DESIGNS

For applications on explosive materials, in addition to the standard machine design, with the exception of the 750 ATP and the 1000 ATP all classifiers in the range are available in explosion-pressure-shock-proof design to 10 bar overpressure.

TURBOPLEX ATP SINGLE-WHEEL CLASSIFIER

Turboplex ATP Type	100	140	200	315	400	500	630	750	1000
Scale-up factor F = approx.	0.25	0.5	1	2.5	4	6.25	10	14	25
Drive power kW	4	5.5	5.5	11	11	22	30	37	45
Max. Speed rpm	11000	8500	6000	4000	3150	2400	2000	1600	1200
Max. air flow rate m^3/h	300	600	1200	3000	4800	7500	12000	17000	30000
Fineness d_{97} = approx. µm	4-100	5-120	5-120	6-150	7-150	8-150	9-200	10-200	12-200
Fines yield max *) d_{97}									
8 µm in t/h	0.035	0.070	0.14	0.35	0.56	0.80	1.2	-	-
20 µm in t/h	0.07	0.14	0.28	0.70	1.12	1.75	2.8	3.9	6.5
45 µm in t/h	0.1	0.2	0.4	1.0	1.6	2.5	4.0	5.6	9.5

TURBOPLEX ATP MULTI-WHEEL CLASSIFIER

Turboplex ATP Type	100/4	140/4	200/4	315/3	315/6	500/3	500/4	630/4
Scale-up factor F = approx.	1	2	4	7.5	15	19	25	40
Drive Power kW	4 x 3	4 x 4	4 x 5.5	3 x 11	6 x 11	3 x 15	4 x 15	4 x 22
Max. Speed rpm	11000	8500	6000	4000	4000	2400	2400	2000
Max. air flow rate m^3/h	1200	3000	4800	9000	18000	22500	30000	48000
Fineness d_{97} = approx. µm	4-100	5-120	5-120	6-150	6-150	8-150	8-150	9-200
Fines yield max.*) d_{97}								
8 µm in t/h	0.14	0.28	0.56	1.0	2.1	2.4	3.2	4.8
20 µm in t/h	0.28	0.56	1.12	2.1	4.2	5.2	7	11
45 µm in t/h	0.4	0.8	1.6	3	6	7.5	10	16

*) Feed material with 70% < d_{97}

ALPINE CLASSIFIER TECHNOLOGY

TURBOPLEX®-MULTI-WHEEL CLASSIFIER

Scale-up through the classifier range to achieve greater throughputs influences not only capacity but also the performance of the classifier in terms of the cut point and the precision of cut.

Superfine end products can usually only be manufactured with relatively small classifiers, i.e. laboratory or pilot units, and naturally only in correspondingly small amounts. Once the pilot plant is scaled up to production scale, the desired ultrafine separation is no longer achievable.

Theoretically, during classification of particles separated in the field of centrifugal force, an equilibrium of forces is established between the centrifugal force and the drag force of the fluid flowing around it. According to Stoke's law (Re < 1), which applies in the case of very fine particles examined here, the following is obtained for the diameter of the cut-size:

$$x_T = F \cdot \sqrt{\frac{\eta_L \cdot w_r}{\rho_S \cdot u^2} \cdot D}$$

The cut point size x_T is proportionate to the root of the radial air velocity w_r and the root of the collector diameter D, and inversely proportional to the peripheral velocity u (η_L = dynamic viscosity of the air, ρ_S = density of solid, F = adaptation parameter). For small particle diameters, therefore, it is best to target low flow rates, small classifying wheel dimensions and high peripheral speeds.

The equation also delivers the basis for Alpine's multi-wheel principle: a small wheel can separate finer assuming constant operating conditions.

In order to satisfy the demand for superfine products at high throughput rates Alpine developed the concept of the Turboplex multi-wheel classifier whereby several smaller classifier wheels are installed in a single machine. This multi-wheel concept enables the production of superfine products, typically in the 3 - 6 µm range, with an extremely high fines yield at an optimum precision of cut.

The multi-wheel Turboplex classifier operates in conjunction with a single cyclone / filter and fanset so represents a cost effective method of achieving superfine separations at high throughput rates.
Dependent on the end-product fineness, the feed product and the machine size, the feed rate of Turboplex multi-wheel classifiers ranges between about 150 and 30,000 kg/h.

APPLICATION AREAS

Especially developed for ultrafine classifying operations, Alpine's multi-wheel classifiers are ideal for processing metal powders, mineral powders, abrasives, toner, and wax.

MULTI-WHEEL CLASSIFIER 630/4 ATP