



# CARBON BLACK

*State-of-the-art technologies for nearly grit-free product*



**HOSOKAWA  
MICRON GROUP**





» *Technical Center of  
Hosokawa Micron Powder Systems, USA*

*The Hosokawa Micron Group offers innovative technology with customized solutions, all from a single source. With more than 120 years of experience in powder processing, we can deliver the highest quality machines for your plant and product safety. Customers all over the world trust in our technologies and in the know-how of our experts.*

**» REPRODUCIBLE AND RELIABLE  
CARBON BLACK SOLUTIONS**

**» PROCESS TECHNOLOGIES THAT  
PRODUCE A HIGH QUALITY END PRODUCT,  
NEARLY GRIT-FREE**

**» IMPACT AND JET MILLING WITH  
INTEGRAL CLASSIFICATION**

**» IMPLEMENTATION TO MEET LOCAL  
MACHINE AND SAFETY REGULATIONS  
IN EVERY REGION OF THE WORLD**

# FOUR TIMES THE COMPETENCE

*We create synergies*

The Hosokawa Micron Group, headquartered in Japan, has various locations around the world. Our worldwide competence centres have combined their know-how to offer you customised process technologies for optimum solutions. With years of experience in the processing of carbon black, we are a market leader in the development, design and manufacture of powder and particle processing machines and systems for grit reduction, classification, size reduction, compaction and drying. With its wide range of particle processing technologies, the Hosokawa Micron Group continues to set trends and standards in particle processing.

