

# **KRATER**



**MANUFACTURING, PROCESSING AND TREATMENT OF METAL AND ELEMENTS OF METAL**

**COMPANY BROCHURE  
2022**

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**ABOUT US**

**Krater DOOEL Import - Export Ilinden** is a leading company working in the field of thermo-technical and hydro-technical installations, with a tradition of more than 30 years of designing and installing heating, ventilation and air conditioning systems and gas installations, providing with the complete equipment - steam boilers, hot water boilers, refrigerators stations, compressor stations for compressed air and the other necessary equipment for the mechanical rooms. We have our own production line for all types of ducts (square and spiral) and fittings.

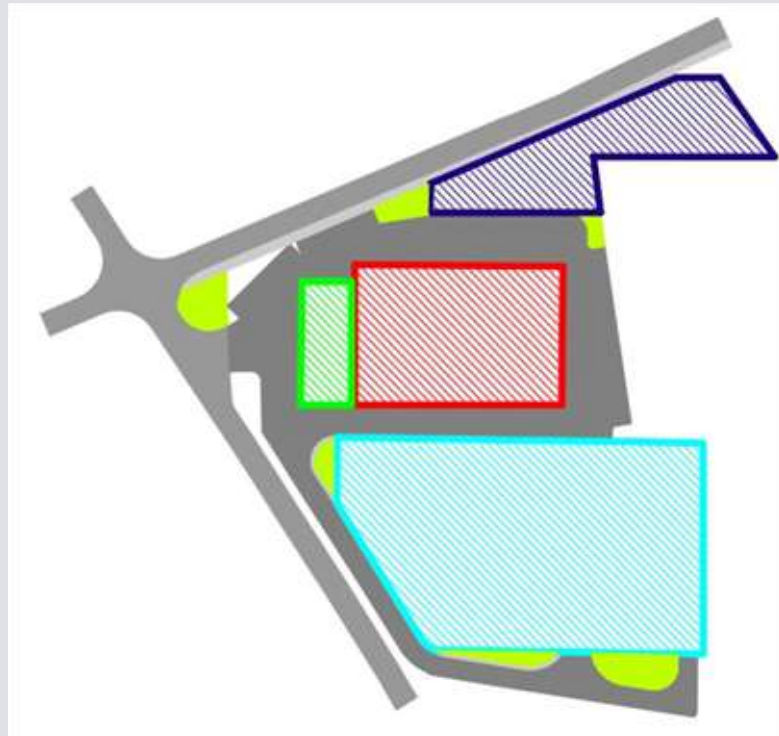
We are proud to announce that recently our company has started a new state-of-the-art production line specialized in metalworking processes and surface treatments of metals for manufacturing individual parts, assemblies and other structures.

**OUR MISSION**

In our many years of experience, we have always strived for quality and high level of professionalism in every project, resulting in the fulfillment of our goal to have satisfied customers, understanding their individual needs and requests and maintaining excellent long-term relationships with them.

To achieve this objective, we continue to practice the values that stand at the core of our professional philosophy of fast and efficient response to customer requests. We are constantly working on improvement and expansion of our facilities and products.

**OUR FACTORY**



- a production plant of 3200m<sup>2</sup>, where the complete ventilation and air conditioning components are produced
- an administration building of 1000m<sup>2</sup> where the offices of the operational engineering, planning, commercial and management teams are located
- a production plant of 8000m<sup>2</sup> for metalworking processes and surface treatments of metals
- a warehouse of 3600m<sup>2</sup>

**PERSONNEL  
STRUCTURE**

**Krater DOOEL Import - Export Ilinden** is adequately and professionally staffed with:

Administration .....	20 persons
R&D.....	5 persons
Quality.....	5 persons
Production.....	95 persons
Other (sales, procurement, controlling...) .....	7 persons
Total.....	132 persons

Our company has all the necessary permits, license A for design, license A for construction and authorizations A for construction, design, supervision and audit in the field of mechanical engineering. Following the local, governmental and international regulations, our projects are carried out professionally.

