

# BUSS Kneader Technology for PVC Pelletizing



PVC PELLETIZING



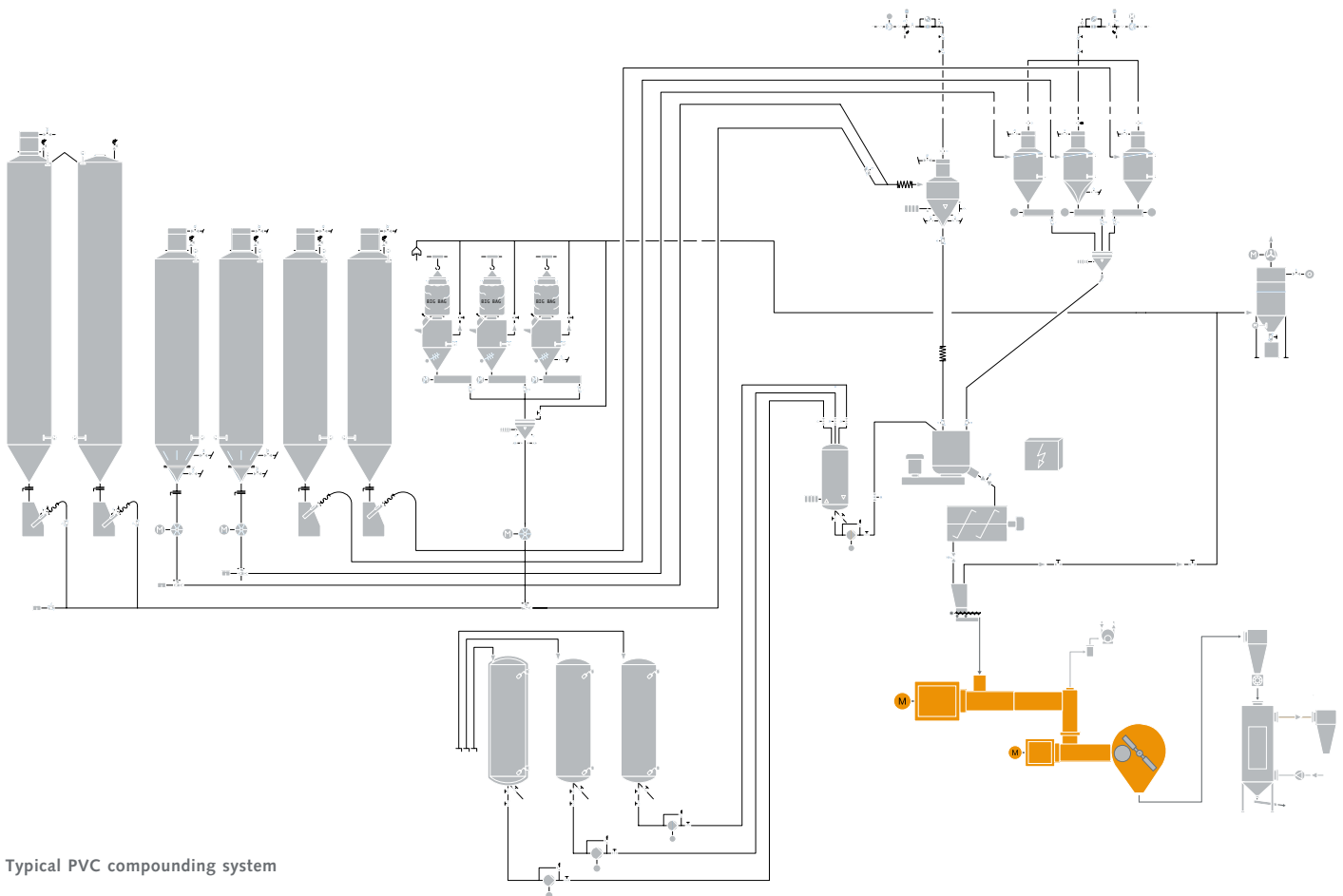
## Compounding and Pelletizing of PVC

Melt compounding and pelletizing is used in instances where direct extrusion of dry-blend into a finished part is not possible or economical. The reasons for this may be frequent product changes, small batch sizes, difficult processing conditions, problematic storage or housekeeping and other logistical issues.

