

## Brazed Plate Heat Exchangers

Series TPL



## With partnership into the future

FUNKE is a leader in the development and production of quality heat exchangers with a heat transfer area of up to 2400 m<sup>2</sup>. The range of products comprises shell-and-tube heat exchangers, bolted and brazed plate heat exchangers as well as oil/air cooling units and electrical oil pre-heaters. Thus, as one of the few producers worldwide, FUNKE offers solutions with optimum thermodynamic designs for different industries and virtually all applications.

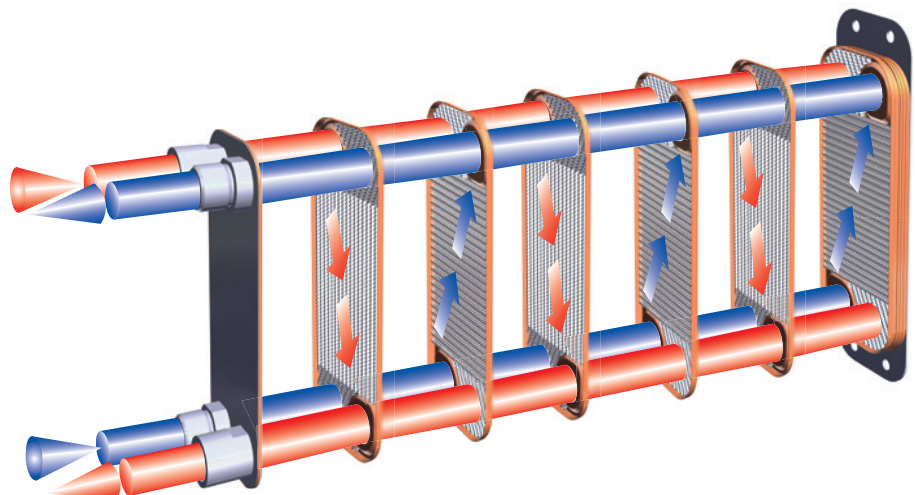
FUNKE focuses on customer orientation, highest quality standards, flexibility and advisory skills – important benefits a company of just the right size is able to offer.



### Construction

FUNKE brazed plate heat exchangers series TPL is basically made of non-corrugated stainless steel plates. In the flow gaps special stainless steel turbulence sheets with high thermal efficiency are inserted. These are brazed to the basic plates to create a firm and pressure-resistant unit.

Variable designs of the inserts and the thermodynamically highly efficient diagonal media flow in the flow gaps allow for optimal adaptation to different applications. By special request, the connections can be on the end plate or on the front- and endplate.







### Advantages

With the FUNKE brazed plate heat exchangers TPL a high heat transfer rate at a low pressure loss can be obtained. The thermodynamically and hydraulically optimized alignment of the turbulence sheets generates high turbulent flow rates even at low volume flows.

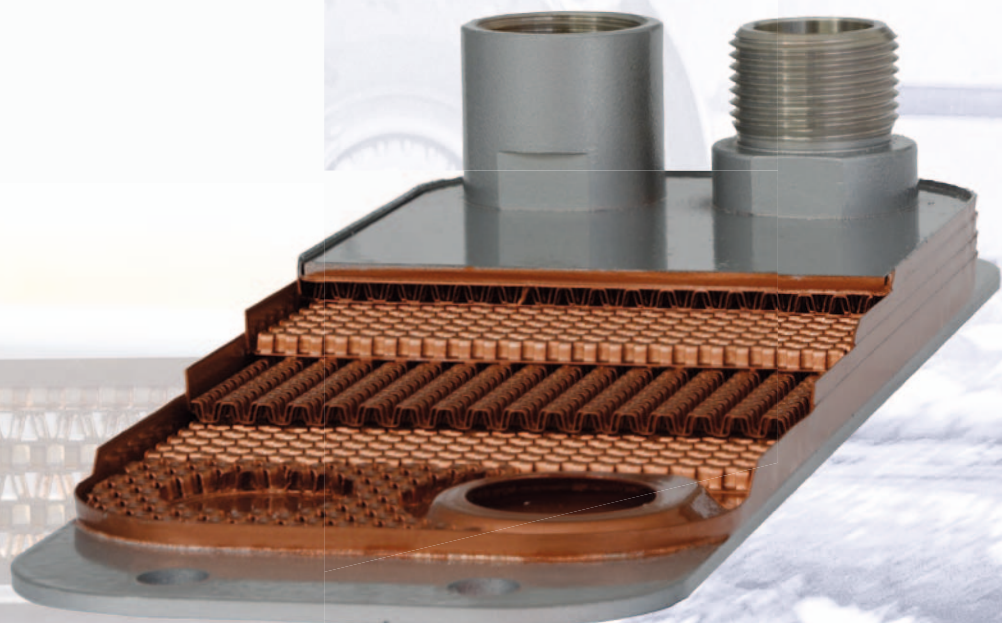
This allows for efficient use of the heat exchange area available and leads to a perfectly optimised heat transfer. The high turbulent flow also results in an efficient self-cleaning effect, which greatly reduces maintenance and time-out. FUNKE TPL have a compact design and are used for high pressures and temperatures.

