



# *thermowave*

PHE for process and industry

[www.thermowave.de](http://www.thermowave.de)



# High-quality application-oriented plate heat exchangers



# Four brands – One strong Group

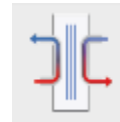
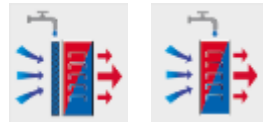
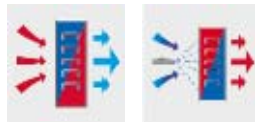


# GÜNTNER GROUP TECHNOLOGIES

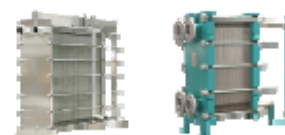
for every application



Technology



Products



Applications





# 23 YEARS OF EXPERIENCE



**1994**

Start of sales activities and series production



**1997** Development of the thermoline series according to Hygienic Design

**2008**

First company worldwide with successful certification of the test facility and the TLC calculation software by the German Technical Inspection Authority TÜV Thüringen

**2014**

Member of EHEDG



**2014**

Introduction L-Frame

**1992**

Foundation of thermowave

**thermowave**



**1995**

Expansion of sales activities in Europe, Asia and South America

**2000**

DIN ISO 9001 Certification



**2007** Development production hall and market launch of the types TL 1100, TL 1500 and TL 2000

**2007** Construction of the second production hall with second plate press and second laser system

**2009**

Market launch thermolineEco



DEVELOPMENT



MANUFACTURE



SALES





# PRODUCTION FACILITIES

Berga

**3,000**

Units per year

**13,000 qm**

production area

**80**

employees (production)





# Modern machinery park – Laser welding machines



2,5 D-CNC-CO<sub>2</sub>

6 kW

precice

flexible



# Modern machinery park – Outstanding press power

**12.000 t**  
for large plates

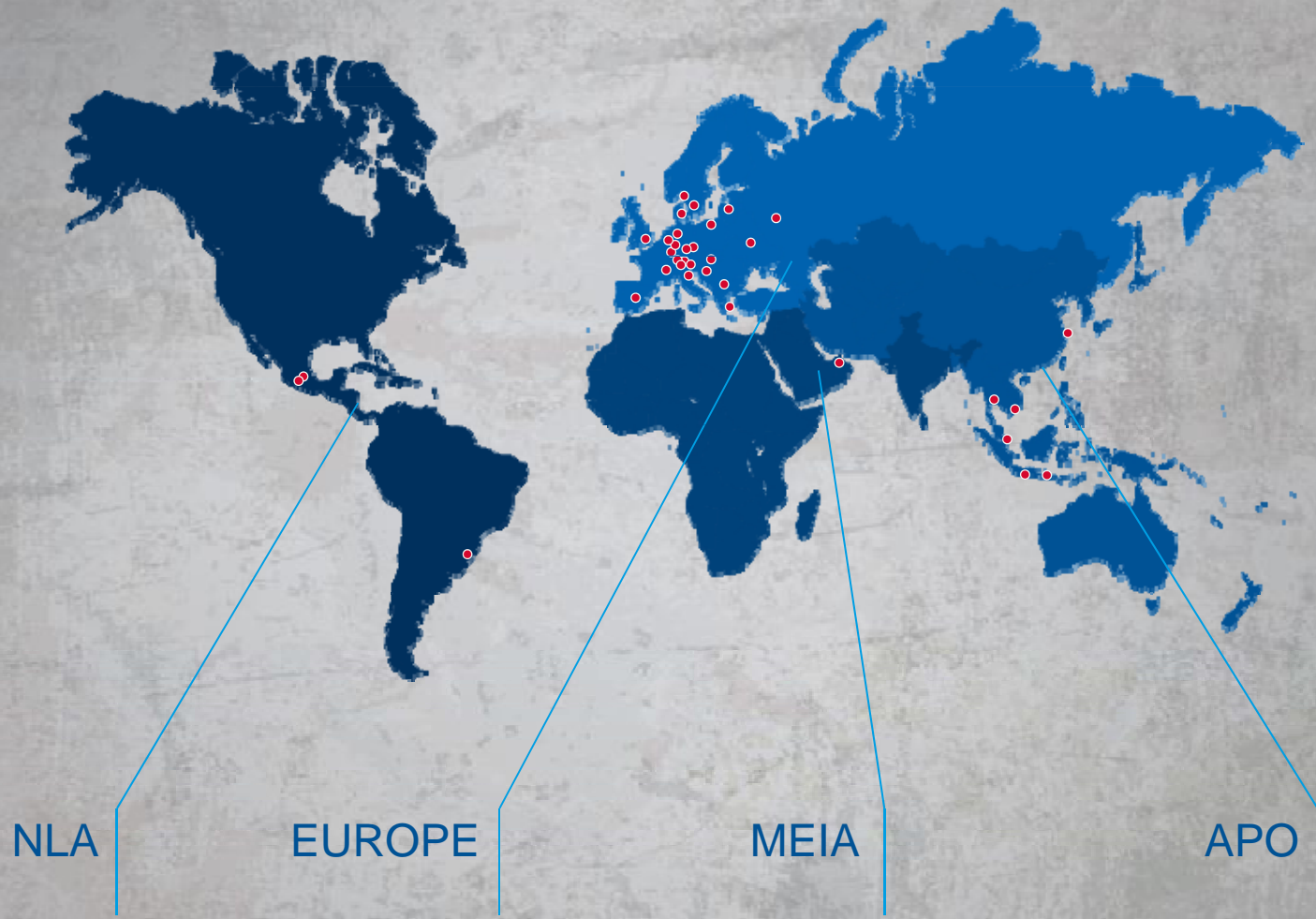
max. Werkzeuggewicht 20 to.





