

## The proven **standard**



We set standards

tunnel machines  
ex drying cabinets  
hood- type furnaces  
hybrid kilns  
industrial furnaces  
chamber furnaces  
paint driers  
paternoster furnaces  
powder drying systems  
silicone annealing furnaces  
annealing furnaces  
drying cabinets  
chest furnaces  
preheating furnaces  
heating cabinets  
maintenance & service

## We set new standards from which you will benefit

Industrial furnaces and heat treatment systems by caldatrac® fulfill the four most important requirements from practice:

- **Protection of your money and the environment**

Energy- efficient solutions which considerably reduce operating expenses and ensure a more environmentally friendly operating process.

- **Improvement of your working practice**

For example an acceleration of workflows due to a diversity of smart, detailed solutions such as the revolutionary door locking system **caldasnap®** which tightly closes with one swing.

Doors by caldatrac® offer an entire access to the interior with a perfect opening angle of 105°. It therefore ensures a comfortable insertion and removal of charging systems and the treated material.

- **To be prepared for all contingencies**

Standardized replacement modules of our unique **caldaflex®** system enable a subsequent retrofitting of existing caldatrac® chambers and systems. As a result, your system can easily be adapted to new manufacturing processes.

- **Shortest delivery times**

Unique, fast and reliable to keep the operation running. In Germany, we can deliver **caldaflex®** replacement modules within 24 hours. These modules can be installed within 1 hour. You avoid long downtimes, while we help to save your money.

**We will prove it.**

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open

# caldatrac®

## the new name for heat treatment

We produce a broad range of industrial furnaces and heat treatment systems in the temperature range of RT+10°C to +800°C since 2010.

The number of clients purchasing our products, which are certified in accordance with DIN EN ISO 9001, is constantly growing.

We have been so successful that we moved into our new production hall together with a new administration building in H6chheim in December 2014.

Our success is based on the expertise of our experienced developers, technicians and designers. We managed to create a new generation of heat treatment systems due to our innovative ideas.

With "Made in Germany" caldatrac® is committed to produce in Germany and to deliver highly-sophisticated products and services.

### These are:

- tunnel machines
- ex drying cabinets
- hood- type furnaces
- hybrid kilns
- industrial furnaces
- chamber furnaces
- paint driers
- paternoster furnaces
- powder drying systems
- silicone annealing furnaces
- annealing furnaces
- drying cabinets
- chest furnaces
- preheating furnaces
- heating cabinet
- maintenance & service

Our configurable series CD and CDF (DIN EN 1539) are both distinguished by new technical solutions.

As standard, all caldatrac® heat treatment systems consist of a tightly welded interior and a silicone- free electrical installation in contrast to products offered by other suppliers.

The standard series with a useable space volume from 200l to 8000l and a temperature range from RT+10°C to +800°C form the basis for tailored chambers and systems.

Systems with a nominal temperature above +400°C are equipped with our CDH series.

Our corporate name is derived from the Latin words **calda**rius "connected with heat" and **trac**tare "treat", your heat treatment system.

Intere



Please

caldatrac®

## protection of your money and the environment



*We verifiably reduce your operating costs as well as your costs of provision by a consistent implementation of energy-saving measures.*

- The use of highly- efficient components improves the energy efficiency.
- Efficient processes lead to optimal energy efficiency and decreasing costs.
- The energy- optimized construction reduces the demand for electricity.

In consequence of a consistent implementation of these measures, you can empirically reduce your demand for electricity by 5% to 15% per furnace.

Energy saving motors of the efficiency class IE3 are standard at caldatrac®. In a three- shift operation one uses up to 1800 kWh less in comparison to conventional motors.

Our high performance fan wheels reduce the energy consumption by another 25 % compared to conventional fan wheels. Temperature- resistant air circulation fan motors eliminate usual follow- up times and additionally reduce your energy consumption.

Tightly sealed mechanical throttles optimize the volume of fresh air and thus fully preserve temperature accuracy.

