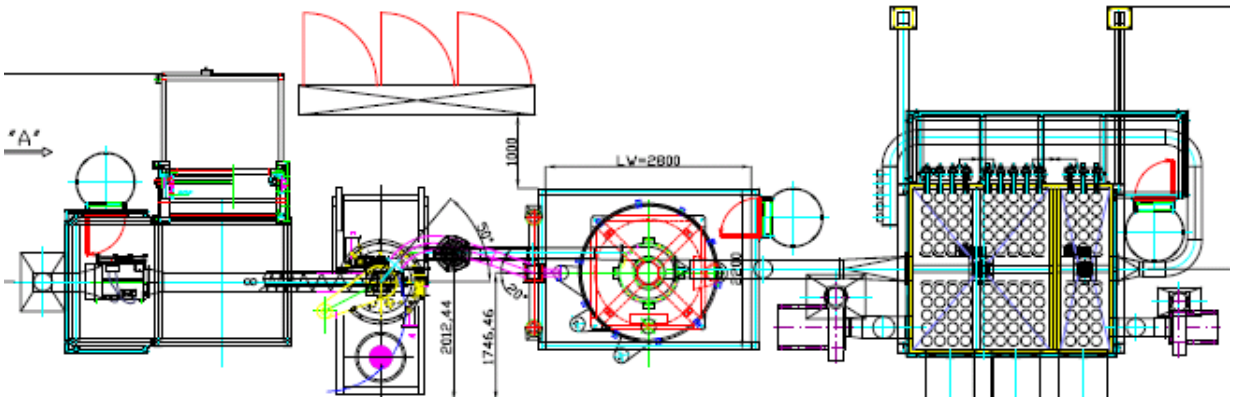
Graf Anlagenbau

Expertise in Processing Technology

Plants and Components for the Processing of dry Powders



Graf Anlagenbau

Expertise in Processing Technology

For more than 25 years we are your experienced partner for machines, plants and tailor-made special solutions for the processing of dry materials

Our systems include the processing steps:

- material feeding and storing
- precise dosing onto the processing system
- fine grinding , micronisation
- sieving
- air classifying
- mixing and blending
- extrusion
- conveying technology (mechanically and pneumatically)
- final product handling and filling
- process control

We supply worldwide single components, single machines as well as turnkey processing systems including installation and commissioning.

Sophisticated customer specific solutions are our standard.
On demand also with inclusion of existing or second hand components

Plant design made by *GRAF* means:
Our plant design is adapted to YOUR specific demands and not vice versa

We look forward to Your request

Graf Anlagenbau GMBH

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Graf Machine Program

Whirl Mill UTM

The whirl mill UTM is the ideal system for the fine grinding of various materials up to a Mohs-hardness of 3,5.
The milling performance is covering a fineness range from d97= 20µ to 3 mm (with some materials even higher finesses down to 10µ and finer are possible).

In the whirl mill the micronisation is effected by a mixture of impact effects between product and grinding rotor and also impacts particle against particle (jet milling effect).
This jet milling effect is caused by the extremely intensive whirl effects in the grinding zone.
This is the main reason for the very high efficiency of this grinding technique.

For temperature sensitive products the UTM also can be operated as cryogenic grinding system with liquid nitrogen cooling. (Micronisation of spices, pulverization of rubber)

The whirl mill is available in different sizes with grinding rotor diameters from 100 mm to 1600 mm

Whirl Mill UTM, technical data							
Model		**UTM 100**	**UTM 200**	**UTM 400**	**UTM 800**	**UTM 1200**	**UTM 1600**
Diameter Rotor	mm	100	200	400	800	1200	1600
Mill Drive	KW	3 -5	11-18,5	22-45	55-90	110-160	160-250
Rotor Speed	Rpm max	22.000	12.000	6.000	3.000	2.000	1.500
Air Flow	m3/h	180	800	1.800	3.600	7.000	10.000
Scale-Up Factor		0,25	1	2,5	6	8,8	13
Opening Device		manual		hydraulical (EU Patent)			
Weight	kg	300	700	1.500	4.500	8.500	12.500
Length	mm	650	1.250	1.410	1.900	2.490	3.100
Width	mm	300	500	710	1.010	1.430	2.150
Height	mm	350	700	950	1.260	1.395	1.850

