FEEDEX

High density exothermic feeder sleeves

VESUVIUS

FOSECO

Customer Requirements

Exothermic spot feeding technology

Industry trends

The need for high modulus spot feeders continues to increase as a result of:

- The development of more complex cast parts, with more isolated sections having no direct feed path.
- Increased mechanical requirements and more stringent as cast specifications.
- Growing pressure to reduce casting production costs, by maximizing casting yield and minimising post casting operations such as fettling.

High pressure greensand moulding

The primary use of FEEDEX sleeves is on modern high-pressure automatic greensand moulding lines which place extra demands on ram-up feeder sleeves.

These products must be able to withstand the highest moulding pressures, yet be simple and convenient to apply. FEEDEX sleeves provide the highest compressive strength resistance and can be applied easily using a wide range of application technologies.

Product Requirements

Exothermic Characteristics

In order to deliver the high modulus required for spot feeding, the exothermic properties of the FEEDEX material are key. Properties such as ignition time and burn rate have been optimised and adjusted for iron castings. A specific requirement of spot feeders is a high modulus to volume ratio. Feeders are required to provide long solidification times, but contain at the same time only small amounts of feed metal. The development of the FEEDEX recipe had to balance the exothermic characteristics to ensure the correct graphite micro-structure formation in ductile and vermicular iron alloys. The consistent performance of FEEDEX is assured by comprehensive tests of incoming raw materials and finished product.

Ease of Application

The most critical requirement for FEEDEX sleeves is the quick and easy application onto the pattern plate. A range of application technologies has been developed which allow the foundry to introduce FEEDEX sleeves without negatively impacting moulding line productivity.

FEEDEX Product Range

FEEDEX G, -V, -VS, -GK, VSK and VAK sleeves

Product Range Development

The comprehensive range of FEEDEX products reflects the technical and commercial requirements of the foundry industry.

Working closely with our customers drives our product development and optimisation programs, ensuring product performance is tailored precisely to casting needs.

1980s

G and V

In the early 1980s G and V-type sleeves were developed to allow a spot feeding on moulding lines where standard slurry formed sleeves failed due to insufficient strength and lack of application space.

1990s

VS

The requirements of moulding lines with highest moulding pressures introduced in the 1990s led to a further development. VS type FEEDEX sleeves were introduced in response to higher moulding pressures, and a need for smaller casting contact areas.

2000s

GK and VSK

The latest generation of GK and VSK type sleeves provides the simple application in conjunction with maximum benefits in terms of footprint area and cleaning cost reduction.

2010s

VAK

The new spot feeder concept combining the benefits of all V-type feeder generations.

2020s

FEEDEX V and G sleeves

Application

The initial use of G and V FEEDEX sleeves was on low pressure jolt squeeze green sand moulding lines. Depending on the application these geometries can also be used in high pressure moulding lines and in the poduction of jobbing iron castings. The jobbing foundries discovered the benefits of improved casting yield and minimised cleaning work which were already known by the automotive iron foundries.

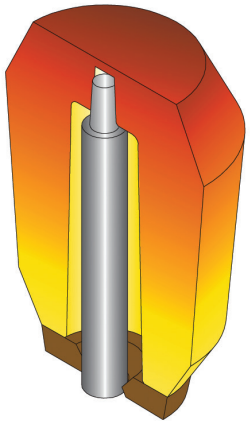
FEEDEX V sleeves can be applied either with a fixed pin or on a spring pin without a breaker core.

PRODUCT RANGE

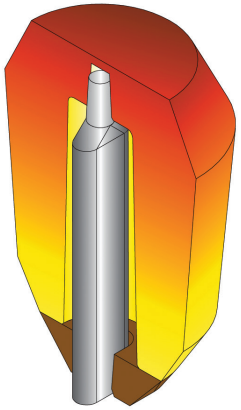
FEEDEX HD V8 (smallest)
- + Modulus – 0.75 cm
- + Cavity volume – 8 cm^3
- + Base footprint – Ø 3 cm / 7 cm^2

FEEDEX HD V2565 (largest)
- + Modulus – 5.2 cm
- + Cavity volume – 2565 cm^3
- + Base footprint – Ø 15 cm / 176 cm^2