Therefore, your expenses for energy consumption in order to reheat will decrease by up to 50%. Thermal image recordings of a caldatrac® furnace and a conventional furnace clearly prove our energy- optimized construction. Thermal bridges are limited to a minimum. As a result, extremely low blank values are reached, even for furnaces with a 2- leaf door. This saves money.

Your costs of provision are reduced, especially due to our fully automatic load peaks management and the on- load tap- changer. Once the set temperature is reached, the heating input will automatically decrease by up to 50 % while preserving the temperature stability.

Due to our mechanical reduction of the heating performance (option), a part of the heat output can be deactivated, if needed.

It is possible to integrate the system into power load management. This is a further contribution to avoid expensive load peaks.

Our switch cabinets work without electromotive conditioning. This leads to further electricity savings and an elimination of ventilating units or air conditioners.

**caldatrac® - a real benefit.**



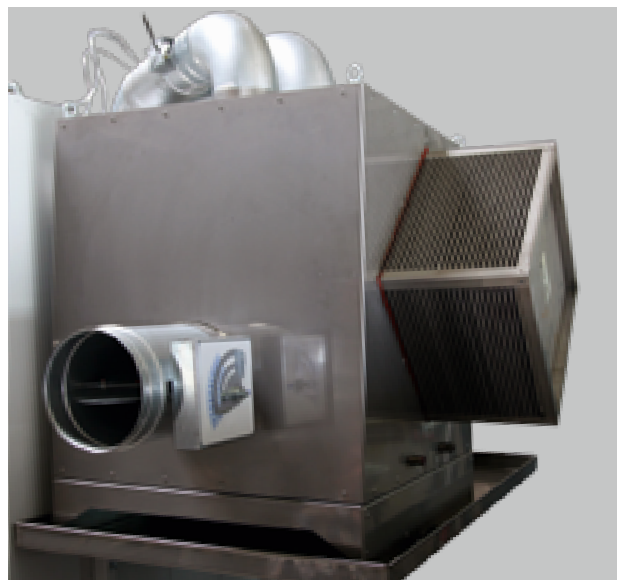
*caldatrac® furnaces and systems sustainably save valuable resources and the health of your employees.*

- The primary energy consumption as well as CO<sub>2</sub> emissions will be reduced due to an optional heat recovery.
- The hybrid technology developed by us, which is a combination of different energy- carrying mediums, leads to an optimization of your consumption costs (option).
- Reduction of harmful VOCs (volatile organic compounds) - problems in the firm and the environment. The targeted condensing of harmful plasticizers is carried out by optional cross- flow heat exchangers in conjunction with deep-freeze condensation and a unique energy efficiency. Additionally, particles and particulate material can be electrostatically isolated by an electrostatic filter system. A downstream filter stage with an activated carbon clean gas filter binds additional aromatics.
- Hot outer surfaces are systematically avoided, resulting in an eliminated risk of burning for employees. Additionally, this construction leads to no waste of electricity.

Due to our hybrid technology existing heat

transfer mediums can be combined in such a way that power and consumption are optimized. caldatrac® furnaces and systems demonstrably make an effective contribution to reduce greenhouse gases (e.g. CO<sub>2</sub>) that harm our climate.

**caldagreen® - a clean affair.**



*Edelstahl-Kreuzstromwärmetauscher mit vollautomatischer Frischluft-Volumenstromregelung Typ A*

# caldatrac® improves your working practice



Developed by practitioners for the everyday work.

- An excellent spatial and temporal temperature distribution guarantees a high reproducibility of your output. A high accuracy of regulation and optimized routing of air flow enable a brilliant spatial temperature distribution up to  $\pm 0,3$  K. caldatrac® provides evidence with DKD calibrated measurement equipment.
- The caldasnap® door inimitably closes tightly with only one swing. This accelerates and guarantees safety. As standard, furnaces by caldatrac® dispose of a door contact switch which stops the recirculating air when opening the door. As a consequence, energy efficiency, temperature values and working conditions are improved:
  - reduction of heat losses when opening the door
  - faster temperature recover
  - increased energy efficiency
  - significant reduction of the noise level at work

- Downtimes are reduced to a minimum for retrofitting, maintenance or service. caldasnap® can be maintained and repaired without any time-consuming dismantling/release of the isolation material. The door hinges are adjustable in all 3 levels without any removal. The very robust, low-maintenance door reveal and chamber floor are unique. As a result, downtimes for service work are reduced to a minimum.