# DISTRIBUTION PRESENCE

worldwide





# Vision & Mission

This graphic is a vivid yet concise illustration of the different components forming the foundation of our Group's image, answering the questions of who we are, how we act and what requirements we have to fulfil in order to reach our objective.





# TECHNOLOGY



# THERMOWAVE TECHNOLOGIES



Gasketed Plates  
up to 32 bar



Semi-welded Modules  
up to 63 bar



# THERMOWAVE TECHNOLOGIES



In-house test facility

Certified by the German Technical  
Inspection Authority TÜV



# WE ARE EXPERTS IN EVERY APPLICATION



Refrigeration



Food



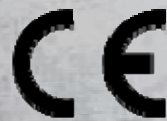
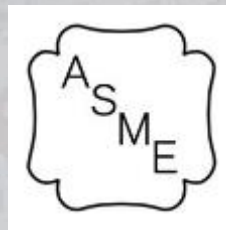
Process Industry



HVAC



# TESTED FOR SAFETY





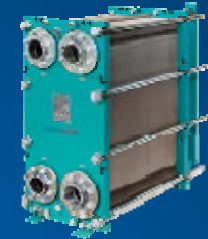


# PRODUCTS



## VARIO

Gasketed plates and laser welded modules for high flexibility



## STANDARD

Compact technology, low maintenance, quickly available



## HIGH PRESSURE

Outstanding efficiency in high pressure applications



## FOOD & BEVERAGE

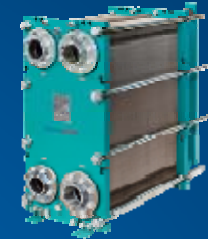
Reliable quality control, food-safe materials