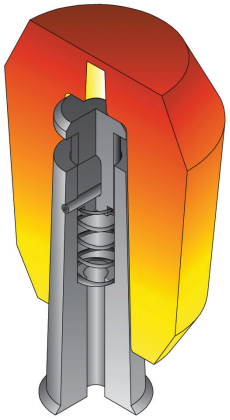
Supplied with and without breaker cores



Fixed DZ Type Pins for FEEDEX HD V Sleeves with Standard 10Q Breaker Cores



Fixed DZ Type Pins for FEEDEX HD V Sleeves with Standard 40Q Breaker Cores



Spring loaded DF Type Spring Pins for FEEDEX HD V Sleeves

Largest and smallest V and G FEEDEX sleeve

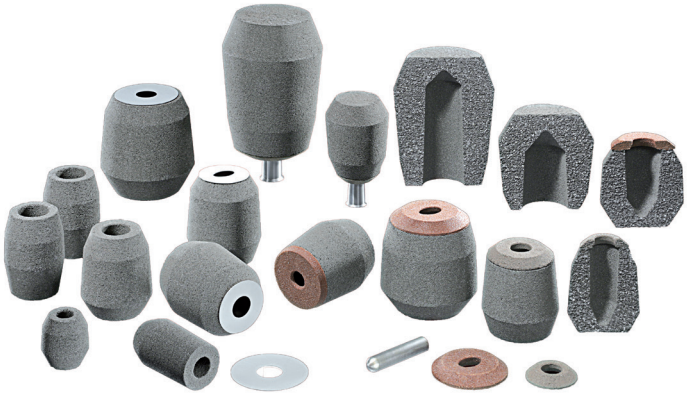
FEEDEX VS sleeves

Application

FEEDEX VS sleeves are used on low to high pressure green sand moulding lines. The fields of application are castings which require the smallest feeder footprint and contact area.

Like FEEDEX V sleeves they provide an optimized yield. In addition VS geometries provide a higher resistance to moulding pressures.

The optimised design facilitates ease of use as the sleeve is always self-centred when applied to the spring pin.



PRODUCT RANGE

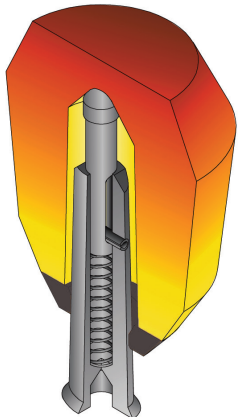
FEEDEX HD VS 10 (smallest)

+ Modulus – 0.85 cm
+ Cavity volume – 15 cm^3
+ Base footprint – Ø 3.8 cm / 11.3 cm^2

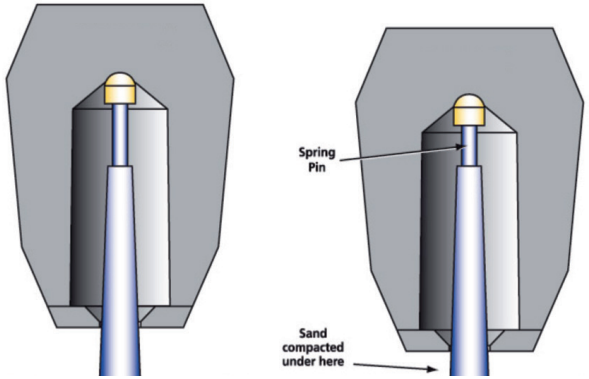
FEEDEX HD VS 770 (largest)

+ Modulus – 4.2 cm
+ Cavity volume – 756 cm^3
+ Base footprint – Ø 11 cm / 95 cm^2

Supplied with highly exothermic locator cores and standard sand breaker cores.



Spring loaded DF Type Pins for FEEDEX HD VS Sleeves with Exothermic Locator Core.



Before Moulding

After Moulding

Largest and smallest VS FEEDEX sleeve

FEEDEX K - VSK and GK sleeves

Application

FEEDEX VSK and GK sleeves are applied on high pressure green sand moulding lines, specifically those where FEEDEX VS sleeves reach their limits.

The cavity design of VSK is adopted from VS geometry, however in contrast to the VS design FEEDEX VSK sleeves do not require a spring pin, eliminating the need for maintenance of the locator pins.

The GK range with collapsible metal breaker cores was developed for use on castings with a higher metal volume demand.

PRODUCT RANGE

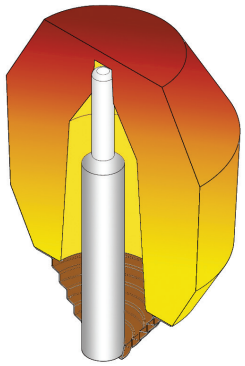
FEEDEX HD VSK 36/35 (smallest)

+ Modulus – 1.30 cm
+ Cavity volume – 30 cm^3
+ Base foot print – 2.27 cm^2

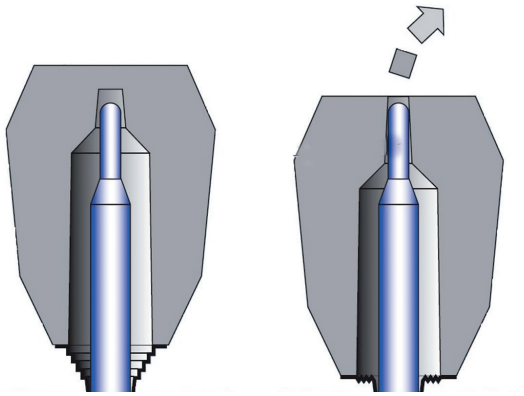
FEEDEX HD VSK 770/33 (largest)

+ Modulus – 4.1cm
+ Cavity volume – 720 cm^3
+ Base foot print – 7.1 cm^2

Supplied with collapsible metal breaker cores.