The reason for quality-reducing deposits on the good are often impurities in the air treatment room. An easily removable ceiling of the useable space opens access to air ducts, heating elements and fans. Thus, contaminations can be quickly and thoroughly eliminated.

**caldatrac® - so it works very good.**



Easily removable ceiling of the useable space



Removal without tools possible



Open ceiling of the useable space with view at recirculation air fan wheels

caldasnap®



caldasnap®



**caldaflex®**

**with us you are prepared for all contingencies**



*Adaptability is an outstanding feature of our industrial furnaces.*

We quickly and cheaply adapt your caldatrac® industrial furnace to changing systems, processes or products within 1 day based on our unique caldaflex® exchange concept.

We retrofit or enlarge at any time:

- heat performance
- fan performance
- routing of air flow
- hybrid kiln model
- size of control cabinets
- side of the door stop
- retrofitting from a single- leaf to a double- leaf door is possible (depending on the model)

Thus, caldatrac® preserves and improves the value of your investment. Three heating energy modules with standardized geometry and standardized connectors guarantee a smooth exchange. In Germany, we can deliver from stock within 24 hours. The installation is finished after circa 45 minutes, 8 times faster than conventional furnaces are installed. An exchange of recirculation air fan modules is carried out in a similar cost- efficient and fast way.



**annealing furnace  
with HEPA cleanroom filter wall**



**industrial furnace  
with rotation loading trolley**



**preheating furnace  
for model plates**



**Ex-oven with cold trap**

caldatrac® realizes the intelligent hybrid technology for the following types of heating: steam, pressurized water or thermal oil.

This technology automatically realizes the supporting electrical heating, if the energy provided by heat carriers is insufficiently available. If the heat carrier is not available at all, the heating is purely electrical.

The horizontal routing of air flow can be perfectly adjusted to a vertical one by our venetian blind system within a few minutes depending on its varying requirements. At the same time, the excellent spatial temperature distribution is conserved.

As a tightly welded interior belongs to the standard equipment, a retrofitting is also feasible without any problems according to DIN EN 1539 (ATEX Schutzzone 2).

A completely silicone- free industrial furnace comes into existence by the exchange of a standard door seal (made of silicone) with a fluororubber door seal. By the way, our switch cabinets as well as the electric installation are silicone- free as standard.

**caldatrac® - always fits.**



Safety first with regard to drying processes of surface coatings or sizing varnishes as well as to the use of impregnating resins.

If the provided amount of solvents per batch is limited in your drying process, you can make a choice from our energy- optimized CDF series. This device series is in accordance with the guideline DIN EN 1539, also considering the performance level d.

If your application does not allow a limited amount of solvents, caldatrac® industrial furnaces can be carried out according to the guideline on protection against explosion 94/9/EG (ATEX 95). An area is explosive when a dangerous explosive atmosphere might occur.

According to industrial safety regulations, the employer has to execute a hazard evaluation of the entire system. Furthermore, an explosion protection document needs to be created.

For this, we can advise you in a competent manner.

## ATEX zonal structure

### Zone 0

An area in which an explosive atmosphere consisting of a mixture with air and flammable substances in the form of gas, vapor or mist is present continuously, for long periods or frequently.

### Zone 1

An area in which a dangerous explosive atmosphere consisting of a mixture with air and flammable substances in the form of gas, vapor or mist might occasionally occur during normal operations.

### Zone 2

An area in which a dangerous explosive atmosphere consisting of a mixture with air and flammable substances in the form of gas, vapor or mist does usually not or only for a short time occur during normal operations.