Graf Machine Program

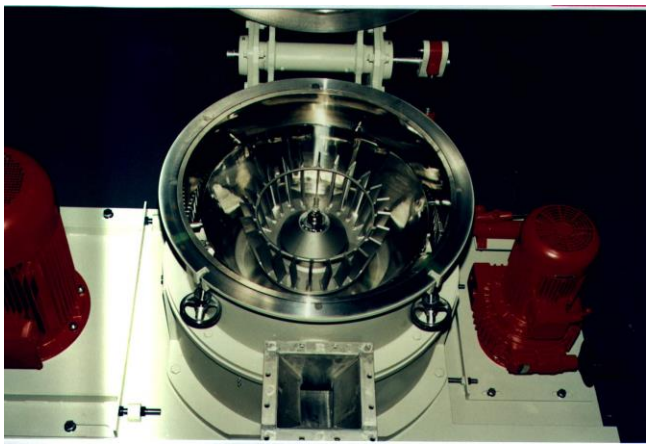
Classifier Mill MS

The classifier mill MS is our system for the fine grinding of all dry materials with a Mohs-hardness up to 3,5 with precise limitation of the top size

The classifier mill MS unifies 2 processing steps in 1 machine:

- Fine impact mill
- Dynamic air classifier

Due to this combination the enables you to produce in one processing step powders with precise top size limitation.



Available machine sizes:

Classifier Mill MS, techncal data										
Model		**MS 20**	**MS 100**	**MS 150**	**MS 300**	**MS 400**	**MS 600**	**MS 750**	**MS 1000**	**MS 1500**
Diameter mill rotor	mm	185	325	325	494	494	774	774	970	970
Diameter classifier	mm	112	195	195	296	296	470	470	580	580
Mill drive	KW	3	7,5	11	22	30	45	55	75	110
Classifier drive	KW	0,37	1,1	1,1	4	4	7,5	11	15	18,5
Mill rotor speed	Rpm min	6000	3000	3000	1500	1500	1000	1000	800	800
	Rpm max	10800	7200	7200	4700	4700	2900	2900	2600	2600
Classifier speed	Rpm min	1000	500	500	400	400	300	300	200	200
	Rpm max	5400	5000	5000	3000	3000	2700	2700	1800	1800
Air flow	m3/h min	200	600	900	1500	2500	3000	4000	6500	8000
	m3/h max	325	900	1350	3240	4200	6300	7200	9600	14400
Scale -up factor		0,2	1	1,35	2,7	3,6	5,4	6,75	9	13,5
Length	mm	1100	1250	1250	1750	1750	2450	2450	2850	2850
Width	mm	800	580	580	640	640	960	960	1200	1200
Height	mm	1000	820	820	1385	1385	1445	1445	1445	1445

Graf Machine Program

Jet Mill MFG

High-Tech micronizing system for fine grinding of abrasive as well as temperature sensitive materials with precise top size limitation.

Through the grinding principle of jet milling the materials are micronized by impacts particle against particle. Therefor the material is not contaminated by wear of grinding tools.
Even hardest and abrasive materials like ceramics; polishing powders, powder metals and abrasive powders can be processed free of ferrous contaminations.

Due to the high air flow through the mill also temperature sensitive materials like waxes, thermoplastics, PTFE and powder coatings can be micronized.
Finesses down to 97% smaller 2µ can be achieved.

Jet Mill MFG technical data								
Model		**MFG 63**	**MFG 132**	**MFG 200**	**MFG 315**	**MFG 710**	**MFG 800**	**MFG 1500**
Diameter classifier	mm	63	132	200	315	400	500	630
Classifier drive	KW	2,2	4	7,5	11	15	30	45
Speed	Rpm max	15.000	9.000	6.200	4.000	3.200	2.500	2.000
Air flow	m3/h	100	450	900	2.800	4.500	7.000	10.000
Scale-up factor		0,2	1	2	5	10	14	20
Multi-wheel version		-	-	-	200/3	315/2	315/3	400/2
Gravimetric control		Option	Standard: Mill feeding control by gravimetric system					
PowerJet-nozzles		foreseen	PowerJet-technology available					
highest fineness	µm	2	2	2	4	6	6	6
Weight	kg	65	250	380	950	1.500	2.200	4.000
Length	mm	2.300	900	1.000	1.580	1.650	2.150	2.450
Width	mm	1.000	850	970	1.450	1.500	2.000	2.250
Height	mm	2.000	1.200	1.450	1.500	2.800	4.300	5.700

Graf Machine Program

Air Classifier HTS

Turbo-air classifier for achieving of highest fineness degrees in the processing of dry powders. Even on production machine level fineness of 99% below 2µ can be reached.

