

POWER. INNOVATION. RESPONSIBILITY.



Accelerating the energy transition with 3D printing and hydrogen:

Furnace refit with the iRecu[®] – saving money and CO₂!



IN 3 STEPS TO CO₂-NEUTRALITY



-
-
-
-
-
-

IKU

Der Innovationspreis für
Klima und Umwelt 2022
Preisträger



01 Increasing efficiency:
Saving more than 10 % fuel gas immediately - guaranteed

02 Hybrid operation:
Alternately with natural gas or H₂ - depending on availability

03 CO₂-neutral:
Switching to 100 % H₂

THE FUTURE IS NOW: HOW TO BE TRULY H₂-READY



01 Increase efficiency immediately:

The iRecu® achieves up to 50 % fuel gas savings. It can only be manufactured using 3D printing. High complexity, unbeatable efficiency are given.

02 Immediate investment security:

Short payback period due to immediate savings in fuel gas. The savings assist in compensating for the future additional cost of hydrogen.

03 Instant hybrid operation:

Thanks to our patented Dual-Fuel mixing unit, our iRecu® is able to use both 100 % natural gas and 100 % hydrogen flexibly and efficiently.

04 Immediately H₂ compatible:

The iRecu® ensures consistent flame geometry, heat input and heat distribution when switching between natural gas and hydrogen for continuous furnace operation.

05 Get started immediately:

3D printing allows the burner to fit plug & play into the existing system. We build the iRecu® "Custom-Made" in series.

06 Switch immediately:

Maximum production flexibility - manufacture premium products with hydrogen, seamlessly switch to natural gas for conventional products - without furnace conversion

Invest into the future with the iRecu®: Economical efficiency meets performance.

CASE STUDY Dual-Fuel-iRecu®



3 furnaces

converted



42

recuperative burners



Q4 2022

realization period



Mannesmann Precision Tubes installs the world's first Dual-Fuel iRecu® in real operation



13,6 % fuel gas savings



CASE STUDY Plug-In-iRecu®



1 furnace

converted



42

recuperators



BEST PRACTICE



Q4 2022

realization period



thyssenkrupp Rasselstein installs the world's first additively manufactured plug-in iRecu® in real operation



12,9 % fuel gas savings



CASE STUDY Hydrogen Annealing



Bell-type annealing furnace

11

Dual-Fuel-Burner

Q2 2023

realization period

BILSTEIN realizes the world's first locally CO₂-neutral heat treatment of around 100 t of cold-rolled strip in a batch annealing plant using 100% hydrogen (instead of natural gas).

World's first hydrogen annealing cycle in a batch annealing plant.



PRODUCT RANGE iRecu®



1

iRecu® BG2

nominal power
20 to 120 kW

2

iRecu® BG3

nominal power
60 to 180 kW

3

iRecu® BG4

nominal power
100 to 250 kW

Other capacities on request



iRecu[®] BG 2



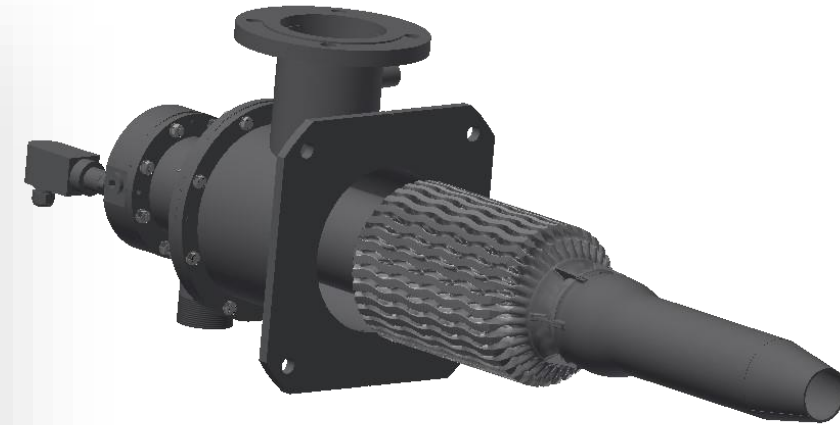
	Dual-Fuel-iRecu [®]	Plug-In-iRecu [®]
nominal power	20 kW to 80 kW	40 kW to 120 kW
air pressure	min. 35 mbar	min. 20 mbar
gas pressure	> 35 mbar	-
gas pressure H ₂	> 200 mbar	-
relative air preheating	70 – 85 %	65 – 80 %
typical fuel gas savings	> 12 %	> 12 %
installation diameter	128 mm – 142 mm	128 mm – 142 mm
supply connections	customized	



iRecu[®] BG 3



	Dual-Fuel-iRecu [®]	Plug-In-iRecu [®]
nominal power	60 kW to 150 kW	80 kW to 180 kW
air pressure	min. 35 mbar	min. 20 mbar
gas pressure	> 35 mbar	-
gas pressure H ₂	> 200 mbar	-
relative air preheating	70 – 85 %	65 – 80 %
typical fuel gas savings	> 12 %	> 12 %
installation diameter	172 mm – 185 mm	172 mm – 185 mm
supply connections	customized	