**Krater DOOEL Import - Export Ilinden** has a certificate for quality management system ISO 9001:2015. In the future we're aiming to implement: ISO 45001 (OHSAS 18001), ISO 14001, IATF 16959 and ISO 3834 standards.

**OUR SERVICES**

We are offering the following processes and configurations:

- Consulting
- Designing and installing of thermo-technical and hydro-technical systems
- Testing, measuring, control and maintenance of the systems
- Production of all kinds of ventilation and air conditioning components
- Metalworking processes (for production of parts, assemblies and other structures) such as: tube and sheet bending, laser and plasma cutting, profile and plate rolling, pipe end forming, milling and drilling, seaming, roll forming and flanging, seamed tube forming, spiral elements forming, spot, stitch, orbital and manual welding, brazing etc.
- Surface treatment of aluminium (anodization) and stainless steel products (pickling)
- Research and development
- Leading personnel in the industry



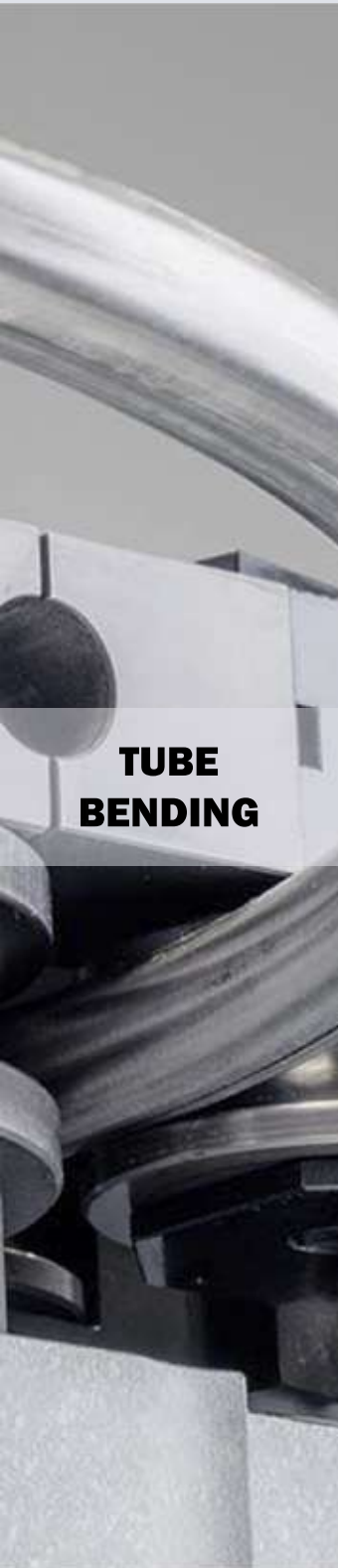
**LASER CUTTING**

<b>General information</b>	single laser cutting head for two complementary processes of tube and sheet / plate 2D cutting with fiber source of 4kW
<b>Workable materials</b>	mild, alloyed and stainless steel, aluminium, copper, brass
<b>Working area</b>	3000 x 1500 mm
<b>Material thickness (max.)</b>	mild steel - 20 mm stainless steel - 15 mm aluminium - 15 mm brass - 6 mm copper - 6 mm
<b>Tube length</b>	up to 6500 mm
<b>Tube shape</b>	round, square, oval, rectangular, flat, semi-flat-oval round - Ø12 mm up to Ø120 mm square - 12 x 12 mm up to 100 x 100 mm rectangular - 10 x 12 mm up to 120 x 70 mm flat - 10 x 12 mm up to 120 x 70 mm oval - 10 x 12 mm up to 120 x 70 mm semi-flat-oval - 10 x 12 mm up to 120 x 70 mm
<b>Working range</b>	software for designing and drawing of the workpiece geometry with included module which automatically applies the best parameters depending on each individual geometry, also managing the correct cutting strategy, with the possibility of importing 3D models created on other CAD packages (STEP and IGES)
<b>ARTUBE</b>	automatic and dynamic management of all cutting parameters (diameter less than half thickness, zero heat-affected zone, narrow cutting features) resulting in smooth, well-defined edges
<b>Active Speed</b>	automatic beam diameter optimization that produces the right power concentration on each sheet metal
<b>Quality</b>	



