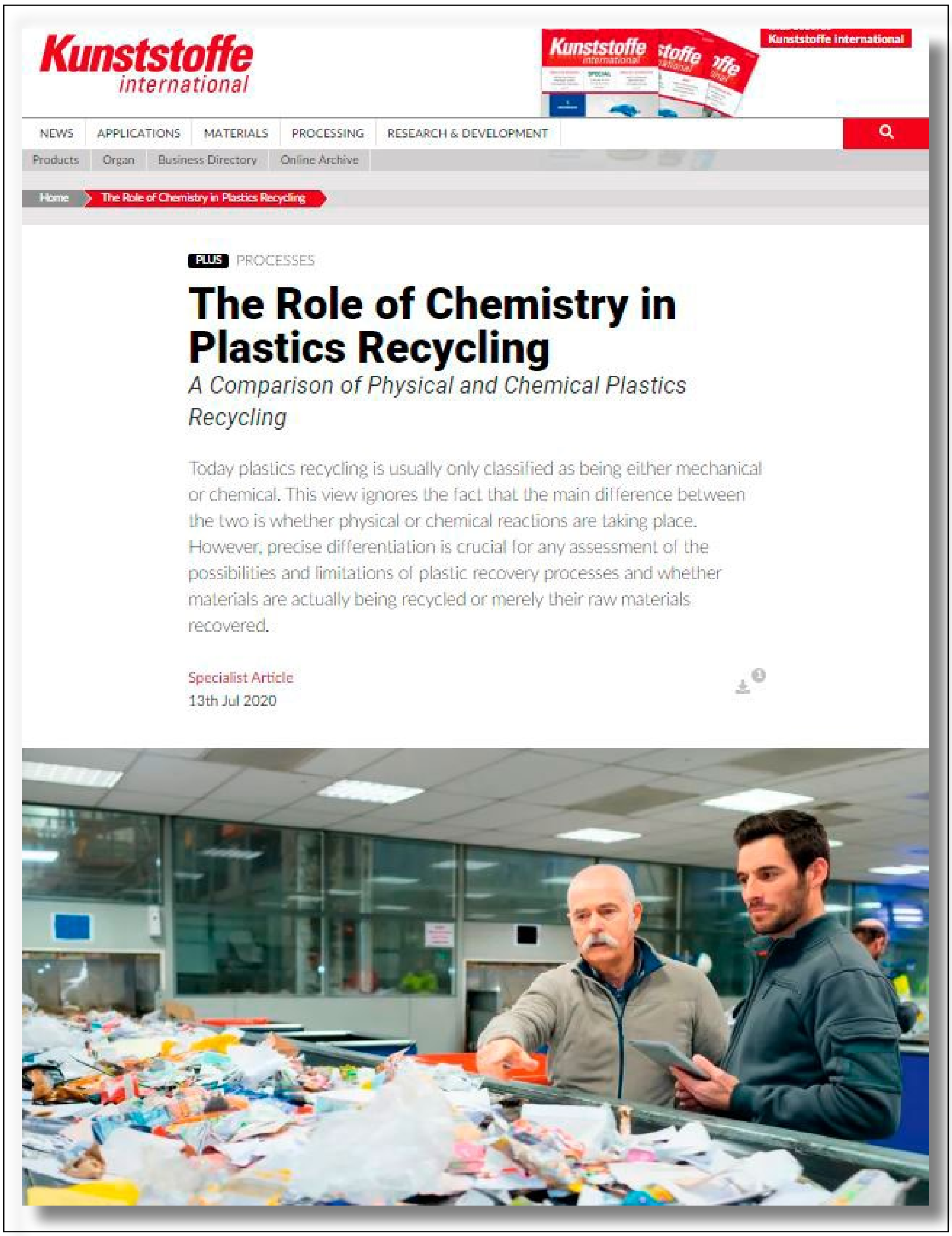
Sample	# Tested	0.1	0.25	0.5	1	2	3	4	5	8	21	24	32	45	48
Sample D (Control)	20	0	0	0	0	0	0	0	0	0	5	6	12	16	17
Sample E (12.5% f-HDPE)	20	0	0	0	0	0	0	0	0	0	3	5	13	15	15
Sample F (25% f-HDPE)	20	0	0	0	0	0	0	0	0	0	10	10	13	19	19

Table 5. ESCR testing results comparing ESCR plaques made from ordinary recycled HDPE and blended recycled f-HDPE and ordinary HDPE, measured at increasing time intervals up until 48 hours

The Role of Chemistry in Plastics Recycling

This article first appeared in Kunststoffe International in May 2020.

