Benda-Lutz[®] Aluminium Powders & Pastes

who can create durable and sustainable building materials?

you can.

working for you.







If you want to go far, you have to get close. At Sun Chemical we pay attention to the details, take pride in innovation and sense our deep responsibility to the environment. To supply our customers with the best possible ingredients for their product is our primary goal.

The Benda-Lutz[®] Aluminium Powder, Flakes and Pastes portfolio is part of DIC/Sun Chemical Group with its headquarters in Tokyo, Japan. With representatives all over the world, we are best known for our customer service and care.

Our products satisfy the most exacting demands namely those of our customers. From development to delivery, we accept no compromises in regard to quality, handling convenience and environmental sustainability. We at guarantee top quality management in all areas and at every stage to fullfill our customer's high demands.

Conducting intense research, implementing improvements persistently, paying close attention to the finest details while not loosing sight of the overarching goals - all this has brought us a long way. We are proud to work closely together with our trusting customers all around the world.

History and Tradition.

For more than 110 years now, customers recognize the Benda-Lutz[®] portfolio as the best products for powder coatings, autoclaved aerated concrete (AAC), plastics, paints, printing inks, explosives and the chemical industry.

Tradition and continuity are the foundation upon which current and future success of Benda-Lutz[®] is based on. One thing has not changed since 1910, the first Benda-Lutz[®] product was manufactured: our expertsstand behind our products. They constantly strive to develop new products and processes to make good things even better.



A striking difference - your advantage with Benda-Lutz



- Specialized products optimizing AAC qualities
- In-house AAC application and R&D lab .

- dry waste reduction •
- shorter cutting time •
- **Optimized machine efficiency**

Introduction

An important feature of our products is the raw material used for their production. It is primary aluminum with a minimum purity of 99.7% in the form of atomized aluminum with the highest quality additives. Using our products. AAC manufacturers can reduce the consumption of aluminium up to 10% compared to other suppliers' products.

Our Sales Team along with our R&D department and in close co-operation with the plant technologist are able to design special products tailored to our customers' specific requirements. Marked with special suffixes like "A", "CS", "D" e.g. 5-7390/70 A, 5-6380 CS, etc., these special aluminium products may be characterized by a modified start of aluminium reaction, enhanced flowability, modified pore structure or decreased AAC casting viscosity. The properties of our special products combined with the experience of our AAC technological advisers may allow to reduce the cutting time and the consumption of process water or binders (lime and cement).

All our products are manufactured with the use of a unique continuous dry milling technology, which allows us to keep parameters of reproducibility and maintain a high content of active aluminium. After the milling process, our powders are mixed in controlled conditions. It ensures safe handling and the highest homogeneity. During the production of paste, powders are mixed with a carrier solvent (Diethylene Glycol). It is also possible to use a wide range of additives effecting the paste parameters.

Advantages of Benda-Lutz[®] Aluminium Powders and Pastes as a Raw Material for AAC

During the production of AAC, milled sand + lime + cement + gypsum and water are mixed. Then, aluminium is added to the AAC slurry as an expanding/blowing agent, mixed several seconds and poured into a mould where it grows and hardens as the so-called "green cake". In some technologies fly ash can be used as well. The cake rising process in the mould is caused by an exothermic chemical reaction of aluminium with Ca(OH), and H₂O from binders (lime, cement, fly ash) and pores are created by blowing hydrogen.

$$2AI + Ca(OH)_{2} + 6 H_{2}O --> Ca[AI(OH)_{4}]_{2} + 3H_{2}$$

The green cake is cut into blocks or panels of the dimension suitable for the building industry and put into an autoclave to harden due to pressure and temperature inside the autoclave.

Aluminium in the form of flakes of D50 20-100 microns and thickness around 1 µm (lamellar structure) is very reactive and allows for gas bubbles formation, distributed very homogenously in AAC.

Microscopic image of aluminium flake. The high specific surface area of our aluminium flakes provides high reactivity.



Our quality control takes care, that every batch of our production meets the fine tuned parametres we set ourself as a standard.

In order to choose the right product, it is very important to consider various parameters and their influences on each other. We are more than happy to help you in evaluating the best product for your process.



Narrow and Broad Particle Size Distributions in Comparison

Aluminium Powders

BULK DENSITY – this parameter is determined by grinding degree, thickness and shape of aluminium flakes and particle size distribution.

WETTABILITY IN WATER – this property tells about dispersability of aluminium powder in water.

PARTICLE SIZE DISTRIBUTION – describes the aluminium particle fineness. Determined by laser granulometry.

D10 = 10% of particles are below given value D50 = median of flakes particle size distribution. 50%

of particles are below the given value D90 = 90% of particles are below given value

ACTIVE ALUMINIUM CONTENT - shows the amount of aluminium in the finished flake.

GAS EVOLUTION – characterizes the speed of reaction of aluminium flakes with Ca(OH), and H₂O.

WATER COVERAGE - describes the surface area of water covered by 1 gramm of non-wettable aluminium flakes. Together with PSD it gives an idea about the thickness of the flakes.

Aluminium Pastes

CARRIER SOLVENT – type of solvent in aluminium paste.

SOLID CONTENT – amount of aluminium powder content in paste.



Gas Evolution of Benda-Lutz® Powders and Pastes

Benda-Lutz[®] Aluminium Flakes for AAC

5-74XX and 5-73YY series flakes

non-wettable powders dispersible in water with addition of a wetting agent. This type of powders is typically applied in tank dosing systems where high stability in water suspension is important. The prepared suspension guarantees high dosing uniformity and reproducibility during the entire production shift without undesirable, too early hydrogen evolution in the tank.