**PLASMA CUTTING**

<b>General information</b>	especially efficient process of 2D plasma sheet cutting
<b>Workable materials</b>	mild, galvanized and stainless steel, aluminium, copper, brass
<b>Working area</b>	3000 x 1500 mm
<b>Thickness range</b>	from 0.5 mm up to 15 mm
<b>HVAC</b>	software for designing and drawing of the workpiece geometry, including libraries of rectangular, round and oval fitting shapes as a standard, with the possibility of importing 2D models created on other CAD packages (DXF)



**TUBE  
BENDING**

<b>General information</b>	right-handed and / or left-handed in-process bending allowing freedom of bending directions and orientation (flat, sideways, inclined)
<b>Workable materials</b>	in general all alloy (copper, aluminium, brass), iron and steel
<b>Bending shapes</b>	round, oval, rectangular, pre-processed with holes or slots, special shapes**
<b>Diameter range</b>	from 6 mm up to 102 mm
<b>Bending radius</b>	up to 165 mm* and up to 350 mm**
<b>Radius - single cycle</b>	fixed and / or variable
<b>Mode - single cycle</b>	single and / or multiple radiuses
<b>X axis accuracy</b>	± 0.05 mm
<b>Y and Z axis accuracy</b>	± 0.05°
<b>VGP3D</b>	efficient software for creating feasible machine programs using single part coordinates or importing 3D models created on other CAD packages (STEP and IGES) where the program is written automatically
<b>B-Tools</b>	function of automatically and safely applying a correction in the theoretical data of the part stored in a database of prior bending experiences in similar or identical materials
<b>Spring back</b>	automatically calculating the behavior of the part to prevent the formation of unsightly marks caused by slippage at the end of the bend
<b>Features sensor</b>	bending pre-processed laser-cut parts accurately by using an effective system for detecting the presence of holes, slots, and beads (or other features) and correctly orienting them during bending, guaranteeing accurate results regardless of the operator's skills
<b>Repeatability</b>	unique geometric accuracy even for complex parts resulting in an infinite number of virtually identical parts

\* Configuration 1  
 \*\* Configuration 2



**SHEET  
BENDING**

<b>General information</b>	motorized process of folding sheet metals
<b>Workable materials</b>	mild, galvanized and stainless steel, aluminium
<b>Working length</b>	up to 2500 mm
<b>Sheet thickness</b>	up to 2 mm




**PROFILE ROLLING**


**General information**


motorized process of section bending with set of 3 rolls that are independently and hydraulically adjustable in all three directions enabling additional versatility (asymmetrical and symmetrical bending) with the possibility to pre-bend both ends of the part

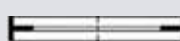
**Bending shapes**

flat, square, rectangular and round bar, tubes, pipes, L-, T-, U- and I-structural profiles, UPN and IPE profiles


 75 x 75 x 7 mm - up to Ø750 mm\* (160 mm\*\*)

 60 x 60 x 6 mm - up to Ø750 mm\* (250 mm\*\*)


 70 x 70 x 8 mm - up to Ø750 mm\* (160 mm\*\*)


 60 x 60 x 7 mm - up to Ø750 mm\* (230 mm\*\*)


 70 x 70 x 8 mm - up to Ø750 mm\* (200 mm\*\*)


 75 x 15 mm - up to Ø500 mm\* (160 mm\*\*)


**Capacity table (max.)**


 200 x 20 mm - up to Ø500 mm\* (160 mm\*\*)


 45 x 45 mm - up to Ø450 mm\* (160 mm\*\*)


 Ø50 - up to Ø500 mm

 Ø76 - up to Ø750 mm

 50 x 50 x 5 mm\*\*\*

 IPE 140 - up to Ø700 mm

 UPN 140x60 - up to Ø700 mm

 UPN 140x60 - up to Ø800 mm

**Machine capacity**

up to 14 cm<sup>3</sup>\*\*\*\*

\* Indicated diameters valid for max. section in one or few passes. Smaller sections can be bent to smaller diameters