As the whole surface of the plates is coated with solder, the resulting brazing allows for a higher integrity joint. Thus, stresses arising from e.g. variations in pressure or temperature can be absorbed more effectively compared to conventional brazed plate heat exchangers where only single dots of solder are applied.

### Applications

Typical applications for brazed plate heat exchangers are heating, cooling, condensing

- System separation
- Heating engineering (solar thermal systems, central heating, floor heating)
- Cogeneration units
- Heat pumps
- Heat extraction and heat recovery in domestic and process technology
- Hot water / Process water
- Refrigeration engineering
- Evaporation / Condensing in cooling systems
- Mechanical engineering
- Oil cooling
- Air drying
- Hydraulic oil cooling
- Cooling of machines and motors
- Mold machine temperature control
- Economizing



## Media

Copper brazed plate heat exchangers TPL are mainly used for media such as

- Oil and oil containing fluids
- Glycol mixtures
- Alcohols
- Refrigerants
- Gas / Air
- Water
- many more (according to media properties and its viscosity)

## Information

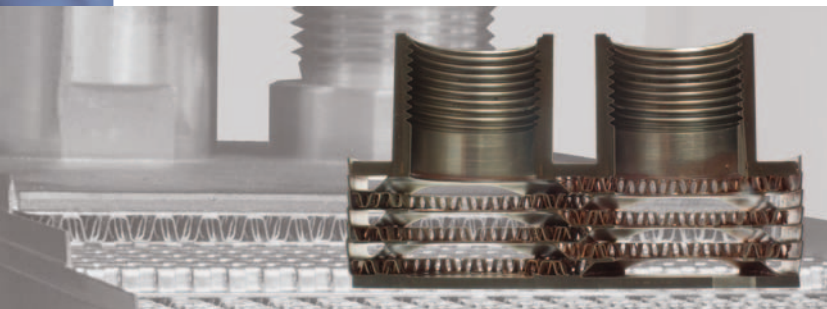
Copper brazed plate heat exchangers GPLK should not be used for the following media:

- Seawater
- Ammonia
- Deionates
- Silicone oils
- High chloride Media

## For applications with

- Ammonia
- Deionates
- Silicone oils

the nickel brazed plate heat exchangers NPL or stainless steel brazed GPLB are recommended.



