



# TNC™ Technology

Copper castings with cast – in copper coil system for the metallurgical industries / comparison between a chilled coils system and TNC™

# Chilled condition during casting



## Commonly used and wide spreaded casting technology

- ◆ Copper coil system chilled down during casting process
- ◆ Confirmed bonding contingent max. 70 %

## TNC™ technology

- ◆ Copper coil system unchilled during the casting process  
(Hundt & Weber GmbH patent – EP1581779)
- ◆ Confirmed and guaranteed metallurgical bonding contingent  
min. 80 % up to 95%

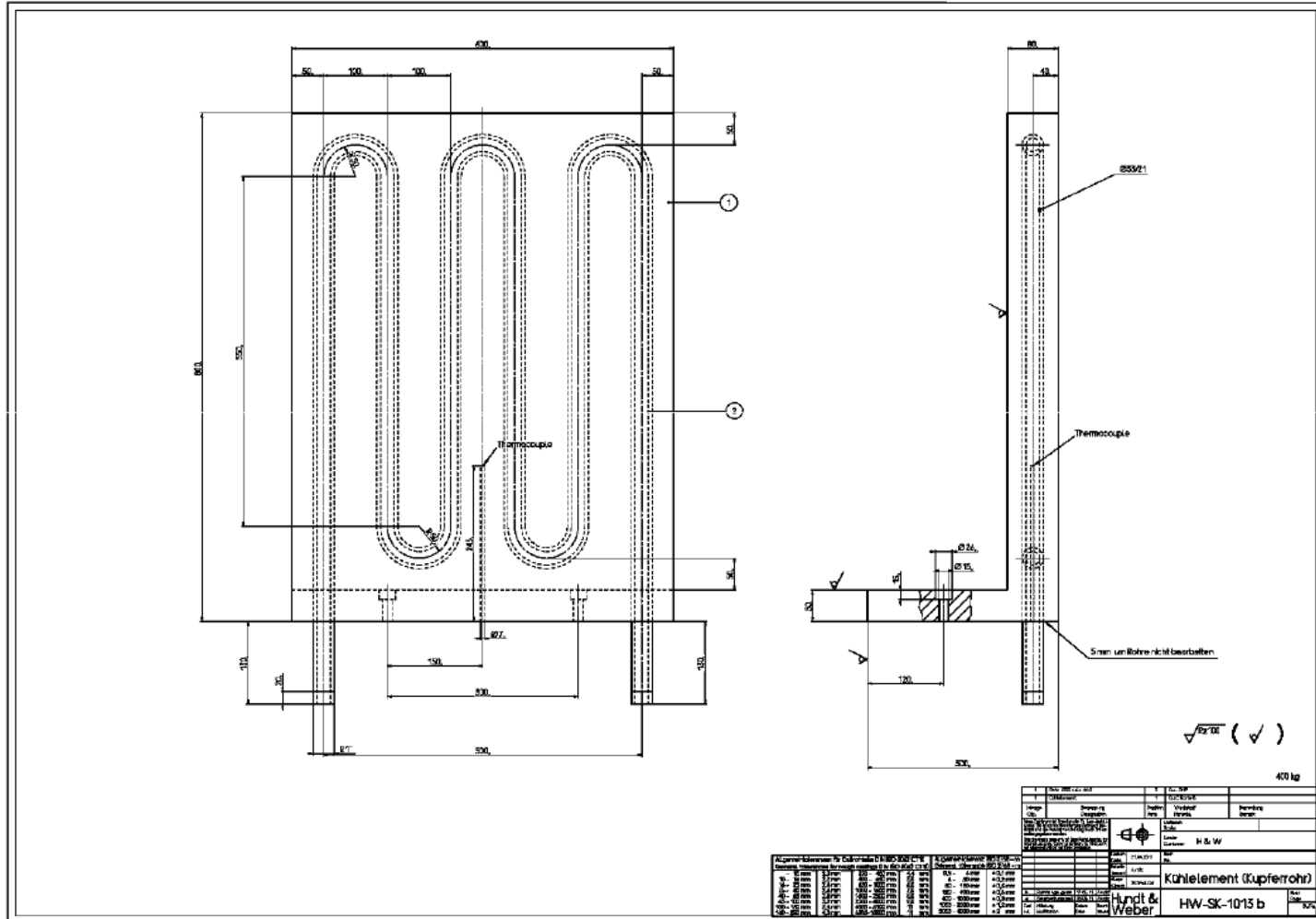
## Basic conditions

- Flow rate: 1,75 m<sup>3</sup>/h
- Water velocity: 1,4 m/s
- Inner coil diameter: 21 mm
- Length of coil system: 4650 mm
- Weight of copper plate: approx. 400 kg
- Heat conductivity: Cast copper: 305 W/(mK)  
Cu coil: 305 W/(mK)