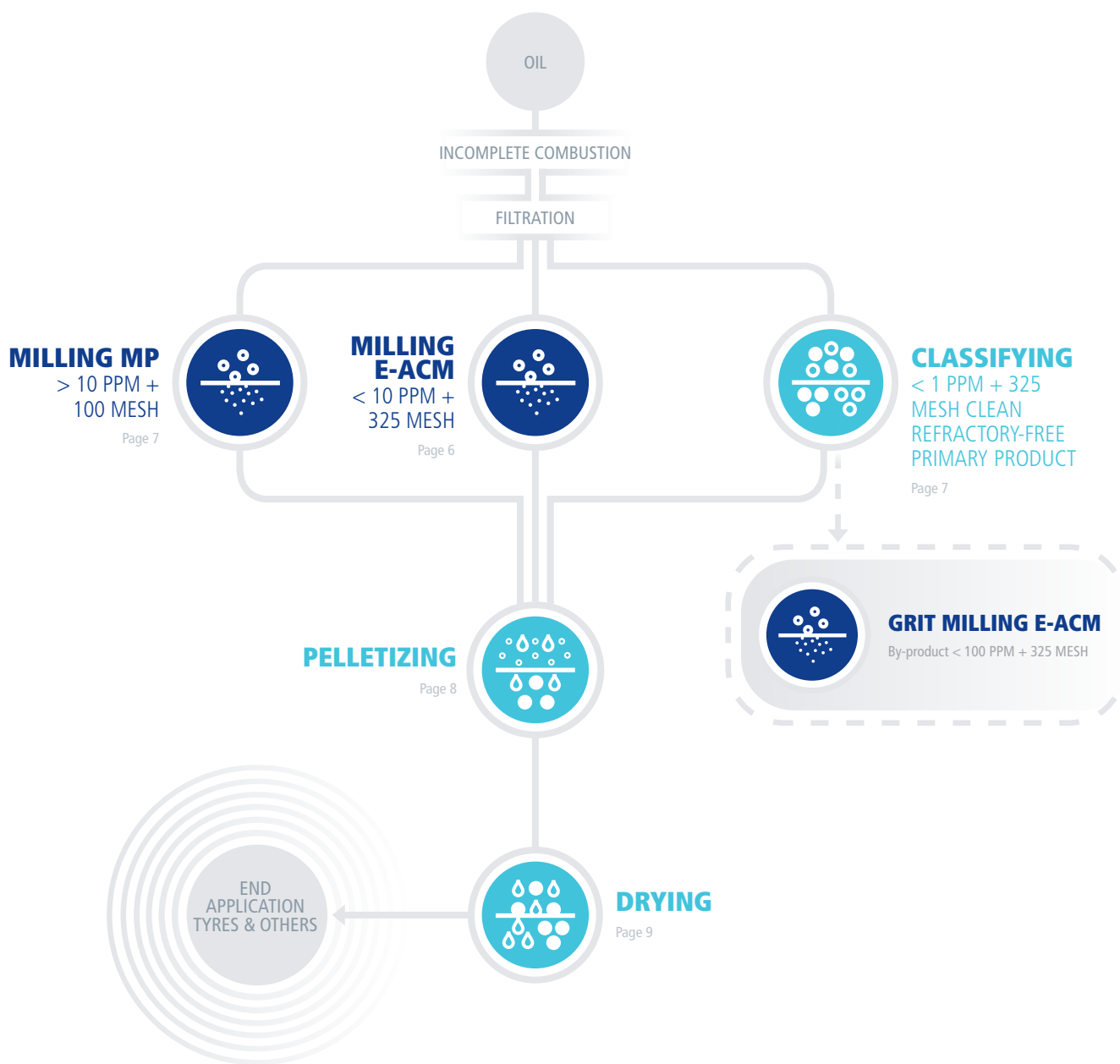




# CARBON BLACK

Carbon black is produced by the incomplete combustion of petroleum-based materials. With its high surface area-to-volume ratio, carbon black is primarily used as a reinforcing filler and colorant for automotive tires and other rubber products. It is also used as a pigment and wear protection additive in plastics, paints and inks. A common occurrence from this process is the formation of either carbonaceous or refractory particles much larger in size than the nano-sized carbon black particles, i.e. grit. For further refinement of the

end product, the Hosokawa Micron Group offers state-of-the-art process-technological solutions in the form of classifier mills that employ application-specific state-of-the-art mechanical impact and classification mechanisms. We offer you solutions to either reduce the size of the grit particles, or to remove the refractory grit particles by classification techniques. In any case, our technology produces nearly grit-free carbon black products that offer superior performance characteristics for specialty grade applications.





# MILLING

*Clean, low grit product*

The Mikro E-ACM air classifying mill is specially designed for the grit reduction of carbon black. The internal parts and geometry of the grinding and classification sections have been modified to meet the particle characteristics and quality specifications of carbon black. The Mikro E-ACM is unique in the fact that it has an internal classification and external coarse recirculation, ensuring that 100% of the material is returned to the grinding chamber for more efficient size reduction.

## YOUR ADVANTAGES

- Reduces grit levels as low as < 1 PPM + 325 MESH
- Can be installed in existing reactor lines
- Operates in gas streams up to 200 °C
- Available sizes from 10 HP to 300 HP
- Capacities up to 10 t/h
- Even lower cost grades of feedstock can be used to produce clean, high quality carbon black

➤ Mikro E-ACM: energy efficient and economical to operate



**SPECIFIC REQUIREMENTS FOR EACH DEMAND**

CB Grade	Product +325 Mesh [ppm]
Specialty Grade	≤ 2 PPM
N220	≤ 2 PPM
N326	≤ 5 PPM
N330	≤ 5 PPM
N339	≤ 5 PPM

CB Grade	Product +325M [ppm]
N550	≤ 10 PPM
N650	≤ 15 PPM
N660	≤ 15 PPM
N774	≤ 15 PPM

## TECHNICAL SPECIFICATIONS E-ACM

MIKRO E-ACM MODEL	ROTOR POWER HP (KW)	CLASSIFIER POWER HP (KW)	MAX. ROTOR SPEED (RPM)	NOMINAL AIR FLOW (NM3/H)	SIZE FACTOR	APPROX. DIMENSIONS L X W X H (CM)	WEIGHT (KG)
15 E-ACM	10 (7.5)	1.5 (1.1)	7.000	850	1	112 x 76 x 142	590
40 E-ACM	30 (22)	5 (3.7)	4.600	1.650	3	137 x 76 x 200	1.179
100 E-ACM	100 (75)	20 (15)	3.000	5.700	10	218 x 132 x 265	2.858
150 E-ACM	150 (110)	25 (18.7)	2.500	8.500	15	229 x 147 x 265	3.402
250 E-ACM	250 (187)	50 (37)	2.000	14.200	25	310 x 159 x 370	7.938
300 E-ACM	300 (224)	50 (37)	2.000	17.000	30	318 x 173 x 380	11.340



# MILLING & CLASSIFYING

### Standard grit reduction

In the production of carbon black, the Mikro Pulverizer Hammer & Screen Mill pulverizes the grit particles, creating finer particle sizes and reducing the carbon black's grit levels to 100 to 200 PPM +100 MESH.

#### YOUR ADVANTAGES

- › Laboratory (1 HP) to production (300 HP) available
- › Process 250 g batches up to 15 t/h
- › Air swept design installed downstream of the reactor



› Mikro Pulverizer: compact design, easy to operate and clean

The Micron Separator is a dynamic air classifier that separates fine and coarse particles by centrifugal aerodynamic force of a rotating rotor and airflow that carries particles through the rotor. For carbon black, grit free product and high capacity can be achieved. The Micron Separator has various references and varieties of production size for non-grit carbon black.

