



Corma and the 3 R's

TECHNOLOGY SHOWCASE

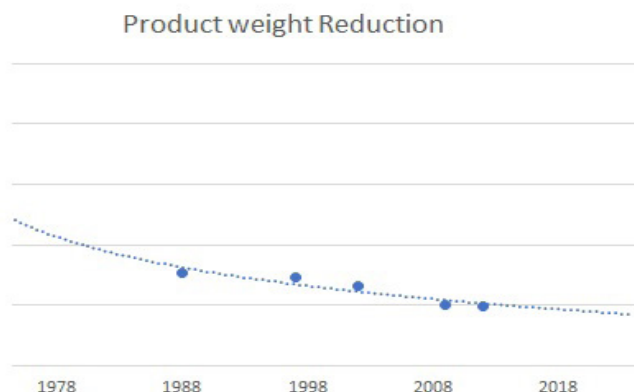
Overview

As a leading innovator in the industry, Corma is committed to developing a sustainable platform for plastic pipes by working towards a circular economy. It starts with the 3R's; Reduce, Reuse and Recycle. Our technologies provide solutions for plastics that are recyclable and reusable at any stage of their life-cycle, whether as pre/post-industrial, or pre-consumer and more importantly, post-consumer. This ethos will drive sustainability within our industry.

Consider that since 1956 only 9% of the plastics used have been recycled and that currently, only 10% of the global demand for plastics is fed by recycled sources¹. We need to improve these figures by providing more outlets for using recycled plastics within the industry. It will increase demand and change our culture of a "take, make, dispose" mentality to one that considers plastics as a renewable resource.

Reduce

Corma has years of experience, extensive knowledge of materials and product design, allowing our corrugators to produce pipes at lighter weights. We continually drive improvements in the efficiencies of our equipment, looking at novel ways to recover and reduce their energy demands, and by improving distribution and supplier network, we further reduce our carbon footprint



Line Graph 1 Showing weight of DWP 300mm SN8 in PE.

¹ The Veolia Institute Review Fact report March 2019

Reuse

Skipping the Reuse step of the process sometimes happens, as the materials are easy to recycle and because the products made using our corrugators can have a lifespan of 100 years². But we incorporate the Reuse philosophy into our design, embedding flexibility and interchangeability within, enabling our customers to use existing tooling on various sizes of machine regardless of their age. It gives our customers peace of mind and knowledge that their investments will always be compatible with future projects/requirements.

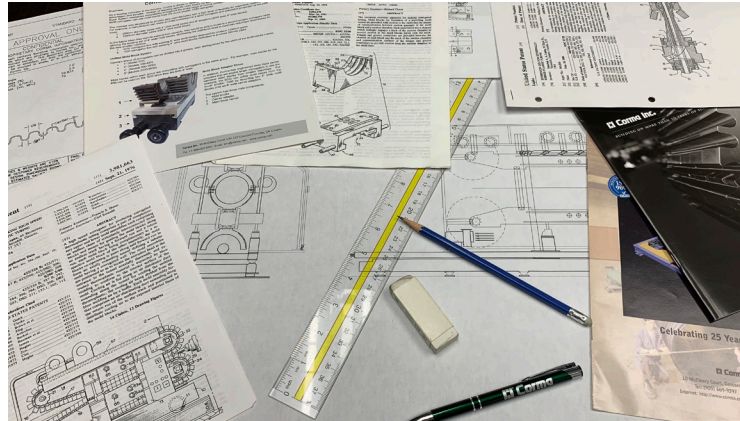


Image 1 Design; (Corma Inc.)

Recycle

We know that plastic pipes have many benefits and are more environmentally friendly than those made from other materials. It is why we actively promote the use of recycled materials with our customers. We know that using recycled materials; helps reduce ocean-bound plastics; it reduces greenhouse gases and energy consumption; it reduces landfill; all the while creating jobs for the recycling sector and ultimately develops a circular economy for sustainability.

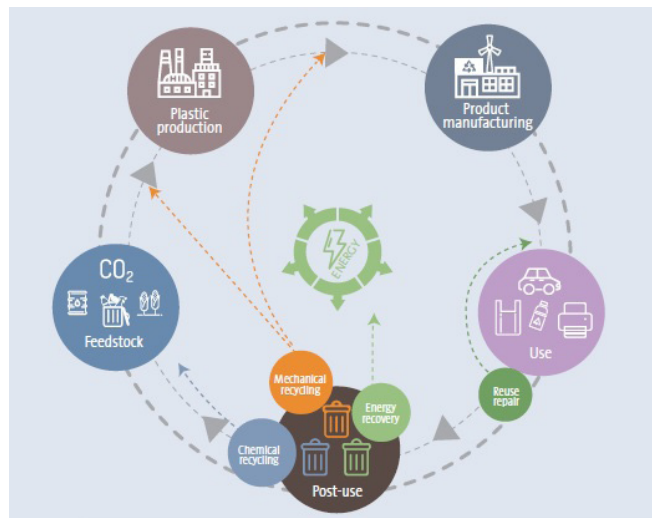


Image 2 Plastics Life Cycle; (Source: PlasticsEurope)

Showing our customers that using recycled materials does not alter the quality or performance of their products³ but is an environmental commitment. Highlighting examples like using recycled plastics reduce greenhouse gas emissions by about 69% with embedded energy savings of 88% from the material (HDPE)⁴ – a ton of recycled plastic can save about two tons of carbon dioxide.