\*\* Maximum diameter for smaller sections

\*\*\* Bending diameter depending of the grade of deformation that can be accepted

\*\*\*\* Elastic section modulus only for profiles with center of gravity that is not displaced



**PLATE ROLLING**

**General information**

process of bending and shaping plate sheets, with the possibility of producing ferrules of various diameters (conical bending)\*\*

**Workable materials**

steel, stainless steel, aluminium, alloys\*\*\*

**Plate width**

up to 1270 mm\* and up to 2000 mm\*\*

**Material thickness**

rolling - up to 3 mm\* and up to 7 mm\*\*  
prebending - up to 6 mm\*\*

**Material thickness (conical bending)**

rolling - up to 3.6 mm  
pressing - up to 36 mm

**Achievable diameter**

minimum 135 mm\* and 171 mm\*\*

**Ferrule diameter**

minimum 775 mm

\* Configuration 1

\*\* Configuration 2

\*\*\* For configuration 2 if the material composition is within the scope of the machine



**END FORMING**

**General information**

separate left-head and right-head hydraulic forming units for expansion, reduction and processing other forms (collar)

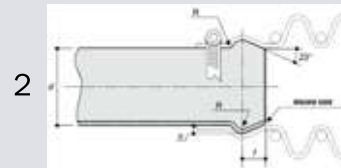
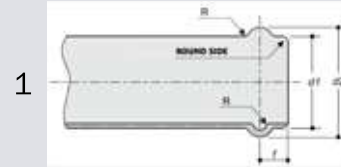
**Workable materials**

mild and stainless steel, aluminium, copper, brass, titanium

**Diameter range**

expansion - 20 mm up to 80 mm  
reduction - 10 mm up to 80 mm  
collar - 10 mm up to 101.6 mm

**Types of collar**



**Wall thickness**

up to 4 mm

**Forming length**

max. 90 mm



**MILLING AND DRILLING**

**General information**

possibility of horizontal and vertical milling, drilling and boring function with pivotable (+90° / -90°) vertical driven milling head

**Milling width**

max. 80 mm (horizontal)

**Milling diameter**

max. Ø25 mm (vertical)

**Tapping size**

max. M16



**MANUAL WELDING AND BRAZING**

**General information**

skilled workers for manual Stick/Arc, MIG/MAG, TIG welding and brazing



**ORBITAL WELDING**

**General information**

continuous welding process where the arc is rotated automatically through 360° around a static workpiece placed in a welding head

**Power source**

source for TIG welding with automatic configuration calculation of the parameters and program generating mode with the possibility of documentation of the welds (date, start time), guaranteeing traceability at each stage in the processes

**Configurations**

pipe with pipe, pipe with elbow, pipe with reducer, pipe with T-piece, spot welding

**Max. wall thickness**

< 3 mm

**Gas lines**

two separate

**Alarms**

on-time alarms that display the defects that are automatically detected by the station during the welding process

**Welding heads**

microfit, closed and open

**Diameter range**

microfit - from 3 mm up to 17.2 mm  
closed - from 6 mm up to 115 mm  
open - from 10 mm up to 220 mm

**SEAMED TUBE FORMING****General information**

fully-automatic process of production of seamed spiral ducts from coil

**Workable materials**

galvanized and stainless steel, aluminium

**Material thickness range**

galvanized steel - from 0.4 mm up to 1 mm  
stainless steel - from 0.4 mm up to 0.6 mm  
aluminium - from 0.6 mm up to 1 mm

**Diameter range**

from 100 mm up to 1250 mm

**Coil width (all mat.)**

137 mm

**SPOT WELDING****General information**

rocker arm spot welding machines with synchronous welding control (S1)

**STITCH WELDING****General information**

process of production of a low heat welded tube seam, ducts and gores, on a specially designed machine, which does not alter the quality of the material

