

The right answer for every PET application

CONICAL CO-ROTATING – LEADING THE WAY

The conical, co-rotating MAS extruder features a large feeding opening as well as intake volume and hence high screw fill levels. As a result “shear-sensitive” materials such as A-PET, G-PET but even GAG-PET and PLA (pellets & virgin quality, bottle regrind, film regrind, film edge stripes), as well as additives can be directly fed directly into the extruder and processed very gentle with low screw speed and high throughput.

The short length of the MAS extruder is not only a major contributor to the very low specific energy consumption [kWh/kg], but also allows for a very short residency time in the processing unit, which results in outstanding quality.

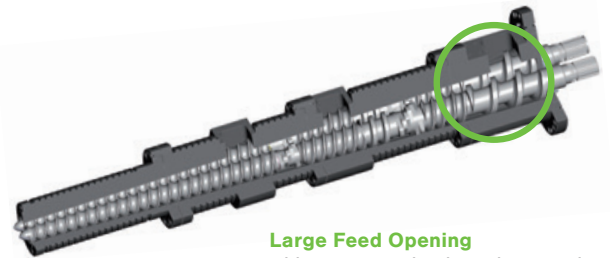
Depending on the application, the vent ports can be equipped with various different de-gassing systems, ranging from closed vent ports to one stage water ring pumps all the way to the 3-stage High performance vacuum system (< 5 mbar).

For undried applications MAS offers the optional “PET Feeding Gate”, which is used to remove surface moisture from the input flakes in the extruder feed zone.

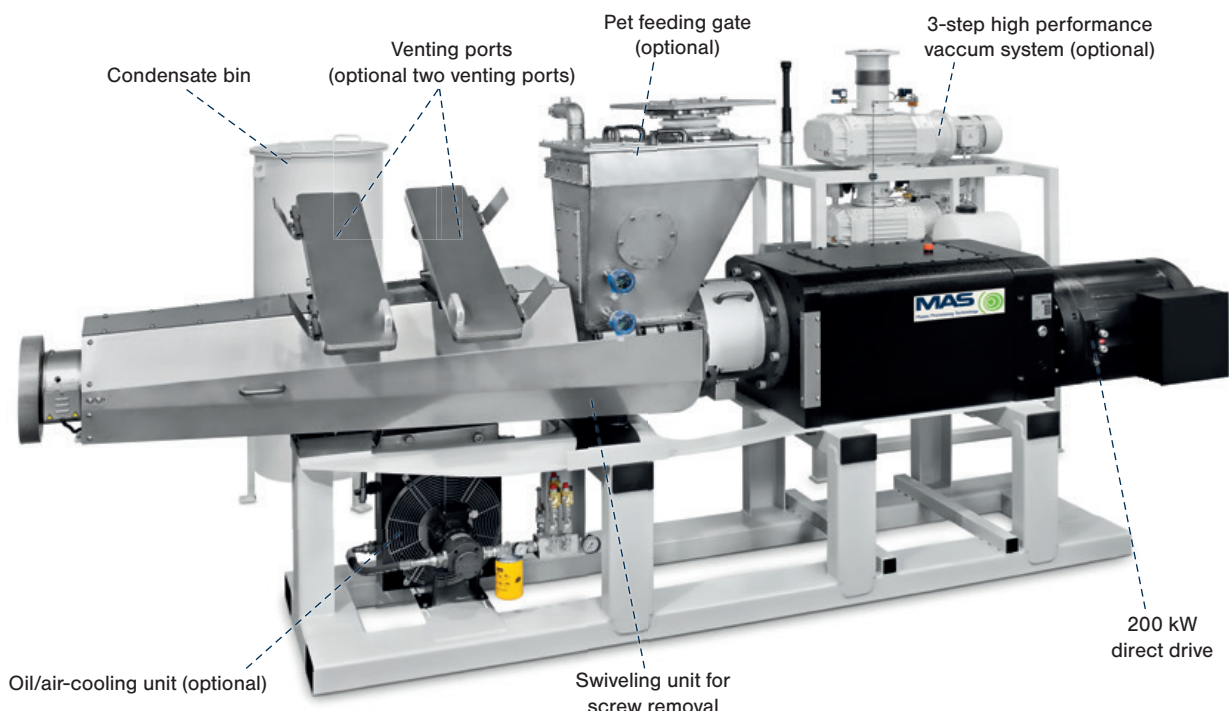
The downstream equipment, such as melt filtration, on demand melt pump, and pelletizing system can either be provided by the customer or supplied by M-A-S as a complete package.

