

TURBULATORS

The solution for **increasing**
the **efficiency** of tubular heat
exchanger systems

www.jdturbulators.com



JD Turbulators, for more efficient heat transfer

Energy efficiency has become an increasingly important theme in the cooling and heating industry. For many years turbulators have been an important means to improve convective heat transfer in tubular heat exchangers and thereby increase the overall efficiency of the system. In addition to saving on energy use, it also helps to reduce the size, weight and cost of equipment.

JD Turbulators BV; leading in heat transfer with the use of turbulators

The product group of JD Turbulators has grown its expertise in heat transfer enhancement with the use of turbulators for more than 40 years, working with many global heating companies and heat exchanger equipment manufacturers.

With our turbulators we offer a very practical and cost-effective solution for increasing the efficiency of gas boilers, biomass boilers, air heaters, coolers and a broad range of other tubular heat exchangers systems.

We make turbulators in a wide range of geometries, dimensions and materials offering the best efficiency solution for many tubular heat exchanger systems.

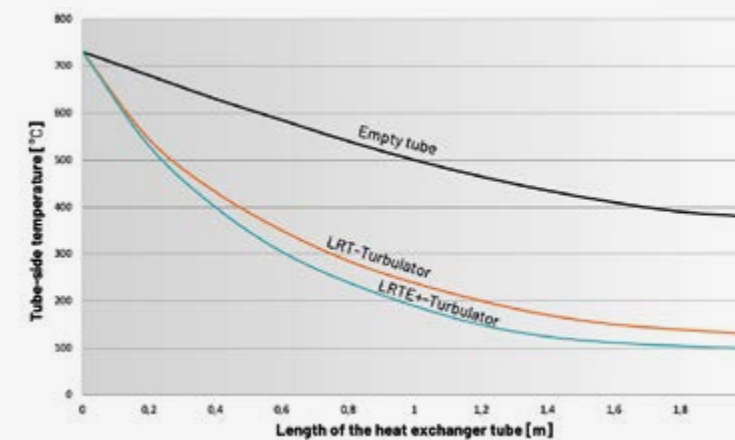
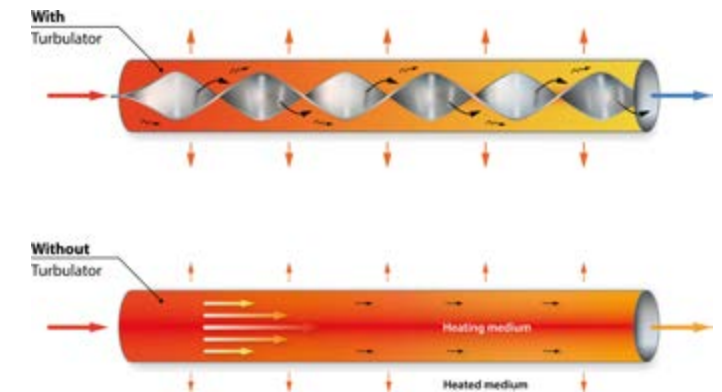
Through the mutual utilization of our modern and innovative machine park and in-house state of the art metal welding and assembly plant in Raamsdonksveer, we can produce quickly, effectively and in high capacities.



Why turbulators?

Working principle

In tubular heat exchangers, heat transfer takes place at the tube wall. Turbulators are inserted into heat exchanger tubes to increase the turbulent flow through the tube. By increasing turbulence intensity turbulators prevent flow stagnation near the tube wall. Additionally, turbulators increase mixing and greater contact of the heating medium with the tube wall. These combined effects significantly increase the convective heat transfer coefficient and thereby the thermal performance of the heat exchanger system.



In practice, the use of turbulators can reduce the length of heat exchanger tubes up to 50%

The graph shows our temperature measurement results of flue gas flowing through a two meter long heat exchanger tube. With turbulators installed, the heat transfer coefficient is almost three times higher than with a smooth tube without turbulators.

In practice this means that with the use of turbulators the length of the heat exchanger tubes can be reduced up to 50% compared to a smooth pipe without turbulators.



Benefits of using turbulators

- ✓ Significant increase in heat transfer
- ✓ Major energy savings
- ✓ Reduce fuel costs
- ✓ Reduction of size and weight of the heat exchanger system
- ✓ Meet the latest emission and efficiency standards/norms
- ✓ Improved heat distribution and pressure control
- ✓ Easy to install and remove
- ✓ Quick return on investment

Our Products

The turbulator that best suits your needs

Our extensive experience with forming techniques, heat transfer enhancement and turbulator applications has led to our unique and innovative product range. We offer five

main turbulator designs each with different heat transfer and pressure drop characteristics. The right turbulator model will be perfectly matched with your application and needs.



Left-right twisted turbulator (LRT)

Get the most out of your gas heating and cooling systems with our Left-Right Twisted Tape range. The left-right twisted geometry offers the best balance between pressure drop and heat transfer improvement, perfect for applications with limited pressure drop.



