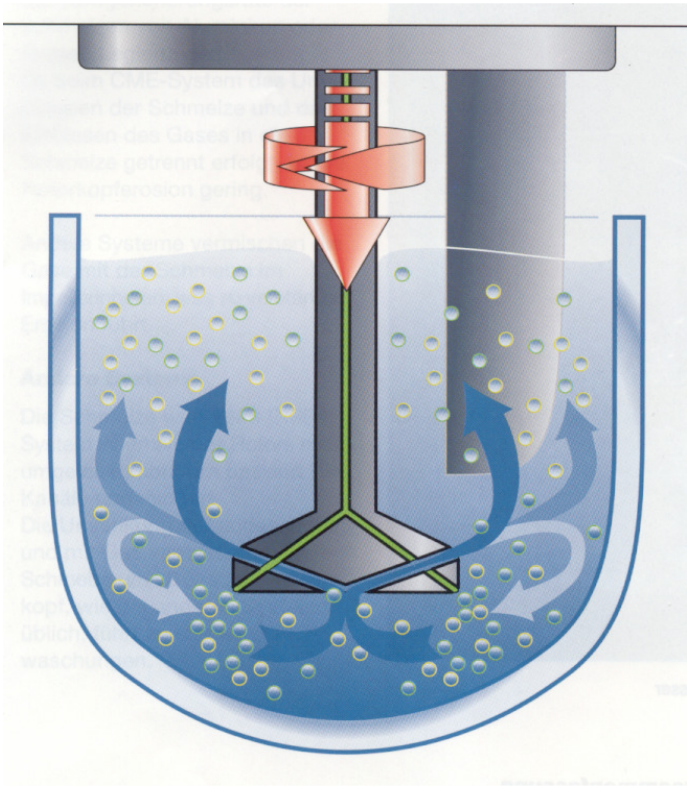

# GRAPHITE IMPELLER SYSTEM

# FOR TREATING MOLTEN ALUMINIUM

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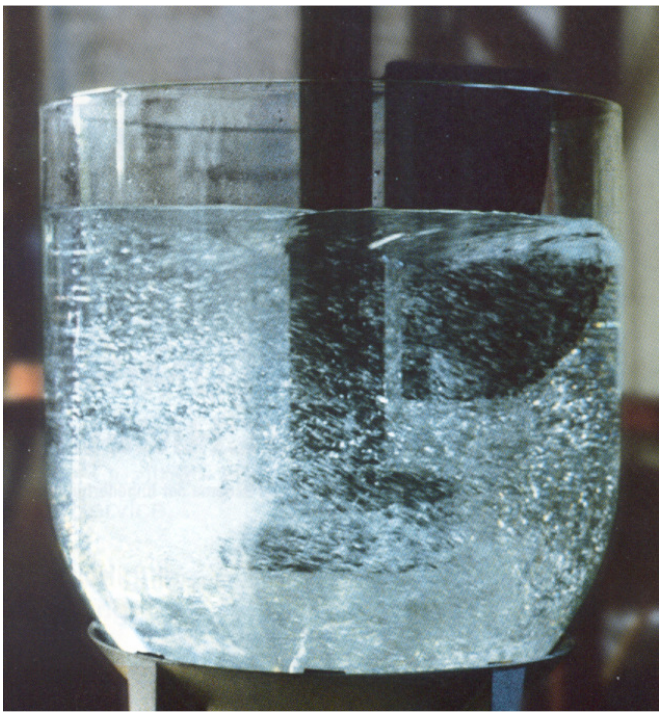
During the casting of aluminium and its alloys, it is well known that difficulties arise when dissolved hydrogen exists in the melt which leads to hydrogen gas porosity resulting in defects in the cast. These defects greatly reduce the strength of the castings and can cause blistering during the later rolling and annealing processes.

It is common practice to treat molten aluminium with a dispersed gas such as chlorine, nitrogen or argon, or a mixture of these gases, as a method of removing the hydrogen and solid impurities.

The standard practice for degassing and purification employs the use of degassing units which incorporate a shaft and rotary head which are immersed into the melt.

