

# **AirForge<sup>®</sup>**

## **Forging Lubricants**



Human Technology  
for man, environment  
and machines

**HUTEC**

# Superior fluids for all your applications

Innovation is the key to success!



**Philipp and Martin Storr**  
Managing Directors

Today's oelheld group of companies is based on the business Carl Christian Held established in 1887. Back then, Carl Christian Held could never envision that from the humble beginnings one of the most innovative companies in the high tech lubricant business would emerge.

Testimonial to the high standards, oelheld is committed to the unveiling of yet another revolutionary new product, this time for the forging industry:

## AirForge®

Increasingly sophisticated and complex forging processes require new varieties of release agents thus making more traditional forming processes a thing of the past.

Besides its perennial and internationally best selling AirForge (glass coating) products, oelheld is more and more penetrating the market of water

miscible forging products for the hot and warm forging industry, e.g. the auto industry.

With or without graphite, black or white AirForge products meet or exceed the highest standards.

- Water miscible and therefore economical and environmentally-friendly to use
- Extremely good homogenous spray coverage under a wide range of temperatures guarantee an immediate and even release film on the forging die
- Material flow and mold release benefit from superior release and discharge properties



## Human Technology

- Human technology is not just a trademark at oelheld - it is a guiding principle. Low risk potential as well as environmental safety of the products and the application are most important for us.
- Following the principle, we develop fluids that are best-suited for the application of our customers but also provide the best possible health and environmental aspects. Therefore our production plant is based on special sealed floors and equipped with the latest blending technology which provides additional safety.
- **Human Technology for Man, Environment and Machines – our contribution toward a better future!**



# AirForge®

## - Forging Lubricants -



### AirForge® Advantages

- Clean & sharply pronounced recessed lettering and engravings
- Superior release, cooling and discharge properties
- Well defined shapes on deep cavities
- Increased tool life
- Reduced down-time
- Excellent wettability
- Perfect part quality
- No build-ups
- Economical
- Environmentally friendly
- Skin friendly through low pH value





## Graphite based black products

### AirForge® 5200

- Water graphite based, extremely stable die lubricant
- Produced with extremely fine graphite
- Easily mixable with water
- Forms a homogeneous release film
- Excellent wettability
- Superb lubrication
- Excellent release properties at a wide range of temperatures
- Good material flow control
- Suitable as pre-lube
- Skin friendly through low pH value

#### Mixing Ratio

Simple Forming	1:10-25
Medium Forming	1:5-10
Difficult Forming	1:4-5

#### Alloys

Steel  
Steel alloys

### AirForge® 5400

- Water graphite based die lubricant
- Easily mixable with water
- Forms a grey colored release film
- Excellent wettability
- Clean engravings with minimal build up
- Excellent release properties
- Suitable as pre-lube
- Skin friendly through low pH value

#### Mixing Ratio

Simple Forming	1:10-25
Medium Forming	1:5-10
Difficult Forming	1:4-5

#### Alloys

Steel  
Steel alloys

## White products

### AirForge® 4027

- Synthetic, transparent die lubricant
- Easily mixable with water
- Pigment free
- Forms a white colored release film
- Can be used with automatic or manual spray equipment
- Superb material flow control
- Excellent wettability up to 320° Celsius / 608° Fahrenheit
- Excellent formed shapes and cavities
- Clean engravings with minimal build up
- Superior release and discharge properties
- Suitable for complex warm to medium warm forming
- No build-ups on forms
- Can be used as a recirculation lubricant

#### Mixing Ratio

Simple Forming	1:10-25
Medium Forming	1:5-10
Difficult Forming	1:4

#### Alloys

Steel  
Steel alloys

### AirForge® 4891

- Water miscible, white die lubricant
- Easily mixable with water
- Pigment free
- Forms a grey colored release film
- Excellent wettability
- Clean engravings with minimal build up
- Superior release properties
- Skin friendly through low pH value

#### Mixing Ratio

1:10-25

#### Alloys

Aluminum  
Aluminum alloys

## Special products

### AirForge® 4500

- Modern lubricant, especially developed for the use on high speed Hatzburg forging equipment
- Synthetic, transparent die lubricant
- Excellent solubility in water
- Colorless
- Minimal foaming through a wide range of temperatures
- Can be used as recirculating lubricant