## VARIO

Gasketed plates and laser welded modules for high flexibility



## STANDARD

Compact technology, low maintenance, quickly available



## HIGH PRESSURE

Outstanding efficiency in high pressure applications

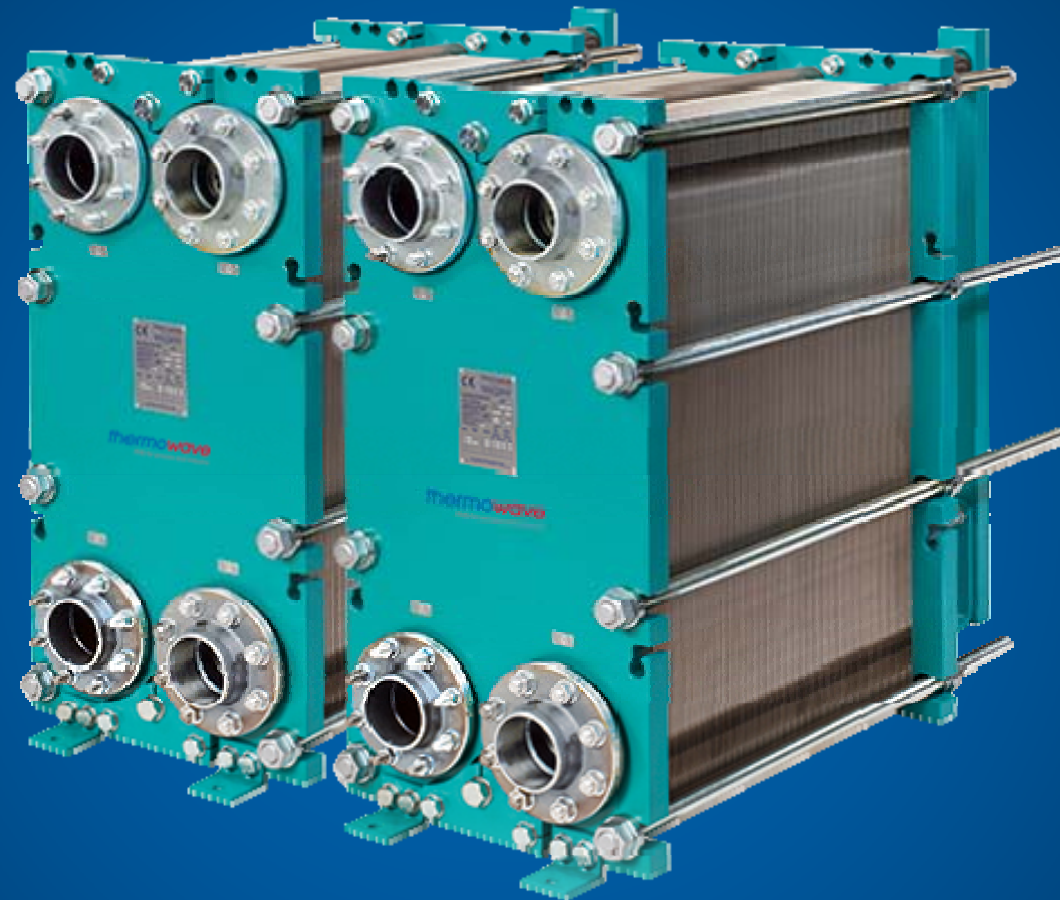


## FOOD & BEVERAGE

Reliable quality control, food-safe materials







# thermolineVario

Gasketed plates and welded modules for high flexibility

# thermolineVario



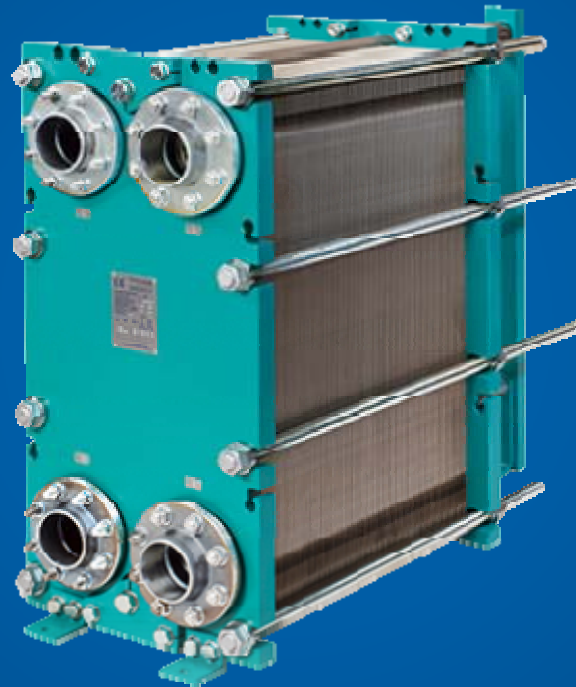
Simple assembly and servicing

Efficient heat exchanger  
for small  $\Delta t_m$

Fail safe operation

Six possible gap types  
(combined)