The rotary head controls the introduction and dispersion of the gas. Fine bubbles are produced and circulated in order to achieve thorough contact of the gas throughout the melt.
The rotary device, developed by Graphite COVA GmbH, consists of a hollow rotary shaft and a rotating pump head which is attached to the shaft.

The pump head contains four or more channels rising from the bottom center to the outer shell of the rotor, which pumps and circulates the melt, and four or more jet holes which inject the gas. These jet holes are connected to the hollow shaft and are slanted down to the surface of the rotor head.
The rotor head is most often connected to the shaft by a cylindrical nipple, although other connection designs are available upon request.



Picture: lab test of the GC impeller in water

## Summary

The COVA system is designed to provide a lower cost Impeller System.
This patented* system has several advantages over current designs as indicated below:

## Benefits of the COVA System

- Improved mixing of gas throughout the melt
- Lower erosion of the Rotary Head providing improved life
- Simplified cleaning operation
- Simplified scrap removal

The COVA Impeller System allows for high rotating speeds and consistent rates of dehydrogenation. The system design permits the separation of the gas injection and the circulation of the melt, which will result in minimized head erosion. Other systems mix the gas and the melt utilizing the rotor, which leads to greater head erosion.

*in Germany

## Competitive Systems

Unlike other systems, in the COVA purification process the metal is not diverted through 90 degrees within the rotary head

This diversion has the following adverse effects on the rotary head:

- Graphite erosion
- Reduced Rotary Head life
- Increased difficulties of head and shaft cleaning which can cause head damage

## COVA System

The COVA System will provide the following

- Increased Rotary Head life
- Reduced downtime for rotor replacement
- Reduced Rotary Head damage,
- Easier cleaning
- Faster turnaround between melts

COVA Graphite Impeller Systems are impregnated with an "Antiox"-additive which greatly reduces the rate of graphite oxidation.

## Connection to Degassing Apparatus

COVA manufactures its systems to the requirements and specifications of the customers.

Hence our impeller Systems can also be connected to their existing degassing apparatus.

The COVA Graphite Impeller System can be easily adapted to all types of degassing apparatus currently utilized in the aluminium industry.

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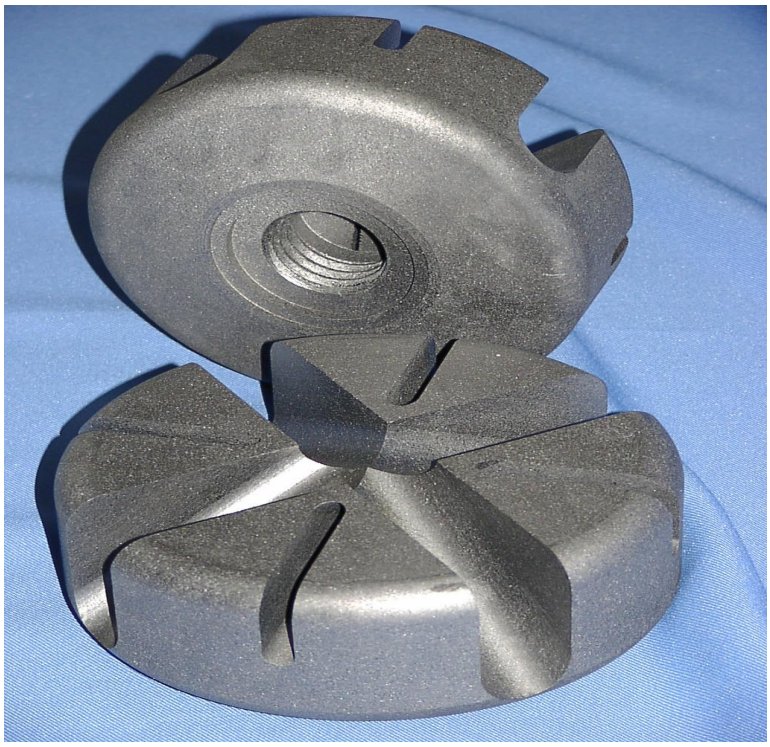
# Graphite COVA IMPELLERS

## Batch degassing



## Inline degassing