#### YOUR ADVANTAGES

- › Feed: #100 on 30 – 70ppm, #325 on >150ppm
- › Product: #100 on <1ppm, #325 on <10ppm
- › Feed rate 2.500 kg/h, Product yield ~80 %



› Micron Separator





# PELLETISING & DRYING

*Easy to handle, dry and stable*

The pelletising systems from Hosokawa Micron B.V. first of all consist of a mixer to mix the finely ground carbon black together with the binding solution. After mixing, the wet carbon black pellets need to be dried in order to produce easy-to-handle, dry and stable pellets.

## **MARS MINERAL PIN MIXER**

The Mars Mineral Pin Mixer is a horizontal high intensity pin mixer. Here, the carbon black is agglomerated by mixing it with the binder (usually water). This is supplied by a precise binder feeding system. The pin mixer produces strong, dense and spherical pellets.



➤ Mars Mineral Pin Mixer

## **DRYING**

After the mixing is complete, the drying process takes place in a specially designed fluidised bed dryer directly under the mixer. This ensures that all the moistened carbon black falls freely into the fluidised bed. The dry carbon black can also be cooled in the last section(s) of the fluidised bed.

The mixing and drying processes are continuous and can be tested at the test centre of Hosokawa Micron B.V. in Doetinchem, the Netherlands.

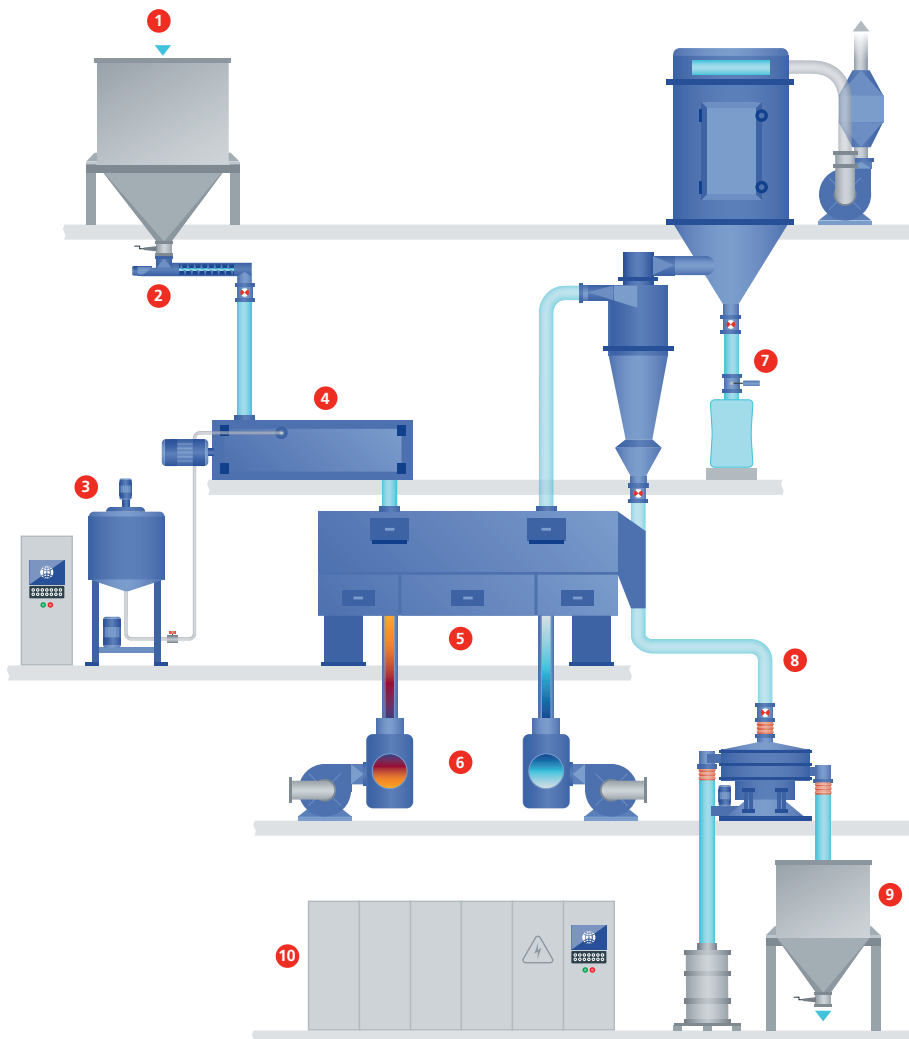


➤ Fluidised bed dryer



# TECHNICAL SPECIFICATIONS

	DIAMETER	CAPACITY (m <sup>3</sup> /h)
12D54Li	12"	1
16D80Li	16"	2.5
20D90Li	20"	5
22D90Li	22"	6
26D100Li	26"	10
30D120Li	30"	15.5
40D160Li	40"	36.5