Kunststoffe is a German plastics industry publication. In 2007, the publisher launched an English-language version, *Kunststoffe International,* which is available for subscription. In a special arrangement for SPE Recycling Division members, the publisher, Carl Hanser Verlag GmbH & Co. KG, has granted limited access to articles of interest. The linked article here, "The Role of Chemistry in Plastics Recycling", was published in 2020 but remains relevant today, especially as advanced recycling is under more scrutiny. Click on the picture below to access the article.



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PLUS PROCESSES

The Role of Chemistry in Plastics Recycling

A Comparison of Physical and Chemical Plastics Recycling

Today plastics recycling is usually only classified as being either mechanical or chemical. This view ignores the fact that the main difference between the two is whether physical or chemical reactions are taking place. However, precise differentiation is crucial for any assessment of the possibilities and limitations of plastic recovery processes and whether materials are actually being recycled or merely their raw materials recovered.

Specialist Article
13th Jul 2020

SPE Council Meeting (Virtual)

January 28, 2021

Jaime Gomez, SPE President presented a thought-provoking paper on how broader societal and demographic trends are affecting SPE members. As shown below, the US labor force is changing, and not just from one generation to the next. The way we learn, network, and communicate have profoundly changed, with increasing focus on computer-based learning.

hub of knowledge, where objective, data-driven research and publications are central to the brand's value.

SPE Financial Report

The 2021 budget is forecast to be similar to that of 2020. The SPE organization has kept expenses low, showing admirable cost management over last three years, while

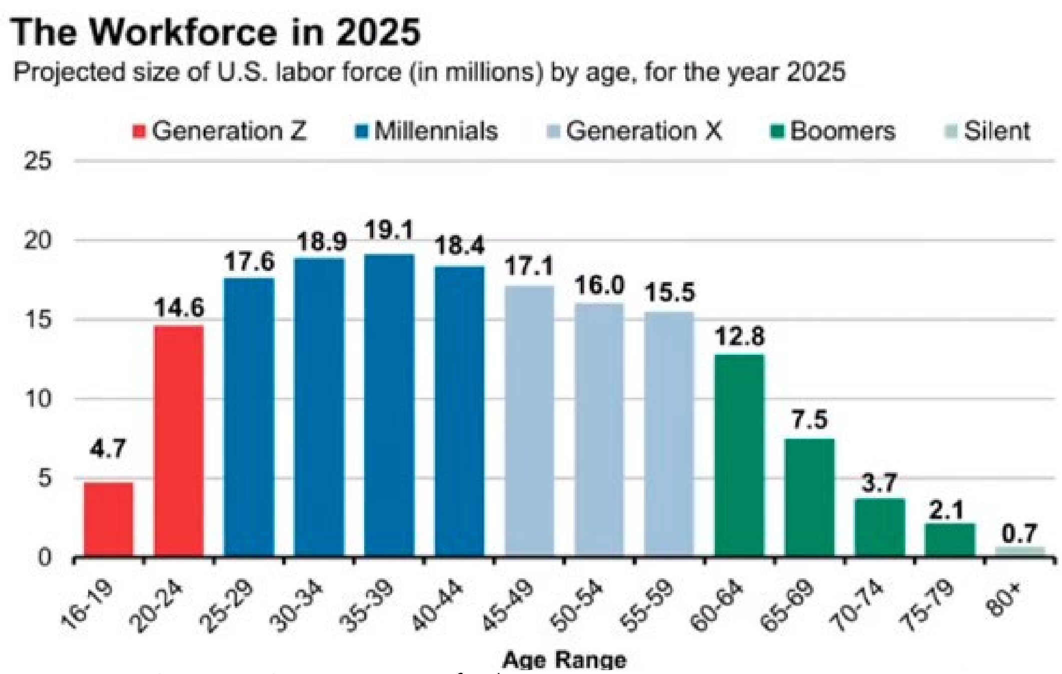

Figure 1: Source: US Department of Labor

So how can SPE change to meet the new demands from our current and future members? Sometimes change is forced through exogenous shocks. COVID-19 forced us to transition from Crisis Mode to Opportunity Mode. SPE re-invented itself in a matter of weeks, taking full advantage of new remote software platforms to leverage a full AN-TEC program into a profitable 6-week event.

Jason Lyons, SPE President-Elect emphasized the importance of the key pillars of SPE: knowledge and networking. While the organization cannot – and should not – try to be everything to everyone, we must always keep our "north star" in mind. By supporting plastics professionals across the world, we enable members to learn from each other and grown networks. This enhances our reputation as a

still managing to add staff in critical revenue-generating areas. Significant technology and operational savings were realized through rationalization of certain IT assets and overlapping programs. Publications remain a key driver of revenue, while the virtual ANTEC platform offers new opportunities for sponsorships and advertising.