Corrosion resistant



Capacity can be adjusted  
By adding or removing plates

Compact design,  
low space requirements

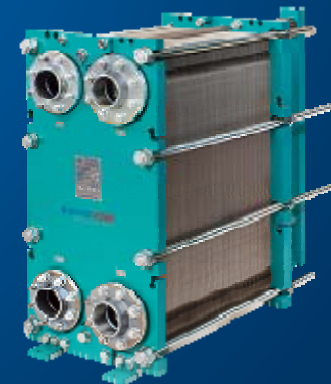
Ideal ratio between  
heat transfer  
and pressure drop

# thermolineVario



**Capacity range 50 – 50.000  
kW**

<b>Evaporation</b>
<b>Condensation</b>
<b>Desuperheating</b>
<b>Oil Cooling</b>
<b>System Separation</b>
<b>Heat Recovery</b>
<b>District Cooling/Heating</b>



# thermolineVario



## Technical details

### Connection variants:

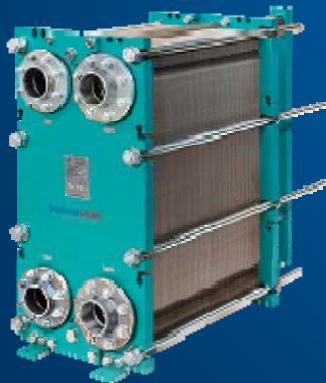
Welding neck flange  
Stud bolts with lining  
Lapped flange with plain collar  
Threaded coupling

### Gaskets

NBR  
EPDM  
Chloroprene  
Butyl  
FKM  
FEPM  
HNBR

### Rack frames:

Painted carbon steel





# thermolineEco

Plate heat exchangers for standard applications



# thermolineEco



**Energy-efficient**

**Corrosion resistant**

**Compact design,  
low space requirements**

**Capacity can be adjusted  
by adding or removing plates**

**Fail-safe operation**

**Excellent fouling resistance**



**Six possible gap types  
(combined)**

**Ideal ratio between heat transfer and  
pressure drop**

# thermolineEco



**Capacity range 10 – 10.000  
kW**



**System Separation**

**Free Cooling**

**Heat Recovery**

**District Cooling**

**District Heating**

## Technical details

### Connection variants:

Stud bolts with lining  
Threaded coupling

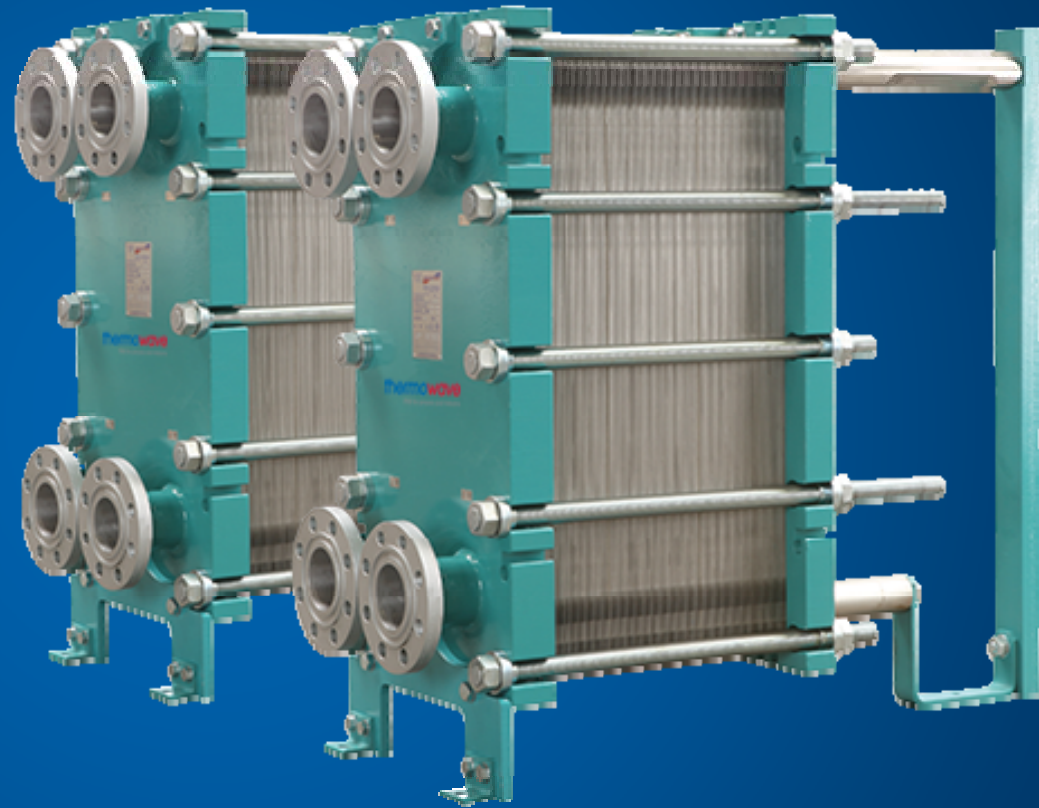
### Gaskets:

NBR/EPDM

### Rack frames

Painted carbon steel





# thermolinePlus

Plate Heat Exchangers for high pressure applications



# thermolinePlus



High pressure applications  
up to 63 bar

For all common  
refrigerants

NH<sub>3</sub>, CO<sub>2</sub> cascade  
applications

Six possible  
gap types (combined)



Simple assembly  
and servicing

Compact design,  
High power density

Low refrigerant filling

Laser-welded modules  
for unique pressure resistance

# thermolinePlus



**Capacity range 100 – 10.000  
kW**

**Evaporation**

**Condensation**

**Desuperheating**

**Oil Cooling**

**Cascade PHE**



# thermolinePlus



## Technical details

### Connection variants:

- Welding neck flange
- Stud bolts with lining
- Lapped flange with plain collar
- Threaded coupling

### Gaskets

- NBR
- EPDM
- Chloroprene
- Butyl
- FKM
- FEPM
- HNBR



### Rack frames:

Painted carbon steel



# thermolinePure

Plate Heat Exchangers for food applications



# thermolinePure



**Corrosion resistant**

**Fail-safe operation**

**Food-safe materials**

**Product friendly design**

**Reliable design**

**Capacity can be  
adjusted by adding  
or removing plates**

**Heat recovery up  
to 96 %**



**Excellent fouling resistance due to  
high turbulence and smooth surfaces**

# thermolinePure



Capacity range 30 – 20.000  
kW

Pasteurization

Cooling

Heating



## Technical details

### Connection variants:

Dairy screwed pipe joint – DIN11851

Aseptic connection

DIN11864-1 (screwed pipe joint)

DIN11864-2 (flange connection)

APV-FN1/FG1 (APV small flange)

Neumo BioConnect® Clamp  
Connection – DIN32676

Welding neck flange

### Gaskets

NBR, EPDM, FKM

### Rack frames:

Stainless steel

Carbon steel, stainless steel clad

Intermediate frames with connections







# REFERENCES

EXPERIENCE YOU CAN RELY ON

# EXPERIENCE YOU CAN RELY ON



Refrigeration



Food & Beverage



HVAC



Process Industry



# REFERENCES: Refrigeration



Neuhauser Gruppe  
Folschviller, France



KGHM  
Debica, Poland



Bitzer  
Australia





# Neuhauser Gruppe

## FOLSCHVILLER, FRANCE



www.neuhauser.com



Neuhauser Gruppe

Folschviller, France

### Frozen bakery products with a long tradition

- Capacity: 1.5 billion pastries and 600 million baguettes/year
- thermowave  $\text{NH}_3/\text{CO}_2$  cascade system for cooling a 90,000m<sup>3</sup> cold store
- Enormous efficiency increase of the system
- Modular designed PHEs allow uncomplicated changing of single plates
- temperature difference in the cascade system of up to 2° K between evaporation and condensation
- maximum energy efficiency





# KGHM Wuch

## DEBICA, POLAND







KGHM Wuch

Debica, Poland

### Great performance at low filling quantities

- thermowave has been delivered different plate heat exchangers for cooling a calcium chloride solution in a mining-frozen system
- 4 thermolineVarioTL 850 ammonia evaporators
- 4 thermolineVario TL 650 condensers with an overall capacity of 7,000 kW
- Refrigerant: propylen glycol (35%)