The classifier can be used as independent stand-alone unit as well as a on-line classifier in combination with a milling system.

For abrasive und contamination sensitive materials classifier wheel can be made in ceramic materials as well as the machine lining inside the classifier.

Turbo Classifier HTS technical data									
Model		**HTS 63**	**HTS 132**	**HTS 200**	**HTS 250**	**HTS 315**	**HTS 400**	**HTS 500**	**HTS 630**
Diameter Classifier	mm	63	132	200	250	315	400	500	630
Classifier drive	KW	2,2	4	5,5	7,5	11	15	30	45
Speed	Rpm max	15.000	9.000	6.200	5.750	4.000	3.200	2.500	2.000
Air flow	m3/h	100	500	1.300	1.500	3.200	4.500	9.000	12.000
Scale-up factor		0,06	0,25	0,75	1	1,7	2,5	5	7
Multi wheel version		-	geplant	200/3	-	315/2; 315/3	400/2	geplant	geplant
Highest fineness	µm	2	2	2	2	4	6	6	6
Weight	kg	80	250	400	500	950	1.200	1.800	3.000
Length	mm	2.300	900	1.000	1.000	1.580	1.650	2.150	2.450
Width	mm	1.000	850	970	970	1.450	1.500	2.000	2.250
Height	mm	1.800	1.450	1.950	1.950	2.600	3.000	3.400	4.000

The a.m. data refer to the single wheel versions of the classifier. For all productions machines bigger than HTS 132 also multi-wheel version are available or foreseen

Graf Machine Program

Laboratory
Small Scale Production

For research and development; laboratory and small scale production all our grinding and classifying systems are available in small sizes. All machines are designed so that the performance values and parametres defined on them can be scaled-up to our production machines. Also for the small scale machines ceramic classifier wheels and lined grinding chambers for iron-contamination-free grinding are available. Standard material of construction for the small scale machine: stainless steel.

Multi-purpose-plant MFG100/HTS63

In operation as classifier:

in operation as jet mill

MFG100/HTS63 ECO

Operation with
Vacuum-cleaner

UTM 100

Whirl mill for
Laboratory

Zig-Zag-Classifier

ancient principle:
Gravity vs airflow

Graf Machine Program

Peripheral Components

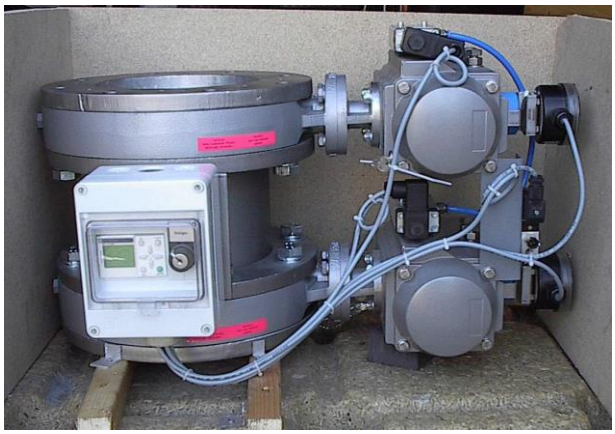
„Buying is good, own design and manufacturing very often is better“ Based on this perception we use in our plants a lot of peripheral components which we have developed on our own and which we produce ourselves.
In the following some examples:

Multi-screw bottom for bunker discharge of heavy materials

Dosing screw without agitator

Double dosing screw with agitator

Double flap valve



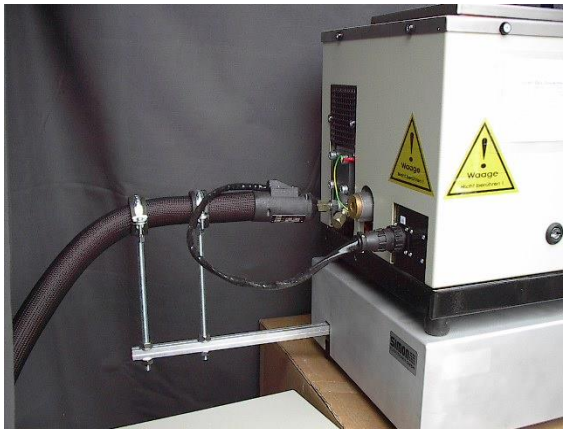
Zig zag classifier

Cyclone

Graf Machine Program

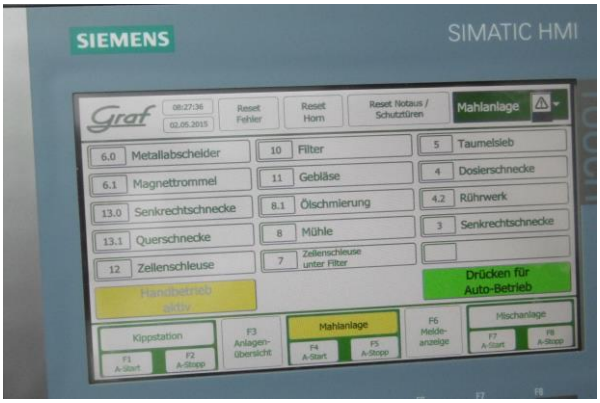
Peripheral Components

Gravimetric dosing system for liquid additives. Trade name: GrafiDos



Pneumatic conveying system

Process control system

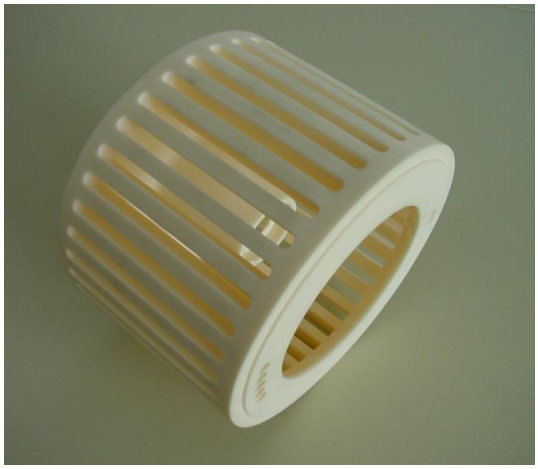


Spare part service

We supply spare parts and wear parts for pin mills, classifier mills, whirl mills and air classifiers.
Furthermore: Filter hoses filter baskets

Grinding disc of pin mill

Ceramic classifier wheel



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Second hand equipment

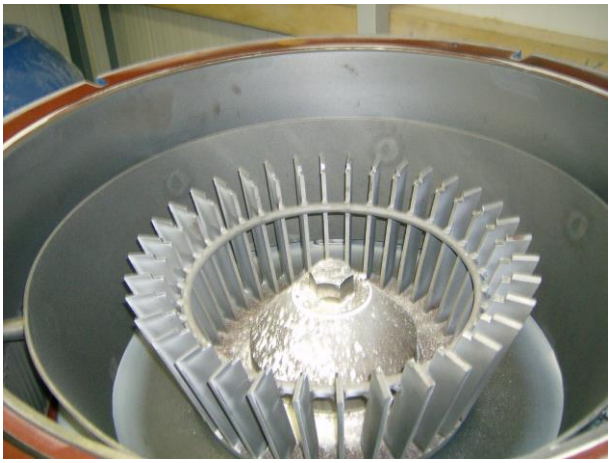
In this sector we are not focused on simple purchasing and selling of equipment like a typical used equipment dealer. We offer completely overhauled and improved machines. Furthermore turnkey-processing systems with integration of used components.
Thanks to our experience we have the competence even to transform scrap into a running machine.

Example: Repair /total revision of a ACM 60-mill

Initial situation: Disassembled machine “stored” for 10 years open air at customers site)

Graf specialists on duty:

Totally overhauled machine. In operation since 2008 free of troubles:



Graf Processing Systems

Grinding plant with Jet Mill

This customer had three single grinding plants each with one jet mill.
Each plant was operated by one operator manually.
We took out from all plants the most useful components and designed based on these components a new grinding plant state of the art. The plant was completed with our gravimetric mill feeding control system and several other modifications. Now this one plant with one operator produces the same material range and output as it was made before by three plants with three operators. The remaining components which have been no more needed also have been overhauled by us and delivered to other customers.