### Customer benefit is the central focus

The quality of a compounding system is primarily measured by its cost-effective efficiency in all application areas. The well-proven **quantec®** Kneader series meets this criterion in every respect.

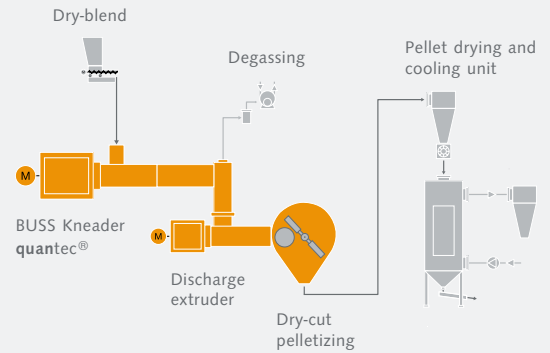
The plant diagram below shows a typical set-up for PVC processing lines, from handling and weighing of raw materials through dry-blend preparation in the heating-/cooling mixer to compounding/pelletizing and pellet cooling.



Typical PVC compounding system



Highly filled rigid PVC pellets



Two-stage PVC compounding systems

### Plasticized PVC (PVC-P)

- Cable grades: insulation, sheathing and bedding compounds
- Extrusion materials for profiles and hoses
- Medical grade applications
- Injection moulding compounds
- Shoe sole material (also with blowing agent)

### Rigid PVC (PVC-U)

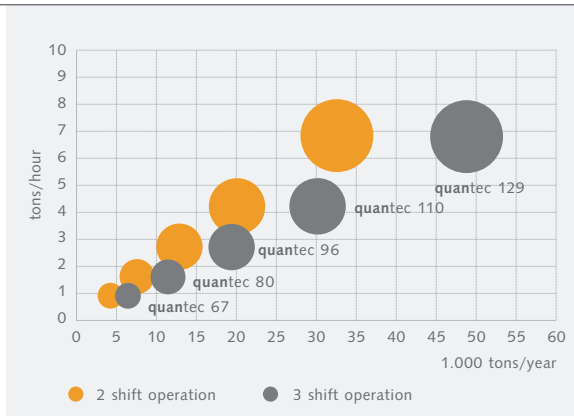
- Extruded profiles for interior and exterior uses
- High-fill extrusion grades
- Injection moulding grades for pipes and fittings
- Blow moulding grades for bottles and containers
- WPCs (wood-plastic composites)
- C-PVC (chlorinated PVC)
- Alloys and blends

### Process stages

- Feeding of dry-blend from the heating mixer or heating-/cooling mixer combination into the **quantec®** processing chamber
- Preheating, mixing and gelling the premix
- Possible feed of pigments and other components (solid or liquid) directly into the processing chamber
- Degassing the compound in the connecting tube, using vacuum
- Conditioning and building up pressure for pelletizing, and/or screening of flexible PVC (cable compounds) in the discharge extruder
- Eccentric dry-cut, wet-cut or underwater pelletizer
- Pneumatic conveying and cooling in a fluidized bed

### Characteristics and advantages of the quantec® series

- The four-flight screw profile provides increased mixing and conveying efficiency, and provides for volumetric scale-up
- Optimal conveying stability and linear output/speed ratio, while at the same time offering simplified handling and stable operating characteristics
- Increased plant efficiency due to maximum reduction in changeover times
- Simple cleaning and inspection; the split Kneader barrel design can be opened within minutes
- Fast start-up with minimal expenditure of materials
- Rapid installation (pipes and wires prelinked to central connection points)
- Consistently optimized product intake eliminates the need for a force-feeding device
- In addition to optimized intake of even low bulk density powders, it is also possible to dose pigments and other components separately
- Two-stage system facilitates independent optimization of the melt compounding and pelletizing steps



Throughput rates for unfilled PVC compounds



Die plate with cutter

**Technical process aspects**

Energy input to the compound during operation is almost exclusively by shear energy dissipation, whereby a higher efficiency is attained. Liquid temperature control serves only for surface conditioning in the processing section and for reaching the operating temperature more quickly. The product temperature can be precisely controlled over the entire processing length.