Efficiency+ turbulator (LRTE+)

Achieve maximum efficiency with the efficiency+ turbulator. Our unique production method enables us to produce a shorter pitch without having to use more material. This makes it the best solution for that last extra step of efficiency increase when more pressure drop is allowed.



Helical twisted tape (HTT)

The smooth helical twisted turbulator is 360° twisted, which forces the flow in a vortex path. For this more conventional twisted tape a wide range of heat transfer and pressure drop correlations are available in the public domain. This ensures application in a broad range of heat exchanger devices.



Corrugated twisted tape (CTT)

This innovative corrugated spiral design and corresponding production process, developed by JD Turbulators, enables to make a short pitch with less material. Hereby we can produce an even shorter pitch while saving on material cost. This turbulator is ideal for the use in more corrosive environments requiring more expensive materials.



Combined spring turbulator (CST)

This turbulator consist of an outer spiral and a twisted tape inner part. This turbulator is used to clean the fluepipes of biomass boilers and maximize their thermal efficiency.

Turbulators in all shapes and sizes

We manufacture turbulators in a wide range of dimensions, materials and geometries adjusted to suit the tube sizes, flow regimes and temperatures of your application. Due to our flexible and innovative machine park we are able to offer you one-off solutions, custom made parts and standard series. We have a broad spectrum of materials on stock ensuring us

to deliver quickly and effectively, both in large and small quantities. According to your requirements we make a proposal for the turbulator design and a quote based on the needed quantities. If required, we can make a heat transfer calculation and provide samples for testing the effect the turbulators will have on the performance of your application.

| LRT | LRTE+ | HTT | CTT | CST |
|-----|-------|-----|-----|-----|
| ✓ | ✓ | ✓ | ✓ | ✓ |
| ✓ | ✓ | ✓ | ✓ | ✓ |
| ✓ | ✓ | ✓ | ✓ | ✓ |

Production and characteristics

- Vary the pitch according to the allowed pressure drop
- Flexible production method allows the production of both large and small quantities
- Tailor made according to the customers specifications
- Cleaning functionality for biomass boilers

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Dimensions & Materials

- Width: 4 - 96 mm (*Available on request)
- Width: 18 - 96 mm
- Lengths: Available in all lenghts
- Thickness: 0.4 - 1.0 mm (* Thicker material available on request)
- Wide range of corrosion and heat resistant materials available on stock
- Materials kept on stock on request
- Diverse range ot endpieces available

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Handling & Shipment

- Easily stackable
- Easy to install and remove
- Lightweight
- Shipment worldwide

| | | | | |
|---|---|---|---|---|
| ✓ | ✓ | ✓ | ✓ | ✓ |
| ✓ | ✓ | ✓ | ✓ | ✓ |
| ✓ | ✓ | ✓ | ✓ | ✓ |

Costs & Service

- Low return on investment
- Performance analysis for your application on request
- Request a quote and determine a turbulator design without obligation

Applications

We have experience with the manufacturing of turbulators for many different types of tubular heat exchanger applications, both for cooling and heating processes.

We offer designs to be used either with gas or liquid media. The following selection of applications demonstrate the broad range of use of our turbulators.

Gas boilers and air heaters

For solid and gas fueled boilers and convective air heaters our left-right twisted turbulator most often is the best choice when the allowable increase in pressure drop is limited.

We recommend our efficiency+ turbulator when there are less constraints on the total pressure drop. Further gas applications we have experience with are numerous: condensers, water heaters, recuperators, syngas boilers, steam boilers, preheaters, radiant heaters, ovens, heat recovery units.

Additionally, we notice an increasing demand for turbulators for applications of the future such as hydrogen boilers and fuel cells.



Biomass boilers

Besides increasing heat exchanger efficiency, turbulators are used to clean scale deposits of the fluepipes from biomass boilers.

As fouling in the heat exchanger is the primary cause of a decreased boiler thermal efficiency within time, cleaning of the heat exchanger tubes of biomass boilers is essential to maintain maximal system performance.

Our combined spring turbulators are an economic solution for both cleaning and efficiency for biomass boilers.



Broad range of tubular heat exchangers

Our turbulators are an interesting option for a wide range of tubular heat exchangers when the flow is in the laminar or near laminar range.

The applications we have experience with are numerous and include; shell & tube heat exchangers, re-coolers, oil coolers, chillers, evaporators, condensers, heat pumps, heat recovery shower drains, solar water heaters and other tube-side heating or cooling applications using water and water/glycol mixtures.

We manufacture our turbulators precisely tailored to the specific application conditions, ensuring the right corrosion and heat resistance as well as heat transfer and pressure drop characteristics.



Static mixers

Turbulators can be useful when fluids need to be mixed. The increased turbulence reduces mixing times or equipment size. As there are no moving parts in the system

besides the pump, maintenance costs are low. Furthermore, turbulators can be installed in reactor tubes to improve overall conversion.

Want to know what JD Turbulators can do for your application?

Call or email us for sample requests, heat transfer calculations or state your dimensional requirements and request a quote.

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JD Turbulators

Your partner for increasing
energy efficiency

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