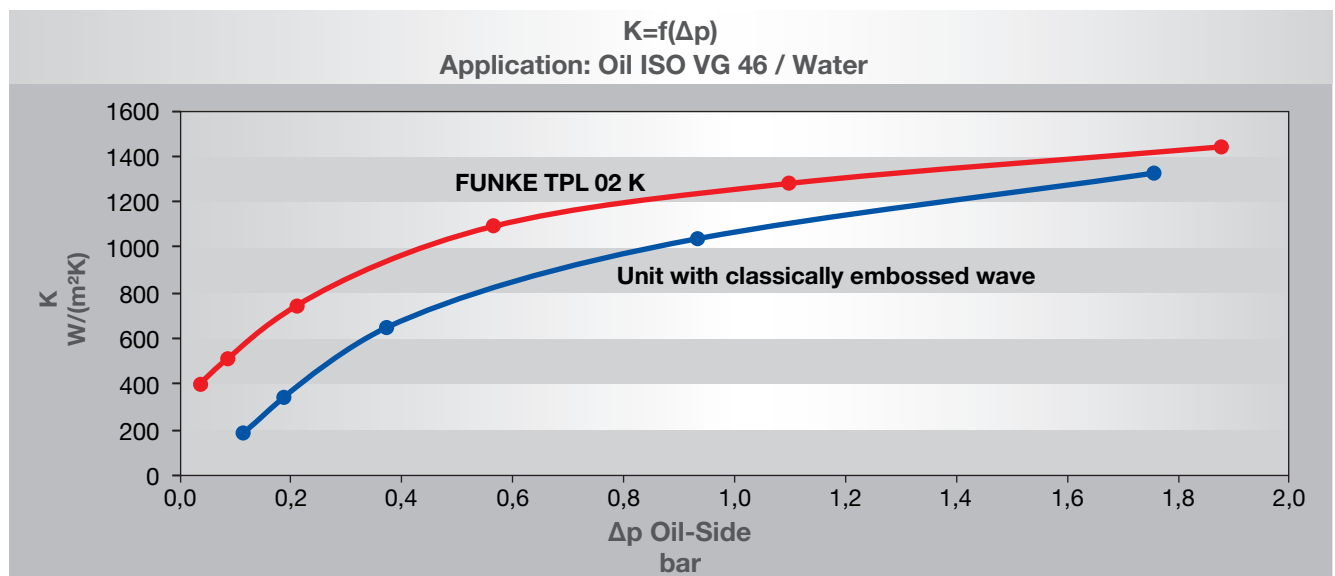
Cross-section: TPL with turbulence sheets

## Series TPL

The TPL-series is a special development to meet the demands of mechanical engineering and plant engineering (e.g. for cooling of hydraulic oil and motor oil). Compared to units with conventional heat exchanger plates, the TPL-volume of the flow gap is up to 80% larger.

Very high heat transfer rates are obtained using special turbulence sheets inserted in the flow gaps and thermo-

dynamically efficient diagonal media flow in combination with maximum diameter connections. Variable design options of these elements allow for optimal adaptation to different applications. Due to the efficient performance of the FUNKE TPL for media with higher viscosities the unit can be of a much smaller size compared to conventional plate heat exchangers!



## Materials

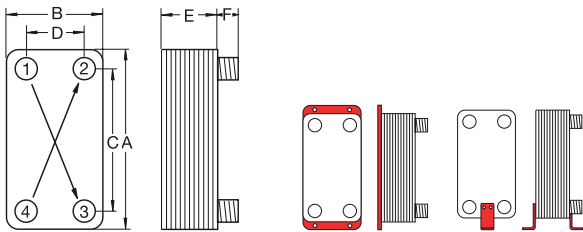
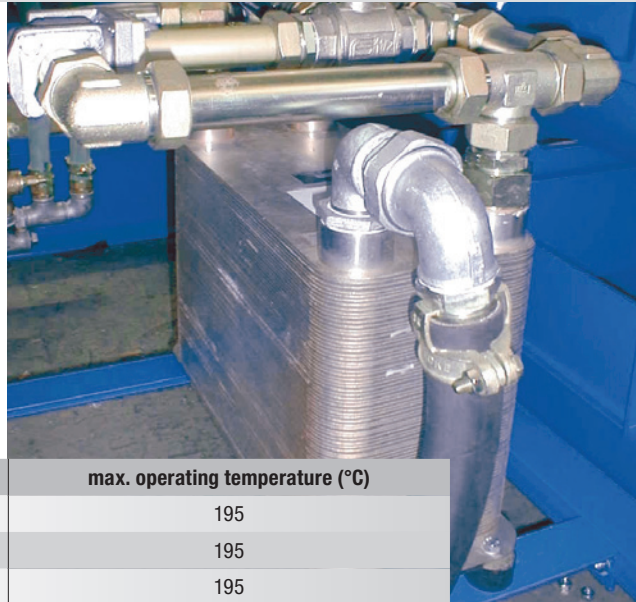
For the plates as a standard stainless steel 1.4404 / AISI 316L or 1.4301 / AISI 304 is used. The solder is copper.



