Vertical Compound Crusher Model Selection and Operating Guide

A practical engineering reference for selecting PFL-600 to PFL-2000 models, controlling product size, and identifying operating limits before commissioning.

What this guide adds: It converts catalogue values into selection checks. It explains which data are suitable for preliminary sizing, which conditions can reduce actual output, and when the material or process should be reviewed before a PFL model is confirmed.

Model range	Feed limit	Nominal capacity	Published fine product
PFL-600 to PFL-2000	**<100 to <220 mm**	**3 to 190 t/h**	**60-90% below 3-5 mm**
7 catalogue models	Model-dependent	Preliminary only	Feed- and wear-dependent

Recommended selection sequence

Material → **Feed** → **Product** → **Machine** → **Process**

- **Material**: Hardness, fracture, abrasivity
- **Feed**: Largest lump, gradation, moisture
- **Product**: Target size and passing percentage
- **Machine**: Continuous capacity and motor load
- **Process**: Feeder, discharge and downstream equipment

Selection rule: Choose the smallest PFL model that can accept the confirmed feed and maintain the required output without sustained overload. A larger inlet or motor does not correct unsuitable material, unstable feeding, or restricted discharge.

PFL Technical Parameters

Catalogue data are shown as a selection baseline. Final duty must be checked against actual material and process conditions.

Model	Max feed (mm)	Fine product	Capacity (t/h)	Main-shaft speed (r/min)	Motor power (kW)	Overall dimensions (mm)
PFL-600	<100	60-90% below 3-5 mm	3-10	934	7.5	1300 x 800 x 1200
PFL-800	<100	60-90% below 3-5 mm	10-20	934	18.5-22	2100 x 1200 x 1700
PFL-1000	<120	60-90% below 3-5 mm	20-40	769	37-45	2600 x 1400 x 1900
PFL-1250	<150	60-90% below 3-5 mm	40-70	530	75	2800 x 1600 x 2100
PFL-1500	<180	60-90% below 3-5 mm	70-100	495	132	3300 x 1900 x 2200
PFL-1750	<200	60-90% below 3-5 mm	130-190	424	160	3710 x 2360 x 2390
PFL-2000	<220	60-90% below 3-5 mm	100-160	370	185	4100 x 2660 x 2620

How to read the fine-product value

The catalogue states a range rather than a guaranteed screen analysis. The actual passing percentage depends on material breakage, feed distribution, rotor and wear-part condition, and the point at which the product is sampled.

Capacity anomaly to verify

The listed PFL-1750 capacity exceeds the PFL-2000 range. Treat both values as catalogue references and reconfirm the duty with the manufacturer before final purchase or process guarantees.

Preliminary model bands

Compact duty
PFL-600 / 800

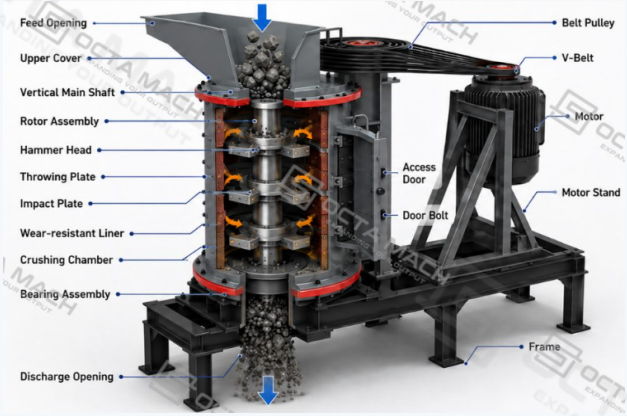
Medium duty
PFL-1000 / 1250

Industrial duty
PFL-1500

Large-feed duty
PFL-1750 / 2000

Working Mechanism and Control Points

The schematic below shows the material path and the operating variables that matter most during selection and commissioning.



Reduction sequence

Stage	What happens	Selection implication
1. Feed entry	Prepared material enters by gravity.	Largest regular lump and feed stability must be confirmed.
2. Acceleration	Rotor, hammers and throwing plate impart velocity.	Main-shaft speed is model-specific; do not alter it without engineering review.
3. Impact zone	Material strikes liners and other particles.	Abrasivity controls hammer and liner duty.
4. Residence and grinding	Particles rebound and continue downward.	Moisture, sticky fines and wear condition affect residence time.
5. Discharge	Reduced material leaves through the lower opening.	Restricted chutes or conveyors reduce actual capacity.

Control priorities during commissioning

- Stability before fineness: confirm continuous feeding and free discharge before judging product size.
- Wear before adjustment: inspect hammers and liners when the product becomes coarser.
- Motor load as a warning: rising load with falling output usually indicates poor flow, oversize feed, or wear-related inefficiency.

Model Selection Logic

Use the catalogue only to define a candidate range. Final selection depends on material behavior, feed preparation, required product and the complete process circuit.