## Test procedure/Set up

- Both cooling elements are heated-up with 75° C hot water simultaneously.
- The heat transfer/heat absorption [Q] and the involved time period is documented per infrared camera.
- The water inlet and outlet temperature is measured per thermocouple.
- With the values of the thermocouples the heat absorption [Q] is released into a graph.
- Additionally the body temperature is measured per thermocouple and released into a graph.

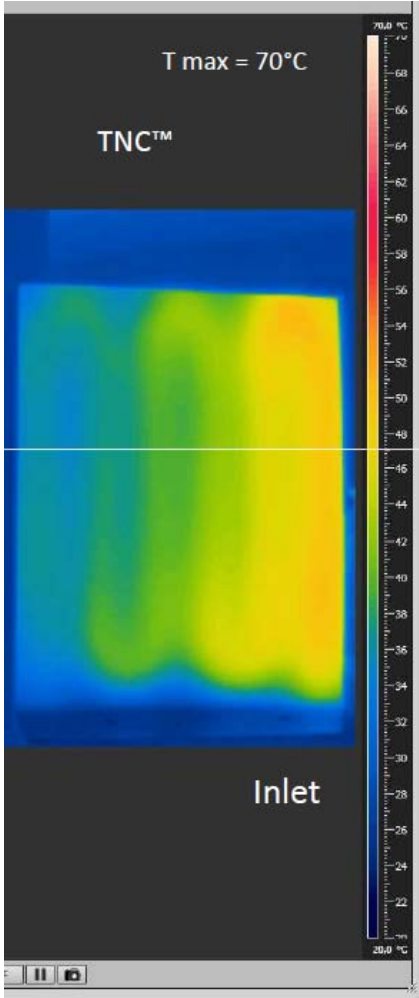
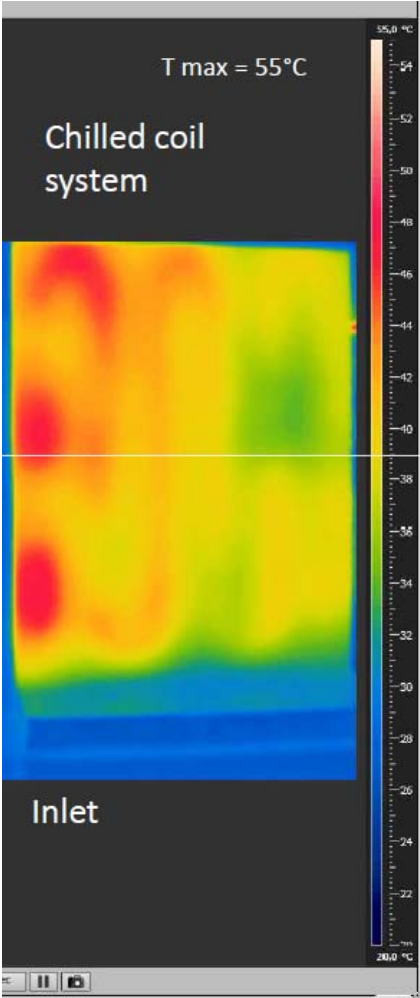
# Basic condition



