

8. Uluslararası Döküm Kongresi / 8th International Foundry Congress by TUDOKSAD Academy In conjuction with Ankiros / Annofer / Turkcast fairs

### «MIRATEC<sup>™</sup> TS Refrakter Esaslı Boya İle İnklüzyonların Engellenmesi»

«MIRATEC™ TS Coatings For Reducing Residuals In Castings»

#### Reinhard Stötzel, Christian Koch, Lars Leineweber, İsmail Yılmaz, Hakan Kakaç (ASK Chemicals)

#### 4.Oturum: Döküm Teknolojileri Kalıp

4th Session: Moulding Technologies

Oturum Başkanı/Session Chairman: Bülent Şirin (Componenta Dökümcülük Tic. San. A.Ş.)



Oturumlarda yer alan sunumlar 3 Ekim 2016 Pazartesi tarihinde akademi web sayfasına (akademi.tudoksad.org.tr) yüklenecektir.



## ANKIROS 2016 MIRATEC TS-Concept Coatings For Reducing Residuals in Castings

Hakan Kakaç, Reinhard Stötzel, Christian Koch, Lars Leineweber



## WE ADVANCE YOUR CASTING

When developing any solution for our customers, we always keep a sharp eye on measurable returns that add value.

We provide premium products and services alongside technical application specialists – all of which reflects our distinct passion for quality and awareness towards environmental and safety issues.

In this way, we actively carry-out our claim: We advance your casting.



# ASK Chemicals Global Production – main production sites





## **ASK Chemicals Technical Service**

- 70 engineers with strong intercultural and technical expertise
- Global design service capabilities
- Two pilot foundries
- Excellent cooperation with foundry institutes, universities and machinery suppliers around the globe

Our international technical service teams always consist of local and international specialists





## Foundry product portfolio





## General benefits of coatings

- Improve casting surface
- Secure against many casting defects
- Reduce fettling and rework time
- Prevent unwanted chemical and/or thermal reactions
- Control metallurgical effects

Cores coated with MIRATEC TS-Concept; Source: Eisenwerk Brühl GmbH





## Description and purpose of coatings

Coatings are suspensions of refractory materials to prevend core and mold surfaces due to

- Smoothen the surface of castings
- Fill out porosious areas to prevent penetrating related defects
- Build up an thermal insulation againt molten metal to prevent thermalshock related defects
- Supress chemical reactions between molten metall/slag <> core/mold





## Description and purpose of coatings





## Examples of refractory materials





## Examples of refractory materials













## Layer thickness on core surface and impregnation characteristics





## Most of the foundries are technique driven, that means they requires:

Automotive Castings:	Wind Power, General Engineering:
Shorten Cycle Time	Shorten Cycle Time But "Green Technology" requires water based coatings
Less Casting Defects Veining, Scabbing etc.	Less Casting Defects (No grafite degeneration is a must)
Added Value Less residue in casting, Influence on grafite structure, Influence on cooling speed	Added Value High speed drying procedure, Less burn on / penetration, Less burn in /metallisation, Hybrid Technology



## ASK Coatings for automotive foundries

#### **Automotive Castings:**

**Shorten Cycle Time** 

Less Casting Defects Veining, Scabbing etc.

#### Added Value

Less residue in casting, Influence on grafite structure, Influence on cooling speed







## ASK Coatings for automotive foundries

#### **Reduction of Casting Defects**

- Veining, Scabbing etc.
- Test castings
- Refractory combination
- Properties of the dilution
- Sand mixture







## ASK Coatings for automotive foundries

#### **Reduction of Casting Defects**

Deep understanding of the defect leads to solving strategy



Casting surface



Reacted area







## Added Value for automotive foundries: MIRATEC TS-Concept

#### How it works

- Less residue in casting
- Influence on grafite structure
- Influence on cooling speed









Requirment as shown: adapted rheological behaviour!







Requirment as shown: adapted rheological behaviour!





**Example 1:** MIRATEC TS-Concept to reduce retaining residue

Assumption: OPTIMAL coated cores – independent of geometry – of this turbo charger housings





**Example 2:** MIRATEC TS-Concept to reduce retaining residue

Vehicle 4-cylinder block









**Example 3:** MIRATEC TS-Concept to reduce retaining residue

Vehicle block – Plus solved gas defects!





**Example 4:** replacement of expensive Special-Sand and pre-coating







# **Example 4:** replacement of expensive Special-Sand and pre-coating





**Example 4:** replacement of expensive Special-Sand and pre-coating

**Truck Cylinder Heads** 







Improvement of Fettling: Crankcases / Blocks

Casting	Fettling		Savings
	S	Miratec	
3-cyl. head SISU	8.57 min.	5.27 min.	38.5%
4-cyl. block DEUTZ 2009	34.00 min.	27.97 min.	17.7%
4-cyl. head DEUTZ 2009	13.87 min.	7.44 min.	46.4%

Casting	Brake	Savings	
	S	Miratec	
VW DISALINE	15%	5%	38.5%



## Process Efficiency with MIRATEC TS

Residue-free & flawless casting surfaces thanks to self-detaching coating

#### **Courtesy of Eisenwerk Brühl**

















## What can we do for you ?



© ASK Chemicals 2016



## Any questions ?



© ASK Chemicals 2016