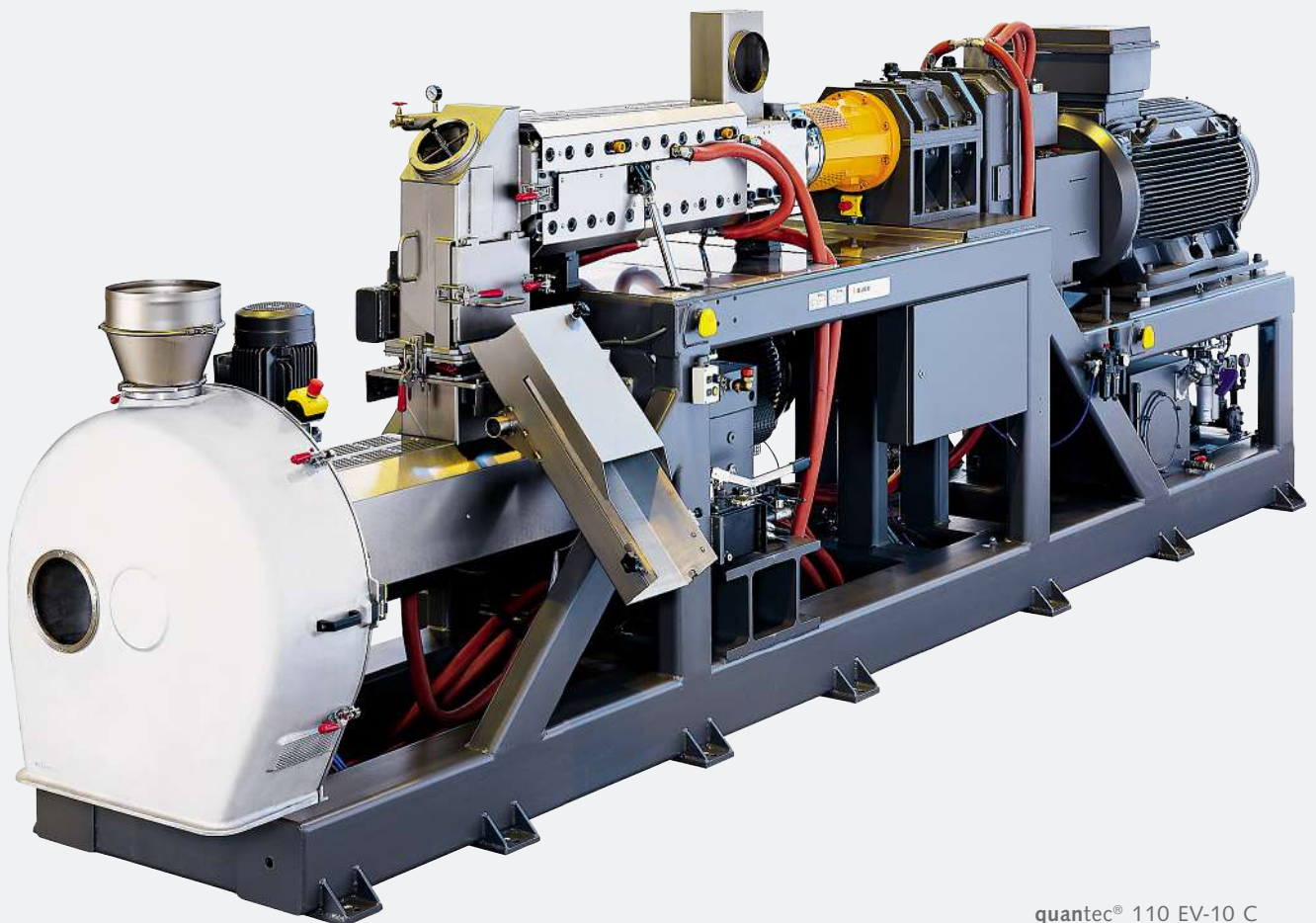
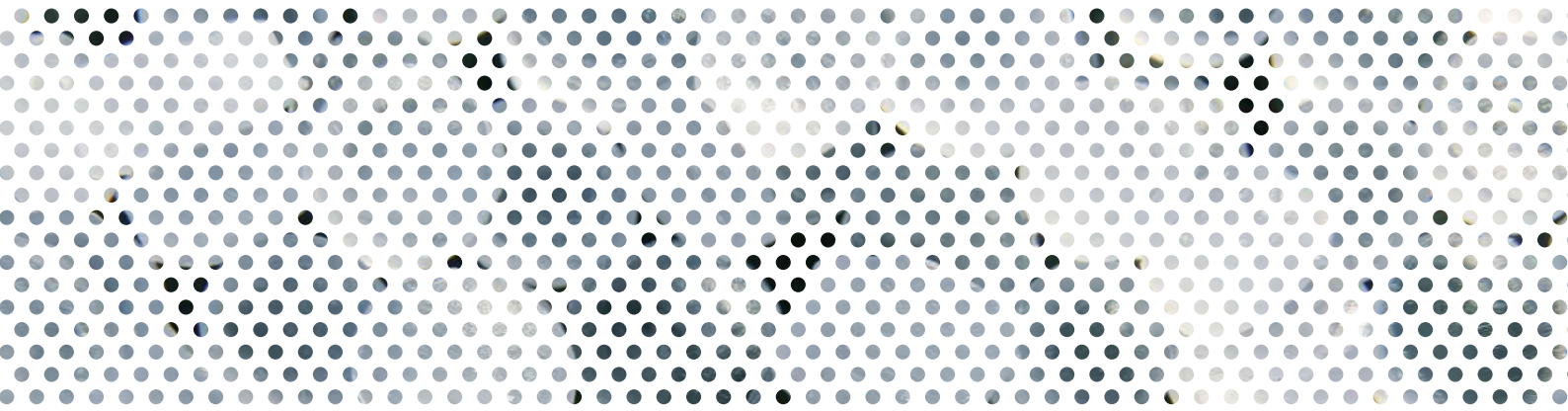
The four-flight process geometry and the resultant linear output/speed behaviour of the **quantec®** series enables far higher output rates than before, and a wider processing window with excellent temperature control in the upper speed range (up to 750 rpm).