2 Trenchless Pedia 24th September 2017 – The Lifespan of Steel, Clay, Plastic & Composite Pipes
3 NCHRP project 04-39
4 Laverigne Inc, 5th June 2020 – The positive impacts of recycling plastic

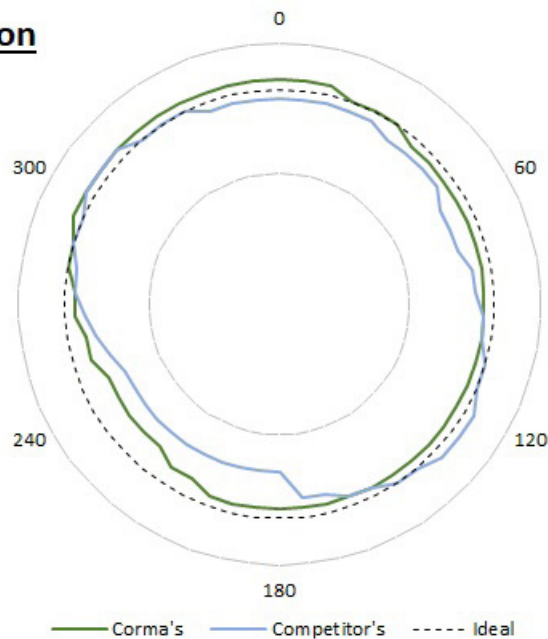
Our tooling designs and experience provide the best foundation for this support, helping our customers integrate recycled materials into their products and optimize their process in all sectors.

We design our die tooling with processing in mind, which is required when using recycled materials:

1 Centralizing of all material layers

When running recycled materials, there needs to be process control of the die tooling for customer optimization with any material batch variation. Having full centering capability allows customers to produce products nearer to the minimum wall thickness requirements.

Centralization



Radar Graph 1 showing crest wall thickness measurements from single-layer pipe taken from before and after new corrugator/tooling installation in October 2020

2 Adjustment of die orifices

Enabling customers to adjust the die orifices opens the processing window for their use of recycled materials. Having this flexibility within the process will allow customers to increase their use of recycled materials because they can tune the tooling to their material needs.

3 Single, double or multiple material layers

Our different tooling styles have the allowance for using recycled materials in a variety of ways. From 100% use or a simple percentage blend, separate levels for either of the layers. Even within these layers, we can incorporate recycled materials in different ways, by design, each layer containing multiple material streams.

4 Advanced surface coating

Using advanced surface coating in specific sections of our tooling reduces material buildup from running recycled materials. Recycled materials can contain materials that separate from the melt stream and adhere to high friction surfaces within the tooling.

Technical Data

Corrugator Model Number* Vacuum Forming or Blow Molding	Pipe Range				Maximum Line Speed**		Maximum Output**	
	mm		inches					
	Min.I.D.	Max. O.D.	Min.I.D.	Max. O.D.	M/min	ft/min	Kg/hr	lbs/hr
054	3	40	0.12	1.6	50	165	40	88
130	6	110	0.25	4.5	55	180	360	790
430	6	160	0.25	6.3	35	115	450	990
630***	50	200	2.0	8.0	35	115	1040	2300
830***	50	300	2.0	12.0	35	115	1040	2300
840	50	300	2.0	12.0	25	80	840	1850
1030	50	365	2.0	14.4	30	100	750	1650
1230***	50	500	2.0	20.0	27	90	910	2000
1530***	50	700	2.0	27.5	26	85	1000	2200
2430	100	800	4.0	32.0	10	33	1300	2860
3630	100	1200	4.0	48.0	6	20	1300	2860
4830	200	1500	8.0	60.0	5	16.5	1400	3100
6030	450	1800	18.0	72.0	3	10	1500	3300
P 30/60	750	1800	30.0	72.0	1	3.3	1300	2860
P 30/120	750	3000	30.0	120.0	1	3.3	1500	3300
Vertical Corrugator Model Number								
V 053	1	20	0.04	0.8	50	165	30	66
V 130	4	110	0.16	4.5	50	165	215	475
Rib-Pipe Model Number								
R 2030	100	700	4.0	28.0	10	33	1100	2420
R 3030	100	1000	4.0	40.0	10	33	1300	2860

* Mold blocks are interchangeable within family (shaded) groupings. Also, mold blocks from smaller corrugators can be used on larger corrugators, using Corma's Unified Mold Block System and Mold Block Adapter Shoes.

** Line speeds and outputs are theoretical and depend on: pipe diameter; type of plastic; machine model; cooling options; mold track length; temperature and quantity of cooling water; profile configuration; extruder capacity, etc.

*** 630-12, 830-12, 1230-12 and 1530-12 line speed and output based on high speed corrugator configuration.

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