



NEW FEEDEX K TECHNOLOGY - VAK

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The requirement for cast parts with thinner wall sections and a more complex design is a continuous trend in the foundry market. This leads to castings with more isolated sections and as a result the requirement for spot feeding.

This article describes the incremental development and optimisation of the ram-up sleeve application technology using a patented collapsible metal breaker core design. The latest development is the result of a consequent implementation of experiences made in the area of spot feeding on high pressure moulding lines.

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INTRODUCTION

In the last 40 years the development of spot feeding concepts was driven by the individual technical requirements of foundries. Changes in the production process of foundries resulting for example in higher moulding pressures had to be covered with adapted spot feeder sleeve designs.

Process cost pressure and increasingly complex casting designs demanded by the end customers influenced the market for reduced feeder contact and footprint areas. As a result, solutions which gave the lowest fettling and cleaning costs, in combination with optimised yield were developed.



Figure 1: Product range of spot feeders with collapsible breaker core

DEVELOPMENT OF COLLAPSIBLE BREAKER CORES

In 2004 a new generation of spot feeders was launched, which addressed the foundry demands (Fig. 1).

The concept of a collapsible metal breaker core provides two key advantages:

- The moulding pressure is partly absorbed by the collapse of the metal breaker core and compaction of the moulding sand beneath it, enabling this concept to withstand higher moulding pressures than other conventional solutions.
- The feeder neck height is reduced during moulding, this helps to ensure that the feeder neck remains open until after the casting solidifies (Fig. 2 – Right).

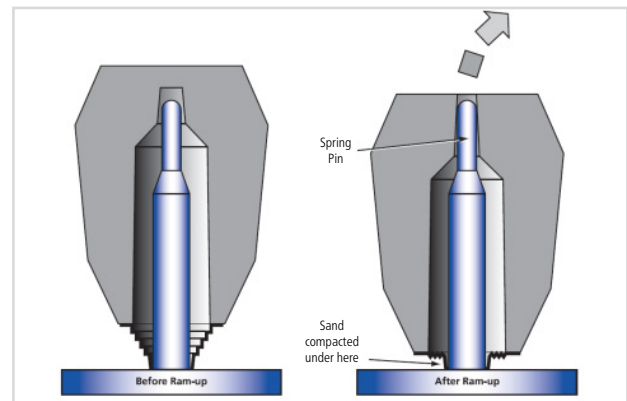


Figure 2: Sleeve and metal breaker core before and after compaction



Figure 3: Application of FEEDEX VAK utilising the benefit of the smallest footprint area



IN THE LAST 15 YEARS THIS FEEDER SLEEVE PRODUCT RANGE PROVED TO BE A ROBUST SOLUTION FOR MANY DIFFERENT FOUNDRIES.

LATEST SPOT FEEDER DEVELOPMENT

A further development, which started in 2015, adopted the advantages of spot feeders with collapsible metal breaker cores such as consistent knock-off areas, constant feeder volume and excellent moulding results. The new design allowed the reduction of the breaker core metal wall section whereas these were still suitable for the use in high pressure moulding applications. The design has been modified from a stepped to a grooved design (Fig. 4).

The new sleeve concept allowed the combination of the metal breaker core with the feeder sleeve, without application of hot glue in a press fit operation. The breaker core itself rests on a small socket in the opening of the feeder sleeve. During moulding the grooved part of the metal core is compacted and the main feeder sleeve body is moving down towards the pattern plate, compacting the mould sand between sleeve and pattern plate (Fig. 5).

After full compaction the major part of the metal breaker core is super-heated by the high exothermic sleeve material. As a result, the metal neck surface in direct contact to the mould sand is reduced by 50% compared to the prior stepped design (Fig. 6).

Several field trials proved an equivalent or even better feeder neck pass-through performance compared to the existing concept with similar knock-off results (Fig 7).

Today FEEDEX VAK is a solution which is utilized in a high number of applications in the iron foundry industry.

CONCLUSION

The concept of collapsible metal breaker cores provides several key advantages such as consistent moulding results even with highest moulding pressures as well as reduced footprint and neck contact areas. Further developments resulted into an improved design providing excellent feeder neck pass-through characteristics. An extensive test program and field trials proved the technical validity of this concept.

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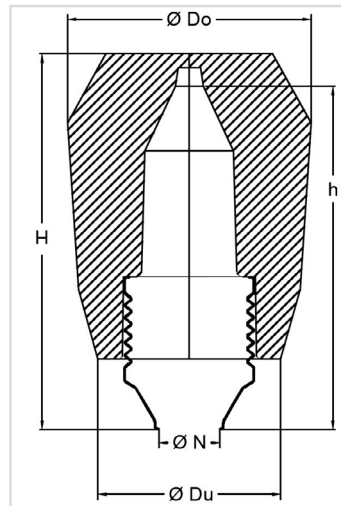


Figure 4: Principle sketch of new generation of collapsible metal breaker core together with spot feeder



Figure 5: New sleeve concept before and after compaction – typically 8 to 15mm distance between sleeve main body and casting



Fig. 6 : Comparison of new and conventional design after application



Figure 7: Knock off result with new spot feeder concept – sound casting with virtually no further fettling work required