## Technical Data

### Application conditions

Overview series TPL	max. operating pressure (bar)	max. operating temperature (°C)
TPL 00	36	195
TPL 01	36	195
TPL 02	30	195



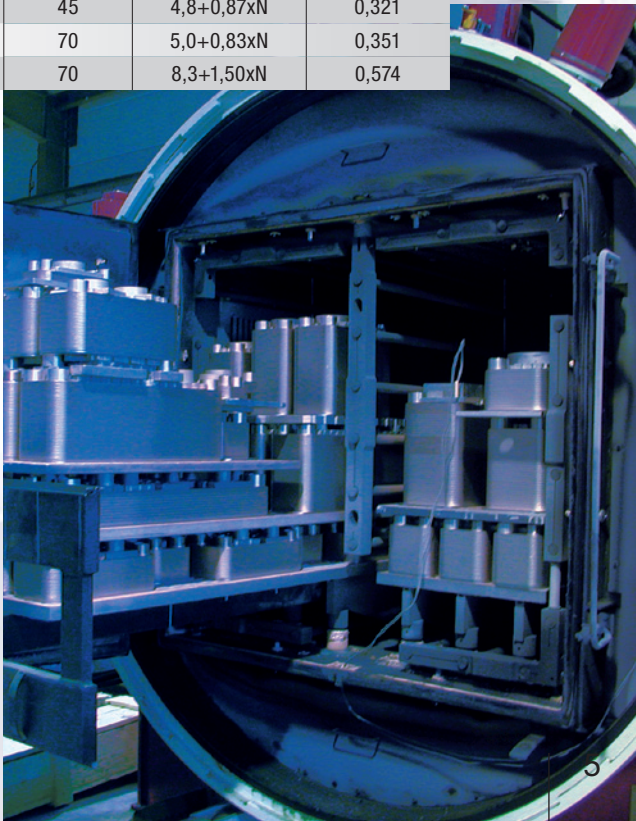
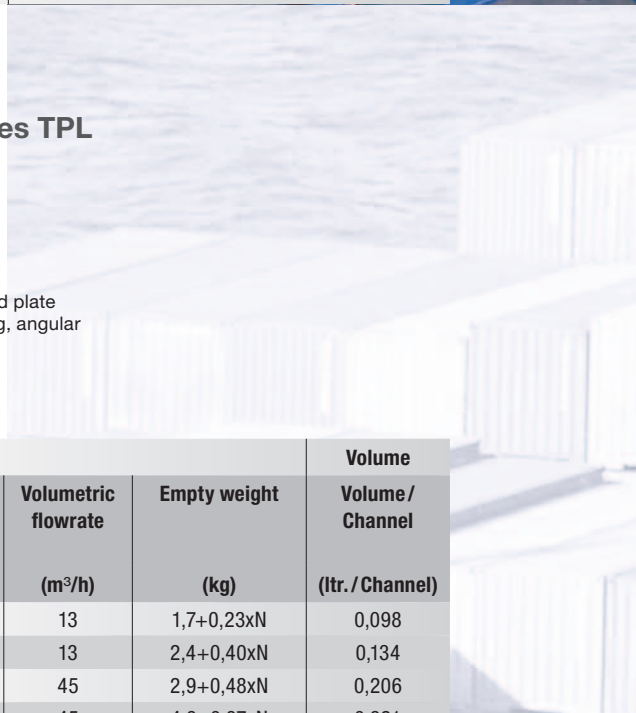
### Overview series TPL

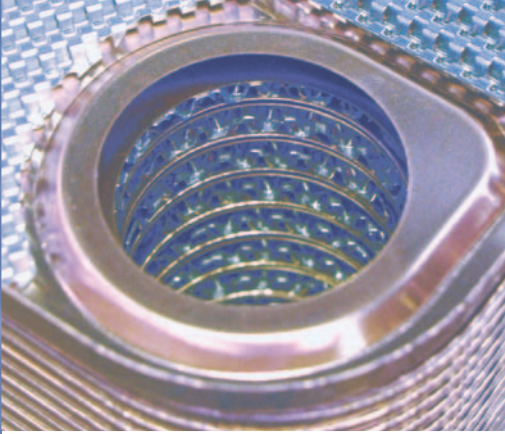
- 1: hot side IN
- 2: cold side OUT
- 3: hot side OUT
- 4: cold side IN

