

Table 13.3 Indexing Belt Filter – operating parameters and statistics.

Indexing Belt Filter		
Commercial introduction 1960s	MIN	MAX
Slurry volume required for lab-scale optimisation (20% solids content)	10 L	50 L
Pilot/Production scale equipment slurry throughput (20% solids content)	100 L h ⁻¹	1000s L h ⁻¹
Solids content	10%	50%
Filtration area	0.1 m ²	90 m ²
Max pressure differential	—	0.5 bar
Typical moisture content post filtration	20%	30%
Residence time	5 minutes	30 minutes
Cake thickness	5 mm	50 mm
Wash regime. Multi-wash and solvent exchange	1	3
Dead volume or heel (adjustable)	—	5 mm
Containment methods	Complete cover operation in pressurised purged enclosure	
Number of cGMP qualified processes	>10s	
Status of cGMP qualification for API production	Intermediates/Current	
Cost of typical initial 2 years strategic spare parts	€10 000	€20 000

The range of operating parameters for an indexing belt filter is displayed in Table 13.3.

13.7.4 Carousel Vacuum and Pressure Filter/Dryer

The AWL continuous feed carousel filter dryer (type CCFD) is a continuous or batch fed optimisation and production system. Throughput is aimed at small to medium scale pharmaceutical production capacities, in line with several key API manufacturers future expectations of 300 kg to 4000 kg per annum for new drug production. Variations of this design facilitate throughputs in line with the batch production volumes of 1 m² to 2 m² filter dryers. The carousel is a series of vertical cylinders moved around a central axis to fixed processing stations. Port diameters are limited to <100 mm to avoid cake cracking and wall effects during de-liquoring and drying thereby negating the need for agitation. Key advantages include the mobile pilot system fitting within a walk-in fume cupboard and it can be validated for a number of processes rather than the manufacturer adopting the traditional route of validating a fixed asset for a specific process. The ability to deploy validated, mobile isolation and drying systems to meet specific geographical demands gives the manufacture new levels of supply chain versatility and flexibility. An image of the AWL CCFD is shown in Figure 13.17.

The operating principles are aligned with Nutsche filtration whereby material is processed in a series of mini batches with a constant