# Bitzer

## SUNSHINE, AUSTRALIA



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Bitzer

Sunshine, Australia

### Cooling a mine at a depth of 500 m

- heat load of 4 x 1250 kW and 1 x 1510 kW are used to cool a mine at a depth of approximately 500 m
- extremely aggressive and corrosive atmosphere in the mine at this depth
- huge additional demands on the pressure frame of the plate heat exchangers
- product line thermolinePlus TL 500 KGGL perfectly suitable for this application (design pressures of 50 bar on the module side, 25 bar on the gasketed side)
- ideal solution for the small logarithmic temperature differences of 3 K in this application



# REFERENCES: Food&Beverage



AIDA Cruises  
Rostock, Germany



Krones AG  
Neutraubling, Germany



Rotkäppchen-Mumm Sektkellereien  
Freyburg (Unstrut), Germany





# AIDA Cruises

## ROSTOCK, GERMANY





AIDA Cruises

Rostock, Germany

### **thermowave plate heat exchangers in a brewery at sea**

- AIDAblu first cruise ship with its own brewery on board
- thermolinePure TL 90 FAXV is integrated into the brewing process
- compact design, low weight, high flexibility
- Media: wort/water



# Krones AG

## NEUTRAUBLING, GERMANY







Krones AG

Neutraubling, Germany

### **Filling and packaging of liquid foods and beverages**

- High hygienic standards crucial
- 3-stage thermowave PHE is integrated into a sterile water UHT system
- Energy recovery of 90 percent
- Refrigerant: water/propylene glycol (35%)



# Rotkäppchen-Mumm Sektkellereien

FREYBERG (UNSTRUT),  
GERMANY





## Rotkäppchen-Mumm Sektkellereien

Freyberg (Unstrut), Germany

### Sparkling droplet – Rotkäppchen-Mumm champagne cellars

thermowave plate heat exchangers  
reliably, powerfully and efficiently  
support the production process

thermolineVario TL 250 FBGV  
thermolineVario TL 650 KCIL (heat load  
765 kW)  
thermolineEco TL 250 EBGL

Application: process cooling  
Refrigerant: propylene glycol (35%)



# REFERENCES: HVAC



BMW  
Leipzig, Germany



Stadtwerke Bitterfeld  
Bitterfeld, Germany



Instal Lublin  
Poznan, Poland





# BMW

## LEIPZIG, GERMANY





BMW

Leipzig, Germany

- Application: Cooling
- Media: water/water  
water/ethylene glycol (34%)
- thermolineEco EL 250 EBGL
- thermolineVario TL 250 TBGL





# Stadtwerke Bitterfeld

## BITTERFELD, GERMANY



Stadtwerke Bitterfeld

Bitterfeld, Germany

- Application: Heat Recovery
- Media: water/water
- 2 thermolineVario TL 850 KDGL
- 2 thermolineVario TL 500 KDGL
- 2 thermolineVario TL 250 KDGL





# Instal Lublin

## POZNAN, POLAND





Instal Lublin

Poznan, Poland

### Central cooling station for new built bus station

- Media: water/water  
water/glycol
- 4 TL 1100 KBLL
- 4 EL 650 ECIL



# REFERENCES: Process Industry



Bio-Ölwerk Magdeburg  
Magdeburg, Germany



VERBIO Vereinigte Bioenergie AG  
Zörbig, Schwedt, Germany





# Bio-Ölwerk Magdeburg GmbH

## MAGDEBURG, GERMANY







Bio-Ölwerk Magdeburg GmbH

Magdeburg, Germany

**Biodiesel made from rapeseed  
by using PHE**

- some 60 thermowave PHE in operation at the bio-oil plant
- for higher reliability and powerful performance of the production process
- thermolineVario TL 90 - 650



# VERBIO ZÖRBIG, GERMANY







VERBIO

Zörbig, Germany

### Fermentation plant for biofuels

- thermowave plate exchangers for cleaning biogas
- heat recovery more than 95 percent
- first TL 2000 with a capacity of more than 7400 KW
- thermowave PHE are best suited because of their specific plate geometry