# Test Set up

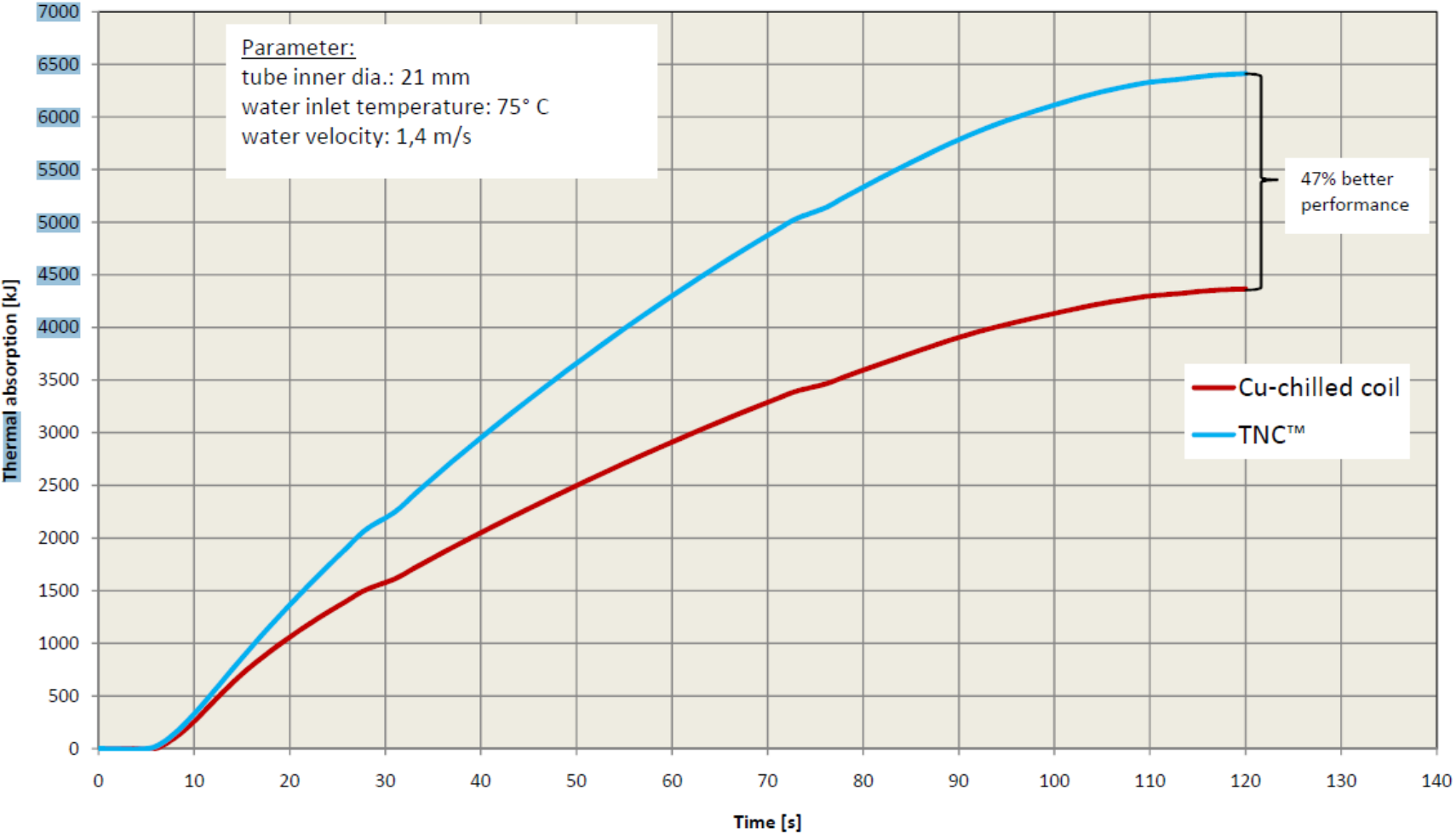


# Test results – Infrared after 60s



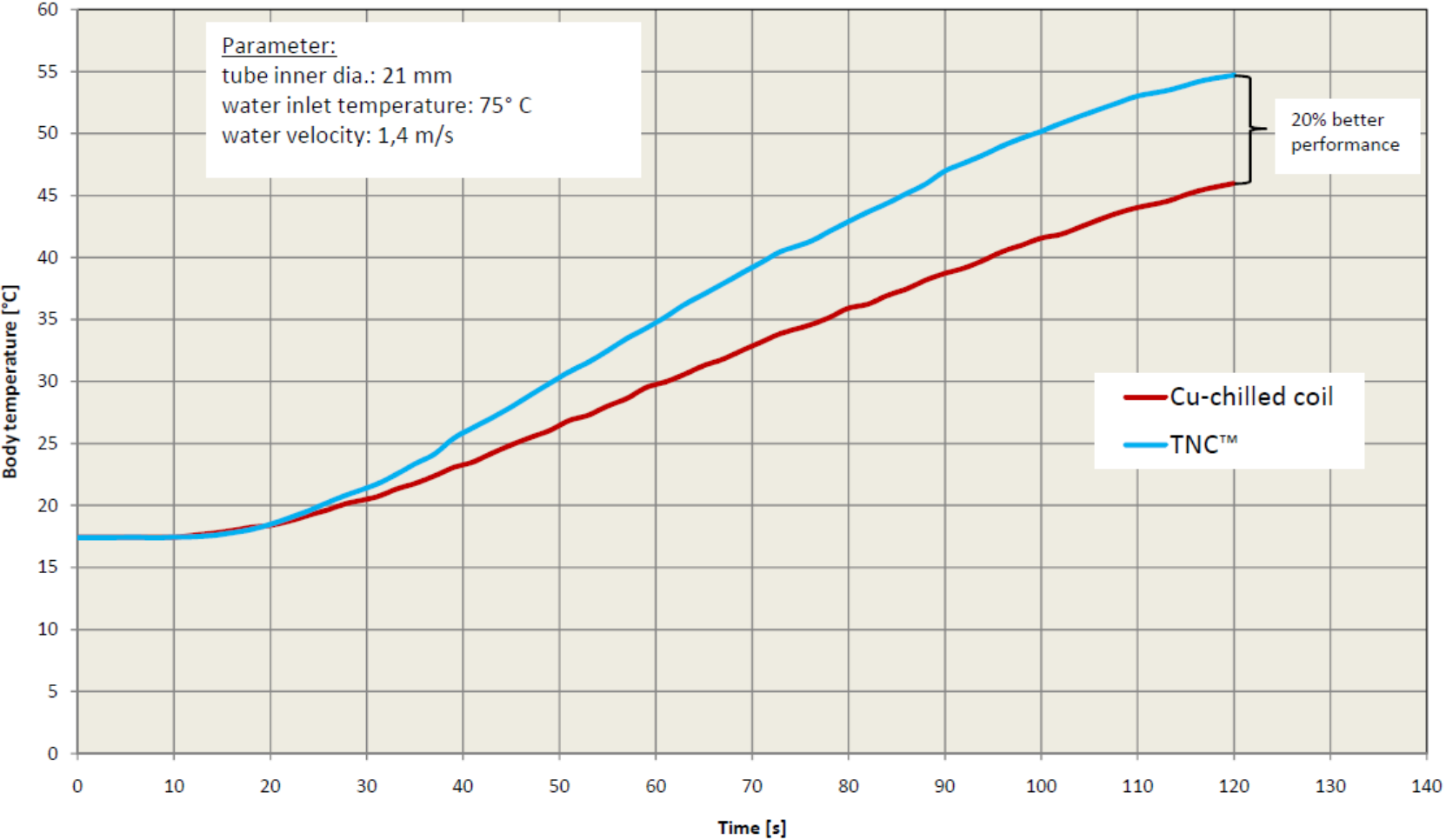
Please consider the different temperature scale when comparing the two infrared pictures !

# Test results – Heat absorption





# Test results – body temperature



# Test results – Heat absorbtion

Heat removal	TNC™	Copper Coil - chilled	Deviation
After 20s	1365 kJ	1058 kJ	29%
After 30s	2248 kJ	1612 kJ	39%
After 40s	3026 kJ	2097 kJ	44%
After 50s	3727 kJ	2541 kJ	47%
After 60s	4361 kJ	2951 kJ	47%
After 120s	6413 kJ	4367 kJ	47%

- Within a short time the heat absorption of the TNC™ element is significant higher than that of the chilled coil system.
- Therefore heat impacts will be removed in a shorter time period.

# Summary

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- ◆ A faster, equal and uniform heat absorption of the TNC™-system as shown on previous page could be confirmed.
- ◆ A faster heat absorption is an equivalent to an faster heat removal.
- ◆ By an heat impact a faster heat removal can avoid a damage/melting of the element.
- ◆ TNC™ elements are characterized with an equal and uniform heat removal, therefore a better and steady furnace condition is given.

# Contact information

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For more information in detail about the lebronze alloys group please have a look at our web pages:

<http://www.lebronze-alloys.com/>

<http://www.lebronze-alloys.de>

<http://www.hundtundweber.de>

Or contact us directly:

Sun Jianliang/孙建良 (authorized agent)

[j.sun@hundtundweber.de](mailto:j.sun@hundtundweber.de)

[jsun@jsunintl.com](mailto:jsun@jsunintl.com)

Siegfried Konitzko

[s.konietzko@hundtundweber.de](mailto:s.konietzko@hundtundweber.de)

Thorsten Knappe

[t.knappe@lebronze-alloys.de](mailto:t.knappe@lebronze-alloys.de)

**lbi**  
le bronze industriel

**FORGES**  
DE TRIE-CHATEAU

**inoforges** **lbi** bronze inox **Alsafil**

**Uba**  
lebronze alloys | Germany

**hundt**  **weber**