Since 1 January 2012, the new "EG- Maschinenrichtlinie 2006/42/EG" has been in force to ensure the safety of persons and systems. We use a Fail- Safe- SPS in order to fulfill the safety requirements according to DIN EN 1539. With a corresponding configuration one can achieve the safety categories up to PL e according to EN ISO 13849-1 and SIL CL 3 according to EN IEC 62061. The modularity and the configuration guarantee a very high degree of flexibility. The security system can be optionally extended at any time and the security functions can be adjusted to your requirements.

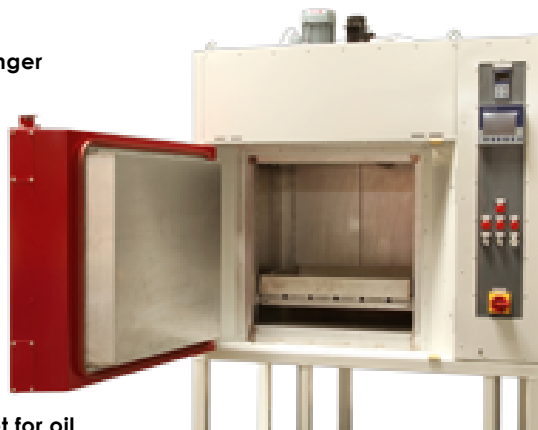
caldatrac® - demonstrably good.



**CDF 200/100/150-25**  
with a cross- flow heat exchanger



**CDF 260/200/200-22**  
indirect gas- fired industrial furnace



**CD 60/60/60-18**  
temperature control cabinet for oil

**caldatrac®**  
**the standard for precision and sustainability**



**High- temperature testing facility for vibration**



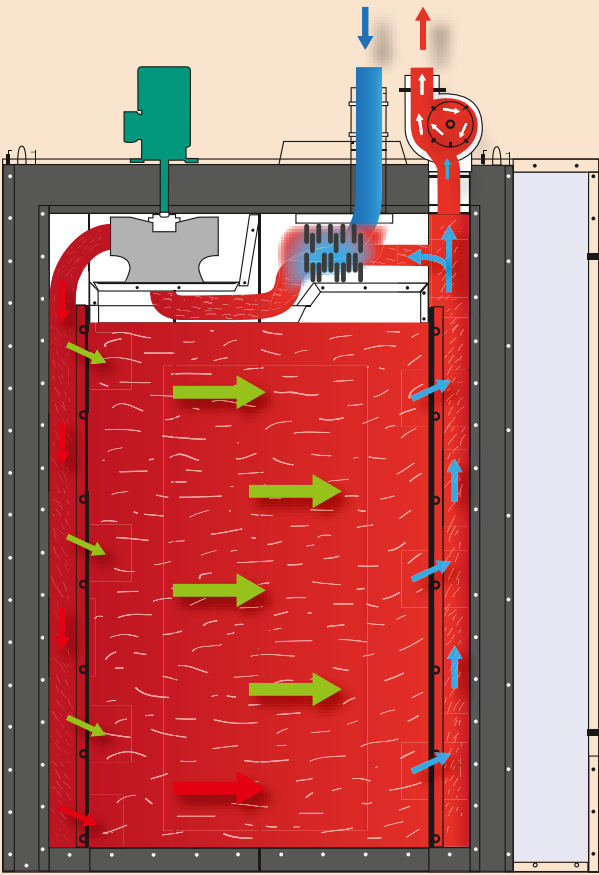
**silicon oven and trolley with rotation drum**

**chest furnace with a useable space free of metal (length: 12 m)**





# air flow principle



The circulating air flow is extracted on the right from the furnace chamber by the recirculating air fan. It is then heated by the heating coil and homogenized in the temperature structure in the fan wheel.