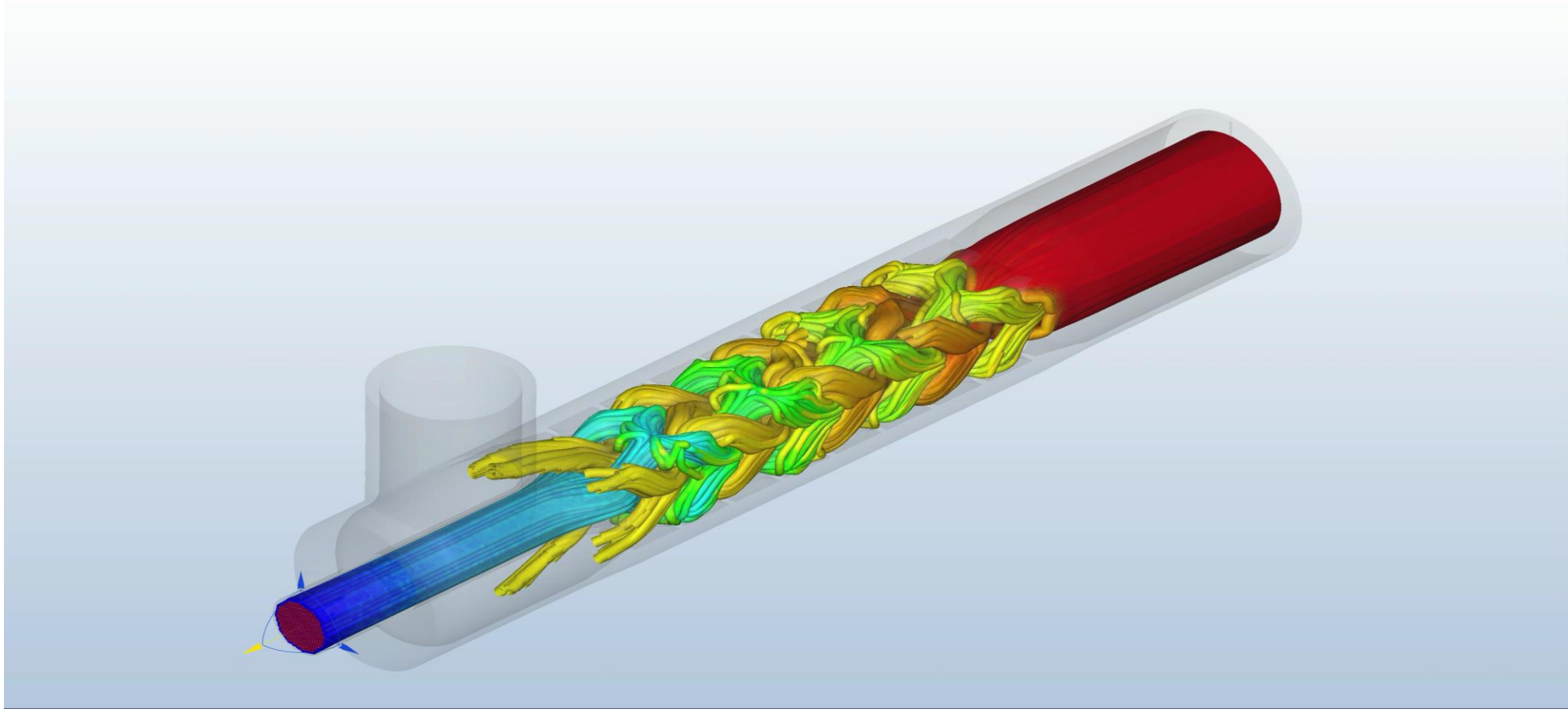
iRecu[®] BG 4



	Dual-Fuel-iRecu [®]	Plug-In-iRecu [®]
nominal power	100 kW to 200 kW	120 kW to 250 kW
air pressure	min. 35 mbar	min. 20 mbar
gas pressure	> 35 mbar	-
gas pressure H ₂	> 200 mbar	-
relative air preheating	70 – 85 %	65 – 80 %
typical fuel gas savings	> 12 %	> 12 %
installation diameter	240 mm	240 mm
supply connections	customized	



WE DETERMINE YOUR GUARANTEED SAVINGS



WE DETERMINE YOUR GUARANTEED SAVINGS



01 Collect the information below

02 Send them to us at info@kueppers-solutions.de - with NDA if desired

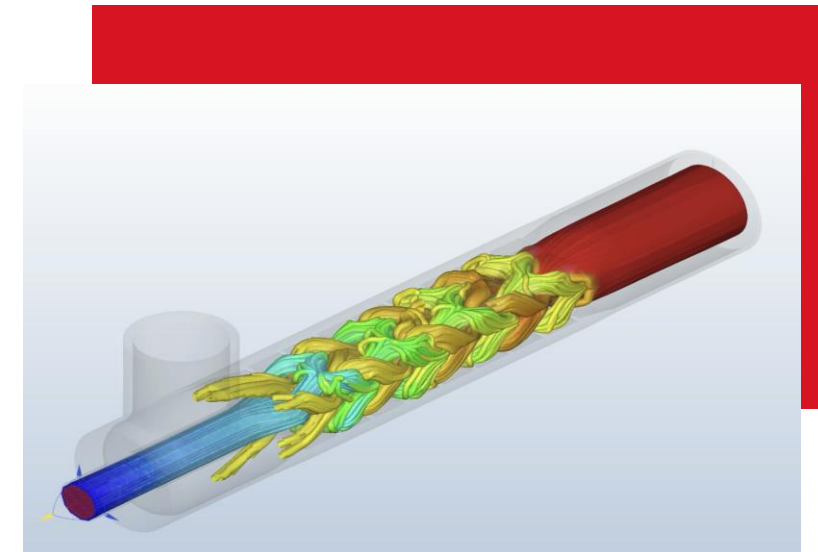
03 We calculate your savings potential with conversion to the iRecu®



Information about the plant




1	max. air pressure	_____mbar
2	installed burner capacity	_____kW
3.1	process temperature	_____°C
3.2	exhaust gas outlet temperature	_____°C
4	type of process heating	<input type="checkbox"/> DIRECT <input type="checkbox"/> INDIRECT
5	contact	_____
6	E-Mail	_____



YOUR CONTACT



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01 Visit our

Website

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Newsletter

04 Contact us directly via

Contact



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Management