**Workable materials**

galvanized and stainless steel

**Material thickness range**

galvanized steel - from 0.5 mm up to 1 mm  
stainless steel - from 0.5 mm up to 0.8 mm

**Welding length range**

from 75 mm up to 1000 mm

**Diameter range**

from 100 mm up to 800 mm



**ROLLING, FOLDING  
AND SHEARING****General information**

rectangular duct production process and traverse cutting of sheet metal, according to dimensions, quantity and shape (with adjustable seam-material allowance)

**Workable materials**

stainless and galvanized steel

**Thickness range**

from 0.5 mm up to 1.6 mm

**Duct shape**

L- standard, U- male, U- sections, Box- standard, L- male, Box- male

**Coil width (max.)**

1500 mm

**SEAMING****General information**

very effective and productive process of seaming (seam closing) of rectangular ducts with machine that is specially designed for profiling the male and female seam on each side

**Workable materials**

stainless and galvanized steel

**Thickness range**

from 0.5 mm up to 1 mm

**Minimum duct size**

100 x 100 mm

**ROLL FORMING  
AND FLANGING****General information**

roll forming and flanging process of pittsburgh seams on rectangular ducts and fittings

**Workable materials**

stainless and galvanized steel

**Thickness range**

from 0.5 mm up to 1.2 mm

**Flange height range**

from 8 mm up to 10 mm

**SPIRAL ELEMENTS  
FORMING****General information**

production of segmented elbows and similar components (reductions, T-, X- and Y- elements, caps, couplings)

**Workable materials**

galvanized and stainless steel

**Material thickness**

galvanized steel - from 0.4 mm up to 1.25 mm  
stainless steel - from 0.4 mm up to 0.8 mm

**General information**

leak detection process (of the leaks resulting from minor defects in the assembly such as cracks, weld porosity, valve leakage) with a portable instrument extremely sensitive to small concentrations of hydrogen gas, achieving exact pin-pointing of the leak position even in case of multiple leaks

**Tracer gas mixture**

5% H<sub>2</sub> and 95% N<sub>2</sub> (environmentally friendly and low cost tracer gas)

**Dynamic sensitivity**

automatically decreasing the sensitivity with increasing concentration of hydrogen enabling to find both small and large leaks

**Testing method**

completely dry and doesn't require cleaning and/or drying after the leak test

**Sensitivity**

7.8 ppm H<sub>2</sub>

**General information**

procedure for detecting and assessing leaks using a visual inspecting method for gas bubbles (in a water-filled bath) as an immediate indicator of the existence of leaks due to pressure differential across the assembly

**Pressure**

by request

**ANODIZING**

<b>General information</b>	electrolytic passivation process used to increase the thickness of the natural oxide layer on the surface of aluminum parts within our own plant for pre-treatment, anodizing and surface conversion where all the parameters intervening in the process are automatically controlled
<b>Laboratory</b>	our plant is also equipped with suitable laboratory instruments (pH meter, conductometer, UV/VIS spectrophotometer) fit to get the license for QUALANOD quality mark, where the final results from the process are measured against the technical specification of the customer's requirements
<b>Finished product quality</b>	high-quality product which complies with the ISO and ASTM standards
<b>Plant capacity</b>	6000 A (in the future 12000 A)
<b>Product dimension</b>	max. 6500x700x1400mm
<b>Oxide layer thickness</b>	by request
<b>Coloring</b>	possibility of electrolytic coloring process of the surface of the aluminum parts by putting an electrolytic coloring film (in many different colors) on the basis of the transparent anode oxide film
<b>Pre - treatment for powder coating</b>	possibility of pre-treatment of the aluminium surface for powder coating with anodic coating without any surface flaws and thickness as requested
<b>Wastes effluents treatment plant</b>	a chemical-physical treatment plant designed to treat effluents coming from anodizing and pickling where the purification process is automatically carried out

**PICKLING**

<b>General information</b>	metal surface treatment that removes superficial impurities from stainless steel products by exposing them to an acidic solution, after which they go through a process of passivation, thus extending the product's lifetime
<b>Product dimension</b>	max. 2000 x 800 x 800 mm