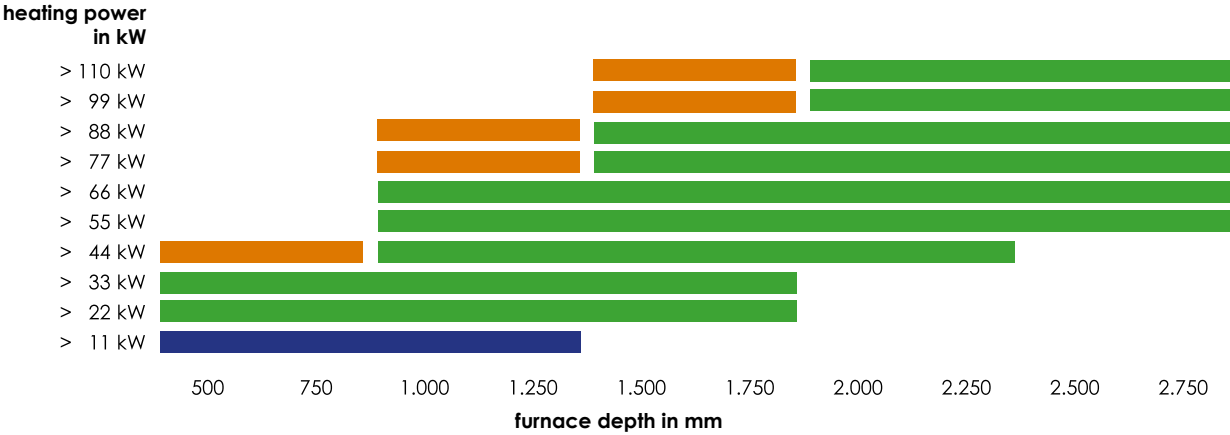
Because of the resulting difference in speed of the circulating air when exiting the supply air duct, the air flow is laminar and horizontally distributed in the useable space. However, a part of the air deposits on the wall of the air duct, flows very close to the ground through the useable space and thus eliminates the temperature impact of the ground on the spatial temperature distribution.

For particular applications, one can supply fresh air to the circulating air flow. After streaming in the air intake, it is spread, evenly heated by the heating coil and supplied to the circulating air. After having passed the useable space and the heat dissipation to the annealing goods, the corresponding exhaust air volume exits the furnace via the air vent before reaching the heating coil.

# load peaks diagram

## fully- automatic circuit for the reduction of load peak

Heating- up the furnace with 100% of the heating power, when the set temperature has been reached, a part of the heating power (max. 50%) is switched off and switched on again, if required.