CEO Report

CEO Pat Farrey announced that ANTEC 2021 will be held in May, not March as previously planned. This is primarily due to the cancellation of NPE. In the past, ANTEC was either co-located with NPE or hosted during a different month to avoid a conflict. Staff and leadership will continue to explore opportunities for 2024.

SPE's networking tool, The Chain, has been replaced by new "SPE Communities". This change was due for two primary reasons: low adoption rates and high software costs. Of the 558 Chain groups created since the platform's inception, 521 have had 10 or less conversation threads total since 2014. 425 of them had 0 posts, ever. Of the 37 remaining "most active" groups, one-quarter of them haven't had a post since 2019 or earlier.

The Chain's software platform costs SPE more than $30K a year to license, and that was negotiated down from a high of more than $100K per year in 2017 and prior. The Chain is a separate platform from the main SPE operating platform, making the login process between the two sites clunky and the synchronization of the user profiles between both difficult and expensive.

If you want to join a community, users will need to subscribe and set up notifications via their SPE account. This only needs to be done once.

Plastics Engineering magazine will become an in-house publication of SPE within a few months. Though previously published by Wylie, there have been many missed opportunities to generate editorial content in concert with SPE sections and divisions. The new approach will allow better communication between staff and chapter members. Farrey and others on SPE staff have deep trade publication experience.

The SPE PlastiVan has developed a new series of educational programming called "PlastiVideos". Driven by changes in how young people consume content – and accelerated by remote developments in the age of the pandemic – the PlastiVan team is expanding its teaching corps and its social media presence. Both the Detroit Section and the Automotive Division have contributed significant support in the past year to realize these exciting changes.

2020 Annual Report

Following the positive reception of SPE's first annual report in 2019, the Executive Board has approved a decision to issue a 2020 report. It is expected to be published in March. |

Recycling Division Sponsors

DATE CHANGE!

ANTEC® 2021 TO NOW TAKE PLACE IN MAY

ANTEC® 2021

REGISTRATION IS NOW OPEN!

There are now two ways to enjoy ANTEC®.

CHOOSE THE EVENT THAT'S RIGHT FOR YOU!

SPE is expanding ANTEC® 2021 to include multiple attendee options, enhanced networking and an international focus. The 2021 program will include three segments: ANTEC® Industry Insights, ANTEC® Classic and ANTEC® International.

Each segment will be presented virtually. ANTEC® will kick off with Industry Insights, a two-day offering presented via SPE's exclusive live-streaming service to remote attendees from May 5-7. ANTEC® Classic will offer real-time, remote presentations occurring over 10-days from May 10-21. ANTEC® International, which begins on May 24, will include live online presentations from Asia, Australia/New Zealand, Europe, India, the Middle East and South America. International dates will be announced shortly.

4SPE.ORG/ANTEC21

GET THE RECOGNITION YOUR COMPANY DESERVES

SPE RECYCLING NEWSLETTER

provides technical and non-technical content aimed directly at the plastics recycling industry and members of the SPE Recycling Division. This professional publication is the perfect platform for your company to get the recognition it deserves!

The Plastics Recycling Division produces four, full-color issues in digital format per year. Circulation includes posting on The Chain and on multiple SPE social media channels.

Publication measures 8.5 x 11″ with all sponsorship ad spaces in full-color. All submitted files should be a minimum of 150 dpi in EPS, PSD, JPG or PDF format. For more information or questions, contact Conor Carlin, Editor, at ccarlin@4spe.org or 617.771.3321.

NOW OFFERING SPONSORSHIPS for 2021. Submission Deadlines:

FEB 15 1st Quarter
JUNE 01 2nd Quarter
SEPT 01 3rd Quarter
DEC 01 4th Quarter

Sponsorship Levels	Ad Space (width x height)	Recycling Microsite	4X	1X
Level 1 – PP	3.65 x 1″	Logo on Sponsor Page, Rotating Ad	$750	$150
Level 2 – rPET	3.65 x 4″	Logo on Sponsor Page, Rotating Ad	$1000	$200
Level 3 – PLA	7.66 x 4.5″	Logo on Sponsor Page, Rotating Ad	$1500	$300
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ABOUT US

The PlastiVan® program is a great way to educate people of all ages about the chemistry, history, processing, manufacturing, applications and sustainability of plastics.

PlastiVan® educators are skilled at tailoring each presentation to meet the needs and grade-level expectations of every classroom and teacher through science, engineering, technology, and math (STEM).

SPONSOR A VISIT

As a sponsor your company can nurture the development of its future workforce by opening young minds to the value of plastics in our everyday lives and excite them about a career in the plastics industry.

SCHEDULE A VISIT

To bring the PlastiVan® Program to your community, contact Julie Proctor at jproctor@4spe.org.

PlastiVan.org