#### Mixing Ratio

Simple Forming	1:25
Medium Forming	1:5-10
Difficult Forming	1:5

#### Alloys

Carbon steel  
Steel alloys



# AirForge<sup>®</sup>

## - Forging Lubricants -



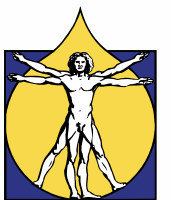
# AirForge<sup>®</sup>

## – Glass Coating –



**Protects! Lubricates!**  
**Isolates!**

Human Technology  
for man, environment  
and machines



**HUTEC**

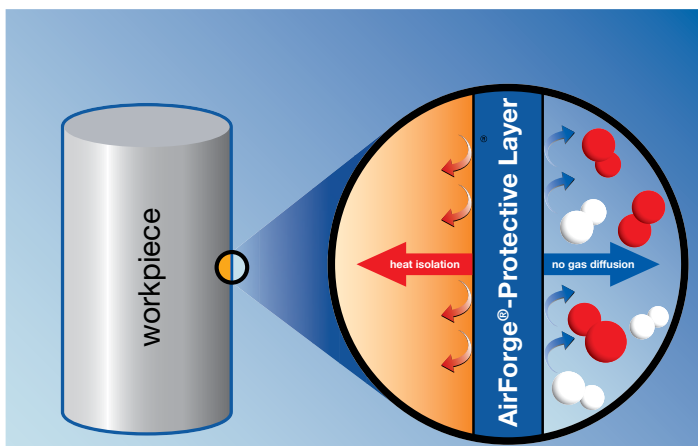


# AirForge®

## - Glass Coating -



### AirForge® – Protective Shield Layer–



Our goal was to develop a protective lubricating glass coating for each specific forging temperature that ensures optimal material flow over the entire forging process when using different materials such as titanium and nickel based or steel alloys.

Thereby the AirForge® glass coating surrounds the casting (billet) and prevents it from hot gas corrosion and hydrogen diffusion. In addition, an optimal material flow during the entire forging process is guaranteed because of its good thermal insulation properties.

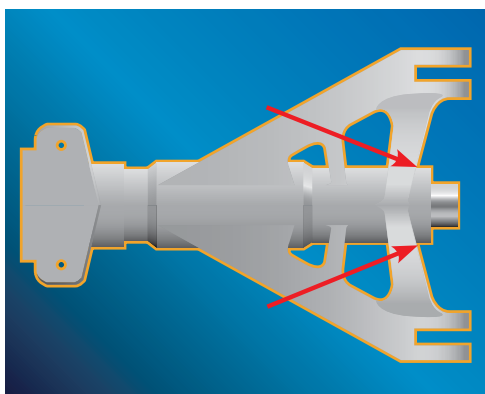
### AirForge® – Health Benefits –

All AirForge® products were developed according to the latest European Union regulations and do not contain any dangerous or hazardous substances such as lead, bismuth, chromium or organic solvents.





## AirForge® – High elasticity of the lubricant film –



Because of the exceptionally high elasticity of the lubricating film, AirForge provides optimal imaging accuracy for areas that are very sensitive and difficult to access.

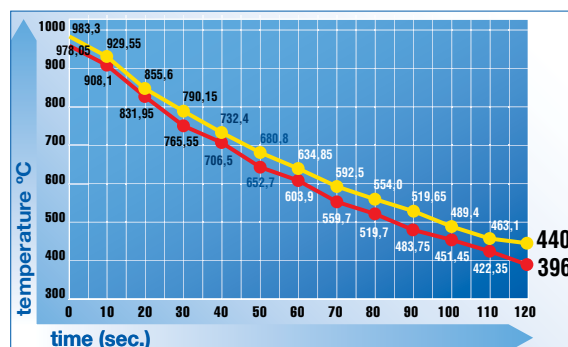
## AirForge® – Cooling results under laboratory conditions –



Heat corrosion  
without AirForge®



Forging slug  
using AirForge®



# AirForge® – Glass Coating – Advantages



## AirForge – Advantages –

- **Excellent tool die reproduction detail**
- **Easy application**  
...by dipping, brush, roller, airless spray system or electrostatic spray system
- **Good adhesion**  
...after drying (also on difficult work piece shapes)
- **Very good thermal insulation**  
... resulting in lower cooling rate and better material flow while forging
- **Excellent high temperature lubrication**  
... because of the high elasticity of the lubricant film it will not break during deformation
- **Forms barrier against gas diffusion**  
...oxygen and hydrogen
- **No chemical reaction with metal surfaces**  
...ensures best surface quality
- **Excellent deforming properties**  
...therefore no die wear
- **Good compatibility**  
...with commonly used forging die greases
- **AirForge® is water-based**  
...and can be diluted with de-ionized water

# AirForge® – Glass Coating – product range



## Glass-based release agent for hot forming of titanium and special alloys

	<b>AirForge 2472</b>	<b>AirForge 1983</b>	<b>AirForge 2596</b>	<b>AirForge 2371</b>
<b>Color</b> (selectable)	grey	grey	grey	grey
<b>Density</b> [ 20°C]	1.27 g/cm <sup>3</sup>	1.28 g/cm <sup>3</sup>	1.27 g/cm <sup>3</sup>	1.28 g/cm <sup>3</sup>
<b>Active Ingredient</b> [%]	40-50	40-50	40-50	40-50
<b>Carrier</b>	Water	Water	Water	Water
<b>Melting Point</b>	750 - 950 °C	830 - 930°C	900 - 1100°C	950 - 1150°C
<b>Alloys</b>	Titanium	Titanium Nickel	Titanium Nickel	Titanium Nickel Steel

# High-tech products for machines – worldwide!

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