**Throughput rates and technical data**

The stress on the product is constant across the entire range of speeds, resulting in a consistently high product quality at all settings. Efficient forward and reverse degassing at the transfer point between the outlet from the BUSS Kneader and the entry into the discharge extruder guarantees an optimal product, free of volatiles.

With a single given screw configuration, a wide range of formulations (rigid and flexible PVC) can be processed. This reduces potential downtimes for product changes considerably. The pelletizer can be swivelled away quickly and completely, which also saves a significant amount of time when switch-

	Unfilled PVC [kg/h]	Filled PVC [kg/h]	Screw diameter [mm]	Processing length [L/D]	Max. screw speed [rpm]	Max. drive power [kW]
quantec® 40EV	140 – 200	180 – 250	44	10 or 15	750	40
quantec® 50EV	280 – 400	350 – 500	55	10 or 15	750	55
quantec® 67EV	600 – 900	700 – 1000	72	10 or 15	750	140
quantec® 80EV	1200 – 1700	1400 – 2000	86	10 or 15	750	200
quantec® 96EV	1800 – 2600	2100 – 3000	105	10 or 15	750	350
quantec® 110EV	2800 – 4000	3500 – 5000	121	10 or 15	750	450
quantec® 129EV	4600 – 6500	5600 – 8000	142	10 or 15	750	710



quantec® 110 EV-10 C

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