- series
- option
- ▼ technical contact with plant

# technical data for industrial furnaces with a nominal voltage of 400 V 3L/PE 50 Hz

CD types

device type	max. process temperature	Size of the useable space in mm		overall size in mm	circulating air volume flow in Bm <sup>3</sup> /h	exhaust air volume flow in Bm <sup>3</sup> /h	management of load peaks	heating power in kW	connected load in kVA	nominal current in A
CD 60/60/60-20	200 °C						▼	8,04	9,00	13,60
CD 60/60/60-25	250 °C	W 600	W 1.240				▼	8,04	9,00	13,60
CD 60/60/60-30	300 °C	D 600	D 1.000	1.400	0-30		▼	8,04	9,00	13,60
CD 60/60/60-35	350 °C	H 600	H 1.310				▼	10,89	11,80	17,80
CD 60/60/90-20	200 °C						▼	10,89	11,80	17,80
CD 60/60/90-25	250 °C	W 600	W 1.240				▼	10,89	11,80	17,80
CD 60/60/90-30	300 °C	D 600	D 1.000	1.500	0-30		▼	10,89	11,80	17,80
CD 60/60/90-35	350 °C	H 900	H 1.610				○	13,56	14,50	21,60
CD 75/75/125-20	200 °C						○	13,56	14,50	21,60
CD 75/75/125-25	250 °C	W 750	W 1.510				○	13,56	14,50	21,60
CD 75/75/125-30	300 °C	D 750	D 1.150	2.400	0-60		○	16,08	17,00	25,50
CD 75/75/125-35	350 °C	H 1250	H 2.060				○	16,08	17,00	25,50
CD 100/100/150-20	200 °C						○	16,08	17,70	26,50
CD 100/100/150-25	250 °C	W 1.000	W 1.760				○	16,08	17,70	26,50
CD 100/100/150-30	300 °C	D 1.000	D 1.400	4.000	0-90		○	16,08	17,70	26,50
CD 100/100/150-35	350 °C	H 1.500	H 2.380				○	21,78	23,40	34,70
CD 125/125/150-20	200 °C				4.000	0-90	○	21,78	23,60	35,30
CD 125/125/150-25	250 °C	W 1.250	W 2.010		7.200	0-120	○	21,78	24,70	37,50
CD 125/125/150-30	300 °C	D 1.250	D 1.665		7.200	0-120	○	21,78	24,70	37,50
CD 125/125/150-35	350 °C	H 1.500	H 2.380		7.200	0-120	■	27,12	30,00	45,60
CD 125/125/200-20	200 °C						○	21,78	24,70	37,50
CD 125/125/200-25	250 °C	W 1.250	W 2.010		7.200	0-120	○	21,78	24,70	37,50
CD 125/125/200-30	300 °C	D 1.250	D 1.665		7.200	0-120	■	27,12	30,00	45,60
CD 125/125/200-35	350 °C	H 2.000	H 2.880				■	27,12	30,00	45,60
CD 150/150/200-20	200 °C						■	32,67	36,00	53,80
CD 150/150/200-25	250 °C	W 1.500	W 2.260		7.600	0-150	■	32,67	36,00	53,80
CD 150/150/200-30	300 °C	D 1.500	D 1.915		7.600	0-150	■	32,67	36,00	53,80
CD 150/150/200-35	350 °C	H 2.000	H 2.880				■	40,68	44,00	65,50
CD 175/175/200-20	200 °C				8.000	0-150	■	32,67	36,00	53,80
CD 175/175/200-25	250 °C	W 1.750	W 2.510		10.800	0-180	■	32,67	36,00	53,80
CD 175/175/200-30	300 °C	D 1.750	D 2.165		10.800	0-180	■	40,68	44,00	67,70
CD 175/175/200-35	350 °C	H 2.000	H 2.880		10.800	0-180	■	40,68	44,00	67,70
CD 200/200/200-20	200 °C						■	43,56	48,60	72,50
CD 200/200/200-25	250 °C	W 2.000	W 2.760		11.400	0-180	■	43,56	48,60	72,50
CD 200/200/200-30	300 °C	D 2.000	D 2.415		11.400	0-180	■	54,24	59,30	88,00
CD 200/200/200-35	350 °C	H 2.000	H 2.880				■	54,24	59,30	88,00