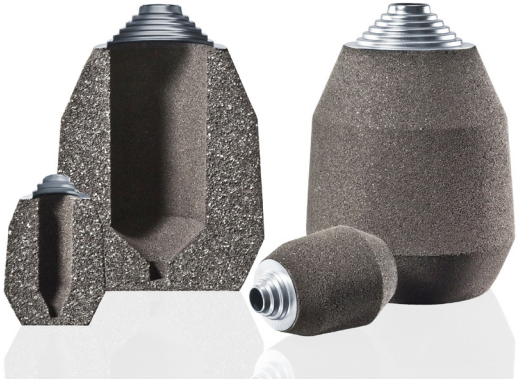


Fixed DZ Type Pins for FEEDEX HD VSK Sleeves with Collapsible Metal Breaker Cores



Before Moulding

After Moulding



Largest and smallest VSK FEEDEX sleeve

FEEDEX VAK sleeves

Application

FEEDEX VAK sleeves are applied on high pressure green sand moulding lines.

Like VSK sleeves the cavity design is adopted from VS sleeves to ease the application.

After full compaction the majority of the metal core is in direct contact with the highly exothermic sleeve materials, which increases the super-heating.

As a result, 50% less of the compressor core surface area is in contact with the moulding sand (compared to VSK - sleeves).

PRODUCT RANGE

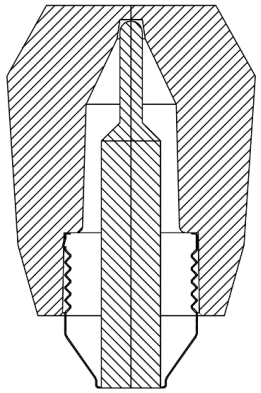
FEEDEX HD VAK 22/61 (smallest)

+ Modulus – 1.20 cm
+ Cavity volume – 22 cm^3
+ Base foot print – 3,8 cm^2

FEEDEX HD VAK 339/61 (largest)

+ Modulus – 3.20 cm
+ Cavity volume – 283 cm^3
+ Base foot print – 7.1 cm^2

Supplied with collapsible metal breaker cores.



Fixed DZ Type Pins for FEEDEX HD VAK Sleeves with Collapsible Metal Breaker Cores

Before Moulding

After Moulding

Largest and smallest VAK FEEDEX sleeve

FEEDEX Product Range

Features / Benefits

Increased Strength

The FEEDEX product range provides 5 times higher compression strength in comparison to slurry formed products. This enables effective use in ram-up applications on moulding lines with highest moulding pressures.

	Modulus [cm]	Cavity Volume (cm³)	Compressive Strength [%]	Sleeve Weight [%]	Density [%]
KALMIN KSP 7/10K	1.8	300	100	100	100
KALMINEX 2000 ZP 6/9K	1.7	180	132	136	132
KALMINEX XP 2000 6/9K	1.7	180	306	136	132
KALMINEX SD 6/9K	1.7	180	306	227	170
FEEDEX HD V88	1.7	80	919	527	302

Optimized yield

By the application of FEEDEX V – shape geometries the feeder weight is reduced by 90% in comparison to a sand riser with equivalent modulus.

	Sand riser	Exothermic-insulating sleeve	High exothermic spot feeder
Weight (KG)	8.2	2.1	0.82
Weight (%)	100.0	25.6	10

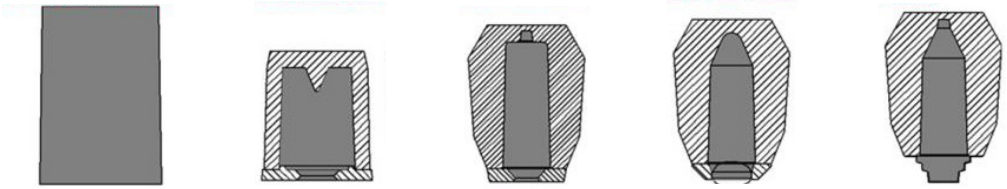
Customisation

To satisfy customer needs and requirements, the FEEDEX product range has been continually extended and now includes more than 1,200 different articles. Both sleeve and breaker core designs can be tailored to suit individual applications, offering the foundryman an optimised solution every time.

Special FEEDEX sleeve and breaker core design

Reduced footprint and contact area

Through the process of continual development, contact area, footprint on the casting and cleaning times have been reduced.



Sleeve design	Sand riser	Exothermic insulating insert Sleeve P 6/9K	Highly exothermic spot feeder with silica and breaker core	Highly exothermic spot feeder with exothermic locator core	Highly exothermic spot feeder with collapsible metal breaker core
Footprint area [%]	100.0	85.8	38.1	5.5	3.5
Contact area [%]	100.0	7.6	3.6	5.0	2.8

Foseco International Limited
PO Box 5516, Tamworth, Staffordshire,
England B78 3XQ,
Phone:+44 1827 262021
www.foseco.com

Please contact the Foseco Foundry Division of your local Vesuvius Company.

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