Optional: extended end plate with holes for fastening, angular feet respectively

Type	No. of plates	Dimensions					Connection	Volumetric flowrate	Empty weight	Volume / Channel
		Overall			Distance Connections					
Cooper	(N) (max)	A (mm)	B (mm)	E (mm)	C (mm)	D (mm)	(standard)	(m³/h)	(kg)	(ltr. / Channel)
TPL 00-K	60	274	111	6+4xN	213	50	G 1"	13	1,7+0,23xN	0,098
TPL 00-L	60	439	111	6+4xN	378	50	G 1"	13	2,4+0,40xN	0,134
TPL 01-K	90	383	168	6+4xN	309	94	G 1 1/2"	45	2,9+0,48xN	0,206
TPL 01-L	90	631	168	6+4xN	557	94	G 1 1/2"	45	4,8+0,87xN	0,321
TPL 02-K	120	488	225	6+4xN	403	140	G 2"	70	5,0+0,83xN	0,351
TPL 02-L	120	818	225	6+4xN	733	140	G 2"	70	8,3+1,50xN	0,574

N = Number of Plates





## TPL

- extended end plate
- angular feet

Note: Angular feet are only used for units with a minimum weight of approximately 10 kg.

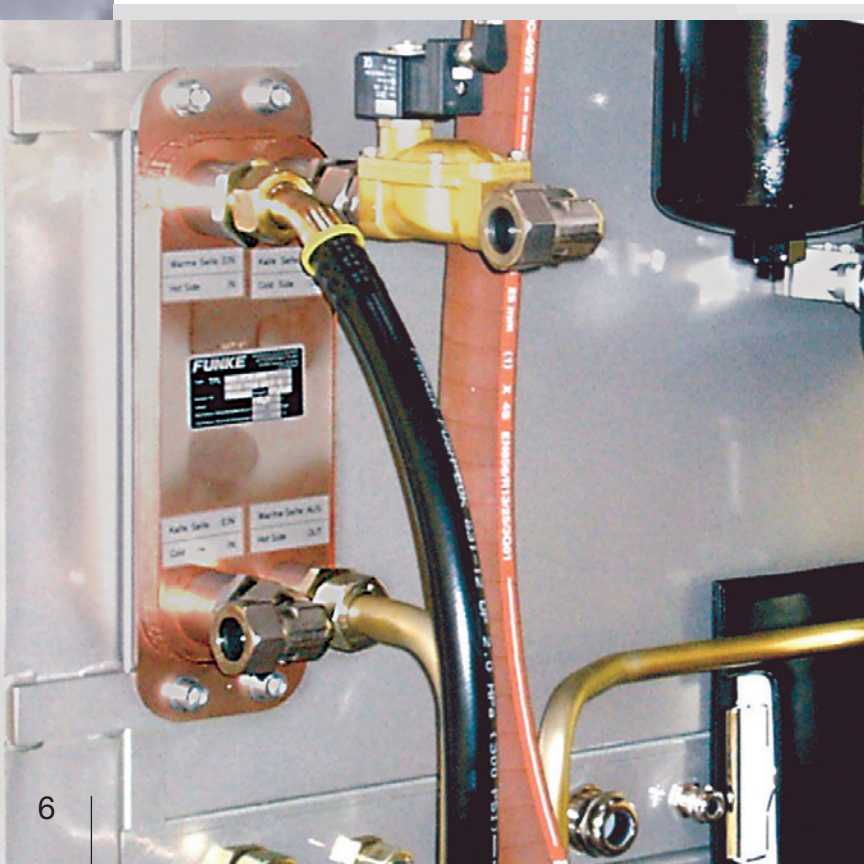
## Insulation (optional)

### Heat insulation

Box with mineral wool with a long-term thermal stability of up to 200°C. Outer casing made of AL-Stucco.

### Cold insulation

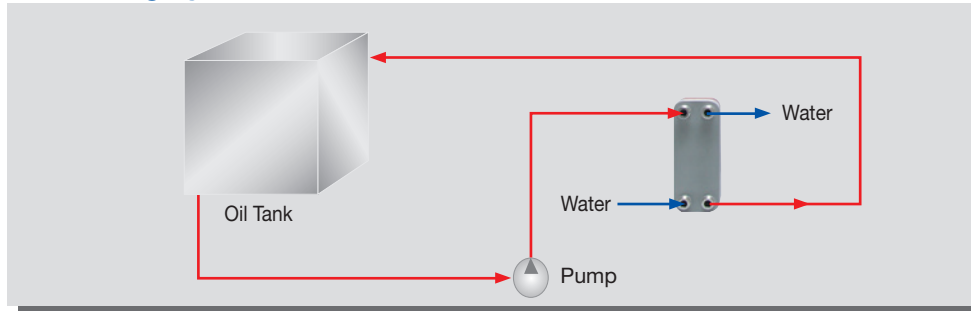
Diffusion tight insulation on the basis of nitrile rubber with a long-term thermal stability from -40°C up to 105° C. Available as self-adhesive multiple part set.