		5-7305	5-7330	5-7345	5-7346	5-7347	5-7348	5-7350	5-7375	5-7390
active aluminium content [%]		≥ 95	≥ 94	≥ 93	≥ 93	≥ 93	≥ 93	≥ 93	≥ 92	≥ 92
water coverage [cm²/g]		ca. 3500	4100- 5000	5000- 6000	6000- 7000	7000- 7800	7800- 8500	ca. 7300	ca. 11000	ca. 12000
particle size distribution [µm]	D10	35-45	25-28	~ 26	~ 21	~ 19	~ 18	17-22	9,5-12,5	7-9
	D50	110-120	67-77	~ 70	~ 60	~ 52	~ 50	50-54	27-33	18-20
	D90	239-272	140-160	~ 150	~ 128	~ 112	~ 110	102-119	60-72	38-50
Bulk density [g/cm³]		0,13	0,20	0,17	0,16	0,15	0,14	0,16	0,16	0,19
Suggested application in AAC density class		heavy								_ light

		5-7444	5-7450	5-7460	5-7465	5-7473	5-7475	5-7490
active aluminium content [%]		≥ 90	≥ 90	≥ 90	≥ 90	≥ 90	≥ 90	≥ 90
water coverage [cm²/g]		5000-8000	5000-8000	5000-8000	5000-8000	5000-8000	10000- 11000	10000- 11000
particle size distribution [µm]	D10	21-27	20-23	15-18	15-18	14-17	11-13	7-10
	D50	55-60	50-55	45-50	37-45	32-35	25-30	20-25
	D90	115-118	109-114	97-102	80-85	77-83	71-75	45-50
Bulk density [g/cm³]		0,16	0,17	0,18	0,19	0,20	0,20	0,20
Suggested application in AAC density class		heavy						light

5-63XX series flakes

wettable powders, easily dispersible in water. This type of powders is typically applied in single-batch dosing systems where fast dispersion in water is essential. Each setting of aluminium-water suspension can be steadily renewed and thus allows for high frequency of preparation. Only such readily dispersible powders offer a full benefit of this dosing technology.

		5-6315	5-6327	5-6355	5-6375	5-6380
active aluminium content [%]		≥ 93	≥ 93	≥ 93	≥ 93	≥ 92
	D10	28-35	23-30	16-21	11-16	8-13
particle size distribution [µm]	D50	87-93	68-77	45-52	30-36	22-30
	D90	185-222	140-155	93-112	65-73	48-58
Bulk density [g/cm ³]		0,19	0,19	0,17	0,17	0,17
Suggested application in AAC density class		heavy				light



Benda-Lutz[®] Aluminium Pastes for AAC

5-73XX/70 series pastes

with 70% aluminium powder content. This paste is made from 5-73XX non-wettable powders with Diethylene Glycol as carrier solvent. For this series a powder content of 75% is also possible on request.

		5-7305/70	5-7312/70	5-7344/70	5-7346/70	5-7350/70	5-7375/70	5-7390/70
active aluminium content in flakes [%]		≥ 94	≥ 93	≥ 92	≥ 92	≥ 92	≥ 91	≥ 91
particle size distribution [µm]	D10	28-38	26-34	20-25	15-23	15-21	9-12	7-9,5
	D50	103-113	87-94	60-65	51-60	47-53	27-33	18-22
	D90	212-245	194-220	127-147	113-127	99-114	61-74	39-50
Suggested application in AAC density class		heavy						light

5-74XX/YY series pastes

with a 75%, 80% and 85% (YY) aluminium powder content. This paste is made from 5-74XX non-wettable powders with Diethylene Glycol as carrier solvent.

		5-7442/YY	5-7448/YY	5-7458/YY	5-7463/YY	5-7468/YY	5-7470/YY	5-7488/YY
active aluminium content in flakes [%]		≥ 90	≥ 90	≥ 90	≥ 90	≥ 90	≥ 90	≥ 90
particle size distribution [µm]	D10	19-22	17-19	13-16	12-16	10-14	8-11	5-9
	D50	50-57	45-50	40-44	36-39	30-35	24-29	20-23
	D90	109-112	107-110	103-108	98-103	75-83	68-72	42-47
Suggested application in AAC density class		heavy						light

5-63XX/80 series pastes

with a 80% aluminium powder content. This paste is made from 5-63XX wettable powders with Diethylene Glycol as carrier solvent.

		5-6327/80	5-6355/80	5-6375/80	5-6380/80	
active aluminium content in flakes [%]		≥ 92	≥ 92	≥ 92	≥ 91	
particle size distribution [µm]	D10	21-28	15-20	11-16	8-12	
	D50	68-77	45-52	30-36	22-30	
	D90	141-167	98-106	65-73	50-62	
Suggested application in AAC density class		heavy			light	



Contact us:

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Watch our company movie:



Cover photo: wall panels Bruk-Bet Thermalica®



quality service A partner who transforms with you.

Today's environment requires more than change. It demands transformation - and a partner who's willing to transform with you. Sun Chemical, a member of the DIC group, is a leading producer of printing inks, coatings and supplies, pigments, polymers, liquid compounds, solid compounds, and application materials. Together with DIC, Sun Chemical has over 20,000 employees located at 176 subsidiaries across 63 countries working every day to meet the needs of customers by improving performance on the essentials of business, such as reliable, on-time delivery and consistent product guality. Sun Chemical tailors solutions to unique customer needs and brings new ideas and the latest technology to market. As you move forward into a world of stiffer competition, faster turnarounds, more complex demands and sustainable products, count on Sun Chemical to be your partner.

working for you.

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