MAS IN THE EXTRUSION OF PET STANDS FOR

- huge feed volume and thus, very good intake behavior
- high screw fill levels → high capacity [kg/screw revolution]
- low screw speeds at high throughputs [kg/h] → low shear and low melt temperature
- short barrel length and short residence time of the melt results in:
 - excellent IV-values/color values/AA-values
 - very low specific energy consumption



Large Feed Opening
with enormous intake-volume and therefore good intake behavior



MAS EXTRUDER

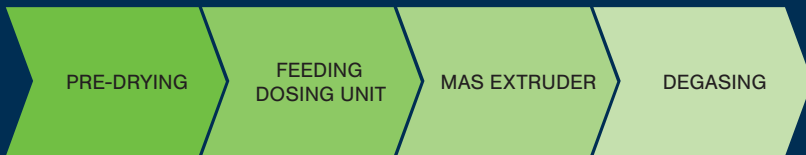
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Type	MAS 45	MAS 55-L	MAS 75	MAS 90	MAS 93
Screw diameter [mm]	45/102	55/127	75/156	90/174	93/186
Length processing unit [mm]	1,300	1,500	2,000	2,500	2,680
Heating zones (extruder/adapter) [pc,]	5/2	6/2	5/2	6/2	6/2
Heating capacity [kW]	15	32	32	66	80
Extruder drive [kW]	45	100	200	285/315	345/400
Throughput* [kg/h]	150–350	300–600	600–1,200	900–1,500	1,200–2,500
Input-material	A-PET, G-PET, GAG-PET, PLA, PET/PE, virgin, regrind, regrind of inhouse production waste, bottle flakes				

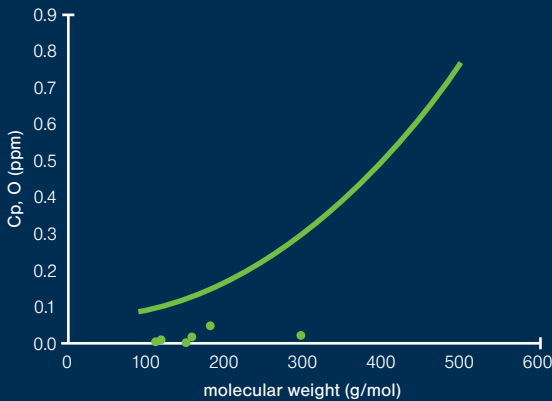
*Throughput depending on viscosity and properties of the input-material, moisture content as well as filtration-fineness.

FDA/EFSA

The MAS Process that received the “No Objection Letter” from the FDA also fulfills the EFSA criteria for processing of washed PET bottle flakes into products for direct food contact. The process is completely modular, which enables customers to supplement certain components of the process with their own (possibly existing) equipment. The main components of this modular system are as follows:



- **Pre-Drying:** dwell time of 3 h with a temperature of $\geq 150\text{ }^{\circ}\text{C}$
- **Feeding/Dosing Unit of the MAS Extruder:** dosing can be, depending on the application, gravimetric as well as volumetric
- **MAS Extruder:** gentle processing of PET with a low melt temperature and short dwell time
- **Extruder Degasing:** $\leq 10\text{ mbar}$ required



Residual concentrations corresponding to a migration of 0.1 ppb (EFSA requirement) of surrogates adjusted to 3 ppm initial concentration, green line: maximum allowed concentration.

MAS EXTRUDER IN SHEET LINES

For inline applications in PET Sheet-Lines (A-PET, G-PET, C-PET, as well as G-A-G und PLA) several essential advantages of the MAS extruder have a huge impact:

- Due to the large feed opening granulated production waste (film edge stripes/bales) can be fed back into the production process.
- Diverse IV-values of different input materials will be perfectly homogenized.
- The combing process unit allows a fast color change.
- The adjustable screw speed enables individual melt temperatures.
- No need for pre-drying of virgin material or in-house industrial waste.
- Very short length, therefore ideal for upgrade of existing lines in order to improve the quality of film, widen the application range, and improve throughput.
- Excellent compounding properties, hence adding fillers and additives for the exact optimization of the film properties and material costs.