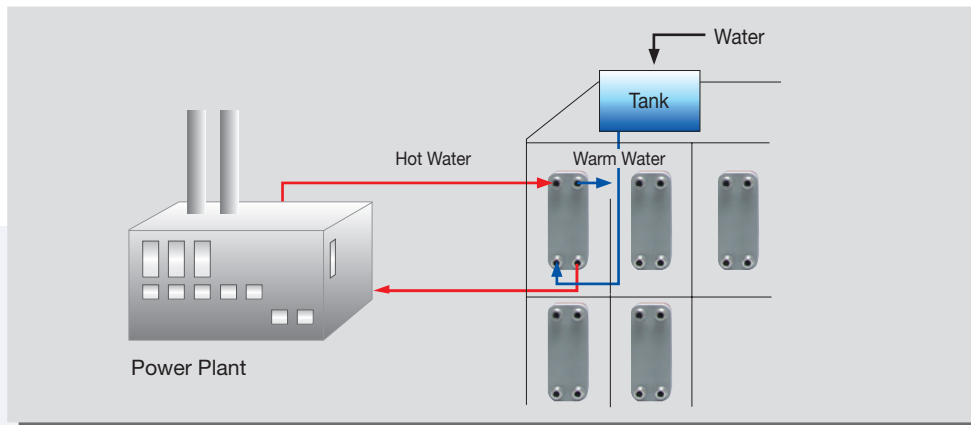


## Brazed Plate Heat Exchangers for industrial applications

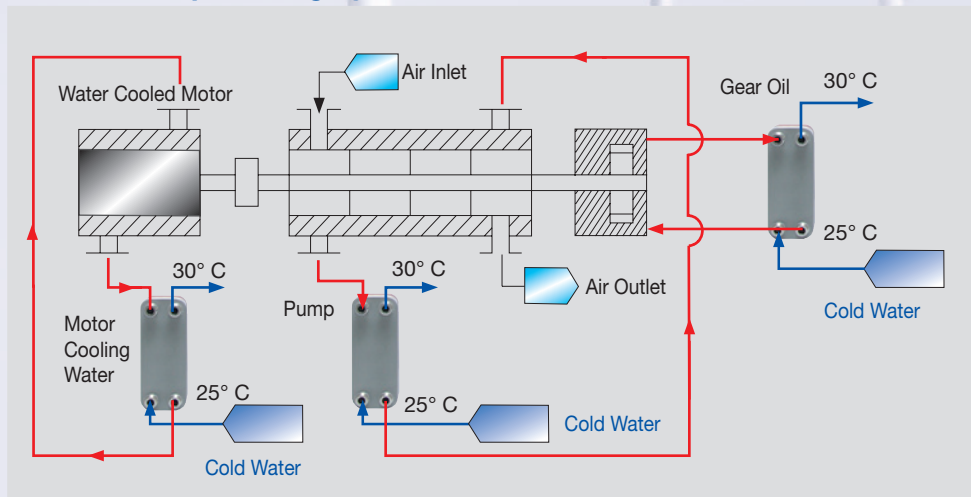
### Oil Cooling System



### Power Plant



### Vacuum Pump Cooling System





Quality means safety. Each unit built by FUNKE is design and pressure tested. Additional approvals are also available in accordance with quality authorities such as:

- American Bureau of Shipping (ABS)
- Bureau Veritas (BV)
- Det Norske Veritas (DNV)
- Germanischer Lloyd (GL)
- Lloyds Register of Shipping (LRS)
- Technischer Überwachungsverein (TÜV)

as well as customers' test and inspection regulations.

FUNKE has been certified according to DIN EN ISO 9001:2008, DIN EN ISO 14001:2004 and is an approved manufacturer according to:

- EU Pressure Equipment Directive 97/23/EC (PED), Module H/H1
- HP0 in connection with DIN EN 729-2
- ASME U-Stamp incl. ASME R-Stamp
- Custom Union (TRTS 032/2013)
- China Certificate



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