Complete Plant:

Gravimetric Sensor for Mill

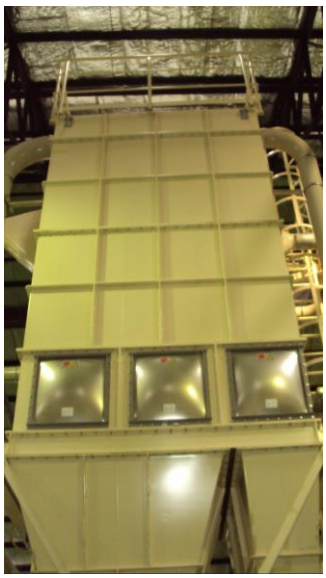
Control Board (totally new)

Graf Processing Systems

Turbo Mill Plant

Based on our turbo whirl mill UTM 800 we have built a versatile grinding plant for various herbal and vegetable raw materials. The plant also can process dust explosion dangerous material due to its pressure proof design. Capacities depending on material and fineness: 500-2000 kg/h. The plant can be extended with a sieving machine so that several final product qualities can be produced simultaneously.

Filter with pressure relief doors



Mill UTM 800

Graf Processing Systems

Classifier mill plant

Fine grinding plant for industrial mineral powders. Main component of the plant: classifier mill. Due to the limited available space at site the plant had to be designed in very compact way.

Mill

Ventilator

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Cryogenic grinding system

Fine grinding plant for spices and other herbal raw materials.
To avoid any loss of flavoring substances during the grinding process the plant is operated with liquid nitrogen. (cryogenic grinding). The material collection containers are connected dust-tight directly to the plant. This also guarantees that no condensation moisture can occur inside the material

Container-Docking-Station

Cryogenic Cooler

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Processing system for refuse derivated fuel (RDF)

Turnkey processing system for operating an asphalt hot mixing plant with RDF based on wood waste. The plant includes:
1. The material feeding station with underground bunker for tilting in of complete truck loads.
2. Complete processing line with mill and separation units
3. Final material silo with pneumatic feeding system to the burners:

Our customer operates the first asphalt mixing plant in Central Europe which is operated without burning of fossil fuels

Mill

Pneumatic feeding system to the burners

Graf Anlagenbau

Custom Processing

Graf Anlagenbau can offer you custom processing services for bath sizes from 5 kg upto real pilot production range with several 100 tons.
Also cryogenic grinding with liquid nitrogen cooling is available

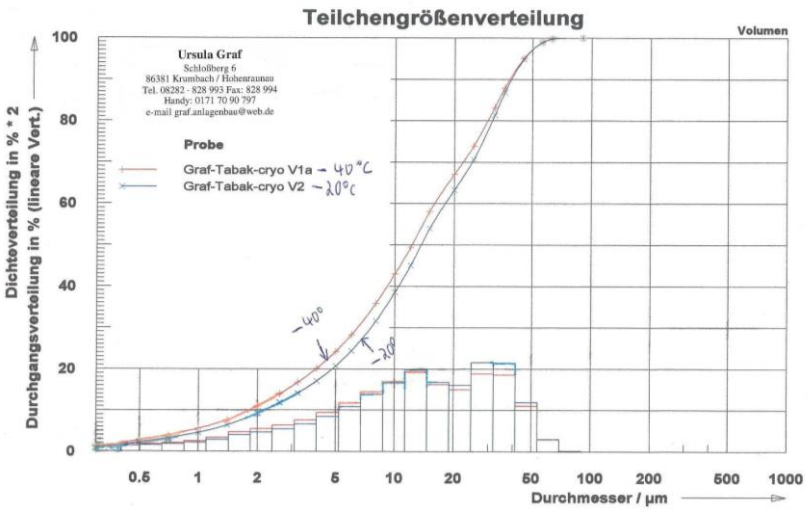
Product handling, packing and commissioning as well as transport can be included in our service package.

Available systems in our custom processing center:

- Knive mill; Granulator
- Hammer mill
- Pin mill
- Universal mill
- Whirl mill
- Turbo air classifier
- Classifier mill
- Jet mill
- Several screening machines
- Zig- zag classifier
- Laboratory mill
- Cryogenic grinding plant
- Particle size analysis with air jet sieve and laser granulometer CILAS

Cryogenic mill

Test report



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Service

Our service-range includes:

- Complete plant design starting from the first basic lay-out until the final plant design with final acceptance drawing.
- Delivery
- Erection
- Training of operators
- Commissioning and test run
- Spare parts service

Furthermore on demand

- Assistance for issuing of documents for approval procedures (ATEX-certificate etc)
- Maintenance contracts
- Project management, project co-ordination with other suppliers of your project
- Tests; custom processing, particle size analysis

Service-Hotline: 0049-171-7090797