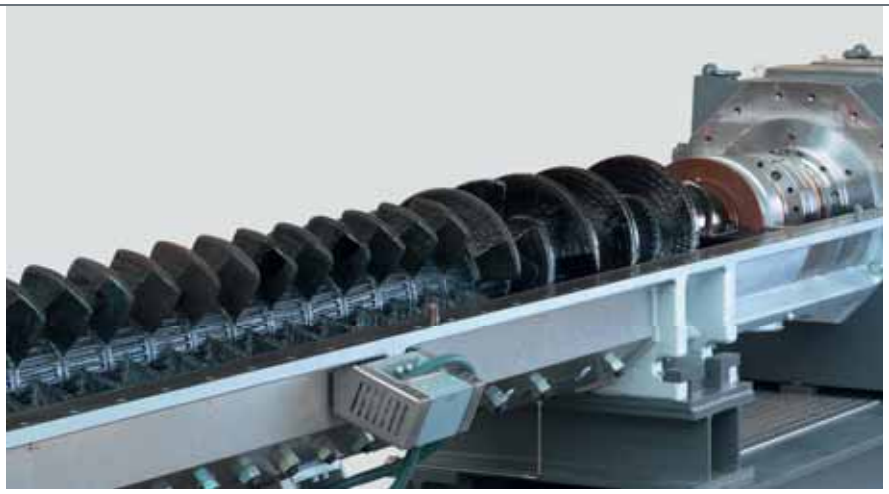
BUSS KNEADER TECHNOLOGY

BUSS Kneader Series KX

High-end mixing and kneading technology for the aluminium industry

BUSS
excellence in compounding



Process section KX 650 DT

KX Kneading element

New KX Kneader generation revolutionizes mixing and kneading of high-grade anode pastes

For nearly 60 years, the BUSS Kneader has been the benchmark for reliable and cost-effective mixing of anode pastes. Now Buss AG is proud to present a new Kneader generation, the KX series, designed for even more intensive mixing and microdispersion at considerably higher output rates.

It was in 1951 when Buss AG introduced the BUSS Kneader for the continuous production of carbon pastes. Based on its unique working principle, providing uniform shear rates for optimal dispersive and distributive mixing, the BUSS Kneader has become the standard for compounding green anode pastes.

While Buss AG had adapted screw speeds, torque and power to nearly double throughput rates over the years, the 3-flighted BUSS Kneader geometry basically remained unchanged. In the late nineties, it became obvious that the traditional screw geometry would inevitably reach its limits in view of the market requirements for greater capacities.

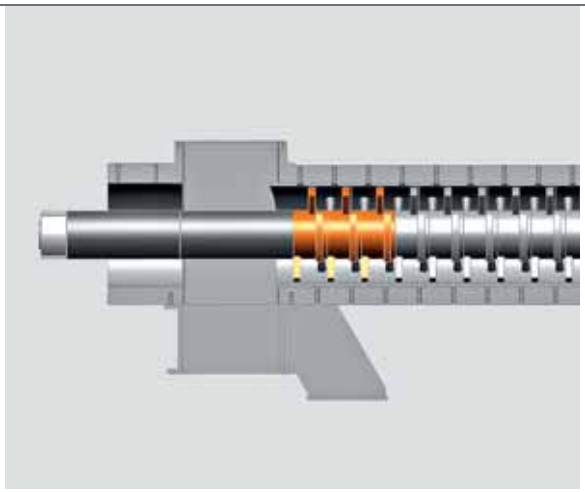
First, the development of a novel 4-flighted BUSS Kneader generation providing more intensive mixing, higher specific throughput and lower investment cost per machine diameter was driven by the plastics compounding industry.

New BUSS Kneader Series KX for anode pastes

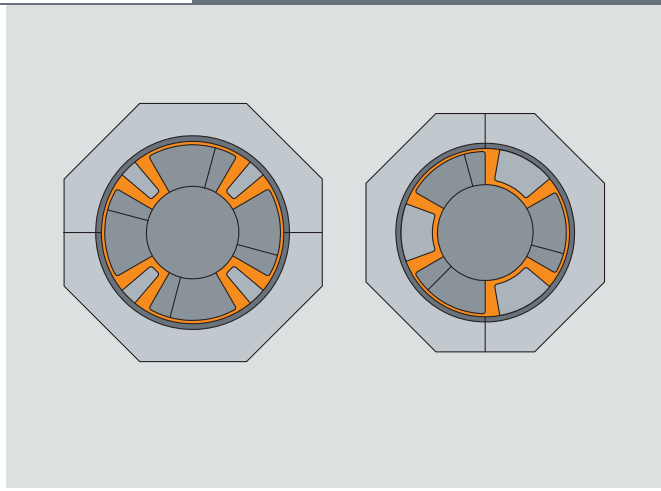
Nearly ten years after the successful introduction of 4-flighted screw technology – thereby doubling output rates and setting new benchmarks in terms of mixing efficiency – Buss AG undertook to adapt and enhance the proven solver-based math modelling tools for anode paste mixing.

The resulting 4-flighted KX geometry has the following main advantages over traditional 3-flighted technology:

- Up to 50% more throughput for the same machine size
- More intense mixing thanks to 33% additional shear surface
- Improved microdispersion due to 45% higher flow separation rate
- Bigger volumetric capacity



Dynamic throttling principle



Process zone cross section: 4-flight vs. 3-flight technology

Process aspects

The KX process zone is divided into four sections, each with a specific purpose and screw geometry:

Intake section
The intake section takes up the incoming coke and transports it into the process zone by feeding elements with continuous flights.

Transition section
In the transition section, liquid pitch is directly injected into the feedstock via drilled kneading bolts. At the end of this section, the screw profile changes from transport to mixing and kneading.

Kneading section
In the kneading and mixing section, the focus is on optimum mixing. Innumerable flow separations and reorientations with uniform shear rates ensure maximum homogeneity.

Dynamic throttling
Dynamic throttling is an innovative feature that replaces the flap-die used previously. Screw flights with reduced feeding effect slow down the mass flow to increase the filling degree in the kneading section, resulting in optimized mixing.

Key features and benefits of the KX series

- Improved anode quality thanks to 4-flight mixing technology and dynamic throttling
- Higher specific output per machine size
- Less maintenance cost due to shorter process zone and dynamic throttling
- Less investment, installation and maintenance cost through electrical heating and omission of hydraulic closing system
- Improved safety and user-friendliness through electrical heating
- Optimal mixing and pitch dispersion through injection of liquid pitch, preventing accretion and lumping at the same time
- No volatile emissions due to liquid pitch injection
- Improved accessibility through omission of external screw shaft bearing
- Shorter downtimes and improved service-ability
- Reduced space requirement due to shorter and more compact machine design
- Improved price/performance ratio in terms of investment, operating and maintenance costs

Technical data								
	Barrel diameter mm	Process length L/D	Speed max. rpm	Drive power kW	Output rates* tons/h	Overall dimensions Length mm	Width mm	Height mm
KX 540 DT	540	9,5	70	400	20 – 38	13 700	1900	1800
KX 650 DT	650	9,5	70	600	35 – 60	15 800	1900	1800
KX 750 DT	750	9,5	70	900	54 – 90	16 700	2000	1900

* continuous operation on a 24/7 basis

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