- 1 Powder storage
- 2 Powder dosing
- 3 Binder preparation and dosing
- 4 Mars Mineral Pin Mixer
- 5 Schugi fluid bed dryer and cooler
- 6 Air preparation system including heating/cooling
- 7 Air exhaust system including cyclone and filter
- 8 Product classification (and crusher)
- 9 Big bag filling station
- 10 Integrated system and process controls



# PLANT DESIGN

## *Explosion protection*

Because handling flammable dust is always associated with the risk of explosion, the EU directives stipulate exactly how these materials are to be handled. When planning systems for operation with potentially explosive materials, close cooperation between the user and the manufacturer is essential. Together with the customer, the Hosokawa Micron Group prepares an ignition source analysis for the entire system

### **PRIMARY EXPLOSION PROTECTION**

- Avoidance of explosive atmospheres
- Avoidance of ignition sources
- Use of ex-protected components
- Machines and safety systems according to ATEX-guideline 2014/34/EU for use in dust explosive areas

and then takes the suitable measures to ensure that the equipment meets the equipment category assigned to the zone in question. In case an inspection by a so-called notified body is necessary, Hosokawa Micron Group has the corresponding type examination certificate for all relevant product lines.

### **SECONDARY EXPLOSION PROTECTION**

- Pressure-shock-proof design
- Pressure relief
- Explosion suppression systems

## *Hosokawa Micron Viblette VBL-F*

VBL-F is optimized for wet sieving of powder materials with vibration and water showering to achieve shorter sieving times and cleaner residue. For sticky/ultra-fine powder, the ultra-sonic vibration model can be used in the production of carbon black. Although ASTM-D1514 is applied, VBL-F has a much shorter sieving time and therefore makes it easier to treat a bigger amount of sample.



➤ Viblette VBL-F





## ADVANTAGEOUS SYNERGIES

The know-how and experience of numerous specialists are pooled in the Hosokawa Micron Group to produce perfect solutions. Experience from a variety of customer segments in mechanical process engineering ensures that you, as the manufacturer, enjoy optimum solutions for practically every product – from an individual component to an entire plant.



## INNOVATIVE TEST CENTRES

Our research and testing facilities can provide you with a wealth of machines and complete systems for the most varied plant configurations, all available on a global level. Precision, quality and innovative technologies: Do your testing with us.



## YEARS OF EXPERIENCE

Profit from our many years of experience in the provision of solutions and our mastery of sophisticated processes. Well-known customers all over the world place their trust in the technology and know-how of the Hosokawa Micron Group.



## GLOBAL SERVICE

Our service teams take care of repairs and maintenance, both on site and in our modern workshops equipped with the latest technology – smoothly, speedily and all around the world! The Hosokawa Micron Group – a partner you can rely on. Find out for yourself, you're sure to be impressed.



## RENTAL AND USED MACHINES

With the sale and rental of used machines, Hosokawa Micron Group enters a new customer segment. We can offer shorter delivery times with attractive conditions and the usual Alpine quality.



# **HOSOKAWA**

## **MICRON GROUP**

### ***HOSOKAWA ALPINE AG***

Milling | Classifying | Compaction

Peter-Doerfler-Strasse 13 – 25  
86199 Augsburg  
Germany

Phone: +49 821 5906-402  
chemical@alpine.hosokawa.com

[www.hosokawa-alpine.com](http://www.hosokawa-alpine.com)

### ***HOSOKAWA MICRON B.V.***

Mixing | Drying | Agglomeration

Gildenstraat 26  
7005 BL Doetinchem  
Netherlands

Phone: +31 314 373-333  
cmm@hmbv.hosokawa.com

[www.hosokawa-micron-bv.com](http://www.hosokawa-micron-bv.com)

### ***HOSOKAWA MICRON CORPORATION***

Group Headquarters | Milling | Classifying

1-9, Shodaitajika  
Hirakata-shi Osaka 573-1132  
Japan

Phone: +81 72 855-2224  
inquiry@hmc.hosokawa.com

[www.hosokawamicron.com](http://www.hosokawamicron.com)

### ***HOSOKAWA MICRON POWDER SYSTEMS***

Contract manufacturing | Fine Size Reduction | Classifying

10 Chatham Road  
Summit, NJ 07901  
USA

Phone: +1 800 526-4491  
help@hmps.hosokawa.com

[www.hmicronpowder.com](http://www.hmicronpowder.com)

Subject to change without notice.

All of the data in this project is purely informative and is not binding.

Our offers are decisive for the order.

© Hosokawa Alpine 2022.

0206-EN-2022-08\_Virgin-Carbon-Black