Selection input	What to confirm	Why it changes the model
Material behavior	Hardness, brittleness, abrasivity, fracture response	Confirms whether repeated impact and grinding are suitable and defines wear risk.
Maximum feed size	Largest regular lump after upstream crushing	Determines inlet requirement and excludes undersized PFL models.
Target product	Required size and passing percentage	Defines reduction duty and whether one-pass performance is realistic.
Continuous capacity	Net plant requirement, not short peak feed	Determines chamber and motor duty and must be matched with feeder and discharge capacity.
Moisture and clay	Surface moisture, sticky fines, clay-bound lumps	Affect downward flow, buildup and cleaning frequency.
Feed temperature	Especially for cement clinker	Influences bearing, lubrication and wear-part selection.
Process position	Before milling, screening, conveying or blending	Determines the acceptable product range and downstream restrictions.

Decision checkpoints

1. Suitability

Reject or test highly abrasive quartz-rich, heavily clay-bound, or metal-contaminated feed.

2. Feed acceptance

Select from the largest regular lump, not the average feed size.

3. Product realism

Treat 60-90% below 3-5 mm as a published range, not a universal guarantee.

4. Circuit capacity

Check feeder, lower chute, conveyor and mill or screen together with crusher duty.

Preferred model = smallest candidate that accepts the feed and maintains the duty with stable motor load and free discharge.

Output Control and Operating Diagnosis

The table links common symptoms to the most probable checks. It is intended for commissioning and first-line troubleshooting, not as a substitute for the manufacturer manual.

Observed symptom	Likely operating causes	Priority checks	Corrective direction
Product becomes coarser	Hammer or liner wear; reduced residence time; unstable feed	Wear profile, fastening, feed rate, bottom discharge	Restore wear geometry and stable material flow before increasing load.
Capacity declines gradually	Wear, chamber buildup, sticky fines, downstream restriction	Hammer mass loss, liner thickness, internal deposits, conveyor load	Clean the chamber, replace worn parts, and remove downstream restrictions.
Motor load rises but output falls	Oversize feed, poor discharge, accumulation, abnormal rotor resistance	Largest lump, chute condition, buildup, bearing temperature	Reduce feed, clear the path, and inspect rotating components.
Vibration increases	Uneven hammer wear, loose parts, buildup, bearing or rotor issue	Rotor balance, hammer mass symmetry, fasteners, bearing condition	Stop and inspect before continued operation.
Bearing temperature rises	Lubrication problem, hot clinker, overload, contamination, misalignment	Oil or grease condition, temperature trend, feed temperature, alignment	Correct lubrication and load conditions; verify cooling and alignment.
Frequent blockage or buildup	High moisture, clay, sticky fines, restricted discharge	Moisture, clay, feed gradation, chute angle and conveyor capacity	Improve feed preparation and discharge flow; do not rely on the screenless chamber alone.

Three operating rules

Do not chase fineness with feed rate

More material can shorten residence time and increase load without restoring a worn crushing profile.

Trend data, do not inspect one value

Motor current, bearing temperature, vibration, feed rate and output grading should be reviewed together.

Stop abnormal vibration early

Continued operation can damage the rotor, bearings, shaft and chamber fasteners.

Application Matching and Commissioning Checklist

Material names alone are not enough. Review the operating risk that comes with each application and confirm the surrounding equipment before startup.

Material / duty	Typical process position	Main review point
Cement clinker	Fine crushing before milling	Clinker temperature, abrasivity, required mill-feed size and bearing protection.
Cement raw material	Prepared feed before grinding	Largest lump, mixture uniformity and downstream mill requirement.
Coal gangue	Reduction before screening, blending or reuse	Clay, metal contamination and variable fracture behavior.
Gypsum	Fine preparation before grinding or cement use	Moisture, stickiness and buildup tendency.
Sandstone / limestone	Fine aggregate or mill preparation	Silica content, wear cost and target passing percentage.
Blast-furnace or metallurgical slag	Crushing before recovery or reuse	Tramp metal, cooled material condition and liner wear.
Coal	Prepared-feed reduction	Moisture, sticky fines, dust control and fire-safety requirements.
Iron ore - selected duty	Fine reduction where material is compatible	Hardness, abrasivity and expected wear-part life.

Commissioning checklist

- ☐ Feed material and maximum regular lump confirmed
- ☐ Feed gradation, moisture and clay condition reviewed
- ☐ PFL model, motor voltage and frequency confirmed
- ☐ Foundation, anchor bolts and equipment level checked
- ☐ Rotor rotation direction and fasteners verified
- ☐ Wear parts and lubrication condition documented
- ☐ Feeder set for continuous, controlled loading
- ☐ Bottom chute and discharge conveyor proven clear
- ☐ No-load vibration, current and bearing temperature recorded
- ☐ Load introduced gradually while current and vibration are trended
- ☐ Product sample taken after stable operation, not during startup
- ☐ Spare parts available and inspection interval assigned