series



option



technical contact with plant

# technical data for industrial furnaces with a nominal voltage of 400 V 3L/PE 50 Hz

## CDF types

device type	max. process temperature	Size of the useable space in mm		overall size in mm	volume of steam chamber in liter	max. amount of solvents in g	circulating air volume flow in Bm <sup>3</sup> /h	exhaust air volume flow in Bm <sup>3</sup> /h	management of load peaks	heating power in kW	connected load in kVA	nominal current in A
CDF 60/60/60-20	200 °C					12,70		90	▼	8,04	9,00	13,80
CDF 60/60/60-25	250 °C	W 600	B 1.240			11,70		120	▼	10,89	11,80	18,00
CDF 60/60/60-30	300 °C	D 600	T 1.000	384		9,40	1.400	120	▼	10,89	11,80	18,00
CDF 60/60/60-35	350 °C	H 600	H 1.310			5,30		90	▼	10,89	11,80	18,00
CDF 60/60/90-20	200 °C					17,00		120	▼	10,89	11,80	18,00
CDF 60/60/90-25	250 °C	W 600	B 1.240			15,00		150	○	13,56	14,50	21,80
CDF 60/60/90-30	300 °C	D 600	T 1.000	519		12,10	1.500	150	○	13,56	14,50	21,80
CDF 60/60/90-35	350 °C	H 900	H 1.610			7,20		120	○	13,56	14,50	21,80
CDF 75/75/125-20	200 °C					29,80		180	○	16,08	17,00	25,60
CDF 75/75/125-25	250 °C	W 750	B 1.510			27,30		240	○	21,78	22,70	33,80
CDF 75/75/125-30	300 °C	D 750	T 1.150	1.197		22,30	2.400	240	○	21,78	22,70	33,80
CDF 75/75/125-35	350 °C	H 1.250	H 2.060			13,10		180	○	21,78	22,70	33,80
CDF 100/100/150-20	200 °C					47,10		240	○	21,78	23,30	35,00
CDF 100/100/150-25	250 °C	W 1000	B 1.760			46,10		360	■	27,12	28,70	42,70
CDF 100/100/150-30	300 °C	D 1000	D 1.400	2.391		38,00	4.000	360	■	27,12	28,70	42,70
CDF 100/100/150-35	350 °C	H 1.500	H 2.380			21,60		240	■	27,12	28,70	42,70
CDF 125/125/150-20	200 °C					70,60	4.000	360	■	27,12	29,80	43,50
CDF 125/125/150-25	250 °C	W 1.250	W 2.010			64,40		480	■	37,86	40,50	61,10
CDF 125/125/150-30	300 °C	D 1.250	D 1.665	3.572		53,40	7.200	480	■	37,86	40,50	61,10
CDF 125/125/150-35	350 °C	H 1.500	H 2.380			32,30		360	■	37,86	40,50	61,10
CDF 125/125/200-20	200 °C					79,00		360	■	27,12	29,80	45,60
CDF 125/125/200-25	250 °C	W 1.250	W 2.010			72,10		480	■	37,86	40,50	61,10
CDF 125/125/200-30	300 °C	D 1.250	D 1.665	4.524		60,10	7.200	480	■	37,86	40,50	61,10
CDF 125/125/200-35	350 °C	H 2.000	H 2.880			37,00		360	■	37,86	40,50	61,10
CDF 150/150/200-20	200 °C					114,40		540	■	43,56	46,20	69,60
CDF 150/150/200-25	250 °C	W 1.500	W 2.260			104,50		720	■	54,45	57,10	85,30
CDF 150/150/200-30	300 °C	D 1.500	D 1.915	6.318		86,90	7.600	720	■	54,45	57,10	85,30
CDF 150/150/200-35	350 °C	H 2.000	H 2.880			53,20		540	■	54,45	57,10	85,30
CDF 175/175/200-20	200 °C					139,10	8.000	600	■	54,45	57,10	85,50
CDF 175/175/200-25	250 °C	W 1.750	W 2.510			120,50		720	■	65,34	69,10	103,30
CDF 175/175/200-30	300 °C	D 1.750	D 2.165	8.408		101,10	10.800	720	■	65,34	69,10	103,30
CDF 175/175/200-35	350 °C	H 2.000	H 2.880			65,80		600	■	65,34	69,10	103,30
CDF 200/200/200-20	200 °C					172,90		720	■	75,72	79,50	118,60
CDF 200/200/200-25	250 °C	W 2.000	W 2.760			152,70		900	■	87,12	90,90	135,00
CDF 200/200/200-30	300 °C	D 2.000	D 2.415	10.794		128,20	11.400	900	■	87,12	90,90	135,00
CDF 200/200/200-35	350 °C	H 2.000	H 2.880			82,30		720	■	87,12	90,90	135,00



**caldatrac®**  
**a real benefit**



**caldagreen®**  
**a clean affair**



**caldasnap®**  
**so it works very good**



**caldaflex®**  
**always fits!**



**caldasafe®**  
**safety first**

**Your contact person:**



**All pictures, information and technical data of this brochure are subject to changes and variations.**